ALLOCATION OF RESOURCES IN THE SOVIET UNION AND CHINA—1978

HEARINGS

BEFORE THE

SUBCOMMITTEE ON PRIORITIES AND ECONOMY IN GOVERNMENT

OF THE

JOINT ECONOMIC COMMITTEE

CONGRESS OF THE UNITED STATES

NINETY-FIFTH CONGRESS

SECOND SESSION

PART 4—SOVIET UNION

EXECUTIVE SESSIONS

JUNE 26 AND JULY 14, 1978

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ALLOCATION OF RESOURCES IN THE SOVIET UNION AND CHINA—1978

MONDAY, JUNE 26, 1978

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON PRIORITIES AND
ECONOMY IN GOVERNMENT OF THE
JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The subcommittee met, pursuant to notice, in executive session, at 10:05 a.m., in room 5302, Dirksen Senate Office Building, Hon. William Proxmire (chairman of the subcommittee) presiding.

Present: Senators Proxmire, Sparkman, and McClure; and Representative Long.

Also present: Richard F. Kaufman, assistant director-general counsel.

OPENING STATEMENT OF SENATOR PROXMIRE, CHAIRMAN

Senator PROXMIRE. The subcommittee will come to order.

Are we all set, Admiral?

Admiral TURNER. We are all set.

Senator PROXMIRE. Admiral Turner, welcome to our annual hearing on the allocation of resources in the Soviet Union and China.

This year we are dividing the discussion of the Soviet Union and China so we can increase our attention to both subjects. This morning we will discuss the Soviet Union, and on July 21 we will resume the hearing to discuss China.

As in the past, we are anxious to release as much of the testimony as soon as possible to enable Congress and the public to better understand the economic developments in these two countries. We would like to report last year's procedures, by first releasing a sanitized version of your presentation—I should say we would repeat last year's procedures, by first releasing a sanitized version of your presentation together with excerpts from the testimony preliminary to publication of the whole hearing.

Can we do this, Admiral, within 2 or 3 weeks?

Admiral TURNER. We will be ready within 2 weeks, sir.

Senator PROXMIRE. For the sanitized version.

Admiral TURNER. Yes, sir.

Senator PROXMIRE. Admiral, how long will the statement take, incidentally, so that we can be prepared?

Admiral TURNER. Hopefully no more than 30 minutes, sir.

Senator PROXMIRE. All right, fine.

May we have a third statement here, so Mr. Kaufman can follow.

Admiral, go right ahead.

STATEMENT OF ADM. STANSFIELD TURNER, DIRECTOR OF CENTRAL INTELLIGENCE, ACCOMPANIED BY DOUGLAS DIAMOND AND JOHN ECKLAND, OFFICE OF ECONOMIC RESEARCH, AND SIDNEY GRAYBEAL, DIRECTOR, AND DONALD BURTON, OFFICE OF STRATEGIC RESEARCH, AND CHARLES PETERS, CHIEF, CONGRESSIONAL SUPPORT STAFF, NATIONAL FOREIGN ASSESSMENT CENTER; AND LYLE L. MILLER, ACTING LEGISLATIVE COUNSEL, AND ROBERT J. KELSO, OFFICE OF LEGISLATIVE COUNSEL, OFFICE OF THE DIRECTOR OF CENTRAL INTELLIGENCE

Admiral TURNER. Mr. Chairman, I appeared last year and we said that we anticipated a period of significantly reduced growth in the Soviet economy. We have now completed a detailed review of economic developments in the Soviet Union in 1976 and 1977 which reinforces that conclusion.

REDUCED ECONOMIC GROWTH

This first chart in my prepared statement shows that in the period 1966 to 1970, over on the left, the Soviet economy, shown in the first bar, grew at rates comparable to those of Western Europe, shown in the third bar to the right, and considerably faster than that of the United States. In the middle set of bars, 1971 to 1975, the Soviet Union, at 3.8 percent, was well ahead of both Western Europe and the United States. Yet you can see in the final bars of 1976 and 1977 that there has been a change and we now predict the Soviet Union may have trouble keeping pace with the West, either the United States or the European Economic Community in the future.

Let me start dissecting this by looking at our findings of Soviet growth in heavy industry, which is shown on these bars. This is the mainstay of growth in GNP, of course, providing the wherewithal to maintain rapid rates of growth simultaneously in investment goods, defense hardware, and consumer durables. You can see from this chart the sharp slowdown in growth in the Soviet Union in the 1976–77 period.

SHORTFALLS IN PRODUCTION

Shortfalls in production of key industrial commodities, especially steel, are shown on the left here, construction materials, not shown here, and machinery have been a major factor in this slowdown.

The growth in steel production slowed to about 2 percent in 1976–77, less than half of what it was in the period 1971–75. These shortfalls can be traced mainly to the increasing Soviet dependence on less accessible and lower quality ore plus past failures to build sufficient processing capacity.

Shortages of steel have also impacted on the machine building industry, a key source of technological progress and productivity gains. Machinery producton, which accounts for about one-third of industrial output in the Soviet Union, increased by about 6 percent annually during 1976–77 after an average of 8.2 percent in 1971–75.

Moreover, the Soviet record in bringing new industrial capacity on stream during the last 2 years has been dismal. With the growth

of investment slowing, gross additions of new plant and equipment increased by an average annual rate of only 2 percent in 1976–77. The left hand bars show the drop in——

Senator PROXMIRE. Do you have any comparison with our own growth of plant and equipment?

Admiral TURNER. Mr. Diamond.

Mr. DIAMOND. We too, have had a slowdown, Senator; in the first half of the 1970's, both here and in Western Europe.

Senator PROXMIRE. Those are in real terms, of course.

Mr. DIAMOND. Yes, sir.

Senator PROXMIRE. And it would seem to me that in the 1971–75 period, they did a lot better. They probably did better than in the 1976–77 period.

Mr. DIAMOND. That's right, but still not as well as in the last half of the 1960's.

EUROPEAN AND U.S. GROWTH IN FIXED INVESTMENT

Senator MCCLURE. Would it be possible to parallel by the same measurement techniques the same fixed investment, sir, in the European Economic Community and in the United States?

Can we have a precise comparison?

Mr. DIAMOND. Yes, sir. We could do parallel charts for investment, as we have official information up through 1976. There is no parallel indicator for unfinished construction, however.

We will supply that for the record.

[The following information was subsequently supplied for the record:]

AVERAGE ANNUAL GROWTH IN GROSS FIXED INVESTMENT

[Percent per year]

	1966–70	1971–75	1976
U.S.S.R.	7.6	7.0	3.9
United States	0.8	0.0	8.6
United Kingdom	3.7	1.3	−3.3
Canada	3.0	7.2	.8
France	7.7	3.1	5.0
West Germany	3.8	−1.0	5.1
Italy	7.3	−1.0	2.3
Japan	16.4	3.6	4.5

UNFINISHED CONSTRUCTION

Admiral TURNER. I think the thing that distresses the Soviets most here is the volume of unfinished construction which has increased markedly and is particularly distressing to them because they have put a lot of emphasis in this period on finishing projects that were already underway. Project completions are frustrated by endemic bottlenecks in the supply of components, particularly machinery, and by a lack of incentives in their construction organizations. Bonuses are based largely on the value of the work accomplished, regardless of whether this results in a finished, viable product. Basic construction work has a higher ruble value, but finishing work does not, so the incentive isn't there that needs to be.

In addition, major investment projects are becoming longer term and more costly, requiring large amounts of supporting infrastructure before they can become operational.

Agricultural Sector

Turning now to the large swings in agricultural output which continue to cause annual fluctuations in GNP, after rebounding in 1976 from the disastrous grain crop of 1975, the growth of farm output in the U.S.S.R. fell back to its long-term trend of about 3½ percent last year.

A bright spot in the future of the farm outlook was a clear signal for a more liberalized Government policy toward the private agricultural sector. Press articles in 1976 and 1977 not only officially sanctioned private farming, but also promised aid, including the all-important provision of feed.

The second chart in my prepared statement shows the private sector has begun to respond to these initiatives with private holdings of livestock which increased last year, the first gain since 1970.

As usual, the wide swings in farm output and their effect on industrially processed food and softgoods have hit the Soviet consumers sharply, particularly in the availability of food. Per capita, meat production in 1976 was set back almost to the 1970 level as a result of the poor harvest in 1975. Meat shortages were frequent and widespread. Although some gains occurred in 1977, meat supplies still remained below the 1975 levels resulting in long queues and several civil disturbances.

Trade

Although the Soviet Union continued to make large outlays of hard currency for grain to support the livestock program, the one area in which the Soviets have achieved major success is in hard currency trade. The deficit was cut from $6.3 billion in 1975 to $5.5 billion in 1976—would you, Mr. Eckland, show where that is—to $3.2 billion in 1977. This is likely to be reduced further in 1978 as purchases of machinery and equipment from the West drop sharply because of the decline in orders last year.

Moreover, we do not expect Moscow to experience any difficulty in meeting its financial obligations of about $3.5 billion in debt service this year. The picture is expected to change sometime between 1978 and 1982 as declining oil production results in reduced exports of oil.

Bedeviled by low productivity, declining resource growth, and uncertain harvests, the Soviet leadership has planned for continued slow growth in 1978. Although modest by Soviet standards, the 1978 plan nevertheless will require better than average weather for agriculture as well as success in dealing with the problems of steel and energy. The Soviets must break the bottleneck in steel output, for example, if they are to meet their output plans for industry as a whole and for machinery in particular. They must also avoid a decline in oil production which we foresee perhaps as early as 1979 and almost certainly by the early 1980's. Otherwise, a slowdown in growth of total energy production can be expected during the next year or two.

Looking ahead to 1980 and beyond, our bleak assessment still rests primarily on the four major problems mentioned last year: Manpower, productivity, energy, and agriculture. This chart shows a slowdown in labor force growth which begins this year and will continue through the 1980's, the inevitable consequence of falling birth rates of the 1960's.

MANPOWER

Senator PROXMIRE. Do they have anything like our flexibility?

Now, we had an enormous increase in the work force the last year, so big that even though we had a huge increase in jobs in one year, the biggest in any one year, we still didn't diminish unemployment as much as it ordinarily would because the work force grew so much, a lot of women coming in, young people coming in.

Do they have that kind of potential, or do they in that regimented society have their women and young people working about as much as they can.

Admiral TURNER. They have a potential on the older end of extendin the working age, which would give them a one-time shot in the arm for this. They don't have an incentive system today that makes you want to work after you have reached your normal retirement.

Senator PROXMIRE. What age do they retire?

Mr. DIAMOND. Age 55 for females and 60 for males.

Senator PROXMIRE. So they could lengthen that one way or another and increase their work force that way.

Mr. DIAMOND. That's right, Senator. That is a potential method for enhancing and correcting some of that sharp drop-off indicated in that graph. On the other hand, it is politically sensitive because at the present time there are 25 to 30 million pensioners. Incidentally, a large proportion of these pensioners are caught up in economic activity. For example, when some industrial workers leave the labor force at the time of retirement age, they frequently go back to their village and pick up agricultural activity in the way of a plot of land and one or two head of livestock, so their contribution doesn't go to zero by any means.

In addition, another 20 percent, or so, continue jobs in State organizations under the current regulations and still receive their pension upon retirement.

Senator PROXMIRE. We have more than one-half now, I understand, close to a half of women with school-aged children in the work force.

Mr. DIAMOND. That's true.

Senator PROXMIRE. Twenty years ago we had only one out of four.

Mr. DIAMOND. That's right.

Senator PROXMIRE. What kind of participation do women with children have in the work force? Is it comparable to ours now or do they have more?

Mr. DIAMOND. Well, let me give you the overall statistic first. It is the highest in the world; in the 1970 census tracts, which is the last benchmark, 89 percent of females in the prime working ages of 20 through 54 were in the labor force. In the child bearing ages, say 18 to 35, where the preponderance of young children would be associated with these females, the participation rate is the same, about 90 per-

cent. One of the reasons, it has been argued recently, the Soviet infant mortality rate is rapidly rising is because such a large proportion of the mothers are in the labor force and such a large proportion of young children or infants are being kept in communal establishments where communicable diseases are rampant.

Senator PROXMIRE. So they don't have much of a potential there.

Mr. DIAMOND. No, very little potential for increasing the participation rate. Most western industrial societies are around the 50-percent mark for participation of women age 20 through 54. In eastern Europe, between 70 and 80 percent. But we think 90 percent as it is now in the U.S.S.R. is absolutely the upper limit for females. The current rate for males is 92 percent in the able-bodied age brackets, and that possibly could go up to about 94 percent, but probably not.

Senator MCCLURE. You say that they retire at 55 and 60, and yet it is evident to any visitor that there are people older than that working.

For instance, all the streets are swept by older women, and they are above 55, I would judge by observation.

Are they officially retired and then transferred to different work, or were they people that were not covered by the——

Senator PROXMIRE. They probably age pretty rapidly.

Mr. DIAMOND. Under the pension laws——

Senator MCCLURE. I figure that's why there aren't any dogs in the street. Those little old women beat them to death.

Mr. DIAMOND. Under the pension laws, they can remain in employment if total income doesn't exceed a certain level. The type of work, as you personally saw it, is mostly done by low-income service workers who can legally continue to do part-time employment.

Senator MCCLURE. I just wondered if their retirement is real or whether that is just another one of the paper shuffles.

Mr. DIAMOND. That is in the context of what I was saying earlier, that a large part of it is not real, either because of private agricultural activity or doing the sort of thing in urban areas that you visually have observed.

Admiral TURNER. Maybe like the famous story about the little old man who looked like he was in his fifties and was out boasting about how he drank a bottle of booze a day and had a couple of women a day and did all these other great things, and finally somebody asked him how old he was, and he said 32. [General laughter.]

All right, that's the labor force.

The second item was the productivity, and gains here have been slowing for years, and the rising cost of resources is going to make future gains of productivity more difficult.

In the agricultural sector, the third problem area, the key element remains the mercy of the uneven weather conditions that they face.

ENERGY

I would now like to explore in more depth the fourth sector, the energy sector, where the record of the past 2 years is better, but the prospects are at least equally bleak for the future. A major push on western Siberian oil producing areas has kept growth in primary energy near 5 percent, and thus close to their target for 1976 and 1977.

Nevertheless, growth in energy production is slowing, particularly in oil, and the major efforts to exploit the oil producing regions of West Siberia over the past 2 years may cause a sharper slowdown in the years immediately ahead.

The Soviets are not finding and developing new oil deposits rapidly enough to offset the declines in their older fields, and in addition, the production techniques now in use, such as excessive water flooding, focus on short-term gains at the expense of maximum lifetime recovery.

I would like to dwell for a few minutes on this critical topic. Last year's oil production of 10.9 million barrels a day was close to the estimated maximum potential of 11 to 12 million. We expect oil output to fall to between 8 and 10 million by 1985. This estimate is unchanged from last year. We believe it is now generally accepted by other experts in this field.

All growth in oil output through 1980 is to come from West Siberia where the inhospitable climate, the difficult terrain complicate operations. New fields are being put into production in West Siberia at the rate of 6 to 8 per year, but no giant ones comparable to Samotlor, which produced one-fifth of Soviet oil in 1976, are on the horizon.

Beyond the mid–1980's, the Soviet Union is counting on large new oil discoveries, as well as the development of alternative energy sources, coal, natural gas, and hydroelectric. Most potential major sources, however lie east of the Urals, far from major industrial and population centers. Their development would take years and require massive capital investment.

Differences of Opinion About Oil Production

Senator McClure. Could I interject just a moment because you said most experts now generally accept your estimates of 1985 oil production. I have apparently been talking or listening to some others who not only were critical of the original CIA report, but if it were constrained to the 1980–81 period, they might accept it, but beyond 1981 they did not, and I think still do not agree. Their estimate of the ability of the Russians to find oil is apparently higher than yours.

Do you have any comment with respect to that?

Admiral Turner. I will turn to Mr. Eckland on my right as a real expert, but let me say to begin with there are really very few experts in this area. There are very few other Americans than ourselves who pay this much attention to the Soviets. The American oil companies don't have that much interface with them. I have met personally with some of the chairmen, and they don't profess to be real experts on the Soviet situation, and of course, there is disagreement in the general community between our two studies, the one on the Soviet oil and the one on the world oil situation. We find even less disagreement on the Soviet one today than on the world situation.

Beyond that, I think the area of disagreement is in how long it is going to take to get into the Siberian reaches and get it back out again.

Mr. Eckland.

Mr. ECKLAND. Their major problem has been a drilling constraint that limits their ability to both explore and to maintain current production, and they were first hit with this in the early 1970's when the rate of depletion of their existing well stock accelerated sharply, forced them to transfer the rigs from exploration into development, and even though they have made an effort to accelerate their drilling capacity, this trend has continued, and they have programed it this year. There will be about another 10-percent drop in exploratory drilling this year, and this is despite lots of effort and attention given in their press to the need to explore and find more oil.

Even in the priority effort they are giving to West Siberia now, they are running into shortages of drilling equipment to maintain the goal for this, which is given their prime priority in this 5 years, to try to maintain growth in production.

Senator MCCLURE. I understand the point and I don't want to belabor it now, but I might ask to go into it at greater depth at some other time.

Admiral TURNER. Even if the development of other energy sources than oil is pushed to a maximum—and they have been doing well in natural gas—we expect a sharp slowdown in the annual rate of growth of total energy output from an average of 5 percent in 1976 to 1980 to not much above 1 percent in 1981 to 1985. Soviet energy consumption is closely paralleled——

NUCLEAR ENERGY

Senator PROXMIRE. Admiral, I notice that neither here nor in your subsequent remarks do you have anything on nuclear energy, or at least I couldn't find any, nor on the charts.

Do they have any substantial production here, any potential, any potential nuclear production?

Admiral TURNER. Well, it would be a very small percentage of the total.

Mr. Eckland.

Senator PROXMIRE. Like what—less than 1 percent?

Mr. ECKLAND. It would be less than 1 percent through 1980. They have 13——

Senator PROXMIRE. How about 1985?

Mr. ECKLAND. It will accelerate by then and we are still talking less than 2 percent. In the early 1980's, they have a plan to bring on a plant, to mass-produce powerplant components, and that plant will be in operation in the early 1980's, and so by 1985, we ought to see an increase in the rate of installation of atomic powerplants, but we are still looking at less than 2 percent of total energy in 1985.

Senator MCCLURE. How long does it take them to put one in operation?

Mr. ECKLAND. Their record hasn't been much better than ours. The reasons are different, but it is that backlog of unscheduled construction; it just doesn't proceed very fast.

Admiral TURNER. And of course, around the world in particular the use of nuclear power seems to be slowing down considerably, particularly in the lesser developed countries who now find that the sharp increase in costs of construction of nuclear plant—double in the last 5

years, for instance—are making the economies of nuclear power not very attractive.

That is a digression from this, but I think that it is a general trend.

Senator McCLURE. It is a digression. Is it based upon analysis, or is it just a conception?

Admiral TURNER. No; we have had a fair analysis of this.

Senator McCLURE. The capital costs and the attractiveness?

Admiral TURNER. That's right.

Senator McCLURE. Is that based upon the charts that are in use by the administration, that we are going to reach a balanced budget by 1982 and the rate of inflation will slow to 4.2 percent by 1985?

Admiral TURNER. No; I am talking here——

Senator McCLURE. Those are the charts that I have seen that have come from the administration, and of course, if you make those kinds of assumptions, capital costs at the present time don't translate into future savings, but if you anticipate higher rates of inflation, capital intensive investment looks much better in the outyear.

Admiral TURNER. We can provide you, if you would like, an analysis we have done of the attractiveness of nuclear power in the lesser developed countries; how they see it from their point of view, and it really depends very largely on what you accept as a discount rate here. They also had the problem that the few lesser developed countries—the Brazils, the Indias, the Pakistans—who can accept a nuclear power capacity of more than 600 megawatts, and by going to smaller scale, your costs are up, too.

The chart in my prepared statement tries to lay out the question of the relationship of Soviet energy consumption to growth in their economy. Normally it has paralleled the rate of growth of the economy and as a result, of course, a sharp slowdown in energy production could threaten to impede economic growth further unless they save large amounts of energy or allow a major turnaround from its present net energy export position to a net import position.

CONSERVATION

Indeed, some gains in energy conservation were achieved last year. After increasing at about 1 percent per year in 1971–76, energy consumption per unit of GNP leveled off in 1977. Many of these savings were one-time gains which will not be easily repeated. How Moscow copes with the energy problem will have a far-reaching impact.

Senator McCLURE. Could I ask one question?

You are relating gains in energy to 1 percent per unit of GNP? In other words, it was going up more rapidly than GNP?

Mr. ECKLAND. Yes, it was, about 1 percentage point per year more rapidly than GNP.

Senator McCLURE. I think that is important to stress because there are a lot of people talking about a 1 or 2 percent per year growth rate in energy consumption but not per unit of GNP.

Thank you.

Admiral TURNER. How they cope with the energy problem will have a far-reaching impact. Sizeable oil savings through conservation are difficult to identify because a much larger share than in the West is for commercial and industrial use. In the West, transportation and

residential energy use is large and the potential for savings is great. In the Soviet Union, many of the techniques now being discussed in the West to save energy in industry and in households are already employed on a wide scale.

For instance, in transportation, the bulk of Soviet intercity freight is shipped on electrified rail lines rather than trucks. The U.S.S.R. has only one passenger automobile for every 40 to 50 inhabitants compared with one car for every four to five in Western Europe.

Major energy conservation gains in the Soviet Union must come from upgrading much of the current industrial plant and equipment with more energy efficient machinery, a time-consuming, capital-intensive process.

Hard Currency Earnings From Oil Exports

The oil problem could have severe consequences for hard currency earnings of the Soviet Union and Eastern Europe. Last year oil accounted for half of the Soviets' hard currency earnings, while the East Europeans were able to obtain most of their oil needs for soft currency from the Soviet Union. Continuation of present policies could lead to a shift from the Soviet bloc selling 1 million barrels a day for hard currency to buying more than 2 million barrels a day in 1985, a net shift of perhaps $15 billion a year. Under these circumstances, Moscow and Eastern Europe will be hard pressed even to maintain their hard currency import capacity.

As a result, Eastern Europe could be hit hard by Soviet decisions on oil. First, Eastern Europe now gets 1.4 million barrels a day, and by 1980 it is scheduled to get 1.6 million, which is a diversion of about $7 billion in potential Soviet earnings. Moscow will carefully weigh the tradeoffs between continued economic support to Eastern Europe and its own exports for hard currency. There will be strong pressure to force Europe to share the oil shortage. Any substantial cut in oil supplies to Eastern Europe would worsen the already difficult economic situation and could threaten political stability there.

Overall, therefore, we believe the reduction in the rate of economic growth in the 1980's, which we forecast last year, still seems inevitable. A plausible forecast is a growth of GNP of about 4 percent per year during 1978–80, and roughly 3 to 3½ percent in 1981 to 1985. Economic growth could be substantially slower. If the output of energy falls to the lower end of the expected range and there is little conservation, growth in GNP could be limited to 2 to 2½ percent by an energy shortage.

Senator McClure. Admiral, when you answered Senator Proxmire's question with respect to nuclear energy, you indicated that they don't have much and they are not likely to have much, yet they are aggressively pursuing a program of exporting enriched fuels, and as the United States withdraws from the world's commerce as a supplier of enriched uranium, they are eagerly stepping forward. Do I judge from what you say that that may be rhetoric and that they are not able to match their promises with their performance?

Admiral Turner. Mr. Eckland.

Mr. Eckland. What has happened here is that they have a surplus of hydroelectric power in the Siberian area that they can't—they don't

have the transmission lines to bring to European Russia. That is where they located their enrichment facilities. At present they can generate more enriched uranium than their own power industry can consume, and it is at essentially no cost to them there. It is for hydroelectric power that otherwise would go unutilized. That situation is likely to persist until some time in the 1980's, when they will have enough of their own generating capacity to use all the enriched fuel they produce.

Senator McCLURE. Do they have a potential capacity or are they adding capacity to enrichment facilities?

Mr. ECKLAND. I would have to check on that.

Mr. DIAMOND. They are slowing down, and we foresee that the share in the world market will fall.

Senator McCLURE. That their share of the world market?

Mr. DIAMOND. That it will fall in the 1980's, that they will run out of capacity to maintain the recent rates of growth. We forecast that in the mid-1980's they will be earning something like $300 million a year, which will be something above what they are doing now, from selling these enrichments.

Senator McCLURE. In other words, the decline in the 1980's will not be a decline from present levels but from present rates of growth.

Mr. DIAMOND. Correct. They will level off and they will not be able to sustain their recent rapid rates of growth.

Senator McCLURE. But they will be able to increase the exports that they have now.

Mr. DIAMOND. Increase, but not very much.

Senator McCLURE. But they will be able to maintain those exports.

Mr. DIAMOND. There is a range of estimates, and on the lower end of the range there is some decline, but on the higher end, some small increase, but not very much.

Admiral TURNER. In summary, we are looking at these lower rates of growth of GNP and we view the possibility of achieving substantially higher growth to be small. First, they can't do much about their manpower problem. Second, they can't do too much about their productivity investment except in the very long run. Third, agriculture looks like it will remain a headache for them.

Finally, recent measures they have taken and statements they have made indicate that the Soviet leadership is aware of the severity of their energy problem. In brief, the options are limited for mitigating these problems, especially in light of the rigidity of their doctrinaire approach to economic issues, and the high probability of a change in Soviet leadership coming up.

DEFENSE SPENDING

The one option which cannot be overlooked is a change in defense policy, and I would now like to take a few minutes, Mr. Chairman, to discuss the allocation of resources to defense in the Soviet Union, if I may. As you know, in the Soviet Union, only a single line entry for defense is published in the state budget. Even this figure is manipulated to suit Soviet political purposes and bears no relationship to the level of military activities.

To fill the void, we annually estimate the cost of Soviet defense activities. We begin with a detailed identification and listing of their defense activities for a given year. These data are then converted into two value estimates, one in rubles and one in dollars. The ruble estimates are used to assess the impact of defense on the Soviet economy and the relative priorities of the different forces and activities. We estimate the cost in dollars to compare the sizes and trends of Soviet defense activities with those of the United States.

The ruble estimates are expressed in 1970 prices. The dollar estimates this year are expressed in 1977 prices. Constant prices are used in both the ruble and dollar series so that the estimates reflect only real changes in defense activities and not the effects of inflation. Our annual estimates reflect a continuing effort to acquire better and more data and to improve our methodology.

Ruble Estimates

Let's look first at Soviet defense spending in rubles. While we have incorporated a substantial amount of new information this year, it has not affected significantly the magnitude or the trend of the overall estimate we presented last year.

The chart in my prepared statement shows our latest estimates of Soviet defense spending in rubles. The different bars indicate different definitions of defense activities. Using a definition comparable to that used in the United States—represented by the lower bar—Soviet defense spending is estimated to have increased from 35–40 billion rubles in 1967 to 53–58 billion in 1977.

The Soviets might use a broader definition of defense, including in their defense expenditures additional programs such as internal security troops, civil defense activities, military stockpiling, foreign military assistance, and space programs that are operated by the military in the Soviet Union, but by the National Aeronautics and Space Administration in the United States. Estimated spending under this definition, which is shown in the upper bar grew from 40–45 billion rubles in 1967 to 1958 to 63 billion rubles in 1977. The single line below both of these is the announced figure that the Soviets give to us. Our estimates indicate that the average annual rate of growth of Soviet defense spending in ruble expenditures from 1967 to 1977 was 4 to 5 percent.

Senator McClure. That is after inflation is adjusted out?

Admiral Turner. That is correct.

Let me now discuss briefly the resources implications of these estimates of Soviet defense programs. Although no single measure adequately describes the economic impact of the Soviet defense effort, defense spending as a share of gross national product is often used for this purpose. When measured according to a definition of defense activities comparable to that used in the United States, the lower bar in the chart in my prepared statement, the Soviet defense effort absorbs some 11 to 12 percent of Soviet GNP calculated at factor cost.

When the calculation is based on the broader definition of defense, the upper bar, the share is about 12 to 13 percent. Because defense spending grew at roughly the same rate as the economy as a whole

between 1967 and 1977, there was little change over the period in the share taken by defense. By comparison, Soviet spending for civilian investment goods during this period accounted for approximately one-fourth of GNP and spending for health and education 6 to 7 percent.

All of the evidence available to us suggests that the long-term upward trend in Soviet defense spending is likely to continue. Because several major weapon procurement programs are nearing completion, however, the annual rates of growth during the next few years will probably be slightly lower than the long-term average. Such cycles have occurred several times in the past, for example, in the early 1970's, after deployment of the third generation strategic systems tapered off and before deployment of the fourth generation systems began. They do not signal changes in resource allocation policy.

During the early 1980's, we expect the annual rates of growth in Soviet defense spending to increase to a pace more in keeping with the long-term trend of 4 to 5 percent. We project this, first, because we have identified potentially costly systems in some stage of development for all of the Armed Forces, including intercontinental ballistic missiles, strategic naval missiles, fighter aircraft, land arms, and defensive missiles. Second, we see continued capital construction at defense plants, including those associated with the production of costly systems such as strategic missiles, ships and aircrafts. Third, in the Soviet Union as in the United States, the increasing complexity of new weapons has resulted in escalating development, production and maintenance costs.

Finally, we see no indications that the Soviets are dismantling defense research and development and industrial capacity or diverting it to other uses. We think they view the maintenance of this capacity as at least as important as military forces in the field. They know that the Soviet economy is less effective than ours in marshalling high technology resources in an emergency.

Senator McCLURE. You have not touched on civil defense.

Will you?

Is that included in the figures as a defense item?

Admiral TURNER. It is included under the Soviet definition—represented by the upper bar on the chart—but not in the lower bar.

Senator McCLURE. That civil defense figure is included in the total cost of their defense?

Admiral TURNER. Well, again, we think they include it in their total cost of defense, but because it is not included in our defense budget, we don't show civil defense in the lower bar. I am going to discuss the specific figures on it in a minute.

Senator McCLURE. All right, thank you.

Admiral TURNER. Mr. Chairman, I will leave with you today an unclassified paper on estimated Soviet defense spending, trends and prospects which discusses our ruble estimates in some detail.

Senator PROXMIRE. Has that been released publicly?

Admiral TURNER. It is being released here, today, through you for the first time, Senator.

[The paper follows:]

Estimated Soviet Defense Spending: Trends and Prospects

Central Intelligence Agency
National Foreign Assessment Center

June 1978

Key Judgments

Total Defense Spending. Our estimates of the ruble cost of Soviet defense activities during the 1967-77 period indicate that:

- Soviet defense spending, defined to correspond to US budgetary accounts and measured in constant 1970 prices, grew at an average annual rate of about 4 to 5 percent—from 35-40 billion rubles in 1967 to 53-58 billion rubles in 1977.
- Defined more broadly, as Soviet practice might require, defense spending grew from 40-45 billion rubles in 1967 to 58-63 billion rubles in 1977.

Economic Impact. The defense effort has had a substantial impact on the Soviet economy:

- During the 1967-77 period, defense spending consumed an almost constant share of Soviet GNP—11 to 12 percent or 12 to 13 percent, depending on how defense spending is defined.
- Defense investment consumed about one-third of the final product of machinebuilding and metalworking, the branch of industry that produces investment goods as well as military hardware.
- Between 65 and 75 percent of the males reaching draft age were conscripted into the Soviet armed forces. Uniformed military servicemen and civilians working for the Ministry of Defense constituted 3 to 4 percent of the total labor force.
- Defense takes a large share of the economy's best scientific, technical, and managerial talent and large amounts of high-quality materials, components, and equipment.

The armed forces accounted directly for a small share of total Soviet energy consumption. Less than 5 percent of the refined petroleum and less than 5 percent of the heat and electricity consumed by the USSR went to the armed forces.

Composition and Allocation. Ruble estimates provide insight into the resource composition of the Soviet defense effort and the trends in resource allocation among the services. Analysis based on the narrower definition of defense—for which the estimates are more precise—indicates that during the 1967-77 period over one-half of total spending went for investment, a little over one-fourth for operating expenditures, and over one-fifth for research, development, testing, and evaluation.

Examination of defense spending according to service indicates that:

- The Air Forces and the Ground Forces received the largest shares of investment and operating spending. The share going to the Air Forces increased during the period as a result of increased spending for Frontal Aviation. The Ground Forces' share was relatively constant.
- Spending for the Navy and the National Air Defense Forces grew more slowly than defense spending as a whole. As a result, the shares of investment and operating spending going to these forces were smaller in 1977 than in 1967. Most of the growth in spending for the Navy was allocated to ballistic missile submarines, while most of the growth in spending for the Air Defense Forces was allocated to interceptor aircraft.
- The Strategic Rocket Forces received the smallest share of investment and operating spending among the five services. Spending for the SRF was primarily determined by deployment cycles for ICBMs and fluctuated more than that for any other service. By the end of the 10-year period, spending for this service was only slightly higher than in 1967.

Examination of defense spending for intercontinental and regional forces indicates that:

- Spending for intercontinental attack forces subject to SALT II limitation constituted a little over 10 percent of total defense spending and grew at a slower pace than the total.
- Spending for Ground Forces and Frontal Aviation in the NATO Guidelines Area constituted less than 10 percent of total defense spending but grew at about twice the rate of the total.
- Spending for Soviet forces along the Sino-Soviet border constituted a little over 10 percent of total defense spending and grew at more than twice the rate of the total.

Prospects. Soviet economic growth has been slowing in the 1960s and the 1970s, and we forecast a further slowdown in the 1980s. Nonetheless, all of the evidence available to us on Soviet defense programs under way and planned suggests that the long-term upward trend in allocation of resources to defense is likely to continue into the 1980s. There is no indication that economic

problems are causing major changes in defense policy. The atmosphere in Moscow with regard to the economy, however, is one of concern, and the Soviet leaders could be contemplating modest alterations in military force goals. But even if such alterations were undertaken, the rate of growth of defense spending over the next five years or so probably would slow only marginally.

- For the next two or three years, Soviet defense spending will continue to grow. Because some current ICBM, ballistic missile submarine, and fighter aircraft programs are nearing completion, the annual rates of growth in that period probably will be slightly lower than the long-run average.
- During the early 1980s we expect the Soviets to begin testing and deploying a number of the new weapon systems under development. This probably will cause the annual rates of growth in defense spending to increase to a pace more in keeping with the long-term growth trend of 4 to 5 percent a year.
- Conclusion of a SALT II agreement along the lines currently being discussed would not, in itself, slow the growth of Soviet defense spending significantly.

CONTENTS

PREFACE

This report presents estimates of Soviet spending for defense in rubles during the 1967-77 period and describes what we believe to be the prospects for the next five years.

The estimates are expressed in rubles to reflect our understanding of the costs of military equipment and activities in the USSR. Such estimates allow us to assess the impact of defense on the Soviet economy, the resource considerations confronting Soviet defense planners, and the relative priorities assigned to the forces and activities that make up the defense effort. Constant prices are used so that the estimates reflect only real changes in defense activities, not the effects of inflation. The use of 1970 prices permits comparison of estimated defense expenditures with other CIA estimates of Soviet economic performance, which also use that price base.

The estimates are based on a detailed identification and costing of the activities and components that make up the Soviet defense program for each year. A description of our methodology and our confidence in the estimates can be found in the appendix.

This report complements our dollar cost comparison of Soviet and US defense activities.[1] It is the basis for the testimony the Director of Central Intelligence presented to the Joint Economic Committee of the Congress in June 1978.

[1] SR 78-10002, *A Dollar Cost Comparison of Soviet and US Defense Activities, 1967-77*, January 1978.

Estimated Soviet Defense Spending: Trends and Prospects

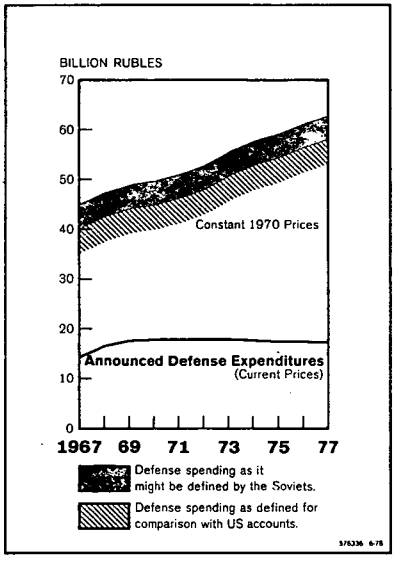
Soviet Spending for Defense

Estimates of Total Defense Spending

We do not know precisely how the Soviets define defense spending. This report uses two definitions: one corresponds to that used in the United States; the other is broader and includes additional costs the Soviets are likely to classify as spending for defense. These additional costs include expenditures for internal security troops, certain civil defense activities, military stockpiling, foreign military assistance, and space programs that are operated by the military in the USSR but by the National Aeronautics and Space Administration in the United States.

Defined to correspond to US accounts, estimated Soviet spending for defense increased from 35-40 billion rubles in 1967 to 53-58 billion rubles in 1977, measured in 1970 prices. According to the broader definition, estimated spending grew from 40-45 billion rubles in 1967 to 58-63 billion rubles in 1977. Under the narrower definition, for which the estimates are more detailed and precise, estimated Soviet defense spending increased at an average annual rate of about 4 to 5 percent for the period as a whole. Growth rates varied from year to year, however, reflecting primarily fluctuations in procurement spending for aircraft and strategic missiles.

Estimated Soviet Expenditures for Defense, 1967-77



Economic Considerations

Although no single measure adequately describes the economic impact of the Soviet defense effort, defense spending's share of GNP is often used for this purpose. During the 1967-77 period, defense spending according to the narrow definition accounted for 11 to 12 percent of Soviet GNP, and, according to the broader definition, for 12 to 13 percent.[1] In comparison, Soviet spending for investment in the economy during this period accounted for approximately 26 percent of GNP, and spending for health and education accounted for 6 to 7 percent.

[1] Because defense spending grew at approximately the same rate as the economy as a whole, there was little change in the share of GNP going to defense.

Another perspective is provided by comparing our estimate of Soviet defense spending with the size of the total Soviet state budget. In 1970, the year in which our defense spending estimate (stated in constant 1970 rubles) is directly comparable to Soviet state budget data (published in current rubles), spending for defense under the narrow definition was over one-quarter the size of total budget expenditures. According to the broader definition, it was nearly one-third.

Another indication of the economic impact of defense is provided by examining defense's share of crucial industrial output and economic resources. During the 1967-77 period, defense consumed approximately one-third of the final product of machinebuilding and metalworking, the branch of Soviet industry that produces civilian investment goods as well as military hardware. In ruble cost terms, about two-thirds of the aircraft and over two-thirds of the ships and boats produced in the Soviet Union went to the defense sector.

During the period, 65 to 75 percent of the males reaching draft age were conscripted into the Soviet armed forces. Uniformed military servicemen and civilians working for the Ministry of Defense constituted between 3 and 4 percent of the total Soviet labor force. The Soviet armed forces accounted directly for a relatively small share of total Soviet energy consumption—less than 5 percent of the refined petroleum and less than 5 percent of the heat and electricity consumed by the Soviet economy.

To the extent that these measures fail to take qualitative considerations into account, they tend to understate the impact of defense programs on the Soviet economy. Defense takes a large share of the economy's best scientific, technical, and managerial talent and draws heavily on the output of science and high-quality materials, components, and equipment.

Spending By Resource Category

A useful way of analyzing Soviet defense spending is to break it down into three principal resource categories—investment, operating, and RDT&E (research, development, testing, and evaluation).[3] Investment, which includes spending for the procurement of new equipment and major spare parts as well as for the construction of facilities, reflects the flow of new equipment and facilities into the military forces. Operating expenditures are those associated with the day-to-day functioning of the military. RDT&E expenditures, associated with exploring new technologies, developing advanced weapons, and improving existing weapons, provide some indication of plans for future force modernization.

During the 1967-77 period, Soviet expenditures for investment averaged a little over one-half of defense spending, while expenditures for operating averaged over one-quarter. The share of defense expenditures going to RDT&E—the fastest growing category—increased from less than one-fifth in 1967 to nearly one-fourth in 1977.

Investment

Between 1967 and 1977, more than 90 percent of Soviet investment spending was for procurement, and most procurement spending was for acquisition of weapons. The bulk of the weapons acquisition outlays went for aircraft, missiles, and ships. Spending for aircraft and missiles grew most rapidly. Spending for land armaments grew at a somewhat slower pace, while spending for naval ships grew little during the period.

Expenditures for the investment category as a whole grew at an average rate of about 4 percent per year during the period, although growth rates varied from year to year. The growth pattern for investment was determined, for the most part, by procurement cycles for aircraft and missiles.

Operating

Operating expenditures, which are associated with maintaining current forces, can be divided

[3] The analysis presented here is based on the narrow definition of defense, corresponding to that used in the United States. However, in breaking down Soviet defense spending into resource categories, we use a wider definition of investment, and a narrower definition of operating, than employed in US defense accounts. These different definitions, which are consistent with our understanding of Soviet accounting procedures, assign a greater share of spending for spare parts and repair to investment, and a lesser share to operating, than the US definitions.

into personnel costs and operation and maintenance costs. Between 1967 and 1977, personnel spending—military pay and allowances, food, personal equipment, medical care, travel, and military retirement—averaged about 60 percent of operating expenditures and approximately one-sixth of total spending for defense. An approximately 20-percent increase in the total number of Soviet uniformed military personnel, along with increased food rations and higher spending for military retirement pay, caused these expenditures to grow during the period at a rate of 2 to 3 percent per year. The growth in personnel spending was most rapid between 1967 and 1972—during the height of the Soviet buildup along the Chinese border.

Operation and maintenance expenditures—for the maintenance of equipment and facilities, the purchase of petroleum, lubricants, and utilities, the hiring of civilian personnel, and the leasing of communications—were consistently lower than personnel expenditures but grew at approximately twice the rate.

RDT&E

The estimate for Soviet RDT&E outlays is the least reliable of our estimates. Because the estimate is based on highly aggregated and uncertain data, we cannot speak with confidence, nor in detail, about the allocation of this category of defense spending among the services or among missions. Nevertheless, the information on which the estimate is based—published Soviet statistics on science, statements by Soviet authorities on the financing of research, and evidence on particular RDT&E projects—suggests that military RDT&E expenditures are large and growing. We estimate that outlays for RDT&E currently account for almost one-quarter of total Soviet defense spending. As with the investment category, we believe that the growth in Soviet RDT&E spending varied from year to year.

Spending by Service

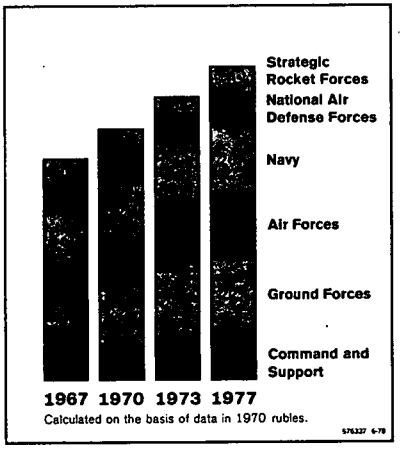
The Soviet armed forces are organized into five services—Ground Forces, Air Forces, Navy, National Air Defense Forces, and Strategic Rocket Forces (SRF). Our direct-costing approach enables us to estimate the allocation of much of defense spending among these services. We cannot, however, estimate how the costs of RDT&E or of certain command, rear service, and other support functions are allocated. The analysis that follows excludes RDT&E and assigns the command and support [1] functions to a separate category. Again, the analysis is based on the narrower and more detailed definition of spending for defense.

Overview

During the 1967-77 period, the Ground Forces and the Air Forces each claimed a little over one-fifth of total investment and operating expenditures. While the Ground Forces' share remained relatively constant throughout the period, the share allocated to the Air Forces grew from one-sixth in 1967 to about one-quarter in the early

[1] This category should not be confused with command, control, and communications, the costs of which are distributed among the services in this analysis.

Percentage Shares of Estimated Soviet Investment and Operating Expenditures for Military Services



1970s before declining slightly near the end of the period. The Navy's share averaged one-fifth and declined slightly during the period. The share going to the National Air Defense Forces, which averaged one-eighth during the period, fluctuated and was smaller in 1977 than in 1967. Outlays for the SRF, which averaged well under one-tenth of total spending for investment and operating between 1967 and 1977, constituted the smallest and most widely fluctuating share. The portion assigned to the command and support category averaged one-sixth during the period. [5]

Ground Forces

Total investment and operating spending for the Ground Forces grew throughout the period at approximately the same rate as total defense spending. With the exception of 1968—the year the Soviets invaded Czechoslovakia—spending for the Ground Forces did not change abruptly from year to year. A major factor in the growth was an increase in manpower from over 1.2 million uniformed personnel in 1967 to over 1.7 million in 1977. Another was the long and steady procurement programs for the principal Ground Forces weapons and equipment.

Investment consistently took a little over 50 percent of spending for the Ground Forces—the smallest share for any military service. Procurement spending, which accounted for 90 percent of Ground Forces investment, was driven, in large part, by the purchase of tanks and mobile tactical surface-to-air missiles and to a lesser extent by spending for armored personnel carriers and artillery. Operating expenditures took over 40 percent of spending for the Ground Forces, and the share for personnel, which averaged 30 percent, was higher than that for any other service.

Ground Forces expenditures between 1967 and 1977 were spurred by the addition of divisions along the Sino-Soviet border and by the modernization of units in the western Soviet Union and Eastern Europe. Expansion of ground forces opposite China proceeded at a vigorous pace between 1967 and 1972, when the Soviets doubled the number of divisions along the border. Throughout the 1967-77 period the Soviets modernized Ground Forces units by introducing a number of new, more expensive weapon systems, by increasing the number of tanks, armored personnel carriers, and artillery pieces in maneuver units, by providing more helicopter support, and by increasing the number of men assigned to tank and motorized rifle divisions. These changes gave the Soviets more balanced and operationally flexible ground forces with improved capabilities for conventional as well as theater nuclear war.

Air Forces

Between 1967 and 1977, spending for the Air Forces increased more rapidly than spending for any other military service. From 1969 to 1973 it grew at over three times the rate for defense spending as a whole. After 1973 it declined slightly but remained at a high level.

Investment expenditures for the Air Forces averaged about 80 percent of total spending for the service, and more than 90 percent of investment spending was for procurement. Expenditures for operation and maintenance and for personnel each averaged about 10 percent of the total. Air Forces manpower increased slowly throughout the period and totaled over 500,000 in 1977.

Spending for both Long Range Aviation and Military Transport Aviation grew somewhat in absolute terms, but by far the largest increase in Air Forces spending between 1967 and 1977 was for Frontal Aviation. Major investment expenditures for Frontal Aviation caused that component's share of Air Forces spending to rise from less than 60 percent in 1967 to over 70 percent in 1977.

The number of tactical aircraft in the Frontal Aviation inventory increased by about 50 percent over the period. The increase was most evident along the Chinese border, where the number of tactical aircraft grew more than fivefold.

[5] This estimate assigns the command and support category a smaller share of defense spending than our previous estimate because it allocates to the individual services costs for a number of functions which were previously allocated to the command and support category.

The Soviets also improved the quality of the force. By 1977 over 60 percent of the fighters in Frontal Aviation were aircraft that entered production after 1969. These new aircraft were initially introduced in large numbers into units in the European USSR and Eastern Europe. They began to appear in large numbers along the Sino-Soviet border after 1975.

The expansion and modernization of Frontal Aviation paralleled the modernization within the Ground Forces and provided the Soviet theater forces with a better capability to wage both conventional and theater nuclear war.

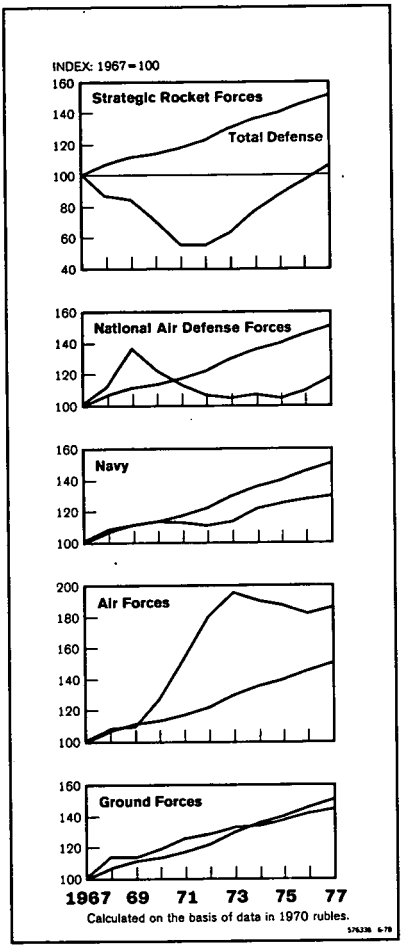
Navy

Between 1967 and 1977 the Navy ranked third in total investment and operating spending, behind the Ground Forces and the Air Forces. During the period, spending for the Navy grew at a rate slightly slower than that for defense as a whole. Spending for ballistic missile submarines grew at a rapid pace between 1967 and 1974, at the same time spending for general purpose naval forces declined. These trends were reversed after 1974.

During the 1967-77 period, investment spending constituted over 80 percent of total spending for the Navy. Procurement expenditures comprised over 90 percent of investment and over three-quarters of total spending for the Navy. Operating expenditures absorbed about 20 percent and were about evenly divided between operation and maintenance and personnel. In 1977, uniformed Navy manpower totaled about 400,000—over 10 percent higher than in 1967.

Trends in naval procurement spending during the period indicate a Soviet emphasis on forces associated with strategic attack, open-ocean antisubmarine warfare (ASW), and open-ocean antiship missions. The bulk of expenditures for combat ships and naval aircraft went for weapon systems associated with these missions. Expenditures for procurement of systems associated with the ASW mission showed a marked increase in 1967 that was maintained throughout the period. Less emphasis was placed on forces for coastal defense, amphib-

Trends in Estimated Soviet Investment and Operating Expenditures by Branch of Service, 1967-77



ious warfare, mine warfare, and interdiction of sea lines of communication. Also evident was a preference for submarines. Between 1967 and 1977, approximately two-thirds of naval ship procurement spending was for ballistic missile and attack submarines.

Major procurement programs during the period included Y- and D-class ballistic missile submarines, which have a strategic attack mission; the C-I and C-II nuclear attack submarines, associated primarily with the open-ocean antiship mission; and V-I and V-II nuclear attack submarines, whose primary mission is open-ocean ASW. Major surface ship procurement programs included Kresta I, Kresta II, and Kara guided-missile cruisers and the Kiev-class ASW carrier—all having either open-ocean ASW or open-ocean antiship missions. Soviet Naval Aviation's antiship capabilities were enhanced by the procurement of Backfire bombers.

National Air Defense Forces

Between 1967 and 1977 the Soviet National Air Defense Forces ranked fourth among the services in terms of spending for operating and investment, with an average share of about one-eighth. During this period, spending for these forces grew at a slower pace than defense spending as a whole. Overall spending for the service peaked in 1969, when expenditures for air defense interceptor aircraft and the Moscow antiballistic missile (ABM) system reached their highest levels. With a reduction in spending for the ABM system, surface-to-air missiles, and interceptor aircraft, outlays declined through 1973. The increase in spending for the National Air Defense Forces after 1975 is primarily the result of procurement of a large number of new interceptors.

Investment spending consistently absorbed over two-thirds of overall spending for these forces, and over 90 percent of investment expenditures went for procurement. Expenditures for operation and maintenance of the National Air Defense Forces averaged 10 percent of the total, while spending for personnel accounted for about 20 percent. Uniformed manpower increased by about 10 percent during the period, to a total of almost 600,000 in 1977—ranking the service second, behind the Ground Forces, in number of men.

Outlays for the National Air Defense Forces exhibited a shift toward interceptor aircraft, and away from SAMs and ABMs, over the period. Spending for interceptor aircraft increased by one-third, while spending for SAMs and ABMs decreased by over one-quarter.

Strategic Rocket Forces

During the period, spending for the SRF grew at a slower pace than total defense spending. Of the five Soviet services, the SRF received the smallest and most widely fluctuating share of investment and operating spending. Primarily responsible for the fluctuations were deployment cycles for ICBMs. In 1967, at the height of deployment for third-generation ICBMs, the SRF accounted for about 10 percent of total investment and operating expenditures. By 1972 the share had fallen to about 5 percent. Outlays have grown steadily since then with the acquisition of fourth-generation ICBMs and the SS-20 intermediate-range ballistic missile, and in 1977 spending for the SRF rose above its 1967 level for the first time in this period. As a result, the SRF's share of total investment and operating spending increased to about 8 percent.

Investment outlays declined through the early 1970s with the completion of deployment of third-generation ICBMs and rose sharply during the mid-1970s with deployment of fourth-generation ICBMs. Operating costs remained relatively stable, however, as the SRF shifted to systems that were more complex but had lower manpower requirements. In 1977, uniformed military personnel assigned to the service numbered over 300,000, a figure slightly lower than the total in 1967.

Most of the spending for the SRF was allocated to ICBM forces. These forces consistently accounted for over three-quarters of spending for the service. Spending for medium- and intermediate-range ballistic missile forces associated with the peripheral attack mission accounted for less than one-quarter of spending for the SRF.

Command and Support

Some costs are not allocated to a specific combat branch because they relate to general support provided by the Ministry of Defense apparatus. Other costs cannot be allocated to the combat branches because we lack the information. We assign both types of expenditures to a category called command and support. This category includes rear services, salaries of Ministry of Defense employees, space programs that in the United States would be managed by the Department of Defense, border guards, material for nuclear weapons, and military retirement pay. During the 1967-77 period, spending for command and support grew at about the same rate as total defense spending and claimed approximately one-sixth of total operating and investment expenditures.

Spending for Intercontinental and Regional Forces

The direct-costing methodology also permits us to assess Soviet spending for forces assigned to specific missions and provides a basis for estimating spending for forces assigned to various geographic regions. This section discusses spending for three sets of forces of particular concern to US policymakers—intercontinental attack forces subject to strategic arms limitation, the tactical air and ground forces stationed in the NATO Guidelines Area of Eastern Europe, and the theater forces opposite China. This analysis is intended to provide insights into the priorities the Soviets assigned to these forces during the past decade. While we are not certain that Soviet policymakers are supplied with budgetary data on these particular forces, it is reasonable to assume that they have a general understanding of the levels and trends of resources assigned to each.

The spending estimates presented here include costs of investment for and operation of these forces, as well as a proportional share of command and support costs. RDT&E costs are not included; if they were, the totals would, of course, be higher than shown.

Intercontinental Attack Forces Subject to SALT II Limitations

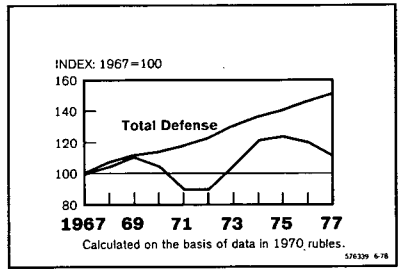
During the 1967-77 period as a whole, the Soviets allocated a little over 10 percent of total defense spending to intercontinental attack forces subject to SALT II limitations.[6] Spending for these forces fluctuated from year to year according to investment cycles for ICBMs and ballistic missile submarines, reaching peaks in the late 1960s and the mid-1970s. Spending was lowest in the early 1970s, during the transition from third-generation to fourth-generation ICBMs and the changeover from production of Y-class to D-class ballistic missile submarines. Between 1967 and 1977, spending for intercontinental attack forces grew at a slower pace than defense spending as a whole, and, as a result, claimed a smaller share of defense spending in 1977 than in 1967.

Soviet Forces in NATO Guidelines Area

The NATO Guidelines Area (NGA) includes East Germany, Poland, and Czechoslovakia. The spending figures discussed here cover spending for Soviet Frontal Aviation and Ground Forces units stationed within these East European countries. These data reflect Soviet efforts to improve

[6] Spending for intercontinental attack, as defined here, includes expenditures for ICBMs, heavy bombers, and those ballistic missile submarines assigned intercontinental attack missions. It does not include spending for the Backfire bomber, which the Soviets contend is not subject to the SALT II limit on the aggregate number of strategic nuclear delivery vehicles.

Trends in Estimated Soviet Spending for Intercontinental Attack Forces Subject to Strategic Arms Limitation, 1967-77



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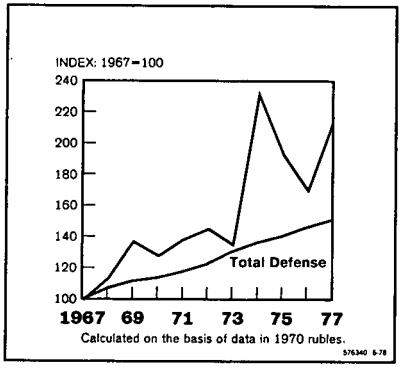
forces positioned in Eastern Europe, but do not reflect improvements to other Soviet forces which have been assigned missions against NATO.

During the period, spending for Soviet forces within the NGA constituted less than 10 percent of Soviet defense spending but grew at approximately twice the rate of total defense spending. Growth was particularly high after 1973 when the Soviets introduced large numbers of new tactical aircraft into Frontal Aviation units within the NGA. Between 1967 and 1977 the Soviets increased the number of tactical aircraft within the NGA by 20 percent. In 1977 over 80 percent of the Soviet tactical aircraft inventory in the NGA consisted of modern aircraft produced since 1969. These improvements to Frontal Aviation in the NGA enhanced the Soviets' capabilities to wage conventional and theater nuclear war in Central Europe.

Spending for Ground Forces units in the NGA grew at a slower pace than spending for Frontal Aviation but reflected Soviet efforts to increase the size and combat ability of these forces. The deployment of five Soviet divisions to Czechoslovakia in 1968 and 1969, and increases in the number of men assigned to divisions, increased the total of Ground Forces personnel in the NGA by about one-third between 1967 and 1977. At the same time, Ground Forces units in the NGA were modernized with additional artillery pieces, rocket launchers, tanks, and mobile air defense weapons.

Trends in Estimated Spending for Soviet Forces in NATO Guidelines Area, 1967-77

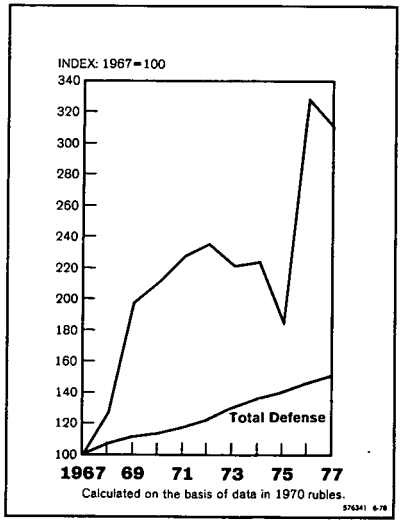


Forces Along the Sino-Soviet Border

The bulk of the Soviet buildup along the Sino-Soviet border, which began in 1964, occurred between 1967 and 1977. During this period, Soviet forces along the Sino-Soviet border accounted for a little over 10 percent of total defense spending and their cost grew at a rate more than twice that of defense as a whole.[7]

[7] Soviet spending for forces along the Chinese border, as defined here, includes spending for Frontal Aviation, Ground Forces, Military Transport Aviation, Border Guards, and National Air Defense units along the border, and Soviet military forces stationed in Mongolia.

Trends in Estimated Spending for Soviet Forces Along the Sino-Soviet Border, 1967-77



Growth was rapid between 1967 and 1972—when the Soviets doubled the number of Ground Forces divisions along the Sino-Soviet border and increased the tactical aircraft inventory fivefold. (Most of these aircraft were older models.) The buildup of forces opposite China proceeded at a slower pace after 1972. High levels of spending in 1976 and 1977 reflected the introduction of new-generation aircraft.

Prospects

Factors Affecting Future Defense Programs

Soviet leaders must weigh a number of factors in formulating future defense programs. These surely include the leaders' perceptions of foreign military threats, their assessment of the utility of military power in advancing Soviet foreign policy goals, and internal political factors—including the influence of institutions and personalities supporting individual defense programs—as well as economic considerations.

The present Soviet leaders appear to share a broad consensus on defense policy. Over the past decade, defense spending has risen each year. Defense activities have been well-funded, even during periodic economic setbacks, and follow-through on key programs has been strong. However, there are forces at work, both at home and abroad, that could make it more difficult to maintain this consensus. These factors—which include gloomy economic prospects, an unsettled strategic environment, and a coming political succession—will assume particular importance over the next year or so, as Soviet plans for defense programs in the first half of the 1980s are formulated.

Economic Outlook. Soviet economic growth has been slowing during the 1960s and the 1970s, and we forecast a further reduction in the 1980s. Recent announcements on plan fulfillment by the Central Statistical Administration confirm that Soviet economic growth in the 1976-77 period was lower than in any other period since World War II, and the situation is likely to worsen. The Soviet economy probably will grow at about 4 percent a year through 1980, but average growth from 1981 through 1985 probably will fall to between 3 and 3.5 percent. These projections reflect the likely impact of the declining growth rate in the Soviet labor force and continuing Soviet inability to achieve offsetting growth in productivity.

While the Soviet leaders are clearly concerned about present and impending economic problems, there is no indication that they are contemplating major changes in defense policy. They will assess future Soviet defense programs, however, against the backdrop of an increasingly troubled economy, and rivalry among major claimants for resources—both civilian and military—almost certainly will intensify.

While there may be pressure to constrain defense spending to promote economic growth, even sizable changes in defense resource allocation policy would not in themselves solve the USSR's economic ills. In part, this is due to the fact that defense is a relatively small and highly specialized sector of the economy. In addition, Soviet economic problems are such that even sizable transfers of resources would have little impact on overall economic growth unless accompanied by major improvements in productivity. The fundamental reforms in the Soviet system that would be required to effect such improvements are unlikely over the next few years, though modest alterations in the system of economic incentives and bolder action in critical areas such as energy use and production are probable. We do not believe that shifts in incentives and priorities are likely to oust defense from its privileged position in the Soviet economy.

The International Environment. Despite the considerable increase of their military power, the Soviets remain concerned about the dynamism of Western military programs and the potential threat from China. The uncertainty with which they view the future strategic environment argues for Soviet prudence in planning military forces and discourages measures to reverse the upward trend in defense spending.

The Political Succession. Over the next five years, several of the top Soviet political leaders will almost certainly pass from the scene. No heir

apparent to Brezhnev has been identified. While we cannot discount the possibility that a strong single leader—or group of leaders—will come to power and implement major policy changes, such an eventuality seems less likely in the period through the early 1980s than a continuation of current policies under a caretaker regime.

Under these conditions, we believe that abrupt changes in defense spending trends are unlikely. The political influence of institutions and leaders who support defense programs—the uniformed military, managers and overseers of defense and related industries, and party and government leaders whose constituents depend heavily on defense production—would be likely to remain substantial.

Problems in Projecting Defense Spending

In part because of these economic, strategic, and political uncertainties, our projections of Soviet spending for defense are less certain than our estimates of spending in past years. In addition, our ability to forecast Soviet defense spending is hampered by uncertainties concerning the size of future forces, the numbers and types of new weapons to be deployed, and their physical and technical characteristics. Even greater uncertainties surround estimates of the costs of future weapon systems, which are closely related to technical characteristics. The difficulties inherent in forecasting the future Soviet RDT&E effort compound the uncertainty in our estimates.

Despite these difficulties, the trends revealed by our estimates of past Soviet defense spending, the evidence gathered in preparing them, and our understanding of the factors the Soviet leaders consider in making their decisions on resource allocation provide a reasonable basis for an assessment of the future. We believe that we can forecast trends in defense spending for the next year or two with high confidence, and for up to five years with moderate confidence. Beyond that, we have low confidence in such projections because of the difficulties inherent in projecting both individual defense programs and the complex political and economic situations which the Soviets will face in the 1980s. The discussion that follows, therefore, focuses on the period from now through the next five years.

Defense Spending Through the Early 1980s

All of the evidence available to us on Soviet defense programs under way and planned suggests that the long-term upward trend in allocation of resources to defense is likely to continue into the 1980s. There is no indication that economic problems are causing major changes in defense policy. The atmosphere in Moscow with regard to the economy, however, is one of concern, and the Soviet leaders could be considering modest alterations in military force goals. But even if such alterations were undertaken, the overall rate of growth of defense spending over the next five years or so probably would slow only marginally.

This view is based on several trends in Soviet defense programs—the large number of weapons development and deployment activities under way, the continuing investment in the defense industries, and the increasing costs of new military hardware.

Given the broad scope of new weapons development and deployment programs now under way, outlays for new military hardware are likely to become a more important determinant of Soviet defense spending in the 1980s. Military RDT&E programs include potentially costly systems for all of the Soviet armed services. In the strategic forces, new ICBMs are being developed, as are new strategic naval missiles. Air defense programs for improving surveillance and control and for new fighters and low-altitude surface-to-air missiles are being pursued. ABM research and development is also continuing. Still other systems are being developed for the air, ground, and naval forces. Not all of the systems under development will be deployed, but many will enter production by the early 1980s, continuing to shift the weapons acquisition mix toward more expensive systems. Even if procured at a slower pace than their predecessors, these systems will drive weapons acquisition and maintenance costs upward.

The Soviets have committed capital resources for development and production of new weapons in the 1980s. Some of this investment is related to weapons development programs and some apparently is designed to enhance production capacity. Much is at facilities associated with the production of strategic missiles, naval ships, and aircraft—those costly systems that have been driving procurement and maintenance costs upward.

Finally, in the Soviet Union, as in the United States, the increasing complexity of new weapons has resulted in escalating development, production, and maintenance costs. Such cost escalation is evident in most of the new systems entering the forces in the 1970s—particularly in aircraft, ballistic missiles, and naval ships.

Economic difficulties notwithstanding, we believe that Soviet defense spending will continue to grow over the next five years. For the next two or three years, growth in defense spending probably will be slightly lower than the long-run average, as the fourth-generation ICBM and current fighter aircraft and D-class ballistic missile submarine programs wind down. This marginal reduction in the growth of defense spending is not related directly to economic difficulties. Such cycles have occurred several times in the past—for example, in the early 1970s when deployment of third-generation ICBMs tapered off before that of the fourth-generation systems reached high levels—and do not signal changes in resource allocation policy.

During the early 1980s we expect the Soviets to begin testing and deploying a number of the new weapon systems under development—including the next generation of strategic missiles, new aircraft, and new ballistic missile and attack submarines. This probably will cause the annual rates of growth in defense spending to increase to a pace more in keeping with the long-term growth trend of 4 to 5 percent a year.

This projection of defense spending is based on the assumptions that a SALT II agreement will not be reached and that the current state of relations between the United States and the Soviet Union will continue. However, a SALT II agreement along the lines currently being discussed would not, in itself, significantly alter this projection. Such an agreement would probably reduce the rate of growth of total Soviet defense spending by only about 0.2 of a percentage point per year. The resulting savings would amount to less than 1.5 percent of total defense spending projected through the early 1980s in the absence of an agreement.

Impact on the Services

Each of the Soviet services will gain from a continuation of the upward trend in defense spending over the next five years. We expect the shares of investment and operating spending allocated to each service to be roughly the same as in the 1967-77 period, although some shifts in emphasis are likely.

Modernization is likely to continue within the Ground Forces, as the Soviets increase the firepower, mobility, and air defense capabilities of these forces with new equipment and weapons. New weapons currently being procured include tanks, self-propelled artillery guns, and tactical ballistic and surface-to-air missile systems. Several major weapons for the Ground Forces are under development. Many of these will enter production by the early 1980s.

Within the Air Forces, spending for Frontal Aviation will probably decline, and expenditures for Long Range Aviation and Military Transport Aviation are likely to rise and consume an increasing share of Air Forces spending into the 1980s. Production of transport aircraft probably will increase, as may production of Backfire medium bombers. During the next five years we expect the Soviets to introduce into the Air Forces several systems currently under development, including the AN-72 jet short-takeoff-and-landing transport. The Soviets may also be developing a new long-range bomber. If such a bomber were to be deployed, it could be introduced into Long Range Aviation units by the early 1980s. The Soviets will undoubtedly make incremental improvements to one or more of the new tactical aircraft currently in production. These could include improved target acquisition and weapons delivery systems, navigation and bombing radars, and tactical air-to-surface missiles.

The Navy's share of Soviet defense investment probably will increase slightly. A new class of large ballistic missile submarines should reach operational status during the early 1980s. The Soviets probably will give a greater priority to the open-ocean ASW mission and to increasing production of nuclear-powered attack submarines. Continued production is likely for a variety of surface combatants, including frigates, guided-missile destroyers, guided-missile cruisers, and at least one guided-missile ASW aircraft carrier. Continued procurement of the Backfire bomber is also likely, and introduction of a new long-range ASW aircraft is possible.

Continuing concern with low-altitude air defense, and with defense against cruise missiles in particular, probably will prompt the Soviets to increase investment in the National Air Defense Forces. By the early 1980s we expect deployment of new low-altitude SAMs and one or more modified interceptors designed to engage low-flying targets. In addition, the Soviets will probably deploy new ground-based air surveillance radars and airborne warning and control aircraft.

Several new or modified ICBM systems are currently under development for the SRF. Some of these systems will be flight-tested and deployed by the early 1980s.

Forecasting future RDT&E activities is more difficult than forecasting future operating and investment activities. Nevertheless, a number of factors lead us to conclude that the resources allocated to the Soviet military RDT&E effort will continue to grow into the 1980s. The rising trend in Soviet expenditures for science as a whole, the high level of activity at Soviet design bureaus and test facilities, the large number of strategic and tactical weapon systems currently under development, and our estimate of Soviet force requirements and objectives all indicate increased funding for military RDT&E.

APPENDIX

METHODOLOGY AND CONFIDENCE IN THE ESTIMATES

Methodology

In the USSR, information on defense spending is a closely guarded state secret. Only one statistic—a single-line entry for "defense" in the published state budget—is reported each year. This figure is uninformative because its scope is not defined and its size appears to be manipulated to suit Soviet political purposes. (Changes in the announced defense figure do not reflect the changes we have observed in the level of military activities.)

To provide information which the official "defense" entry does not, CIA periodically estimates the cost of Soviet defense activities. Our estimates begin with a detailed identification and listing of the activities and physical components which make up the Soviet defense program for a given year. By a variety of methods that data base is converted into two value estimates, one in rubles, the other in dollars. For some components, such as military personnel, the data are costed directly, using available ruble prices and costs and dollar prices and costs. For other components, conversions are made from one value base to the other by applying dollar-to-ruble and, to a much more limited degree, ruble-to-dollar conversion factors. Where possible, the ruble estimates derived from this direct-costing technique are checked for reasonableness against other intelligence information or Soviet statistics.

For two of the main components of defense spending—investment and operating expenditures—prices and quantities are estimated separately for each major element. We cannot, at present, apply this approach to the remaining component—RDT&E. The cost of military RDT&E is estimated by another method—analysis of Soviet information on expenditures for science.

Confidence in the Estimates

The estimates presented in this paper reflect a continuing effort to acquire more and better data and to improve our methods. During the past year we have improved further our understanding of the ruble prices of Soviet military equipment and of Soviet pricing policy and inflation in the Soviet economy. New information and new costing methodologies led to improvements in our estimates of the costs of Soviet military hardware, supplies, and activities—especially petroleum, oil, and lubricants, equipment maintenance, and RDT&E. This effort has increased our confidence in the estimates. Even so, they have a margin of error which could be substantial for some items.

We have the most confidence in the estimates for the aggregate total and the investment category. Moreover, because the direct-costing methodology reflects the actual changes observed in Soviet defense activities over time, we are confident that the upward trend in these estimates is correct. We think it unlikely that the rate of growth in Soviet defense expenditures, in real terms, is significantly higher or lower than the 4 to 5 percent we estimate.

Our confidence in the estimates at the lower levels of aggregation varies from category to category. We have high confidence in our estimates for procurement of major naval ships. Reasonable confidence can be assigned to the estimates of spending for pay and allowances of uniformed military personnel and for strategic missile and aircraft systems. We have less confidence in our cost estimates for operation and maintenance of weapon systems and for procurement of smaller items such as general purpose vehicles and some ground force weapons.

We are least confident of the estimates for Soviet military RDT&E, which are derived in the aggregate using a methodology less certain than those for either investment or operating spending. The level and trend of these estimates, however, are consistent with the judgment, made with high confidence, that the Soviet military RDT&E effort is large and growing.

Dollar Estimates

Admiral Turner. Let me now, if I may, Mr. Chairman, turn to the dollar valuation of Soviet defense activities. The 11th chart in my prepared statement provides a way to compare the size of Soviet military activities with our own defense programs. The military establishments of the Soviet Union and our own differ so much in missions, structure, and characteristics that any common denominator used for comparative sizing is inevitably imperfect. Nonetheless, we think that these comparisons do provide a reasonable appreciation of the relative magnitude and trends of United States and Soviet military establishments. We derive these estimates on the basis of what it would cost in the United States to develop, procure, man, and operate a military force of approximately the same size and with the same inventory of weapons as that fielded by the Soviets.

Because we have, in effect, priced the Soviet defense activities in outlay terms, our figures on U.S. spending were taken from the outlay series rather than from the TOA series. This continues a practice we began last year.

Trends

Our comparisons of the relative levels of United States and Soviet defense activities show no significant changes from the past except that total U.S. outlays for 1977 increased in real terms for the first time since 1968.

The bottom bars here show that total defense activities for the two countries in dollar terms are roughly equal for the decade 1967 to 1977 as a whole.

The upper charts show the trends, and they are dissimilar. The estimated dollar costs of Soviet defense activities grew steadily over the period at an average annual rate of about 3 percent. Growth was evident in nearly all the major elements of the Soviet defense establishment.

U.S. outlays, shown on the left hand chart, on the other hand, declined continuously from the Vietnam peak of 1968 through 1976. They grew slightly in 1977 as increases in weapons procurement and research and development offset a continued decline in personnel costs. As a result of these diverging trends, the estimated dollar costs of Soviet defense activities caught up with U.S. defense activities in 1971 as shown on the right hand chart here, and exceeded them by a widening margin in each succeeding year. At about $130 billion, the estimated costs of Soviet defense activities for 1977 were about 40 percent higher than comparable U.S. outlays of $90 billion.

Now, if we add the costs of military retirement to both of these estimates, total Soviet activities were still about a third higher than U.S. outlays in 1977. In short, without retirement, Soviet outlays were 40 percent higher; with retirement, 33 percent higher. If all personnel costs are removed from both sides, in 1977 the Soviet level is about 25 percent greater than the United States.

Finally, if the dollar cost estimates of research and development—and these estimates are considerably less reliable than those for other Soviet activities—are subtracted from each side, the estimated Soviet figure for 1977 is about 35 percent higher than that of the United States and the cumulative totals are still roughly equal.

So we have a range from 25 percent to 40 percent greater, depending on exactly what you include in these comparisons: retirement, research and development, or personnel costs.

Shares of GNP

Let me now introduce one comparison we have not shown explicitly before, shares of GNP accounted for by defense in both the United States and the Soviet Union. As I mentioned before, the share of GNP is often used as a measure, albeit an imperfect one, of the economic impact of a country's defense effort. For that purpose, the share must be calculated in terms of indigenous currencies. For this chart, the shares of GNP were calculated in 1977 dollars for the United States and 1970 rubles for the Soviet Union.

Senator Proxmire. 1970 rubles?

Admiral Turner. That is correct.

Again, a relatively constant 11 to 12 percent of Soviet GNP was devoted to defense throughout the 1967–77 period. By contrast, U.S. defense spending as a share of total GNP fell continuously from nearly 10 percent in 1967 to 5 percent in 1977. For this comparison, we have used the U.S. definition of defense activities.

Senator Proxmire. That is the first time I have ever seen that. That looks as if the Soviet Union prescribes a specific proportion of their GNP for defense, or does the chart give us not a true picture, because every single year, 1967 through 1977, is exactly the same level.

Admiral Turner. Well, there is the width of our bar these, showing uncertainty.

Senator Proxmire. Well, that's true——

Admiral Turner. But yes, we feel that——

Senator Proxmire. But ours fluctuates, up and down and so forth, but theirs is very, very steady, every single year, exactly the same percent—4 to 5 percent increase in real terms.

Admiral Turner. Well, our share declines by about 5 percentage points, whereas theirs is roughly constant.

We think this is a coincidence, that their rate of growth in the defense sector parallels the rate of growth of their economy and has therefore maintained a constant share of GNP.

Defense and the Economic Slowdown

Senator Proxmire. Well, does this suggest, then, that if their economic growth does slow down, as you have indicated, your estimate is that it will, and maybe you are right or wrong, but if it does could we assume that their investment in defense would also tend to rise at a lesser rate?

Admiral Turner. We have come to the opposite conclusion. We have come to the conclusion that the momentum we see in current deployment programs, as well as programs in the research and development phase today which will come into the production phase in the next couple of years are going to sustain the average 4 to 5 percent growth rate in defense spending.

Senator Proxmire. In spite of the fact that you would expect a slowdown in the economy.

Admiral TURNER. That is correct.

Senator PROXMIRE. You would not expect a slowdown in the rate of growth of defense.

Admiral TURNER. That is the conclusion we have come to, Senator. We do expect a slowdown in the rate of growth in the next couple of years, again, because we see some programs phasing out—older missiles and so on.

Senator PROXMIRE. I just have one more question here, and I hate to interrupt because I know this is out of the usual order the subcommittee follows. We usually wait until you are through. But it seems to me that there is a terribly tough choice for the Soviet people. To the extent that they put money into defense, they are taking it away from their industry, their agriculture, and other sectors that are fundamental to the growth of their economy. In the long run, therefore, they have less potential to go into defense, so that to the extent that they put more and more into defense, they will have a slower and slower rate of growth, and their potential in the out years from now, 10, 15, or 20 years from now would be less, isn't that correct?

Admiral TURNER. That is correct, and we recognize it.

Senator PROXMIRE. Are they conscious of that?

Admiral TURNER. Yes, we think they are conscious of that, but I will ask Mr Diamond to amplify on that because he is more knowledgeable. But we think there is a tremendous momentum behind the military operation, and there are, of course, inelasticities of trying to shift some of these defense industries over to civilian industries. I mean, it is not an easy transition, but the evidence of what military programs they are proceeding with does not give us hope to think that they are going to slow defense spending down to keep other economic investment going.

Mr. Diamond.

Mr. DIAMOND. We have tested that, Senator, in a hypothetical context by saying to ourselves, what would happen and how would the Soviet leaders perceive what would happen if they slowed the average annual rate of growth of 4 to 5 percent in defense outlays that we have observed since the mid-1960's down to the same rate of growth that we project for gross national product in the early 1980's. That is one variation.

The other variation—what if they really wanted to do something drastic by, say, beginning in 1980, holding outlays for military equipment and military investment, constant and not letting it rise at all. Query: How would this impact? How would this impinge on the gross national product rate of growth? After looking at these possibilities plus some others, we came to the conclusion that it wouldn't matter much at the margin. You could take these resources plus perhaps release a million men from the armed forces. Instead of fielding 4.2 million, reduce it to 3½ million to help the labor crunch. You could make a number of moves in both manpower and the military investment area and——

Senator PROXMIRE. And you could make the assumption in all sorts of areas.

Mr. DIAMOND. At the best it would raise the average annual rate of growth in gross national product about a quarter of a percent—a quarter of a percent above what we are forecasting. There are just not

that many resources involved, and in an economy close to $750 billion, you are just not diverting that much to growth.

Senator PROXMIRE. I have more questions and I will ask them later.

U.S. AND SOVIET COMPARISONS

Admiral TURNER. Let's look at some detailed comparisons of United States and Soviet defense activities. To begin with, when comparing different resource allocations, the estimated dollar cost for Soviet activities exceeded U.S. outlays for both investment and operating resource categories in 1977. On the left, the investment category covers the dollar costs of activities that re-equip, modernize, or expand forces through the procurement of equipment including major spare parts and construction of facilities.

For the 1967–77 period as a whole, the estimated dollar costs of Soviet investment were about 20 percent greater than U.S. outlays for military investment programs. Since 1975, they have been about 75 percent greater than the U.S. level. Operating costs made up the largest share of the total defense figure for both countries. The estimated dollar costs of Soviet operating activities exceeded those of the United States in each year since 1971. By 1977, the estimated dollar costs of Soviet operating activities were more than 20 percent above U.S. outlays.

In the area of personnel, the larger component of operating costs, the estimated dollar costs for Soviet military manpower exceeded corresponding U.S. outlays by 85 percent in 1977, reflecting the larger Soviet manpower base. Estimated Soviet military manpower grew by more than 700,000 in the last decade to 4.1 million men. The level of U.S. military manpower has fallen steadily since the peak of the Vietnam buildup in 1968, as shown here.

We estimate that Soviet military manpower will increase only slightly through the early 1980's.

Senator MCCLURE. Now, when you are talking of U.S.S.R. manpower costs, are those related to the same costs of maintaining that manpower in the U.S. Armed Forces?

Admiral TURNER. Yes.

Senator MCCLURE. So it is dollar costs, not ruble costs.

Admiral TURNER. That is correct, and that is part of the comparison we are making here.

Senator MCCLURE. Thank you.

Admiral TURNER. Let me now compare the U.S. and Soviet military activities that support major missions.

This 15th chart compares the dollar costs but do not include those for research, development, test, and engineering.

First, strategic forces, the 16th chart in my prepared statement. These include all those assigned to intercontinental and peripheral attack, strategic defense, and strategic command, control and warning. Over this past decade, the level of Soviet activities for strategic forces, measured in dollar terms, were almost 2½ times those of the United States. In 1977, the Soviet level was about three times that of the United States.

General-purpose forces, the 17th chart in my prepared statement, on

the right, include all those assigned to land, tactical air, naval and mobility—airlift and sealift—forces. Estimated dollar costs of Soviet activities for the general-purpose forces exceeded U.S. outlays starting in 1971, and for the period 1967 to 1977, as a whole, were about 10 percent higher than U.S. outlays. For 1977, the Soviet level was 50 percent higher than the U.S. outlays.

Reliability of Estimates

Let me say a few words about our confidence in these estimates. The reliability depends on the accuracy of our estimates of the size of Soviet forces and activities, and the cost factors applied to that data base. The margin of error can be substantial for some items. We are more confident in the level and trend of total Soviet defense activities than in the lower levels of aggregation.

Within these lower levels, our confidence varies from category to category. For instance, we place our greatest confidence in the investment category—procurement of weapons and equipment and construction of facilities. This makes up about 30 percent of the total estimated dollar cost of Soviet defense activities for the period. Manpower costs, comprising almost 40 percent of the total estimated dollar costs of Soviet activities are the largest, the most reliably estimated component of the operating category. Other operating costs, representing some 20 percent of the total, are less reliable.

Finally, we believe that the estimated dollar costs for Soviet research, development, testing, and evaluation which are derived in the aggregate using a less certain methodology, should be regarded as much less reliable than those for either investment or operating costs. The level and the trend of these estimates, however, are consistent with the judgment made with high confidence that the Soviet military research and development effort is large and growing. We believe that the overall dollar cost estimate for Soviet defense activities is unlikely to be in error by more than 15 percent.

Index Number Problem

As you have indicated in past years, Mr. Chairman, our dollar cost comparisons of United States and Soviet defense activities do have a systematic bias in favor of the Soviets. This reflects a fundamental complexity in international economic measurements, the index number problem. A bilateral comparison, drawn in terms of the prices of one country creates a tendency to overstate the relative value of the activities of the other. This tendency becomes more pronounced when the disparity between the economies is large.

To gauge the extent of the index number problem, we have made some very rough calculations of the ruble value of U.S. defense activities. For 1977, the relative level of Soviet to U.S. defense activities, excluding retirement pay, is about 40 percent greater when measured in dollars and roughly 25 percent larger when measured in rubles.

We believe, therefore, that the effect of the index number problem is not large enough to alter the basic conclusion that overall Soviet defense activities are currently larger than those of the United States.

Ruble and dollar cost estimates cannot be used alone, however, to draw inferences about the relative military effectiveness or capabilities of U.S. and Soviet forces. These judgments require much other data, including the size and technical characteristics of the forces, geographic locations, the allied capabilities, strategic doctrine, and tactical concepts, morale, command and control, and so on.

Soviet Options for the 1980's

If I could conclude with two or three other words, Mr. Chairman. We see this projection as based on the momentum of programs that are under development, and as we have discussed briefly in response to your question, the short-term shift in resources from military programs seems to us unlikely both because of the momentum of the programs and the difficulty of using these defense resources in the civilian sector.

In the longer term, if the combination of energy, manpower and capital constraints should reduce economic growth to 2 percent or so, the Soviet leadership might be more inclined to consider cutting the growth of military spending. The pressure would be increased by major shortfalls in farm output.

What are the options, then, that the Soviets have for coping with the 1980's? They can recognize first, that growth rates on the order of 3 percent, while conflicting with the commitment to high growth rates and satisfying consumer demands inside the Soviet Union, would hardly signal the economic collapse of the Soviet Union and should not be perceived as a major defeat by the Soviet leadership.

Second, given the leadership change that we anticipate and the fact that major shifts of resources or structural changes would require a powerful political leader, we think it is most likely that the Soviets will muddle through, at least into the early 1980's.

Third, we think that they will, in effect, accept a slowdown in economic growth. They would seek to conserve energy and foreign exchange and use this period to concentrate domestic resources on renovating existing industrial capacity while making moderate changes in the administrative and managerial apparatus in the hope of stimulating future economic growth.

Finally, such a decision would have the advantage of sharply reducing their growing trade deficit with the West and might be perceived by their leadership as reducing the West's capacity to employ economic leverage against the Soviet Union.

Senator Proxmire. Thank you very much, Admiral.

Before we proceed, without objection, I will insert Admiral Turner's prepared statement, and my correspondence with him, submitting a number of written questions, and the Admiral's responses thereto, in the hearing record. Some of my questions today will relate to that correspondence.

[The prepared statement of Admiral Turner and the response of Admiral Turner to written questions posed by Senator Proxmire follow:]

PREPARED STATEMENT OF ADM. STANSFIELD TURNER

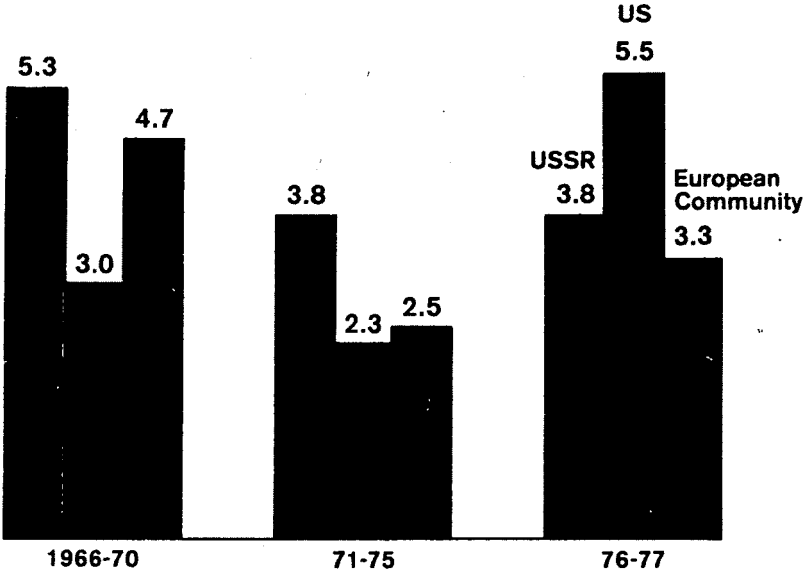
PART I.—*Soviet Economic Performance*

I. Mr. Chairman, a year ago when I appeared before this Committee I said we anticipated a period of significantly reduced growth in the Soviet economy.

A. We have just completed a detailed review of Soviet economic developments in 1976 and 1977 which reenforces that conclusion.

B. This chart shows that in 1966–70, the Soviet economy grew at rates comparable to those of Western Europe and considerably faster than the United States. The columns for 1976–77 show the change that has occurred and we now predict that the USSR may have trouble even keeping pace with the West.

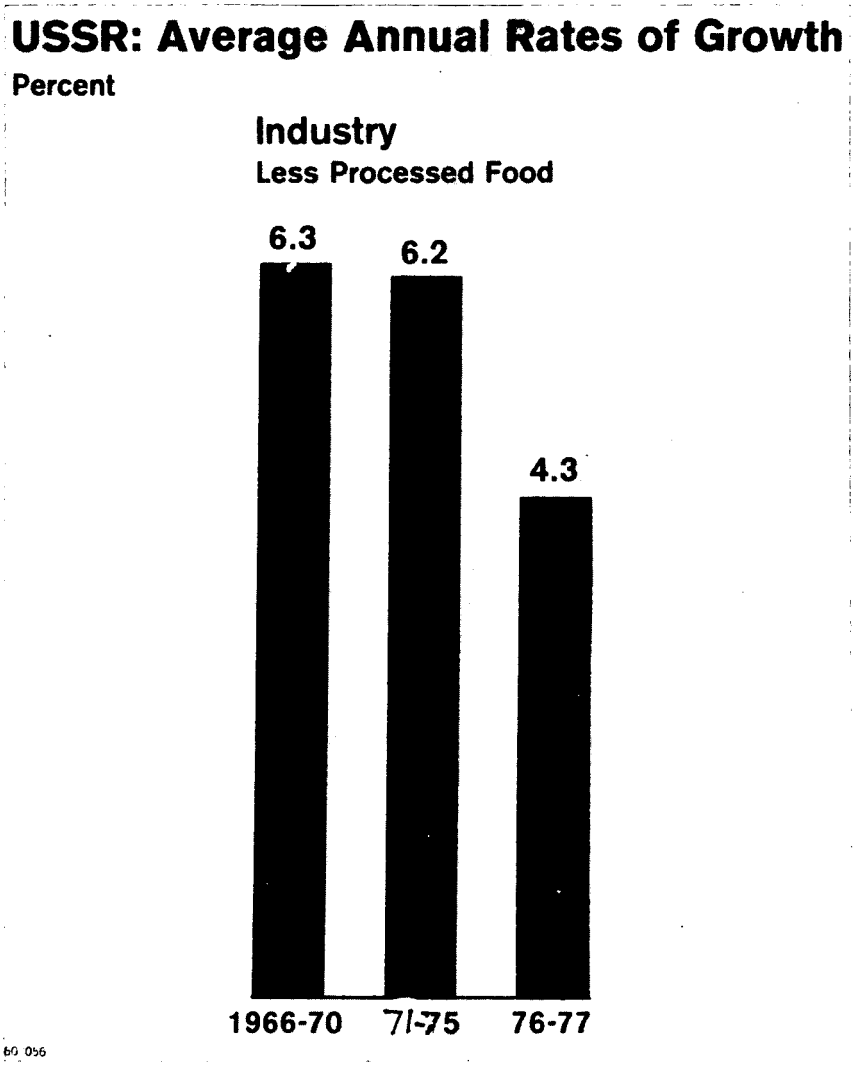
[The chart referred to above follows:]



II. Let me illustrate this first with our findings on heavy industry.

A. This is the traditional mainstay of growth in GNP because it provides the wherewithal to maintain rapid rates of growth simultaneously in investment goods, defense hardware and consumer durables. This chart shows the sharp slowdown in growth.

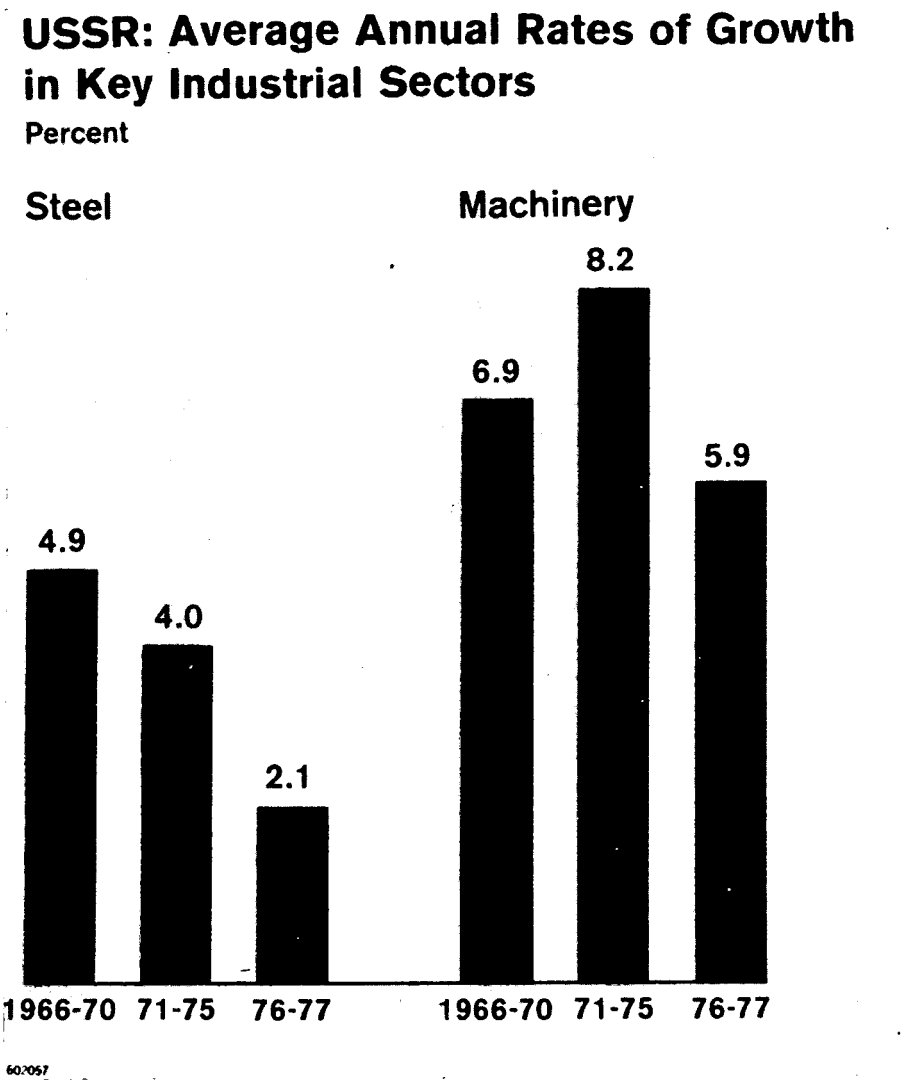
[The chart referred to above follows:]



B. Shortfalls in the production of key industrial commodities—especially steel, construction materials, and machinery—have been a major factor in this slowdown.

1. This chart shows the growth in steel production slowed to about 2 percent in 1976–77 compared with an average of more than 4 percent annually during 1971–75. These shortfalls can be traced mainly to the increasing Soviet dependence on less accessible and lower quality ore plus past failures to build sufficient processing capacity.

[The chart referred to above follows:]



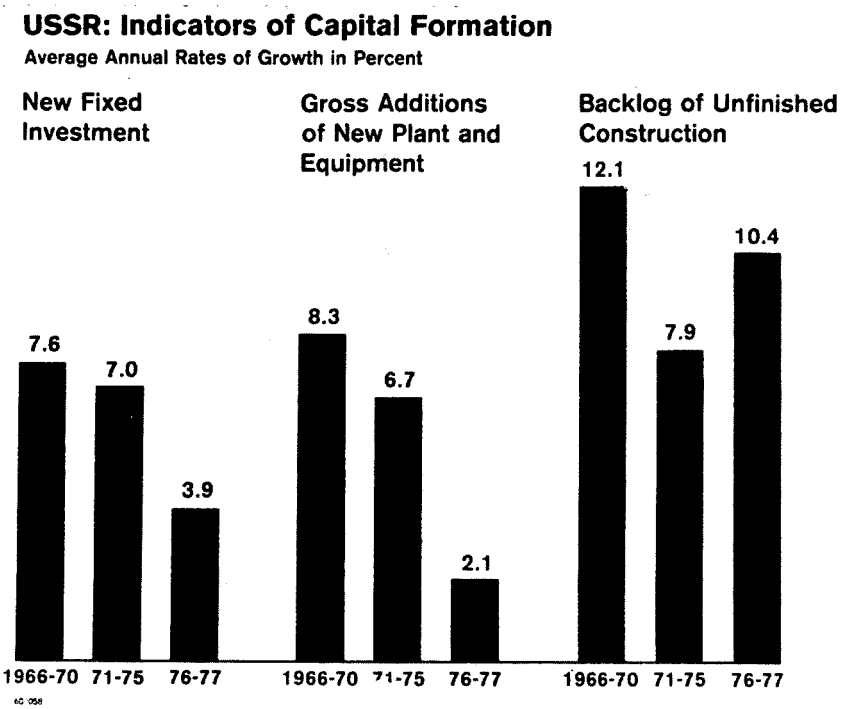
C. Shortages of steel already have impacted on the machine building industry, a key source of technological progress and productivity gains.

1. Machinery production—which accounts for one-third of industrial output—increased by about 6 percent annually during 1976–77, after an average of 8.2 percent in 1971–75.

D. Moreover the Soviet record in bringing new capacity on stream during the last two years has been dismal.

1. The chart shows the growth of investment slowing, gross additions of new plant and equipment increased by an average annual rate of only 2 percent in 1976–77, compared with almost 7 percent during 1971–75.

[The chart referred to above follows:]



2. Meanwhile, the volume of unfinished investment projects grew by more than 20 percent in 2 years. This has tied up enormous sums of investment resources and contributed to a further decline in the productivity of investment.

3. The poor performance in capital formation has been particularly distressing to the leadership—and somewhat surprising to us—given the emphasis placed on finishing projects already underway.

a. Project completions continue to be frustrated by endemic bottlenecks in the supply of components—particularly machinery—and a lack of incentives in construction organizations, where bonuses are based largely on the value of work accomplished, regardless whether this results in a viable productive entity. Basic construction work has a high ruble value, but finishing work does not.

4. In addition, major investment projects are becoming longer-term, and more costly, requiring large amounts of supporting infrastructure before they can become operational. For example, the Soviets are becoming increasingly dependent on the natural resources of Siberia where transportation, housing, and other facilities are lacking and where construction costs range from 30 percent higher to more than double those in the European areas.

III. Turning now to the large swings in agricultural output which continue to cause annual fluctuations in GNP.

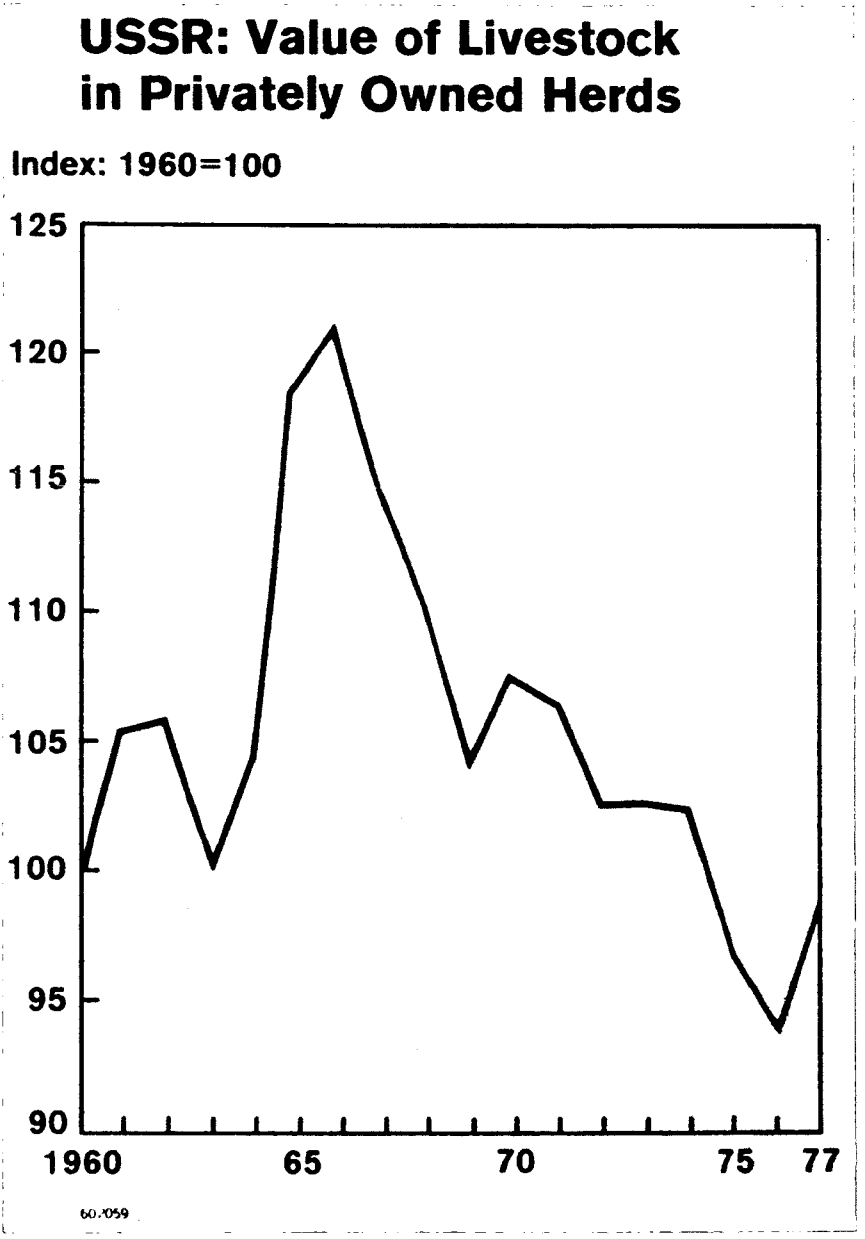
A. After rebounding in 1976 from the disastrous grain crop of 1975, the growth of farm output in the USSR fell back to its long-term trend of about 3½ percent last year.

B. A bright spot in the farm outlook was the clear signal for a more liberalized government policy toward the private agricultural sector.

1. Press articles in 1976 and 1977 not only officially sanctioned private farming but also promised aid, including the all-important provision of feed.

2. As shown in the chart, the private sector has begun to respond to these initiatives; private holdings of livestock increased last year—the first gain since 1970.

[The chart referred to above follows:]

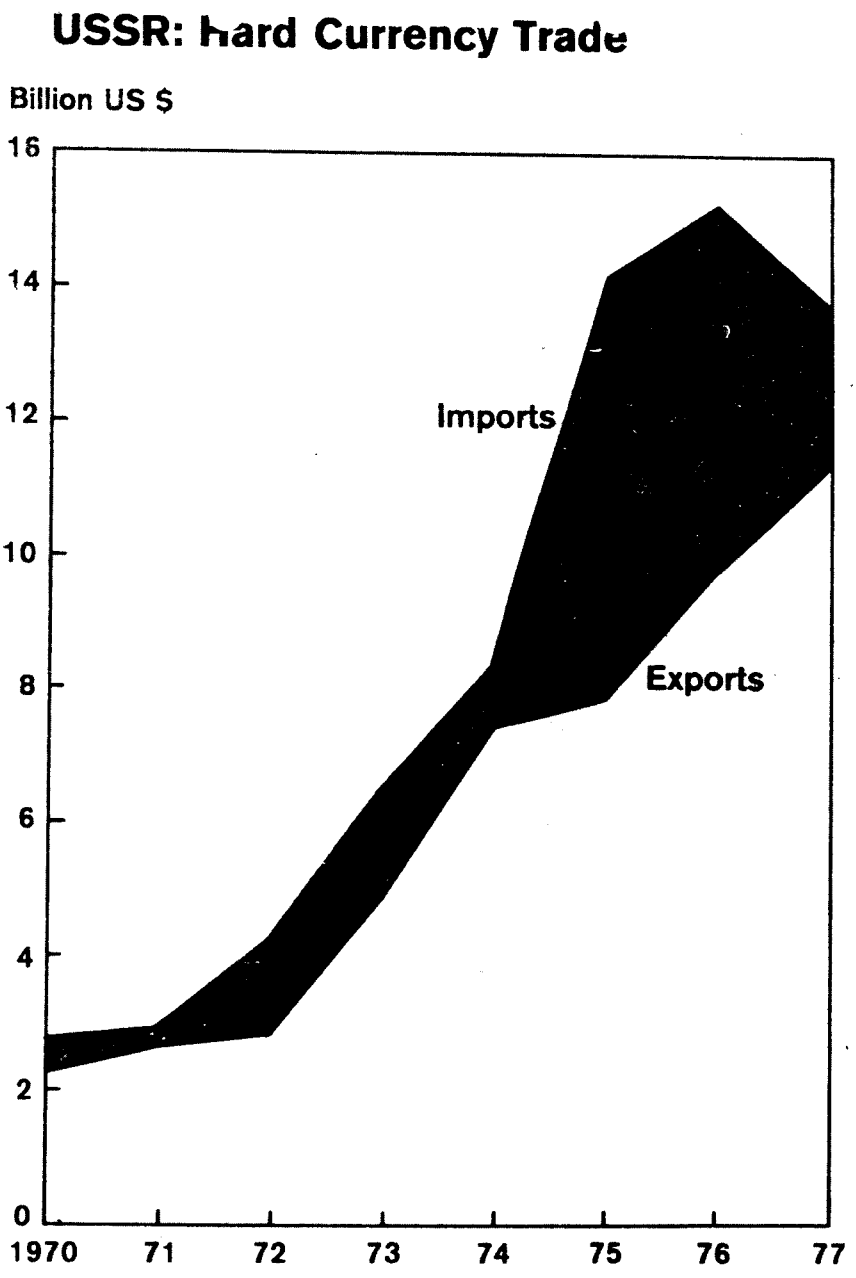


C. As usual, the wide swings in farm output and their effect on industrially processed food and soft goods have hit Soviet consumers sharply, particularly in the

availability of food. Per capita meat production in 1976 was set back almost to the 1970 level as a result of the poor harvest in 1975; meat shortages were frequent and widespread. Although some gains occurred in 1977, meat supplies still remained below 1975 levels resulting in longer queues.

IV. Although the U.S.S.R. continued to make large outlays of hard currency for grain to support the livestock program, the one area in which the Soviets have achieved major success is hard currency trade as shown in this chart.

[The chart referred to above follows:]



A. The trade deficit was cut from $6.3 billion in 1975 to $5.5 billion in 1976 and $2.4 billion in 1977. This deficit is likely to be reduced further in 1978 as purchases of machinery and equipment from the West drop sharply because of the decline in orders last year.

B. Moreover, we do not expect Moscow to experience any difficulty in meeting its financial obligations of about $3.5 billion in debt service this year. The picture is expected to change sometime between 1978 and 1982 as declining oil production results in reduced exports of oil.

V. Bedeviled by low productivity, declining resource growth, and uncertain harvests, the Soviet leadership has planned for continuing slow growth in 1978.

A. Although modest by Soviet standards, the 1978 plan nevertheless will require better-than-average weather for agriculture as well as success in dealing with the problems of steel and energy.

1. The Soviets must break the bottleneck in steel output, for example, if they are to meet their output plans for industry as a whole and for machinery in particular.

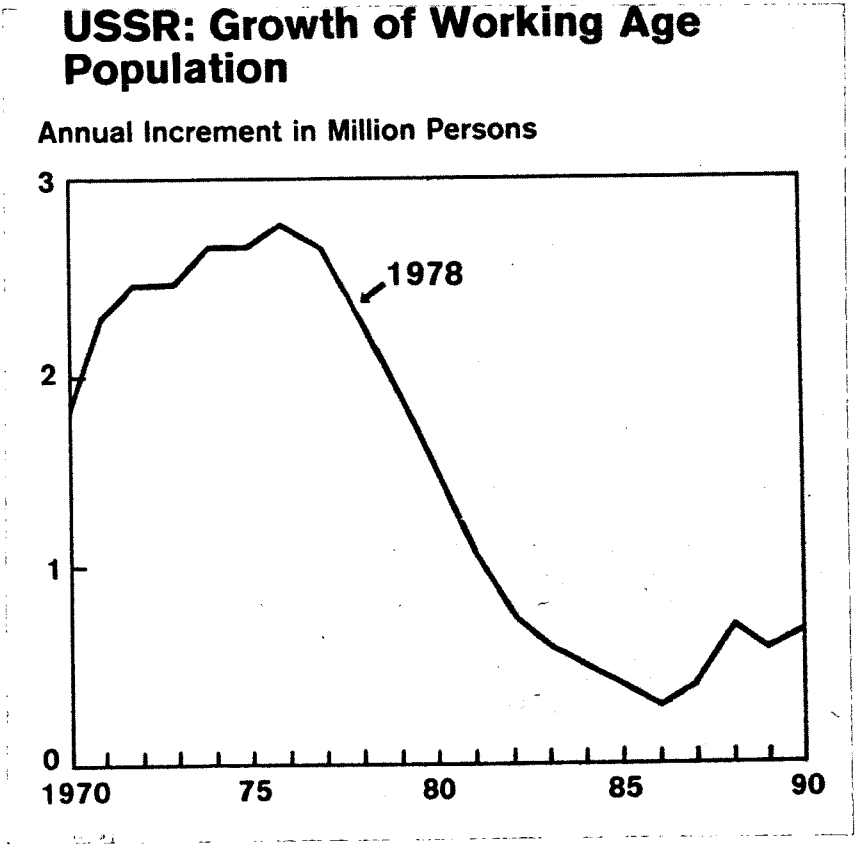
2. They must also avoid a decline in oil production, which we foresee perhaps as early as 1979 and almost certainly by the early 1980's; otherwise, a further slowdown in growth of total energy production can be expected during the next year or two.

VI. Looking ahead to 1980 and beyond, our bleak assessment still rests primarily on the four major problems.

A. These are manpower, productivity, energy, and agriculture.

1. A slowdown in labor force growth begins this year, and will continue through the 1980's as shown in this chart. This is the inevitable consequence of the falling birth rates of the 1960's.

[The chart referred to above follows:]



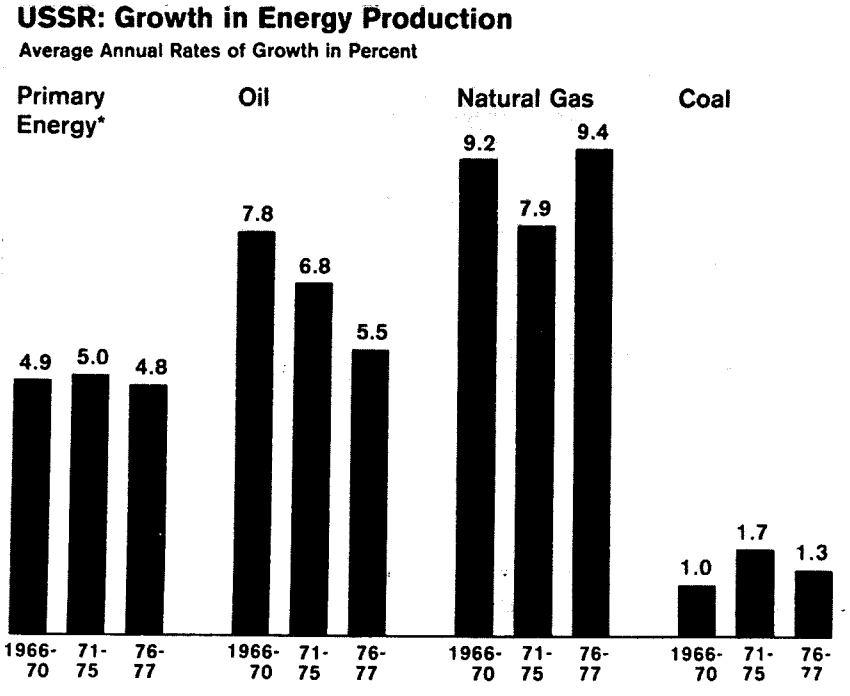
2. Productivity gains have been slowing for years and the rising cost of resources will make future gains more difficult.

3. The agricultural sector—still a critical growth sector and a key element in consumer welfare—remains at the mercy of uneven weather conditions.

4. Turning now to the energy sector, where the record of the past 2 years is better, but the prospects are at least equally bleak as shown in this chart. A major push in West Siberian oil producing areas kept growth in primary energy near 5 percent and thus close to target in 1976–77.

5. Nevertheless, growth in energy production is slowing—particularly oil—and the major efforts to exploit the oil producing regions of West Siberia over the past two years may cause a sharper slowdown in the years immediately ahead.

[The chart referred to above follows:]



6. The Soviets are not finding and developing new oil deposits rapidly enough to offset declines in their older fields, while production techniques now in use—such as excessive water flooding—focus on short-term gains at the expense of maximum lifetime recovery. I would like to dwell a few moments on this issue.

a. Last year's oil production of 10.9 million barrels per day was close to the estimated maximum potential of 11–12 million b/d. We expect oil output to fall to between 8 and 10 million b/d by 1985. This estimate is unchanged from last year. It is, we believe, now generally accepted by other experts in this field.

b. All growth in oil output through 1980 is to come from West Siberia, where the inhospitable climate and difficult terrain complicate operations. New fields are being put into production in West Siberia—6 to 8 per year are called for—but no giant ones comparable to Samotlor, which produced one-fifth of Soviet oil in 1976, are on the horizon.

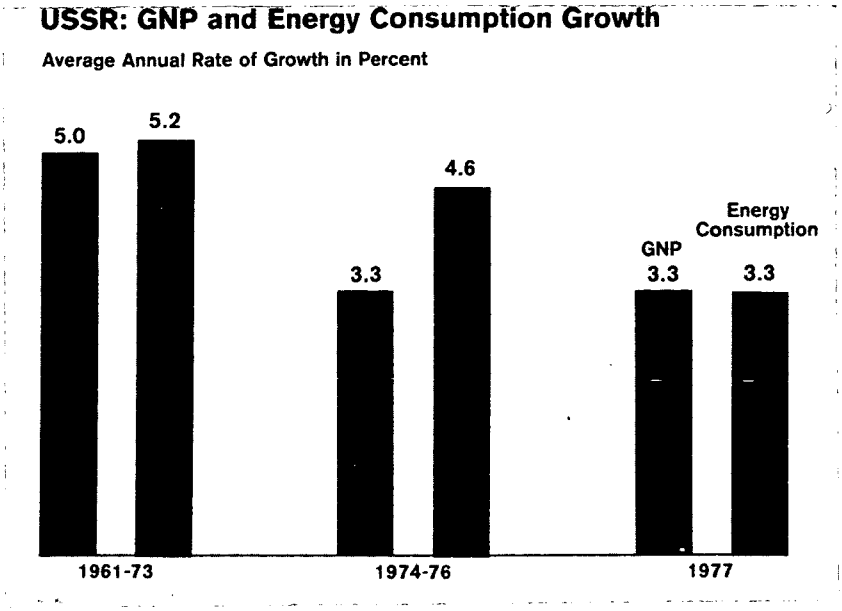
c. Beyond the mid-1980's, the USSR is counting on large new oil discoveries as well as the development of alternative energy sources—coal, natural gas, and hydroelectric power. Most potential major sources lie east of the Urals, far from major industrial and population centers; their development would take years and require massive capital investment.

7. Even if the development of other energy sources is pushed to the maximum, we expect a sharp slowdown in the annual rate of growth of energy output—from an average of 5 percent in 1976–80 to not much above 1 percent in 1981–85.

a. Soviet energy consumption has closely paralled the growth of the economy. As a result, a sharp slowdown in energy production threatens to impede economic growth further unless Moscow saves large amounts of energy and/or allows a major turnaround from its present net energy export position to a net import position.

b. Indeed, some gains in energy conservation were achieved last year. After increasing by about 1 percent per year in 1971–76, energy consumption per unit of GNP leveled off in 1977 as shown in this chart. Many of these savings were one time gains, which will not be easily repeated.

[The chart referred to above follows:]



8. How Moscow copes with the energy problem will have a far reaching impact. Sizeable oil savings through conservation are difficult to identify because a much larger share than in the West is for commercial and industrial use.

a. In Western countries, transportation and residential energy use is large and the potential for savings is great. In the USSR many of the techniques now being discussed in the West to save energy in industry and households are already employed on a wide scale.

b. In transportation, the bulk of Soviet intercity freight is shipped on electrified rail lines rather than trucks as in the West. And the USSR has only one passenger automobile for every 40–50 inhabitants, compared with more than one car for every four to five inhabitants in Western Europe.

c. Major energy conservation gains in the USSR must come from upgrading much of the current industrial plant and equipment with more energy efficient machinery—a time consuming, capital-intensive process.

9. The oil problem could have severe consequences for hard currency earnings of the USSR and Eastern Europe.

a. Last year oil accounted for about half of the USSRs hard currency earnings, while the East Europeans were able to obtain most of their oil needs for soft currency from the USSR.

b. Continuation of present policies could lead to a shift from the Soviet Bloc selling 1 million b/d for hard currency now to buying more than 2 million b/d in 1985—a net shift of perhaps $15 billion.

c. Under these circumstances Moscow and Eastern Europe will be hard pressed to even maintain their hard currency import capacity.

10. As a result, Eastern Europe may be hit hard by Soviet decisions on oil.

a. Eastern Europe now gets 1.4 million b/d of Soviet oil and by 1980 is scheduled to get 1.6 million b/d, a diversion of about $7 billion in potential Soviet earnings.

b. Moscow will carefully weigh the tradeoffs between continued economic support to Eastern Europe and its own exports for hard currency. There will be strong pressure to force Europe to share the oil shortage. Any substantial cut in oil supplies to Eastern Europe would worsen the already difficult economic situation and could threaten political stability there.

VII. Overall, therefore, we believe the reduction in the rate of economic growth in the 1980's which we forecast last year still seems inevitable.

A. A plausible forecast is a growth of GNP of about 4 percent a year during 1978–80, and roughly 3 to 3½ percent in 1981–85.

B. Economic growth could be substantially slower. If the output of energy falls to the lower end of the expected range, and there is little conservation, growth in GNP could be limited to 2 percent to 2½ percent by an energy shortage.

C. The possibility of achieving substantially higher growth seems small. Moscow can't do much about the manpower problem or the productivity of investment, except in the very long-run.

1. Measures such as keeping older workers on the job longer, shortening the term of service in the armed forces, or shifting industrial capacity from defense to the production of investment goods would probably raise economic growth only slightly. Moreover, higher growth would increase the demand for oil and thus make the potential shortage greater.

D. Agriculture will remain a major economic headache. Soviet farm production has climbed well above the level of a decade ago, but still cannot provide the quality diet that the Soviet population desires; demand for meat is rising about as fast as incomes.

1. Some of the rise in farm output reflects a massive infusion of investment but unusually favorable weather has been responsible for roughly half of the increase in grain production between the early 1960's and the mid 1970's.

a. Even under these favorable conditions, imports of farm products have accelerated in recent years.

E. The reduced growth potential means that the Soviet consumer will fare poorly during the next five to ten years relative to recent gains.

1. With an aging labor force and consequent wage creep, the increasing amount of disposable income combined with a slower growth in the availability of consumer goods will result in continued inflationary pressures and growing frustration for the consumer.

VIII. Given the scope and magnitude of these problems, how is the Soviet leadership responding?

The basic outline is clear from some significant policy decisions for the long haul which were made in Moscow at a Central Committee Plenum last December.

A. In January the Party and government published a joint letter that spread to the inside pages of Pravda and Izvestiya, signaling a major step-up in the campaign to accelerate productivity growth. In short, the letter emphasized that sustained economic progress depended heavily on more efficient use of labor, capital, and natural resources.

B. Increased media coverage on the subject of working pensioners suggests that Moscow intends to act to increase the share of the elderly in the labor force (for example, retirement ages of 55 for women and 60 for men may be raised).

C. Adoption of other recent measures indicate that the Soviet leadership is aware of the severity of their energy problem.

1. Men and equipment are being shifted to West Siberia from the Urals-Volga region, in an effort to accelerate oil production.

2. A Party resolution in March ordered research and development institutes to step up work on technology for long-term energy saving.

3. Also in March, Andrey Kirilenko—believed by many to be Brezhnev's most likely successor—convened a special conference in the Kremlin to order accelerated development and production of energy-efficient equipment already pass the research stage or out of the laboratory.

PART II.—*Soviet Defense Costs*

I. One option that has not been discussed is a change in defense policy and, Mr. Chairman, I would now like to discuss the allocation of resources to defense in the Soviet Union.

A. As you know, in the U.S.S.R., information on defense spending is a closely guarded state secret. Only a single-line entry is published in the state budget. Even this figure is manipulated to suit Soviet political purposes and bears no relationship to the level of military activities we observe.

B. To fill the void, we annually estimate the cost of Soviet defense activities.

1. Our estimates begin with a detailed identification and listing of Soviet defense activities for a given year.

2. These data are converted into two value estimates, one in rubles, the other in dollars.

3. The ruble estimates are used to assess the impact of defense on the Soviet economy, and the relative priorities of the different forces and activities.

4. We use 1970 ruble prices to permit comparisons of estimated defense expenditures with other CIA estimates of Soviet economic performance, which also use the 1970 price base.

5. We estimate the costs in dollars to compare the sizes and trends of Soviet defense activities with those of the United States. (The estimates this year are expressed in 1977 prices.)

6. Constant prices are used in both the ruble and dollar series so that the estimates reflect only real changes in defense activities, not the effects of inflation.

7. Our annual estimates reflect a continuing effort to acquire more and better data and to improve our methods.

RUBLE ESTIMATES

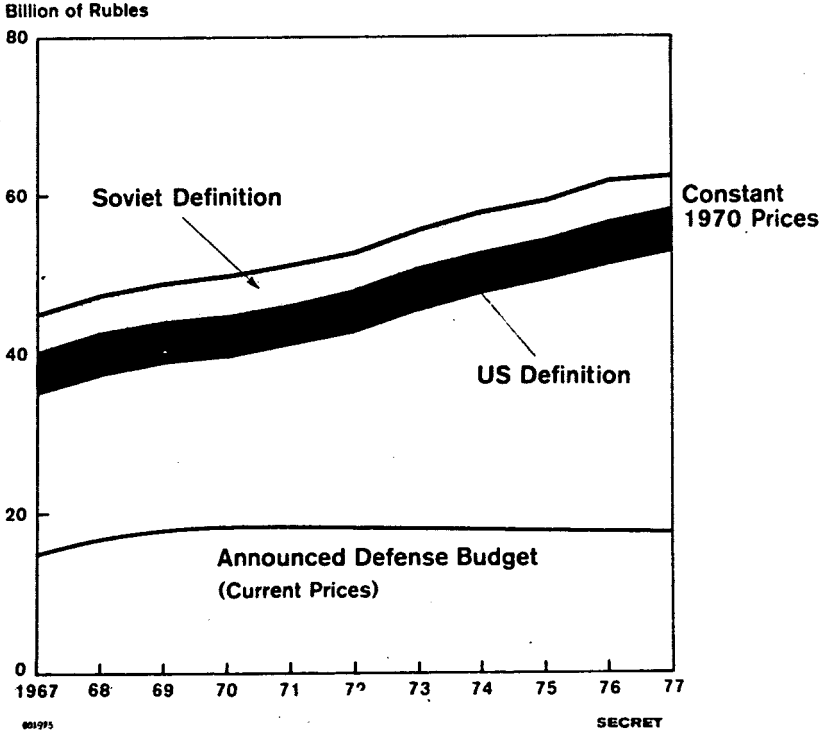
II. Turning first to Soviet spending in rubles.

A. While we have incorporated a substantial amount of new information this year, it has not affected significantly the magnitude or trend of the overall estimate we presented last year.

B. This chart shows our latest estimates of Soviet defense spending in rubles.

[The chart referred to above follows:]

Estimated Soviet Expenditures for Defense: 1967–77



1. Using a definition of defense activities comparable to that used in the United States, we estimate that Soviet spending for defense increased from 35 to 40 billion rubles in 1967 to 53–58 billion rubles in 1977. These estimates are shown by the lower band on the chart.

2. The Soviets might use a broader definition of defense, including additional programs:

a. Internal security troops.
b. Certain civil defense activities.
c. Military stockpiling.
d. Foreign military assistance.
e. Space programs that are operated by the military in the Soviet Union but by the National Aeronautics and Space Administration in the United States.

3. Estimated spending under this definition grew from 40 to 45 billion rubles in 1967 to 58 to 63 billion rubles in 1977.

4. This is portrayed by the upper band on this chart. The single line below shows the announced Soviet defense budget.

5. Our estimates indicate that the average annual rate of growth in ruble expenditures for defense during 1967–77 was 4 to 5 percent.

ECONOMIC IMPACT

III. I'd like now to discus briefly the resource implications of these estimates of Soviet defense programs. Although no single measure adequately describes the economic impact of the Soviet defense effort, defense spending as a share of gross national product is often used for this purpose.

A. When measured according to a definition of defense activities roughly comparable to that used in the United States, the Soviet defense effort absorbs some 11–12 percent of Soviet GNP calculated at factor cost.

1. When the calculation is based on the broader Soviet definition of defense, the share is about 12–13 percent.

2. Because defense spending grew at roughly the same rate as the economy as a whole between 1967 and 1977 there was little change over the period in the share taken by defense.

3. By comparison, Soviet spending for civilian investment goods during this period accounted for approximately one-fourth of GNP, and spending for health and education for 6 to 7 percent.

B. Another indication of the economic impact of defense is provided by examining defense's share of important industrial output. At present, Soviet defense takes about one-third of the output of the machine-building and metal-working sector—the sector that produces investment goods as well as military weapons and equipment.

C. To the extent that these measures fail to take qualitative considerations into account, they tend to understate the impact of defense programs on the Soviet economy.

1. Defense takes a large share of the economy's high grade scientific, technical, and managerial talent, and draws heavily on the output of science and high quality materials, components, and equipment.

2. This priority claim on resources works to the detriment of the other sectors of the economy.

PROSPECTS FOR THE FUTURE

IV. All of the evidence available to us suggests that the long-term upward trend is likely to continue into the 1980's.

A. As I have noted, however, Soviet leaders are concerned about the economic problems facing their country. They could be considering modest alterations in their military force goals.

B. But even if some alterations were made, the growth in defense spending over the next five years or so would probably slow only marginally.

C. Because several major weapons procurement programs are nearing completion, however the annual rates of growth during the next 2 years probably will be slightly lower than the long run average.

1. This marginal reduction in the growth of defense spending probably is not related directly to economic difficulties.

2. Such cycles have occurred several times in the past—for example in the early 1970's after deployment of third generation strategic systems tapered off and before the deployment of fourth generation systems began. They do not signal changes in resource allocation policy.

D. During the early 1980's, we expect the annual rates of growth in defense spending to increase to a pace more in keeping with the long term growth trend of 4 to 5 percent a year. New weapons are under development and capital construction is occurring in Soviet defense industries. These activities will affect Soviet defense spending in the early 1980's as they begin testing and deploying their new weapons.

1. We have identified potentially costly systems in some stage of development for all of the armed forces—including ICBM's, strategic naval missiles, fighter aircraft, land arms and defensive missiles.

2. We also see continued capital construction at defense plants—including those associated with production of costly systems such as strategic missiles, naval ships and aircraft. These new facilities will come on stream in the late 1970's and early 1980's, providing additional or improved capacity for defense production.

3. In the Soviet Union, as in the United States, the increasing complexity of new weapons has resulted in escalating development, production and maintenance costs. Such cost escalation is evident in many of the new systems that entered the forces in the 1970's.

E. Finally, we see no indications that the Soviets are dismantling defense R&D and industrial capacity or diverting it to other uses.

1. They view the maintenance of this capacity as at least as important as military forces in the field—indeed, more important in the long term.

2. They know that the Soviet economy is less effective than the U.S. in marshalling high technology resources in an emergency.

COMPARISONS OF UNITED STATES AND SOVIET DEFENSE ACTIVITIES

V. Mr. Chairman, I would now like to turn to the dollar valuation of Soviet defense activities.

A. This provides a means to compare the size of Soviet military activities with our own defense programs.

1. The military establishments of the USSR and the United States differ so much in missions, structure, and characteristics that any common denominator used for comparative sizing is inevitably imperfect.

2. The approach taken here is to compare the defense activities of the two countries in resource terms.

3. Nevertheless, we believe these comparisons do provide a reasonable appreciation of the relative magnitude and trends of United States and Soviet military establishments.

4. We derive these estimates on the basis of what it would cost in the United States to develop, procure, man, and operate a military force of approximately the same size with the same inventory of weapons as that fielded by the Soviets.

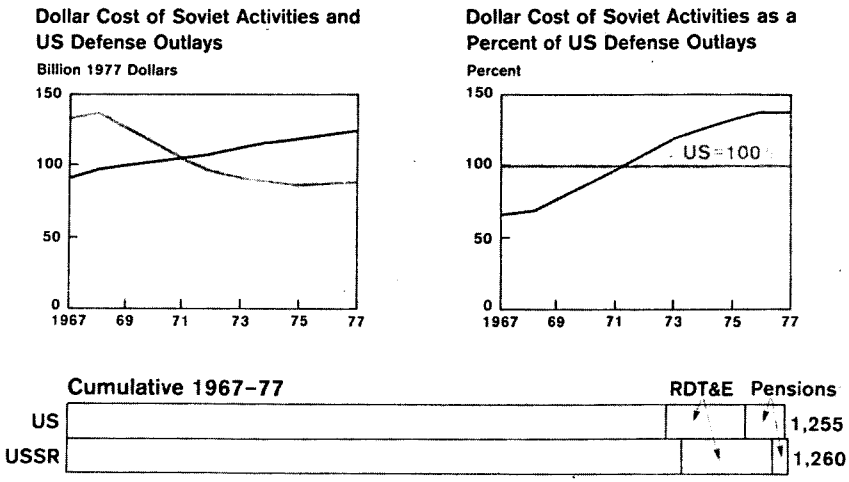
B. Because we have, in effect, priced the Soviet defense activities in outlay terms, our figures on U.S. spending were taken from the outlay series rather than the total obligational authority series. This continues a practice we began last. year.

TOTAL DEFENSE ACTIVITIES

VI. Our comparisons of the relative levels of U.S. and Soviet defense activities show no significant changes from the past except that total U.S. outlays in 1977 increased in real terms for the first time since 1968 as shown in this chart.

[The chart referred to above follows:]

US and Soviet Defense Activities, 1967-77 (Less Pensions)



A. The bottom bars show that total defense activities for the U.S. and the USSR, in dollar terms, are roughly equal for the 1967–77 period as a whole.

B. The trends of the defense activities of the two countries, however, were quite dissimilar.

1. The estimated dollar costs of Soviet defense activities grew steadily over the period at an average rate of about 3 percent. Growth was evident in nearly all the major elements of the Soviet defense establishment.

2. U.S. outlays, on the other hand, declined continuously from the Vietnam peak of 1968 through 1976. They grew slightly in 1977 as increases in weapons procurement and RDT&E offset a continuing decline in personnel costs.

3. As a result of these diverging trends, the estimated dollar costs of Soviet defense activities caught up with US defense outlays in 1971 and exceeded them by a widening margin in each succeeding year. At about $130 billion, the estimated costs of Soviet defense activities for 1977 were about 40 percent higher than comparable US outlays of $90 billion.

4. If we add the costs of military retirement to both of these estimates, total Soviet activities were still about a third higher than US outlays in 1977.

5. If all personnel costs are removed from both sides, US defense outlays exceed the estimated dollar costs of Soviet defense activities by about 5 percent over the 1967–77 period as a whole. By 1977 the Soviet level is about 25 percent greater than the US.

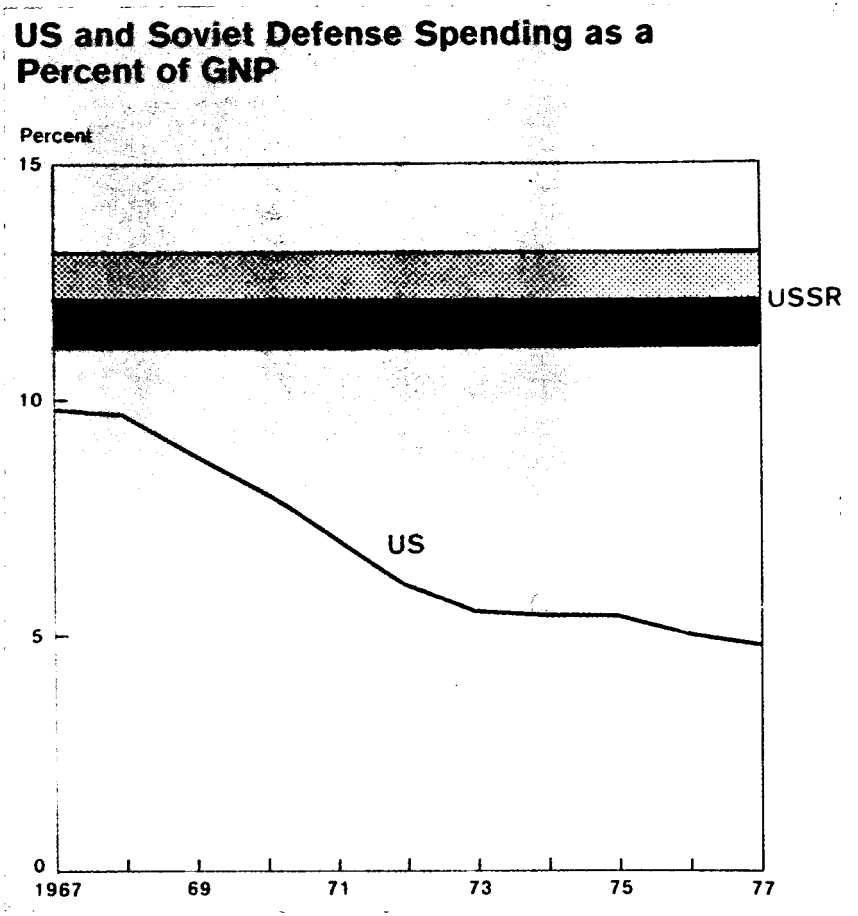
6. Finally, if the dollar cost estimates of RDT&E (these estimates are considerably less reliable than those for other Soviet activities) are subtracted from each side, the estimated Soviet figure in 1977 is about 35 percent higher than that of the US, and the cumulative totals are roughly equal.

SHARE OF GNP COMPARISON

VII. Mr. Chairman, before proceeding to more detailed comparisons of US and Soviet defense activities, I would like to introduce here one comparison we have not shown explicitly before—the shares of GNP accounted for by defense in both the US and Soviet Union as shown in this chart.

A. As I mentioned before, share of GNP is often used as a measure, albeit an imperfect one, of the economic impact of a country's defense effort.

[The chart referred to above follows:]



1. For that purpose, the share must be calculated in terms of indigenous currencies.

2. For this chart, the shares of GNP were calculated in 1977 dollars for the United States and 1970 rubles for the Soviet Union.

3. Again, a reatively constant 11 to 12 percent of Soviet GNP was devoted to defense throughout the 1967–77 period.

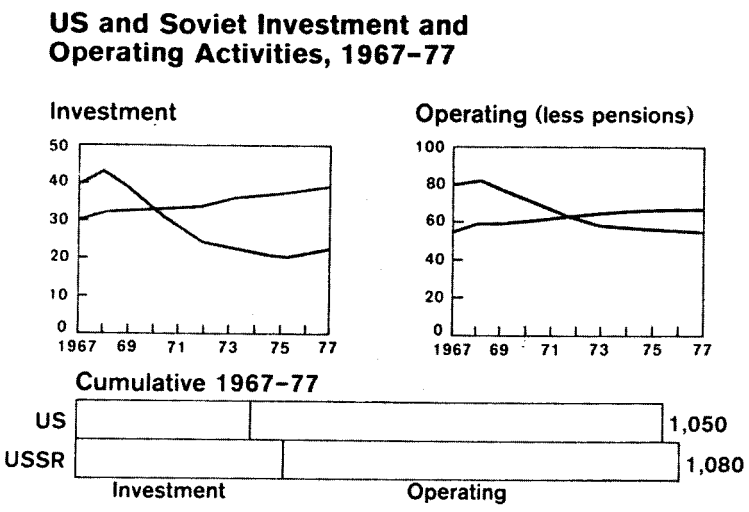
4. By contrast, US defense spending as a share of GNP fell continuously during the period from nearly 10 percent in 1967 to about 5 percent in 1977.

5. For this comparison we have used our estimate of Soviet defense spending under the US definition of defense—the lower band on the chart.

6. The defense share of Soviet GNP under the broader definition alluded to before would of course be higher—12 to 13 percent, as shown in the upper band.

VIII. I would now like to show you in this chart the more detailed comparisons of United States and Soviet defense activities.

[The chart referred to above follows:]



RESOURCE COMPARISON

A. The estimated dollar costs for Soviet activities exceeded US outlays for both investment and operating resource categories in 1977.

1. The investment category covers the dollar costs of activities that re-equip, modernize, or expand forces through the procurement of equipment including major spare parts, and construction of facilities.

2. For the 1967 to 1977 period as a whole, the estimated dollar costs of Soviet investment were about 20 percent greater than U.S. outlays for military investment programs. Soviet investment increased continuously over the period while US investment declined sharply after the Vietnam buildup before turning up in 1976 and 1977.

3. The estimated dollar costs of Soviet investment exceeded U.S. outlays by an increasing margin after 1970 and since 1975 have been about 75 percent greater than the U.S. level.

4. For the 1970–77 period, the Soviet total was almost 50 percent greater than that for the United States.

5. Operating costs made up the largest share of the total defense figure for both countries.

6. The costs of Soviet operating activities exceeded those of the United States by a widening margin after 1971. By 1977, the estimated dollar cost of Soviet operating activities was more than 20 percent above U.S. outlays.

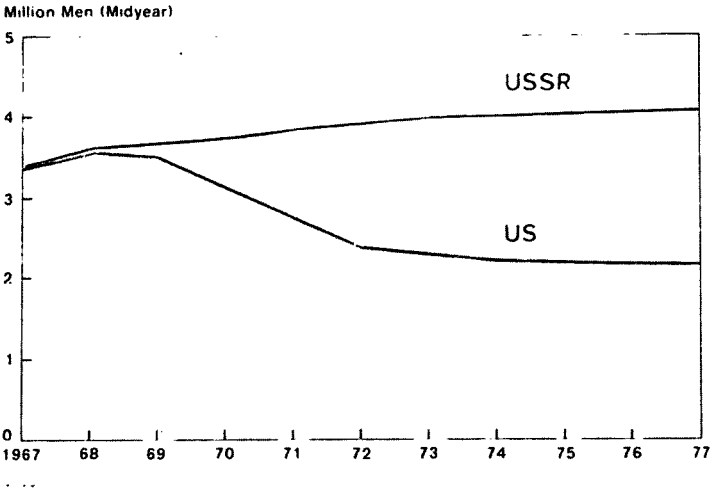
MANPOWER COMPARISON

B. In the area of personnel, the larger component of operating costs, the estimated dollar cost for Soviet military manpower exceeded corresponding U.S. outlays by about 85 percent in 1977, reflecting the larger Soviet manpower base.

1. Estimated Soviet military manpower grew by more than 700,000 between 1967 and 1977 to about 4.1 million men as shown in this chart. By contrast, the level of U.S. military manpower has fallen steadily since the peak of the Vietnam buildup in 1968.

[The chart referred to above follows:]

US and Estimated Soviet Active Military Manpower, 1967-77



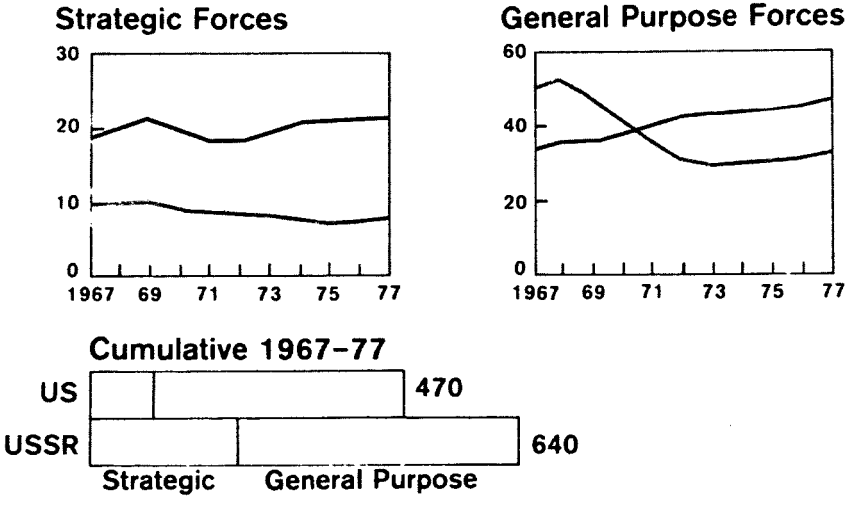
2. We estimate that Soviet military manpower will increase only slightly through the early eighties, and may face some difficulties in the allocation of a declining pool of draft-age youths between the civilian and military sectors of the economy.

MILITARY MISSION COMPARISON

C. Let me now compare with the use of this chart the United States and Soviet military activities that support major missions.

[The chart referred to above follows:]

US and Soviet Major Missions, 1967-77



1. The missions depicted on this chart accord with the guidelines outlined in the Planning and Programming Categories (DPPC).
2. The dollar costs assigned to these missions do not include RDT&E.

STRATEGIC FORCES

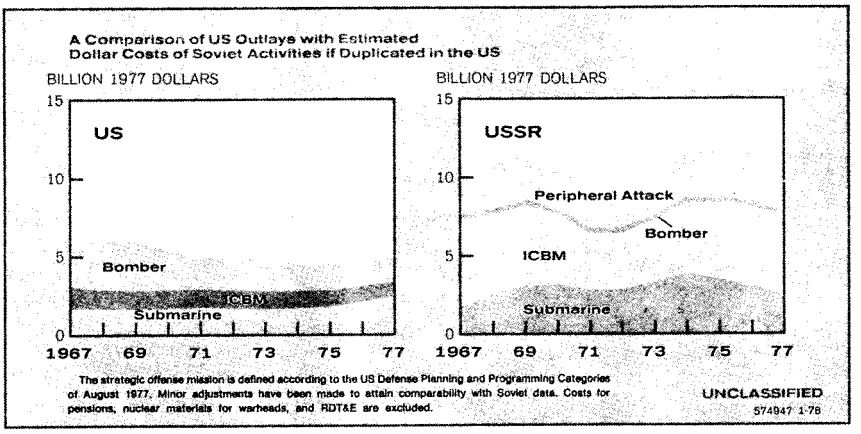
D. Strategic forces, as indicated in this chart, include all those assigned to intercontinental and peripheral attack, strategic defense, and strategic command, control, and warning.

1. Over the 1967–77 period as a whole, the level of Soviet activity for strategic forces was almost two and a half times that of the United States.
2. In 1977 the Soviet level was about three times that of the United States.

E. Intercontinental attack forces include ICBMs, intercontinental ballistic missile submarines, and long-range bomber aircraft.

[The chart referred to above follows:]

US and Soviet Forces for Strategic Offense, 1967-1977



1. Over the 1967–77 period as a whole, the level of Soviet activity was 50 percent greater than that of the United States. In 1977, it was about 55 percent greater.
2. Peripheral attack forces, for which the United States has no counterpart, accounted for about 15 percent of the total Soviet strategic mission.
3. Within the respective intercontinental attack forces, a substantial difference in emphasis on weapons is apparent.

a. The estimated dollar costs of Soviet ICBM programs over the entire period was four times U.S. spending; the 1977 level was five and one-half times that of the United States.

b. For SLBMs, the dollar costs of Soviet programs were 50 percent greater than U.S. outlays for the entire 1967–77 period, although the dollar costs of both countries' activties were roughly equal in 1977.

c. The United States has put more emphasis on its bomber forces.

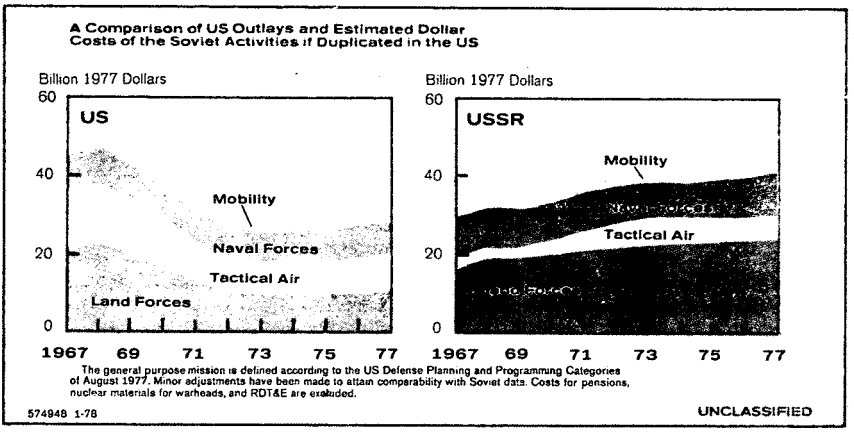
d. Over the 1967–77 period, United States outlays for intercontinental bombers exceeded the dollar costs of comparable Soviet activities by over 600 percent and for 1977 by over 400 percent.

GENERAL PURPOSE FORCES

F. General purpose forces, as indicated in this chart, include all those assigned to land, tactical air, naval, and mobility (airlift and sealift) forces.

[The chart referred to above follows:]

US and Soviet General Purpose Forces, 1967-1977



1. Estimated dollar costs of Soviet activities for general purpose forces exceeded U.S. outlays starting in 1971, and for the period of 1967–77 as a whole were about 10 percent higher than U.S. outlays. Since 1973, Soviet activities measured in dollars have been about 50 percent higher each year than comparable U.S. outlays.

2. Land Forces account for the largest share of both the Soviet and U.S. general purpose forces.

a. The estimated dollar costs of Soviet land forces increased steadily throughout the period. Outlays for U.S. land forces fell sharply following the Vietnam peak in 1968 but have grown since 1973.

b. In 1977, the Soviet level of activity for these forces, measured in dollar terms, was more than twice that of the United States.

3. The costs of general purpose naval forces (excluding attack carriers) were relatively constant for both countries over the period.

a. In 1977, estimated dollar costs of the Soviet activities were about one-third higher than U.S. outlays.

b. If the costs of attack carriers and U.S. Navy and Marine aircraft were included, U.S. outlays would be about 45 percent higher and would average 20 percent more than Soviet costs throughout the period.

4. U.S. outlays for tactical air forces (including naval attack carriers) were more than twice the estimated dollar costs of comparable Soviet forces for the 1967–77 period.

a. However, while the overall U.S. trend has been downward, the estimated dollar costs for Soviet tactical air forces grew rapidly from 1969 to 1973 as they modernized their forces.

b. U.S. outlays in 1977 were about 50 percent greater than the dollar costs of the Soviet forces.

c. If the costs of U.S. attack carriers and Navy and Marine aircraft were excluded from the comparison, U.S. outlays exceeded the estimated dollar costs of Soviet tactical air activities by 30 percent for the 1967–77 period as a whole.

d. Since 1972, however, Soviet activities in dollar terms have exceeded U.S. outlays in each year. In 1977 the two were about equal.

CONFIDENCE IN THE ESTIMATES

IX. Mr. Chairman, at this point I would like to say a few words about our confidence in these estimates.

A. Their reliability depends on the accuracy of our estimates of Soviet forces and activities, and the cost factors applied to that data base.

1. The margin of error can be substantial for some items. We are more confident in the level and trend of total Soviet defense activities than in the lower levels of aggregation.

2. Within the lower levels, our confidence varies from category to category, depending on our assessment of the reliability of our estimates of the size and characteristics of Soviet military forces and on the accuracy of the prices applied to those estimates.

B. We place our greatest confidence in the investment category—procurement of weapons and equipment and construction of facilities.

1. Investment makes up about 30 percent of the total estimated dollar cost of Soviet defense activities for the period.

2. These dollar costs are based for the most part on detailed estimates of Soviet weapon characteristics and construction practices that can be ascertained with reasonable confidence through intelligence methods.

C. Manpower costs, comprising almost 40 percent of the total estimated dollar costs of Soviet activities for the 1967–77 period, are the largest and most reliably estimated component in the operating category .

1. These are obtained by applying U.S. factors for pay and allowances to estimates of Soviet military manpower.

2. Other operating costs, representing some 20 percent of the total, are less reliable.

D. Finally, we believe the estimated dollar costs for Soviet research, development, testing, and evaluating (RDT&E), which are derived in the aggregate using a less certain methodology, should be regarded as significantly less reliable than those for either investment or operating. The level and trend of these estimates, however, are consistent with the judgment, made with high confidence, that the Soviet military RDT&E effort is large and growing.

E. We believe that the overall dollar cost estimate for Soviet defense activities is unlikely to be in error by more than 15 percent. This judgment, while informed, is nonetheless subjective and not the result of statistical measurement.

RUBLE COMPARISON OF U.S. AND SOVIET DEFENSE ACTIVITIES

X. Mr. Chairman, as you have indicated in past years, our dollar cost comparisons of US and Soviet defense activities do have an inherent bias favoring the Soviets. My remarks on this problem closely follow those I have made previously to this committee.

A. This bias reflects a fundamental complexity in international economic measurements known as the index number problem.

1. Given different resource capacities, countries tend to use more of the resources that are relatively cheap in their economy—and less of those that are relatively expensive—for a given purpose.

2. A bilateral comparison, drawn in terms of the prices of one country, creates a tendency to overstate the relative value of the activities of the other. This tendency becomes more pronounced when the disparity between the economies is large.

B. The index number problem is common to all international comparisons of economic activities.

C. To gauge the extent of the index number problem, we have made some very rough calculations of the ruble value of US defense activities.

1. There are significant technical and theoretical problems with these calculations, however, and they should be viewed as rough approximations with considerably less certainty than the dollar estimates.

D. Our tentative calculations suggest that the comparison in rubles is not radically different from that in dollars.

1. Comparing relative Soviet and US defense activities in both dollars and rubles the traditional index number effect is discernible, but not extreme.

a. For 1977, the relative level of Soviet to US defense activities (excluding retirement pay) is about 40 percent greater when measured in dollars and roughly 25 percent larger when measured in rubles.

2. We believe, therefore, that the effect of the index number problem is not large enough to alter the basic conclusion that overall Soviet defense activities are currently larger than those of the United States.

LIMITS OF INTERPRETATION

XI. I would like to remind the committee that there are limitations that attend the use of comparisons such as those we have presented today.

A. Because of the problems of comparing disparate activities, the uncertainties of the estimates of Soviet costs, and the organization of the U.S. data, the comparisons in this paper should not be considered precise measurements.

B. Any conclusions drawn from these cost analyses must be tempered by a appreciation of what they do not do:

1. Ruble and dollar cost estimates cannot be used alone to draw inferences about the relative military effectivenes or capabilities of U.S. and Soviet forces.

2. These judgments must be based on other data such as:

a. The size and technical characteristics of the forces;
b. The geographical locations of the two countries;
c. Their allies' capabilities and requirements;
d. Strategic doctrine and tactical concepts;
e. Morale; and
f. Command and control capabilities.

RESPONSE OF ADM. STANSFIELD TURNER TO WRITTEN QUESTIONS POSED BY SENATOR PROXMIRE PRIOR TO THE HEARING

U.S. SENATE,
Washington, D.C., May 31, 1978.

Adm. STANSFIELD TURNER,
Director of Central Intelligence, Central Intelligence Agency, Washington, D.C.

DEAR ADMIRAL TURNER: I am very pleased to learn that you are available to testify in our annual hearings on the "Allocation of Resources in the Soviet Union and China." Your appearance is scheduled for Monday, June 26, 1978, at 10 a.m. in room 5302 in the Dirksen Senate Office Building.

As in the previous hearings on this subject, your testimony will be received in executive session to permit the free exchange of views. The hearings will eventually be published in sanitized form.

The format used in the earlier hearings has worked well and I am agreeable to following it again. We look forward to a comprehensive, concise presentation of economic conditions in the Soviet Union and China, changes since last year's testimony, allocations of resources for both civilian and defense purposes, and prospects.

In order to develop issues of special interest I have prepared a number of specific questions which I have attached to this letter. I would appreciate your incorporating as much of the information requested in your presentation to the Subcommittee. It would be useful for the Subcommittee to have as much of the information as you can provide in advance of the June 26 hearing. This will facilitate better preparation on our part.

I am very grateful for your cooperation and assistance.

Sincerely,

WILLIAM PROXMIRE,
Chairman, Subcommittee on Priorities and Economy in Government.

Attachment.

Soviet Economic Performance

1. What are the key variables likely to condition Soviet economic performance to 1990? What is the range of projections from best to worst performance in terms of GNP growth rates?

2. One of the areas of dispute between the CIA and many U.S. non-intelligence and European professionals concerns the certainty of your oil, weather, and manpower utilization factors. This applies to both predictions on natural phenomena (resources, climatic shifts, demographic variations) and also policy options. Is it fair to say that you are now predicting rather than projecting alternatives as in the past? Is this a source of some of the differences of views?

3. We understand that the Soviets are upgrading their effort to "prove out" more West Siberian oil. This appears to be a policy option you did not anticipate. We also understand that you no longer project a 3.5 million barrel rate of hard currency import for the Soviet Union in 1985 as was referenced in the President's energy message. Is this correct? Have you also scaled down your views on cutbacks of deliveries to East Europe?

Soviet Defense

1. When comparing the costs of the defense establishments of the U.S. and Soviet Union, can you exclude from those comparisons costs of Soviet forces that do not pose a direct threat to us, such as forces arrayed along the China border?

2. What part of the differential between the dollar costs of U.S. and Soviet forces is due to the manpower differences?

3. What do these comparisons, in dollar terms, of United States and Soviet defense activities imply about the capabilities of both countries?

4. Do you have benchmarks against which to judge the accuracy of the estimates derived with the "building block" approach? To what extent is Soviet economic data helpful?

5. What is the extent of the Soviet civil defense programs? Please provide a sanitized version of the interagency study of Soviet civil defense for the record.

6. What portion of Soviet forces are allocated against NATO and what is the estimated dollar costs of those forces?

7. Can you estimate the dollar costs of the non-United States-NATO forces?

8. How do you advanced technology weapon systems such as the anti-satellite and SA–10 influence Soviet defense spending?

9. We understand Soviet troops are often used for civilian construction projects. How is this activity reflected in your estimates of the costs of Soviet defense programs?

10. What is the extent of Soviet foreign military sales to the lesser developed countries?

11. We understand the numbers of young men becoming eligible for service in the armed forces in the Soviet Union are declining. What impact will this have on the armed services?

12. You forecast a continuing decline in the rate of growth of the Soviet economy, but a continuation of the historic trend in defense spending into the 1980's. Would you elaborate on the reasons for these projections?

13. What is the likely impact of a SALT II agreement on Soviet defense spending? Is such an agreement likely to yield substantial economic benefits?

14. What portion of Soviet POL consumption is accounted for by the military forces and what does this imply about their oil situation?

15. We understand you recently had an opportunity to examine the Foxbat intereceptor. After that examination, were you able to improve your assessments of the capabilities and cost of the aircraft? What are your findings?

16. When you have had an opportunity to examine Soviet equipment in general, what improvements have you made to your cost estimates of the equipment? What other insights have resulted from equipment examinations?

17. The Soviets seem to have a number of civilian programs that are designed to aid wartime mobilization and combat readiness. Examples are training of Aeroflot pilots for combat supply missions. How large are the costs of these activities and how are they reflected in your cost estimates?

18. Since your reexamination of your methodology for estimating Soviet defense expenditures, there have been a number of books and articles that continue to criticize your approach. Please summarize these various critiques and your responses for the Committee.

19. Past testimony has indicated that two or more design bureaus often develop and sometimes produce similar models of new weapons, especially missiles and aircraft. This kind of redundancy may also be encouraged by the many industrial groups in the ministries responsible for defense production. Please provide a breakdown of design bureaus and industrial groups showing the names and numbers working on similar or parallel weapons, and the types and names of weapons.

20. In last year's hearing General Wilson responded to a number of questions concerning Soviet readiness and alertness levels. In general the Soviets seem to have much lower standards than the United States. We would like to know your view on this subject, an explanation of the Soviet approach to readiness and alertness, and the cost consequences of the Soviet approach.

21. Please provide an historical table showing Soviet military manpower levels for each of the past ten years, and deployments in East Europe.

[The response of Admiral Turner to the above follows:]

Soviet Economic Performance

Question 1. What are the key variables likely to condition Soviet economic performance to 1990? What is the range of projections from best to worst performance in terms of GNP growth rates?

Answer. The key variables likely to condition Soviet economic performance in the 1980s are labor and energy.

a. *Labor.*—A slowdown in labor force growth begins this year and will continue through the 1980's. Moscow can do little to alleviate this situation. Measures such as keeping older workers on the job longer, or shortening the term of service in the armed forces would only provide a small one-time boost to labor force growth.

b. *Energy.*—The Soviets are not finding and developing new oil deposits rapidly enough to offset declines in their older fields, while production techniques now in use focus on short-term gains at the expense of maximum lifetime recovery. Even if development of other energy sources is pushed to the maximum, we expect a sharp slowdown in the annual rate of growth of energy output—from an average of 4 percent in 1976–80 to not much above 1 percent in 1981–85. Unless the USSR has unprecedented success in its exploration efforts over the next 3 to 4 years, oil output likely will continue to decline after 1985. Much prospective territory remains to be explored in East Siberia and the offshore areas of the Caspian Sea and Arctic Ocean. But unless substantial discoveries are made soon, long lead times will preclude any significant boost to production before 1990.

c. Given the constraints on labor and energy, together with the low productivity of Soviet plant and equipment and their inability to stimulate greater efficiency across-the-board, GNP growth will average about 4 percent, at best, in 1978–80 and about 3½ percent during 1981–85. At worst GNP growth could be limited to 2 percent to 2½ percent in the 1980s if the output of energy falls to the lower end of the expected range and there is little conservation. Sizable savings through conservation are difficult to identify because a much larger share of energy is for commercial and industrial use in the U.S.S.R. than in the West.

Question 2. One of the areas of dispute between the CIA and many U.S. non-intelligence and European professionals concerns the certainty of your oil, weather and manpower utilization factors. This applies to both predictions on natural phenomena (resources, climatic shifts, demographic variations) and also policy options. Is it fair to say that you are now predicting rather than projecting alternatives as in the past? Is this a source of some of the differences of views?

Answer. Our forecasts regarding resources, climatic shifts, demographic variations and their collective impact on economic performance represent our best judgment of the situations facing the U.S.S.R. after carefully analyzing every piece of evidence that we have at our disposal.

Question 3. We understand that the Soviets are upgrading their effort to "prove out" more West Siberian oil. This appears to be a policy option you did not anticipate. We also understand that you no longer project a 3.5 million barrel rate of hard currency import for the Soviet Union in 1985 as was referenced in the President's energy message. Is this correct? Have you also scaled down your views on cutbacks of deliveries to East Europe?

Answer. In early 1978, the Soviets apparently made a major decision to give increased priority to both small field development and oil exploration in West Siberia. Because of the rapid decline in the older oil producing regions and the decreasing benefits from infill drilling in old fields, we did anticipate a much greater effort in West Siberia. Such a greater effort was inevitable in any event. During 1976–77, about two-thirds of the oil wells drilled in West Siberia were at Samotlor, and had an average yield of about 1,800 b/d. Samotlor is now nearly drilled out. At the smaller fields that now must be developed, well yields average less than 700 b/d, calling for at least three times as much drilling to accomplish the goals of the 1980 plan. Pravda on 5 June catalogued the Soviet's doubts about the difficulties to be overcome in achieving this goal. Doubt about the Soviet's ability to triple drilling in West Siberia prior to 1980 has always been a major factor underlying our oil estimate.

We never projected Soviet oil imports of 3.5 million b/d, but did project 1985 oil imports of 3.5 to 4.5 million b/d by the USSR and Eastern Europe on the assumption that no special efforts would be made to conserve energy and that Soviet

economic growth would average 4 percent during 1976 to 1980 and 3.0 to 3.5 percent during 1981–1985. In Problems and Prospects, we estimated that with strenuous energy conservation efforts and maximum output of alternative fuels, imports by the USSR and Eastern Europe (includinge Yugoslavia and Romania) could be held to only about 2.9 million b/d. Because economic growth has been and is likely to be lower than projected in Problems and Prospects, we now project imports of up to 2.5 million b/d. We continue to believe that Soviet oil shipments to East Europe will be cut back after 1980. Oleg Bogomolov, Director of the Institute of Economics of the Socialist system recently indicated to U.S. officials that such cuts would indeed occur, saying that total energy sales to Eastern Europe would be held constant, with natural gas and electricity rising and oil declining.

Soviet Defense

Question 1. When comparing the costs of the defense establishments of the US and Soviet Union, can you exclude from those comparisons costs of Soviet forces that do not pose a direct threat to us, such as forces arrayed along the China border?

Answer. We estimate that for 1977 about 13 to 15 percent of the estimated dollar costs of Soviet defense activities (11–13 percent in rubles) were for forces disposed against China. These forces include all ground and tactical air elements in the Far Eastern military districts, air defense units within 200 miles of the border, and all peripheral attack systems—bombers, ICBMs, and ballistic missile submarines—in the Far East.

[Security deletion.]

It should be pointed out that any comparison of U.S. U.S.S.R. defense costs that excludes Soviet forces disposed against China should also exclude U.S. forces not directly disposed against the U.S.S.R.

Some writers have excluded Soviet strategic air defenses from comparisons of U.S. and U.S.S.R. defense costs on the grounds that such forces do not constitute a direct threat to the United States. We do not agree with such an exclusion inasmuch as air defenses form an integral part of the Soviet strategic posture.

Question 2. What part of the differential between the dollar costs of U.S. and Soviet forces is due to manpower differences?

Answer. If personnel costs are included, the estimated dollar cost of Soviet defense activities exceeds U.S. defense outlays by about 5 percent for the 1967–1977 period as a whole and by about 40 percent in 1977. If personnel costs are removed from both sides, total U.S. defense outlays for the 1967–1977 period are about 10 percent higher than total estimated Soviet dollar costs. The estimated dollar costs of Soviet nonpersonnel activities, however, surpass those of the United States in 1973 and are about 25 percent higher in 1977.

Question 3. What do these comparisons, in dollar terms, of U.S. and Soviet defense activities imply about the capabilities of both countries?

Answer. U.S. defense expenditures and our estimates of the dollar costs of Soviet defense activities are measures of annual flows of resources devoted to defense. Such measures can be used to compare the overall magnitudes and trends of the defense activities of the two countries in terms of resource inputs.

They have an important advantage over many of the other input measures—such as the numbers and types of weapons purchased and the numbers of men under arms—in that they provide a common denominator which permits us to make aggregative comparisons. Dollar cost valuations can take into account differences in the technical characteristics of military hardware, the number and mix of weapons procured, and manpower strengths, as well as the operating and training levels of the forces.

Like the other input measures, the dollar valuations are probably more instructive as an indicator of changes in the military capabilities of the forces over time than of the comparative capabilities of the forces. That is, trends in resource inputs generally suggest changes in the capabilities of the forces—growth in inputs should result in growth in capability while a decline in inputs probably results in stable or declining capabilities.

But the dollar valuations are still input rather than output measures and—while obviously related to capability just as the physical measures of the forces are—cannot be used alone as any definitive measure of the relative effectiveness or capability of U.S. and Soviet forces. Such assessments must also take into account battle scenarios, strategic doctrine and tactical concepts; the size, dis-

position, morale, technical proficiency and readiness of the forces; numbers and performance characteristics of weapons; logistics factors and a host of other considerations.

Question 4. Do you have benchmarks against which to judge the accuracy of the estimates derived with the "building block" approach? To what extent is Soviet economic data helpful?

Answer. Intelligence sources provide data which permit checks on the reasonableness of the overall level and rate of growth of Soviet defense spending in the late 1960's and early 1970's period. Statistical data published by the Soviets are much less helpful as benchmarks and provide only very gross checks on our results. Published data are helpful, however, in estimating some categories of defense spending.

[Security deletion.]

The only direct information on defense spending that the Soviets provide openly is the single line entry in the published State Budget entitled "Defense". This figure is useful in revealing the impression that the Soviet leaders wish to convey regarding their defense trends in actual defense expenditures. The announced defense budget amounts to only about one-third of our estimate of Soviet defense spending. [Security deletion.] Moreover, we can find no set of Soviet activities which fit the spending trends indicated by the announced defense budget.

[Security deletion.]

Question 5. What is the extent of the Soviet civil defense programs?

Answer. Civil defense in the Soviet Union is an ongoing nationwide program under military control. Total civil defense costs are unknown, but we estimate that three major elements of the program—pay for full-time civil defense personnel, operation of specialized civil defense military units, and shelter construction—cost about 400 million rubles in 1976. If these three elements of the Soviet program were to be duplicated in the United States, they would have cost about $2 billion in 1976, with about three-fourths of this representing manpower costs. The program is not a crash effort, but its pace increased beginning in the late 1960s. Civil defense activities are directed by a nationwide civil defense organization consisting of over 100,000 full-time personnel located in all levels of the Soviet government and economic structure. While improvements have been made in virtually all facets of the program, it has been marked by wide variations in implementation from area to area and year to year. It has also suffered from bureaucratic difficulties and apathy on the part of a large segment of the population. Most progress has been made in providing shelters for the leadership and essential personnel. The Soviets have made little progress in protecting industry by hardening or geographic dispersal.

We estimate that the Soviets have constructed sufficient shelters to protect virtually all of the leadership elements at all levels, about 12 to 24 percent of the total work force at key economic installations, and a minimum of 10 to 20 percent of the total urban population from the effects of blast and fallout. Evacuation of the bulk of the urban population would be necessary, however, in order to achieve a marked reduction in the number of urban casualties. The effectiveness of civil defense in reducing casualties in the U.S.S.R. and in coping with the post attack period would depend primarily on the time available to make final preparations, especially the evacuation of urban areas, before an attack. While many of the essential personnel sheltered at economic facilities would probably survive an attack, the Soviets could not prevent massive damage to their economy and the destruction of many of their most valued material accomplishments.

Question 6. What portion of Soviet forces are allocated against NATO and what is the estimated dollar costs of those forces?

Answer. Measured in terms of either rubles or dollars, and using a narrow definition—that is, just those ground and tactical air forces assigned to the NATO Guidelines Area of East Germany, Poland, and Czechoslovakia—the portion is less than 10 percent of total Soviet defense activities for the 1970–77 period. Under a broader definition [security deletion] which includes ground, tactical air, general purpose naval and peripheral strategic forces believed to have a primary mission against NATO, the share is about 30 percent of Soviet defense spending measured in ruble terms; in dollars, the share is close to 40 percent. Costs for R.D.T. & E. and command and support at the Ministry of Defense level are not included in this calculation.

Question 7. Can you estimate the dollar cost of non-U.S.–NATO forces?

Answer. We have not made direct cost estimates of the dollar costs of non-U.S.–NATO defense activities.

Question 8. How do advanced technology weapon systems such as the anti-satellite and SA–10 influence Soviet defense spending?

Answer. In almost all cases, Soviet weapon systems have become increasingly complex over the last decade or so. In the past, their design approaches stressed simplicity, the use of off-the-shelf technologies where applicable, and producibility by a labor-intensive production system. High-cost advanced technology solutions to weapon system problems were avoided whenever possible. In recent years, however, we have seen evidence that the pragmatic approach to making and deploying weapons has undergone a change and that they are turning to advanced technology to a greater extent than before.

The increased complexity and advanced technology of new weapons systems has resulted in escalating development, production and maintenance costs. This cost escalation is most evident in aircraft, strategic missiles, and naval ships—systems which account for the bulk of Soviet weapons acquisition outlays and a major share of total spending for defense. Advanced technology systems currently under development include new aircraft. ICBM's and strategic naval submarines. Many of these costly weapons systems will enter production by the early 1980s, and will therefore continue to shift the Soviet weapons acquisition mix toward more expensive systems. The escalating costs associated with the production and the operation and maintenance of these advanced systems will give a strong impetus to future growth in Soviet defense spending.

Question 9. We understand Soviet troops are often used for civilian construction projects. How is this activity reflected in your estimates of the costs of Soviet defense programs?

Answer. The Soviet armed forces include specialized construction troops who work on both civilian and military projects. Our estimates include costs associated with military construction but exclude costs associated with civilian construction.

Question 10. What is the extent of Soviet foreign military sales to lesser developed countries?

Answer. Large sales to traditional clients in the Middle East and North Africa and massive support to Ethiopia pushed Soviet arms sales from $3 billion in 1976 to a near record $4 billion in 1977. Only in 1974, when the Soviets were restocking Middle East inventories, were sales slightly higher. Five Soviet customers accounted for almost 90 percent of last year's total—Syria [security deletion], Algeria [security deletion], Ethiopia [security deletion], India [security deletion], and Libya [security deletion]. In 1977 the Soviet also broke the Western arms supply monopoly in the conservative Gulf states with a [security deletion] cash sale to Kuwait.

Question 11. We understand the numbers of young men becoming eligible for service in the armed forces in the Soviet Union are declining. What impact will this have on the armed services?

Answer. Demographic data indicate that the number of young men reaching draft age each year will fall from current high levels of over 2.5 million to a low of about 2.0 million in the late 1980s. The number will begin to increase again by the early 1990's.

If current conscription practices continue, the decline in the number of draft-age men will lead to a manpower shortage in the Soviet armed forces during the late 1980's. The Soviets could avoid these shortfalls by making relatively minor administrative adjustments to their current manpower procurement system. Such adjustments would, however, require the military to command a greater proportion of the U.S.S.R.'s new labor resources. The Soviets could also choose to reduce the size of the active duty military—for example, by reducing manning levels in selected military units and depending more heavily on the reserve and mobilization system.

Question 12. You forecast a continuing decline in the rate of growth of the Soviet economy, but a continuation of the historic trend in defense spending into the 1980's. Would you elaborate on the reasons for these projections?

Answer. Economic difficulties notwithstanding, we believe that Soviet defense spending will continue to grow over the next five years. There is no indication that economic problems are causing the Soviet leaders to contemplate major changes in defense policy. On the contrary, all of the evidence available to us suggests that the long-term upward trend in the allocation of resources to defense is likely to continue into the 1980's.

We base our judgment on several factors:

In the Soviet Union, as in the United States, the increasing complexity of new weapons has resulted in escalating development, production and maintenance costs—a trend which is likely to continue.

We have direct evidence that a number of costly new weapons systems are under development in the USSR and will enter production by the 1980's.

There is no evidence, on the other hand, that military development or production resources are being dismantled or transferred to the civilian sector. Indeed, the Soviets have already committed capital investment resources for expansion and modernization of their defense industries to support future weapons production.

The Soviets see political utility in the maintenance of large military forces. Moreover, their concern about the dynamism of Western military programs and the potential threat from China argues for prudence in planning military forces and discourages measures to reverse the upward trend in defense spending.

Even sizable transfers of resources from defense to civilian uses would have little impact on overall economic growth, unless accompanied by major improvements in productivity.

We are watching closely for any signs that economic pressures are causing the Soviets to alter their military force goals, but we have seen none to date. We believe that any alterations would be at the margin—probably in the form of a slight reduction of production runs or stretching out of development programs. Such actions would slow the rate of growth in Soviet defense spending only slightly.

Question 13. What is the likely impact of a SALT II agreement on Soviet defense spending? Is such an agreement likely to yield substantial economic benefits?

Answer. A SALT II agreement along the lines currently being discussed is not likely to slow the growth of Soviet defense spending significantly. Although a SAL agreement would require the Soviets to dismantle several hundred strategic delivery vehicles and possibly to curtail or stretch out some strategic research and development programs, such an agreement would probably not reduce the rate of growth of total defense spending by more than one-fifth of a percentage point per year. The total resource savings from these changes probably would amount to less than 1.5 percent of total defense spending projected for 1978–82.

The impact on the Soviet economy of the resource savings resulting from a SAL agreement would also be small. These savings would amount to about 0.2 percent of projected Soviet GNP over the next 5 years. If all the resources freed by the agreement were reallocated to civilian investment, investment funds would increase by less than one percent through 1982.

Question 14. What portion of Soviet POL consumption is accounted for by the military forces and what does this imply about their oil situation?

Answer. We estimate that the POL requirements of the Soviet armed forces currently amount to 3 to 4 percent of total domestic oil consumption, or 2 to 3 percent of Soviet domestic oil production.

The Soviet armed forces consume about one-third less POL than the U.S. Department of Defense. Direct oil consumption by our armed forces amounts to a little more than 2 percent of current U.S. demand and some 5 percent of annual production.

The share of POL in total defense costs is small in both countries. POL procurement for the operation of equipment and weapons makes up about 2 percent of the current DOD budget and a somewhat smaller share of Soviet defense spending.

We see no indication that national supply problems are placing significantly greater strains on the Soviet armed forces than they have in the past. Soviet military consumption of oil has grown much more slowly than either domestic consumption or production of oil in the USSR, and this will probably continue to be the case at least for the next few years. To date, there has been no evidence indicating that the Soviet military is contemplating any drastic petroleum conservation measures.

Question 15. We understand you recently had an opportunity to examine the Foxbat interceptor. After that examination, were you able to improve your assessments of the capabilities and cost of the aircraft? What are your findings?

Answer. The examination of the Foxbat improved considerably our assessment of the aircraft's capabilities and costs as well as our understanding of Soviet design and production practices.

[Security deletion.]

Our estimate of the dollar cost of producing the Foxbat increased by roughly a fifth as a result of the new information obtained through the exploitation. Prior to examination of the aircraft we believed that the airframe relied very heavily on the use of titanium structures. The exploitation revealed that, in fact, little titanium was used and the structural composition was primarily steel and aluminum, which imply a much heavier total airframe weight when used on an aircraft such as the Foxbat. The lower costs per pound of steel and aluminum were more than offset by the heavier weight of the airframe. As a result, the airframe cost would be higher than we previously estimated.

The costs estimates of the engine and avionics components also increased somewhat, but were secondary contributors. The engine design was somewhat less complex than previously estimated, but the thrust was marginally higher.

Question 16. When you have had an opportunity to examine Soviet equipment in general, what improvements have you made to your cost estimates of the equipment? What other insights have resulted from equipment examinations?

Answer. Many of our weapons cost estimates are derived from cost-estimating models that relate procurement cost to basic physical or performance characteristics such as displacement or thrust. When we have had the opportunity to examine and test Soviet equipment, we can obtain direct cost estimates from U.S. weapons manufacturers and at the same time determine the actual physical and performance characteristics, thereby sharpening our assessments of foreign weapons in numerous ways.

In addition to the cost-estimating advantage accruing from equipment examinations, we have obtained valuable insights into the design, manufacturing, operation, and maintenance philosophies underlying the Soviet weapon acquisition process. These insights are particularly useful when making projections of future systems. They indicate not only where improvements or breakthroughs are needed, but also the pace at which the Soviets are likely to make them in producing and deploying the next generation of weapons.

Question 17. The Soviets seem to have a number of civilian programs that are designed to aid wartime mobilization and combat readiness. Examples are training of Aeroflot pilots for combat supply missions. How large are the costs of these activities and how are they reflected in your cost estimates?

Answer. The distinction between purely military and civilian programs in the Soviet Union is often blurred by the close relationship between military and civilian ministries and the relatively high level of regimentation in most public aspects of Soviet life. We limit the coverage of our estimates to those activities which appear to fall within US and Soviet concepts of defense expenditures.

A major civilian program which aids the military is the pre-induction training program which is mandated by the 1967 Soviet Law on Universal Military Service. Under its provisions, the Ministry of Education administers a compulsory pre-draft training course in the secondary schools which features the study of basic military subjects. In addition, the Society for Voluntary Assistance to the Army, Air Force, and Navy (DOSAAF) offers classes and memberships in clubs emphasizing specialist skills that are military-related. Because these pre-induction training programs develop skills which would otherwise have to be attained during a lengthened period of post-induction training, their costs—the equivalent of around $3 billion—are included in our estimates of the costs of Soviet defense activities.

Much of what is perceived as civilian training, however,—such as the military training of Aeroflot personnel—is probably military reserve training. The Soviet draft law stipulates that reservists periodically can be called to active duty for short periods of refresher training. This training can take the form of formal classroom study or assignment to operational military units for on-the-job work. These costs are also captured in our estimates, but they are included in cost estimates for the host units and cannot be identified explicitly.

Other civilian activities that benefit the Soviet military, such as the potential naval support capabilities of its merchant marine, are not covered in our estimates because they appear to be beyond the scope of Soviet military programs. For similar reasons, we also exclude from our comparisons, U.S. outlays for defense-associated activities such as subsidizing the merchant marine and upgrading civilian airfields to meet military standards.

Question 18. Since your re-examination of your methodology for estimating Soviet defense expenditures, there have been a number of books and articles that continue to criticize your approach. Please summarize these various critiques and your response for the committee.

Answer. Our estimates begin with a detailed identification of the activities and physical programs which make up the Soviet defense program for a given year. Then we estimate the value of the activities and programs identified, in dollars and in rubles. For some components, the dollar and ruble costs are estimated separately. For other components, conversions are made from one value base to another by applying dollar-to-ruble and to a more limited degree, ruble-to-dollar conversion factors.

Our methodology has been criticized on the following grounds:

1. That we cannot adequately identify the many activities and physical programs which make up the Soviet defense program.

2. That our dollar estimates are seriously flawed because of insufficient knowledge of the characteristics of Soviet weapons systems.

3. That the ruble estimates are based on insufficient knowledge of Soviet prices and costs.

4. That we fail to check our estimate against the published Soviet economic and financial statistics.

Our response to the first of these criticisms is that the identification of Soviet defense activities and programs is among the highest priorities of the intelligence community. We are confident of our ability to identify the large and costly programs and activities that are the major determinants of Soviet defense spending. Moreover, our ability to collect the required information continues to improve.

A knowledge of Soviet weapons characteristics is another high priority of the intellgence community. We are confident that the community's estimates in this area are sufficiently accurate to support our costing work.

We also believe that our knowledge of Soviet military prices and costs is sufficient to support our ruble estimates. We have a large and growing data base of military prices. [Security deletion.] We have used these data to increase the share of our estimates that is done directly in rubles and to improve our dollar-to-ruble conversion factors.

Finally, we do make use of Soviet economic and financial data to check our estimates and to supplement the intelligence information discussed under question 4, above. Unfortunately, analysis of Soviet statistical data yields results that are much less reliable and informative than some of our critics have claimed. We do, however, welcome the efforts of all who are working to advance our understanding of Soviet economic and financial statistics.

Question 19. Past testimony has indicated that two or more design bureaus often develop and sometimes produce similar models of new weapons, especially missiles and aircraft. This kind of redundancy may also be encouraged by the many industrial groups in the ministries responsible for defense production. Please provide a breakdown of design bureaus and industrial groups showing the names and numbers working on similar or parallel weapons, and the types and names of weapons.

Answer. [Security deletion.]

Question 20. In last year's hearing General Wilson responded to a number of questions concerning Soviet readiness and alertness levels. In general, the Soviets seem to have much lower standards than the United States. We would like to know your view on this subject, an explanation of the Soviet approach to readiness and alertness, and the cost consequences of the Soviet approach.

Answer. The Soviet approach to military readiness is different from that of the United States. The Soviets maintain large strategic and theater forces, but they do not routinely keep all of these forces at their highest levels of readiness for war. They do, however, keep portions of their forces ready to respond quickly to an attack. [Security deletion.]

We believe the rationale underlying this readiness posture is that, while a surprise attack or a rapidly developing crisis is unlikely, each is a contingency for which the Soviets must be prepared. In the Soviet view, it is more likely that a "warning period," characterized by increasing tensions, will precede any major East-West conflict. The Soviets apparently believe that they could recognize a developing confrontation in time to ready the bulk of their forces for combat. [Security deletion.]

Given this rationale, the Soviets probably consider it to their advantage to keep the day-to-day operation of the bulk of their forces—particularly theater forces—at relatively low levels in order to be prepared for either a phased, deliberate buildup or a rapid mobilization of forces in the event that war becomes a serious possibility. [Security deletion.]

As a consequence of this practice, Soviet outlays for the operation and maintenance of their forces are lower than would be the case if their weapons systems

were operated at the higher rates prevalent in the U.S. armed forces. We do not believe, however, that saving money is the primary motivation for Soviet operating practices.

Question 21. Please provide a historical table showing Soviet military manpower levels for each of the past ten years, and deployments in East Europe.

Answer.

SOVIET MILITARY MANPOWER

	Total forces [1] (million)	Forces in East Europe [2] (million)
1969	3.7	0.52
1970	3.8	----
1971	3.9	----
1972	3.9	----
1973	4.0	.56
1974	4.1	----
1975	4.1	----
1976	4.1	----
1977	4.1	----
1978	4.2	.59

[1] Excludes about 500,000 men assigned to Internal Security Forces and to construction troop units. These people do not fulfill what the U.S. considers to be national security functions.

[2] All but 68-69,000 of these people are assigned within the NATO Guidelines Area—East Germany, Poland, and Czechoslovakia.

Economic Leverage

Senator Proxmire. Admiral, we are going to follow the usual 10-minute rule this subcommittee follows in questioning you, and I am going to ask Mr. Kaufman to keep time. Our clock, unfortunately, is out.

First I want to ask about two items in this morning's paper because they concern two of the major questions we are concerned about right here. The Washington Post reports that Samuel Huntington of the National Security Council suggested at a conference at West Point 10 days ago that the Council help in a concerted use of economic trade as a U.S. lever on Soviet military and economic policy.

Is this now the administration's policy so far as you know, and can you discuss with us this policy and the way leverage is likely to be effective?

Admiral Turner. No, sir, I am not a policymaker, and I only helped provide them data. I have, for instance, in recent weeks provided them data as to the possible impact on the Soviet oil situation of a freeze on the equipment they buy from us, so we have been making inputs to whatever policy discussions are going on down there. I am not privy to what——

Senator Proxmire. What does that data show?

Admiral Turner. Mr. Eckland, will you summarize that? It shows that we could have an impact but it is a very iffy thing as to how rapidly the Europeans or Japanese would fill the void, and depending on which things we froze, it would slow them down from 1 to 3 years from being able to regain that capacity.

Mr. Eckland.

Mr. Eckland. Yes, sir.

Senator Proxmire. Well, let me follow up then.

There does seem to be a division among experts as to how much the Soviets need United States and Western trade technology, whether it is feasible for the United States to achieve greater coordination with other Western countries on Soviet trade.

Do you have any views on that feasibility?

Increasing Problems in Withholding Advanced Technology from Soviets

Admiral Turner. We are having increasing problems in withholding advanced technology from the Soviet Union because of the various ways around our control mechanisms.

Senator Proxmire. Well, let me give you an example. West Germany, I understand, pursues a vigorous trade policy with the Soviets. There are numerous reports of trade of high technology items, directly and indirectly between West Germany and other Western European countries with the Soviets.

Do you think it is realistic to believe we can control that flow in any way, modify it?

Admiral Turner. I think my personal answer would be no.

Mr. Diamond.

Mr. Diamond. I agree.

Senator Proxmire. You agree we could not?

Mr. Diamond. I think it is unrealistic. That is my personal opinion, although there are people in town who would argue to the contrary.

Admiral Turner. For instance, Senator, the new RYAD II supercomputer they have just started producing has microcircuitry in it which is beyond their capacity to produce in the kind of quantities that they need. They are either counting on getting it from us—I stated this incorrectly—they have designed it so that they can produce them without that circuitry in a less efficient, less effective manner, or with that circuitry if they can get it, and we think it is an indication they are counting in part on being able to buy those circuits from us, or from the West, despite the controls on them.

Senator Proxmire. Anyway, your conclusion is that we would not be effective in persuading West Germany and other European countries to limit their technological exports to the Soviet Union, but you admit that there are others who dispute that view.

Let me put it this way. Then would it be in our long-term interest if the Government could exercise greater control over the Soviet trade? Is it that important?

Admiral Turner. That is really very much a policy issue as to whether you want to get into that kind of a confrontation with them or whether you philosophically——

Effects of Trade on Military Technology

Senator Proxmire. I guess what I am really asking is, in the event you felt that we would be able to not only control our own trade, but influence Europe, would this have a significant, substantial effect on the Soviet Union's military technology?

Admiral Turner. Anyone else want to try that one?

My inclination is no. Among other things, Senator, it is my personal view from watching this that whereas they are behind us in many things like microcircuitry that I described a minute ago, they have ways they work around it. Their missiles are bigger, they put three computers in them. They are less capable, less reliable computers than ours, they take a larger volume——

Senator Proxmire. Well, what you would call brute strength. They do it but they do it at considerable cost, and they have a strained

economy. They have limited resources. They are pushing all of their resources greatly. So to the extent that we could limit their technological progress I would think that it might be worthwhile.

Admiral TURNER. I am not entirely convinced that it is more expensive to put three large computers in a bigger missile than it is to do it the way we do it, which is much more sophisticated, more capable and reliable, but involves a very expensive technology.

Anybody want to dispute me on that?

MONITORING AGRICULTURAL PRODUCTION

Senator PROXMIRE. Another story in this morning's paper discusses the role of U.S. survey teams and satellites in monitoring Soviet agricultural production. Last year we were greatly surprised when the final grain production figures were published.

Do you have any preliminary estimates of Soviet grain production and the state of the agricultural sector this year?

Admiral TURNER. We think they are in for a good crop this year based on preliminary sowing data and indication of the amount of soil moisture.

Senator PROXMIRE. Well, how good is that information? How much progress has been made in monitoring Soviet agriculture?

Admiral TURNER. [Security deletion.]

Senator PROXMIRE. [Security deletion.]

Mr. DIAMOND. Well, the Department of Agriculture in mid-June released for public consumption an estimate, a very wide range for this year, 185 to 225 million tons; which for market purposes and communication to the producer and to the international grain trade was not a very meaningful range. Obviously, a 40-million ton range is not something that people can make decisions on.

They do go ahead and say, though, that the conditions currently suggest a harvest slightly above the middle of this range, that is, that the crop would be better than 205 million tons. [Security deletion.]

Senator PROXMIRE. Senator McClure, my time is up.

Senator MCCLURE. I would like to follow that just briefly because 3 years ago we started looking at the questions of forecasting, not only the questions that they refused to live up to international agreements under which they and we operated with respect to the exchange of information, but we also began looking very closely at satellite photography as a means both direct photography and infrared photography which can say a great deal about crop conditions, moisture conditions, and we of course have weather conditions.

[Security deletion.]

Mr. BURTON. [Security deletion.]

Senator MCCLURE. I have one other question.

And I may return to this later.

MILITARY MANPOWER

If I recall the figures correctly, we have been saying that 30 percent of Russian expenditure in military has been for manpower.

Is that an accurate figure, 30 percent of their total military expenditure?

Mr. BURTON. I think the Soviet share may be even less.

Senator MCCLURE. And that is a ruble figure, not a dollar figure.

Mr. BURTON. Let me turn to that.

Senator MCCLURE. And conversely, 60 percent of U.S. expenditures is for manpower.

That is a dollar figure, not a ruble figure.

Mr. BURTON. I think that's right. You get, of course, different ratios for each country, depending upon the currency that you use because of the vastly different price relatives in the two countries.

Senator MCCLURE. Well, I just wanted to make sure that the figures that I have seen and I have used are still accurate, or if, as a matter of fact, they should be changed.

Mr. BURTON. There has been no change.

Admiral TURNER. That would indicate, then, that the share of the cost in rubles of Soviet manpower is less than the share of the cost of American manpower, in dollars, because military hardware is much more expensive than manpower in the Soviet Union. In the United States manpower is relatively more expensive than hardware.

Senator MCCLURE. That's right, and the reason I got into that is because you at one point in your statistics compared United States and Soviet expenditures in manpower indicating that their manpower expenses were much higher than ours in dollar comparisons, but in ruble comparisons, if we look at their allocation of resources, they spend only about 30 percent of that total budget in rubles for manpower where we spend in dollars about 60 percent of ours.

Admiral TURNER. Yes; in dollars, as we told you this morning, manpower costs comprise almost 40 percent of the total estimated dollar costs of Soviet defense activities for the 1967–77 period.

Senator MCCLURE. Thank you.

[The following information was subsequently supplied for the record:]

Because of differences in the organization and structure of the two defense establishments, it is not possible to draw a meaningful comparison of the share of manpower costs in U.S. and Soviet defense outlays following the definition presented in the Senate Hearings on the Department of Defense Appropriations (Defense Manpower) for Fiscal Year 1978. We can, however, compare U.S. and Soviet personnel costs using the U.S. Budget definition which includes military pay and allowances, subsistence, and PCS travel. Under this definition, U.S. personnel costs account for 27 percent of total defense expenditures in 1977. Soviet personnel account for 36 percent of total defense costs in terms of dollar prices and 14 percent in ruble prices. When retired pay is included, U.S. personnel costs account for 35 percent of the total and Soviet personnel costs account for 37 percent expressed in dollars and 15 percent in rubles.

Expanding the definition to include the Defense Housing Appropriation and Personnel Support Cost categories raises U.S. manpower costs to 40 percent of U.S. defense outlays in 1977. Our methodologies for estimating Soviet defense expenditures do not permit us to break out comparable Soviet spending for these categories.

The further addition of the costs of direct hire Department of Defense civilians brings U.S. manpower costs to 58 percent of defense outlays in 1977. A comparison of such costs with the cost of Soviet Ministry of Defense civilians would not be appropriate, however, inasmuch as many of the activities conducted by Department of Defense civilians are carried out by industrial firms in the U.S.S.R.

Senator PROXMIRE. Senator Sparkman.

Senator Sparkman. Admiral, I have enjoyed this discussion greatly. You have treated the comparison or the contrast between our economy and the Russian economy or between us, the United States and Russia in several different capacities or aspects. I followed with interest your treatment of energy, for instance, and then you also dealt considerably in production and trade. We do have a considerable trade with Russia, do we not?

Admiral Turner. What is the total figure?

Mr. Diamond. It is out of balance, Senator. We are importing only about $200 million of Soviet goods and services.

Senator Sparkman. How much?

Mr. Diamond. $200 million of Russian goods and services, and in recent years, driven mostly by the grain trade, they have been importing between $2 billion and $2½ billion worth of American goods and services.

Senator Sparkman. $2½ billion?

Mr. Diamond. Yes, and that varies sharply from year to year depending on the extent of the grain trade, Senator; as high as $2½ billion, and as low as $1 billion.

Senator Sparkman. What are the principal things that we sell to the Russians?

Mr. Diamond. Up to 1976, the most regularized category of exports is machinery and equipment, that is, regular in the sense of from year to year, cyclical variations were not that large. Agricultural products—not only grain but other products—have been the most dominant feature in the trade, and——

Senator Sparkman. Have been what?

Mr. Diamond. The most dominant feature of the United States-Soviet trade in the 1970's has been Soviet imports of grain. These imports have varied annually between 4 million tons and 15½ million tons since 1972. This means in dollar terms, it has ranged from $350 million to $1.6 billion of American grain imports.

In addition, depending on the year, they import some American soybeans, and some other agricultural products. Overall, they have become one of the world's major agricultural importers. Net imports of agricultural products from all sources, not only the United States but other Western suppliers and from Eastern Europe have risen from net imports of $800 million in 1970 up to about $7 billion in 1976. As I indicated, unlike Soviet purchases of U.S. agricultural products, machinery and equipment purchases have not varied greatly. The most it has ever been is between $500 million and $750 million. The rest of the United States-Soviet trade is made up of selected consumer goods and, albeit minor in value, certain industrial raw materials that they find convenient to buy here.

Senator Sparkman. I remember a few years ago, when we were having somewhat similar discussions, the point was brought out that we had a rather heavy sale to Russia of phosphates from up around Mount Pleasant, Tenn. and the northwest corner of Florida; that that would go into Russia, and we would get back more or less in exchange urea, potash, and ammonia.

Mr. DIAMOND. That's right.

Senator SPARKMAN. Does that pattern still prevail?

Mr. DIAMOND. That is a very large compensatory arrangement worked out by Armand Hammer and the Occidental Corp.

Senator SPARKMAN. Yes; I think it was Mr. Hammer that testified.

Mr. DIAMOND. That's right, sir, and that is a 20-year scenario, beginning this year, in which the Soviets would import a large amount of phosphoric acid and some phosphate, and that will be compensated for by a paycheck arrangement of ammonia, urea, and potash. I think Mr. Hammer has suggested a magnitude of $20 billion—before it is all over—in this major swap of U.S. raw material for Soviet processed material, plus a lot of U.S. chemical equipment that has been associated with the production of this processed material.

Senator SPARKMAN. Thank you.

Do we have any other similar arrangements of that kind?

Mr. DIAMOND. Not of that magnitude, so far. As you know, there have been, since 1973 very large liquefied natural gas proposals which would require perhaps $10 billion to $12 billion worth of American capital equipment and technology and expertise, and for which the Soviets proposed to repay with LNG.

So far, compensatory arrangements with the United States have been nearly all in the chemical area, with the exception, of course, of small consumer good deals like Pepsi-Cola in exchange for vodka.

Senator SPARKMAN. You say Pepsi-Cola?

Mr. DIAMOND. Pepsi-Cola.

Senator SPARKMAN. Where was Coca-Cola?

Mr. DIAMOND. Coca-Cola is now in the bidding. In fact, I think associated with the 1980 Olympics, Coca-Cola along with Pepsi-Cola, has a contract to provide bottling plants, and syrup for a compensation payback.

But outside of those sort of oddities, the main thrust of United States-Soviet bilateral payback arrangements, compensation arrangements, has really been in the energy area and in the chemicals, in Mr. Hammer's occidental deal.

In addition, of course, there are major proposals on the agenda dealing with the Japanese and with the West Europeans. All and all, if the Soviets picked up, or if the Westerners were willing to provide credits on all these compensation deals, it would run $15 billion to $20 billion total.

Admiral TURNER. Senator Proxmire, if I could add an anecdote here, going back to your question, could you encourage other nations to stop this trade?

Senator PROXMIRE. There was a big article in the New York Times yesterday on what Pepsi-Cola has done in the Russian market, tremendous sales. They are selling everything they have got. They are gung ho for it, think it is great. That is the kind of export I would like to see more of, that ought to rot those Russian teeth. [General laughter.]

Senator SPARKMAN. We seem to have quite a bit of activity with Russia in the Olympics. Is that helpful to our maintenance of good relations?

Admiral TURNER. Mr. Diamond.

Mr. DIAMOND. You mean commercial relationships, everything from TV network pickup of the Olympics to helping them build hotels and provide services, is that what you are alluding to, Senator?

Senator SPARKMAN. I don't know what. I just noticed that it seems quite frequently we do have Olympic contests between the United States and Russia. It may be the exercises that are carried on in the Olympics.

Mr. DIAMOND. Oh, yes. Well, both countries perceive this as of commercial interest to the world. They can sell any United States-Soviet athletic confrontation, and both the United States and the U.S.S.R. make money.

U.S.–SOVIET RELATIONS

Senator SPARKMAN. Well, just speaking generally, do we have fairly good relations with the Soviet Union? I know we have our differences, particularly in the field of armaments and so forth, but so far as the economy, political affairs generally, do we get along with them quite well?

Admiral TURNER. I think my answer to that, Senator, is as I see it, the Soviets have carved out a territory they view détente as covering, and relations are basically good there, and negotiations are proceeding on a wide range of fronts concerning arms limitations. It seems to me the Soviets have been discrete in not getting into direct military confrontations with us. But the Soviet concept of détente does not in any way in their view inhibit their taking advantage of opportunities to strengthen their position in countries like Ethiopia and Angola and so on, and there is increasing tension here as they have become more aggressive in supporting so-called revolutionary movements around the world.

In the economic sphere, I think relations are basically good, though this is, even at $3 billion, a major factor and there have, of course, been some rubs here, when they entered the grain market in 1972 so precipitously. We have now worked out a better agreement with them on that, and it indicates their desire to have some kind of stable commercial relationship.

That is a rather rambling answer to your question, which is a very good but difficult one.

Senator SPARKMAN. Well, thank you very much.

My time is up.

Senator PROXMIRE. Congressman Long.

Representative LONG. Thank you very much.

HUMAN RIGHTS

Admiral, do you think this aggressiveness the Soviets have displayed here in the last year, particularly with respect to the revolutionary movements over the world, has in any way been in response to the perhaps initiative that we were taking and the attractiveness of that initiative in the human rights field?

Do you have any way of measuring that?

Admiral TURNER. I don't think there is any direct way, Senator, to do that, and I don't think there is any question that the Soviets

are alarmed or concerned about the human rights position that we have taken. I can't make a direct connection between that and their policy in Ethiopia. If you asked my personal opinion, I would be inclined to doubt that there was any great connection.

It seems to me that on the one hand the Soviets feel détente does not affect their right to go into Ethiopia. Logically at least they can hardly say that we don't have the right to take a human rights stand. I think they are both outside the sphere of what they have defined as détente.

Crop Forecasting

Representative Long. Another thing that is very difficult, and I well recognize that it is, to measure, particularly from afar. I was listening and being sympathetic with the 10-percent error in crop forecasting and thinking how it at least is something tangible that can be measured.

I have 420 acres of soybeans, and 3 weeks before they were supposed to come in we estimated it 20 percent above what it was going to be. The reason we did was in the last 3 weeks the beans didn't fill out. I mean, it is just that little, you know, in that small sector; it becomes very difficult, and I well recognize that.

Soviet Attitudes

Another thing, it seems to me, would be extremely difficult to measure, that could perhaps be extremely valuable should we be able to do it, and I was wondering if you were making any efforts in this regard, and if you were, whether or not you were having any success, or as yet-measurable success. The psychological and sociological attitudes of the Russian people, and to a great extent, or to some extent, would determine the degree to which they could accept and the percentage that they are able to spend of their gross national product on their military production, and as compared to how much they have to spend on consumer goods; have you all attempted to measure whether or not there is any changing attitude here, psychologically, sociologically, what the effect of those have been, and what you see in that field?

Admiral Turner. Yes, of course, measures are imprecise in this area.

Representative Long. I realize that.

Admiral Turner. But there is a greater commitment on the part of the Soviet leadership today than heretofore to, in particular, improve the amount of meat consumption in the Soviet Union as part of bringing up the standard of living. It is my personal view that neither that nor any general commitment from pressure from the people to improve their lot would be an overriding factor, but a lot is going to determine if our prediction is generally true, how earnestly the leadership feels that commitment to improve meat consumption, because as you have brought out, there are some tradeoffs. They are difficult. We don't think that pressure is that great at this time that they will take a tough bullet and reduce their military at that expense.

Mr. Diamond, would you illuminate or——

Mr. Diamond. Yes, I would agree with that.

As you would expect, Congressman, this is a very difficult area to grasp, especially over time whether pressures are worse and the lead-

ership's perception is that they should try to do more for the consumer, say, compared to 5 or 10 years ago. [Security deletion.]

Having said that, I have been moderately surprised how well they have been able to cope in the 1970's with the consumer problem. Having made a firm commitment not to raise prices at retail on basic foods, including livestock products, having made a commitment to increase personal disposable money income on a per capita basis every year, and having watched the queues get longer and longer, and more difficult to handle, I am surprised that the leadership has not taken more drastic action. For example, in 1976, after the 1975 crop failure, I thought they would go out on the world market and buy, say, up to a million tons of meat. At that time meat prices were depressed. They could have picked up excess Common Market meat at $300 a ton. The market is currently around $1,500 a ton. But this suggests that they want to muddle through during times of rising signs of civil discontent over meat and other food shortages.

We have had more reports of civil disturbances in the past 18 months than we have seen in the previous 3 or 4 years.

Representative LONG. To what do you attribute that?

Mr. DIAMOND. Rising consumer expectations combined with persistent and sometimes severe shortages.

Representative LONG. If you put all three of those together, if you put the declining or nonincreasing economic base Senator Proxmire was speaking of, and then if you put in the increasing percentage of the gross national product going into the national defense effort, and then you apply this third intangible in there of rising consumer expectations, if they are, and as you have already recognized the difficulty in measuring them, if they all three get into the mix, it gets pretty tough to——

Mr. DIAMOND. Tough to measure and tough to perceive what their leadership perceptions are. Right now we believe there is 2½-million-ton gap between the demand and the supply of meat. Given the retail price policies they follow, we don't foresee that gap closing. In fact, it may well increase. Therefore, just to keep it where it is, they probably in the early 1980's, under average weather conditions, will be importing 20–30 million tons of grain.

Assuming our oil projections are correct, we see a decline in their hard currency import capacity. Now, that is when the crunch is going to come.

Representative LONG. Right.

Mr. DIAMOND. The question is: What policies are they going to enact in the early 1980's to decide at the margin, how much grain to buy as opposed to, say, machinery and technology to help growth as opposed, say, steel pipe to help move energy? Those are the type of tradeoffs that they have got to face up to.

SINO-SOVIET RELATIONS

Representative LONG. Let me ask one more question that is general in nature, and I recognize Senator Proxmire is going to have some hearings on China, but the interrelationship between these two and the fact that I just recently was in China for about 2 weeks, and the propaganda everywhere you went was the great polar bear to the north.

Sometimes they put it in the front, the middle, and the back, other times the middle, the front and the back, everybody, every public official that did anything toward briefing us never missed that opportunity to bring up the fear of the great polar bear to the north of China. And of course, as you know much better than I, one of the four modernizations in China is the modernization of their armed services, which is something that we will explore with you.

How real to China is the fear that they have because of an invasion from the north, and I say how real is it because of the fact that it appears to me that the logistics that would be involved of taking by force and occupying a substantial amount of China would imply such a very substantial amount of the resources that it would leave them so exposed in other areas and would be such a severe drain on their economic system that it is a pretty good Mexican standoff in that in turn, if I were Russia, I would be hollering as loud as Russia has been hollering here the last few days or the last few weeks at these public things, which is all I have, about the fact that we are playing on that Mexican standoff.

Admiral TURNER. I see no rational, logical position that either of those countries can take for attacking each other militarily.

Representative LONG. I don't either.

Admiral TURNER. I agree with you that there is no way the Soviets can occupy or conquer a large portion of China without a disproportionate allocation of resources, considering they still have, to their point of view a problem on their western front. We think the Chinese do not have a capability, despite the vast size of their military force, to really invade the Soviet Union. One does not rule out border grabs here and there, and it appears to us, to me that the Soviets are somewhat concerned today about Mongolia, and that might be a possible area of friction.

But there is also little doubt in my mind that both sides take this very seriously. So maybe I am not being a good——

Representative LONG. I came out with the same conclusion, that there was an awful lot of talk about it for me to not conclude that they were taking it seriously, but it became after a while so repetitive in even the exact words that the interpreter interpreting it from Chinese to English was using that it appeared to me, I finally came to the conclusion that you do protest it too much.

Another thing that happened—and this might be of interest to you, and this is my last comment—is that we were with the Deputy Premier and he was lecturing us a bit about, I think eight of us from Congress, from Congress and Senate, he was lecturing us about our aggressive nature and the fact of making the point so forcibly that China had no troops on any foreign soil anyway, and he made this point about three times, and then he made the point about how particularly in the SALT talks that perhaps we were being too appeasing toward the "Great Polar Bear" in the north, and he made that point about three times. When it finally came time for my question, I asked him, I said, Mr. Premier, isn't it a little inconsistent to criticize us for having troops stationed abroad, even though you did imply making the point that China did not have any troops abroad—on foreign soil—and at the same time saying that we are appeasing the "Great Polar Bear" to

the north? And he held up his hand and said there would be no further discussion of that matter, and that is as far as we could go. It was a very, very strange experience.

Thank you, Mr. Chairman.

Estimates of Soviet Economic Growth

Senator Proxmire. Admiral, has the intelligence community modified its views of the growth of the Soviet Union since last year? It seems to me that last year you put more emphasis on the possibility that Soviet growth might go down as low as 2½ percent. This year you seem to be deemphasizing that.

Is that correct, and if so, why?

Admiral Turner. Mr. Diamond.

Mr. Diamond. Not really, Senator. Last year we had a baseline case in the publication—sponsored by your subcommittee—for 1981–85 of 3- to 3½-percent growth in gross national product. In the "business as usual" case, where they were not aggressive about energy conservation, and oil output was on the lower end of our estimated range in the mid-1980's, coupled with a failure to overcome some of their bottlenecks in steel, we said possibly they could fall to a growth rate of 2 to 2½ percent. However, the baseline case is our most likely estimate for 1981–85.

Senator Proxmire. So you feel it is consistent with your estimate of last year. You are not putting more emphasis on the assurance that they will grow 3 to 3½ percent.

Mr. Diamond. No.

Senator Proxmire. You think there is still that strong possibility, or possibility at least, that the growth might slow down much in the mid-1980's.

Mr. Diamond. That is our central estimate, 3–3½ percent.

Senator Proxmire. But it might slow down.

Mr. Diamond. It may be worse.

Senator Proxmire. And you don't feel, you haven't changed your view since last year.

Mr. Diamond. Well, let me add one caveat to that. I would sense that we, if anything, have become more bearish about the energy problem. So implicitly it could be a worse problem simply because if things are—and the evidence would support this—worse than estimated last year, they would have to strain to get something more than a 3-percent rate of GNP growth.

Senator Proxmire. Now, in response to my questions, you said that economic growth is likely to be lower than projected in your problems and prospects study, but you also say it will probably be 3 percent to 3½ percent during the 1981–85 period.

Isn't this the upper end of the range of your earlier projections?

Mr. Diamond. No; it isn't.

Senator Proxmire. It is not?

Mr. Diamond. The upper end of the range—what we call the best case is 3¼ to 3¾ percent in GNP growth—depended upon certain special initiatives on their part. For example, we assumed they would hold military investment—building of airfields, and so on, plus procurement of military durables—constant at the 1980 level, and hold

down increases in production of consumer durables. Those two measures would produce more investment goods so they could accelerate growth in capital formation.

Second, in the manpower area, we assumed they could reduce the number of military by say a million over a 5-year period. A second move would be to try to divert a higher proportion of youngsters, age 16 to 19, directly into the labor force instead of letting them obtain admission to advance education. And third, take aggressive actions for retaining a large proportion of pensioners in the labor force than at present. It is currently 20 to 25 percent.

Now, if they took all three of those actions with labor, plus additional measures for expansion of plant and equipment, we said they could probably get up to a 3¼ to 3¾ percent average annual rate of growth in 1981–85.

Senator PROXMIRE. Well, your assumption of 3 to 3½ percent is not based on any of those more favorable asumptions from their standpoint.

Mr. DIAMOND. No.

Senator PROXMIRE. It certainly isn't based on the reduction of any military effort that they propose.

Mr. DIAMOND. No.

IMPLICATIONS OF SLOW GROWTH

Senator PROXMIRE. Now, last year's press reports of your projections for Soviet growth created the impression of an impending crisis if the GNP growth rate went as low as 2 percent to 2½ percent.

Would there be a crisis or severe strain, in your view, in how much GNP growth is enough for the Soviet system to remain stable?

Mr. DIAMOND. That is an important question to which I can't give you a precise figure, of what rate of prolonged slow growth would lead either, say to unacceptable levels of civil discontent or drastic economic reforms.

Senator PROXMIRE. You say you cannot answer that question.

Mr. DIAMOND. I cannot give you a precise figure.

Senator PROXMIRE. But you think there is a figure, a 1 percent figure?

Mr. DIAMOND. First of all, there is no threshhold growth rate—like 2 percent or even 1 percent—below which something dramatic automatically will happen. A growth rate of 1 percent in any single year would not in itself produce automatic sharp differences in economic or political behavior. Sustained low growth, on the order of 1 percent per year for several years, is another matter. In the unlikely event that growth in GNP were to fall to 1 percent per year for a sustained period, Soviet leaders would have to contend with allocation problems which could severely strain any regime. The Soviet consumer's level of living would stagnate after a decade of rapid growth, and in the face of strong expectations for more to come. If in these circumstances, the level of defense spending remained very high, the burden of this would fall very tangibly on the consumer. With this turn of events the Soviet populace might become dispirited to the point of seriously impairing their morale and productivity.

The leadership could hardly ignore such a situation. Whatever the composition of the Soviet leadership, they would have one overriding concern to keep the interplay of the demands among the principal claimants from causing the leadership collectivity to break up. While we do not know what options the leadership would choose, cutbacks in defense programs might become irresistible. Additionally, the leadership might look to fundamental economic reforms, aimed at one, altering substantially the prevailing economic incentive system and two, permitting more decentralized management, as offering some relief. Even if major changes were instituted, however, the situation could not be turned around for many years. Alternatively, if they were unwilling to accept the external constraints of reduced military expenditures or the domestic political risks of far reaching reform, they might be inclined to opt for reversion to harshly repressive political measures at home to maintain discipline during a period of generalized deprivation.

Estimates of Soviet and East European Oil Imports

Senator Proxmire. Admiral, you seem to have changed your projection of the amount of oil imported into the Soviet Union and East Europe. You did project before imports of 3½ million to 4½ million barrels per day. Now you have got that down to 2½ million barrels a day. It is quite a difference.

Why the revision?

Admiral Turner. Mr. Eckland.

Mr. Eckland. The 3½, 4½ million-barrel-a-day figure was one we used in the 1985 overall world energy study, and it was made the same way we made projections for other countries in the world, assuming that existing conservation programs and alternative energy programs continued, and that no acceleration was made in conservation policies or alternative energy production. We made a consistent estimate across the world.

Last year in the Problems and Prospects paper that we did, we took a close examination at the conservation possibilities within the Soviet Union itself and reduced that number to 2.5 million barrels a day at that time for the U.S.S.R. and Eastern Europe, excluding Yugoslavia and Romania.

Oil Exploration and Production

Senator Proxmire. Well, I think the dynamic thing here wouldn't be the conservation, it would be the exploration. After all, maybe I just have a chauvinist prejudice, but it seems to me that this country is far ahead of the Soviet Union in most technological areas as far as oil exploration, and yet ever since I can remember, since I was 10 years old, people have been saying we are only 11 years from running out of our oil. You can keep developing all the time and using it up much more rapidly, yet you are still about 11 years off. The Soviet Union, a more primitive country with a vast area, much of which presumably could be rich in oil, I would think they have a potential of developing over the next few years also a substantial resource of oil.

Admiral Turner. Well, we certainly never predicted they are going to run out.

Senator PROXMIRE. Not run out, but I suppose with the——

Admiral TURNER. Yes, sir, how fast they can get it on——

Senator PROXMIRE. The production wouldn't increase as rapidly as it really has. It seems to me these people who project that have been wrong consistently year after year after year.

Isn't it true that 30 or 40 years ago people were predicting we have got about 11 or 12 years of oil left?

Mr. ECKLAND. Well, they are not predicting—usually in the industry you are not predicting there is 11 or 12 years of oil left. You are saying that your proved-up stock of, in effect, your inventory of reserves in the ground that you are certain are there and certain that you can extract, amounts to 10 years of current production.

Now, they have been saying that in the United States——

Senator PROXMIRE. Well, what assumptions do you make about the Soviet Union—its ability to explore and find oil?

Mr. ECKLAND. We have been expecting that they would go on finding oil at about the best rate that they had over any 10-year period of time.

Senator PROXMIRE. Why wouldn't they be able to do better than that with modern technology improving? They are beginning to be able to get hold of it.

Mr. ECKLAND. Part of it is the history. We have seen, around the world, when we go into every major geologic basin, that fairly early in the time you look in that basin, you find the largest oil deposits. They have a lot of structural content to them and they are very easy to find. We also know if you statistically examine all petroleum basins in the world, that the very big oil fields account for about 70 to 80 percent of the oil that you are ever going to find in that area.

Now, the Soviets have been operating in West Siberia now, and exploring for oil since the late 1950's. Within the first 10 years of operation out there, they found most of the giant oil fields—the Samotlor, the Magyon, most of the fields in the Surgut area.

Now, they have kept on exploring and they haven't found a giant field out there since 1971. Now, for them to start making giant discoveries again, they are going to have to go into completely new frontier areas. Now, the East Siberian Plateau may be such an area. They haven't made any commercial oilfield discoveries in that area yet, to our knowledge, and even if they were to make that discovery now, if it took them, as in the case of Samotlor, about 8 years to bring it up to a commercial level of production from the discovery, you would be looking at a similar trend farther out in territory that is more remote and where the infrastructure is even less susceptible to quick development than it was in West Siberia.

Senator PROXMIRE. My time is up.

Senator McClure.

MONITORING SOVIET AGRICULTURE

Senator MCCLURE. I want to return for just one moment to the crop forecasting question.

Are you familiar with Project Lacie?

Mr. DIAMOND. Yes, sir.

Senator McCLURE. I hope that it will produce better results than we have had in the past because I think it has been long my contention that if we could just marshal and use all the information we have, that we can make better projections, and I am fully sympathetic to the difficulty of using all that mass of evidence and making rational sense out of it so we could project.

And I desire to be helpful. I don't desire to indicate by my questions that I don't. I think it is in our interest to do so. But I would like to focus on where our area of problem lies so that we could focus some resources on that problem area and perhaps resolve it so that we can do a better job.

DEFENSE SPENDING TRENDS

As I understand, you have suggested that not only have military expenditures and defense expenditures in the Soviet Union risen at a relatively constant level, that you expect that level, that rise will be constant in the future, even though GNP might reduce.

Am I correct in that?

Admiral TURNER. We expect a small dip in the near term, a couple of years, and then continuing on at 4 or 5 percent.

Senator McCLURE. But even though the economy might perform less well, you would expect that that military expenditure would continue to rise at the same rate that it now has been rising for several years.

Admiral TURNER. Yes, sir.

MILITARY MANPOWER

Senator McCLURE. You have suggested that the country is manpower-short and that one of their real problems in the economy is manpower. I think that is evident in every analysis, and I certainly have no reason to question that.

In spite of that, they have built up their manpower and military forces over the last several years. They recite that as a reason the threat on their eastern frontier with Red China, and they have built up substantially there, and they have also built up on the western front in terms not only of military hardware, but in manpower, too. Is that not correct?

Mr. BURTON. That is correct.

Senator McCLURE. So it isn't simply the Chinese threat, or the "yellow threat," if they call it that, on their eastern border that is the reason for the military manpower buildup, so they again, not only in terms of GNP but in terms of that short commodity which is manpower, they are willing to make very large assignments of resource to the military buildup.

You suggest at one point in your analysis that the manpower buildup will not parallel the trends of the past. You expect that the manpower buildup will slow or reduce as a result of declining birth rates. That would indicate your judgment that in manpower they will make a different allocation than they do in total reources.

Is that a conscious distinction, and if so, what is the reason for it?

Mr. BURTON. We expect little or no growth in military manpower in the near future or, say, over the next 4 or 5 years. We don't see their forces growing or requiring substantially more military manpower.

As you know, the Soviet military is a conscript army and they have been conscripting roughly the same share of the available cohort of 18-year-olds each year.

If they continue at the same participation rates—if they continue the present conscription policy—the size of the armed forces will diminish in the late 1980's as the size of the cohort of 18-year-olds falls.

Senator McCLURE. Why do you anticipate that the total military expenditures will continue to rise, even though there might be a declining rate of growth of GNP? Isn't the manpower figure related to the availability of resources?

Mr. BURTON. Well, Soviet military manpower is related to what they perceive to be their needs to man all of their weapons and equipments and divisions. The available supply of manpower is determined largely by the number of 18-year-olds that come of age each year.

I don't think that they perceive need for continuing growth in the manning of the armed forces like they have had in the past——

Admiral TURNER. That's why I put this slide up, if I might, Senator, because you can see the growth was in the early part of this period. It seems to indicate they feel rather comfortable with 4.1 million. I think one other factor we should consider is that military costs are going up because of increasing sophistication of military hardware rather than need for more manpower in many cases.

Senator McCLURE. That is for two reasons, then, not only the need for manpower, but also the available manpower pool. Would it be both reasons? Both operate, but with the same result is my understanding. Is that correct?

Mr. BURTON. Yes.

Another thing with respect to manpower, however, is that the Soviets actually like to have their young men serve. I think that they view universal service as having not only a military role but social, political, and ideological roles as well. That is, part of the reason that military manpower has grown over the past decade is because of demographic factors—the size of the 18-year-old cohort.

NUCLEAR ENERGY

Senator McCLURE. One final question. I have been very much concerned with the world energy situation, as it relates to one component of that as well, and that is nuclear energy, and I realize that is a very difficult area for us because the President has taken a very strong position with respect to the nonproliferation problems, or the proliferation problems associated with nuclear energy. The United States and the Congress has enacted the nuclear Fuel Export Act. The President has suggested a nuclear fuel assurance for the free world. You have indicated you don't expect the nuclear component within the Soviet Union will increase very much, nor in the developing world.

Yet if you look at what happens in India, and in Brazil, and what is going to happen in Japan, and what is happening in Japan now, the increased Soviet activity in the export of nuclear technology as well as export of nuclear fuels, it seems like you see an increasing pattern of increasing Soviet activity within the context of increasing world activity, but a decreasing share of that activity coming from the United States.

Would you comment on that briefly.

Admiral TURNER. Mr. Diamond.

Mr. DIAMOND. Let me quickly add, when Mr. Eckland earlier was saying that it is now accounting for less than 1 percent of their total energy production from nuclear sources, we are projecting a very rapid rate of growth, of course, in internal production of electricity from nuclear power plants, but even then, the share will only get up to 2 percent by the mid-1980's. Of course it will start accelerating, after the mid-1980's, maintaining very high rates of growth.

Senator MCCLURE. If I understand, what you are saying is this is a development period for them and it will not reflect in itself in the output until after the mid-1980's.

Is that correct?

Mr. DIAMOND. That's right.

Mr. ECKLAND. That is correct.

For the Soviets, they view nuclear power as the main alternative that they have in European Russia where resources of all forms are being depleted.

Senator MCCLURE. Thank you very much.

MILITARY MANPOWER

Senator PROXMIRE. Admiral, following up on the manpower, your figures show that the Soviet military manpower increased from 3.7 million in 1969 to 4.2 million in 1978.

Where were the additional 500,000 troops deployed, how many in Eastern Europe, how many on the Chinese frontier?

Mr. BURTON. I don't have those numbers——

Senator PROXMIRE. Can you give me off the top of your head roughly what that might be?

Admiral TURNER. According to statistics here, the increase from 1969 to 1978 in Eastern Europe was only 70,000 troops.

Am I reading that number right, Mr. Burton?

Mr. BURTON. Yes, sir, Eastern Europe.

Admiral TURNER. That's just in East Germany, Poland, Czechoslovakia and Hungary. That's a fairly modest increase. The rest of it has to be divided primarily between the western Soviet Union and the Chinese front, and I am afraid none of us have that breakdown at out fingertips, Senator, but we will provide that for the record.

[The following information was subsequently supplied for the record:]

Growth in Soviet Ground Forces manpower accounted for over three quarters of the approximately 500,000 man increase in the Soviet armed forces between 1969 and 1978. The rest of the increase occurred among the air, air defense, and naval forces and in central command and support units that are not allocated to any of the services.

Senator PROXMIRE. Now, the media has been reporting not a 4.2 million figure but a 4.4 million figure for Soviet military manpower.

Can you reconcile the 4.2 million estimate with the larger figure, or is the other figure simply not accurate?

Mr. BURTON. There are a number of different counts that can be made, depending upon what forces are included. We can come up to a total of almost 4.7 million, this depending——

Senator PROXMIRE. The media simply then includes internal security forces, and so forth?

Mr. BURTON. That's right. And so there's a varying——

Senator PROXMIRE. 4.2 million, I take it, makes their military manpower comparable with ours, correct?

Mr. BURTON. That's right, that's correct.

TROOP DEPLOYMENTS

Senator PROXMIRE. Now, how many Soviet troops are deployed on the Sino-Soviet border, and how have Soviet troop deployments on the border changed in the same 10-year period?

Do you have that?

Mr. BURTON. I have that information but not with me, and I can provide it for the record.

Senator PROXMIRE. Has it substantially increased?

Mr. BURTON. Yes.

Senator PROXMIRE. Would you say that accounts for a major share of the 500,000 increase?

Mr. BURTON. A substantial share, yes.

[The following information was subsequently supplied for the record:]

Geographically, almost half of the growth in manpower took place in ground and tactical air force units stationed along the Sino-Soviet border. Additions of men to the Soviet forces in Eastern Europe accounted for about 15 percent of the increase. The remaining growth occurred in internal military units, most of which are located in European USSR and most of which probably have wartime missions against NATO.

Senator MCCLURE. Would you yield, Senator?

Senator PROXMIRE. Yes.

Senator MCCLURE. I saw some figures, if I recall them correctly, that would indicate that after the initial buildup on the Chinese border, the subsequent buildup on the two fronts was about one-third European and about two-thirds Eastern front. I just wondered if you could, when you provide that information, if you could clarify.

Senator PROXMIRE. Well, Admiral Turner has already told us, however, that it appears, at least in two or three of the Eastern European countries, that the buildup was somewhat smaller.

Admiral TURNER. Yes.

Senator PROXMIRE. And as he said, 70,000 in Poland and East Germany.

Admiral TURNER. Czechoslovakia and Hungary, yes.

Senator PROXMIRE. And of course, that would be a lot less than a third of 500,000.

Now, how do you explain the increase in Soviet manpower in the last 10 years, and how large a factor are the tensions with China? Why did they do this? Here is a country that needs this manpower urgently for domestic purposes in all kinds of ways, to build up their economy and their agriculture, and yet they are increasing their military by this much.

Why is that?

Mr. BURTON. Of course, China is a big factor, but in addition they have built up their forces generally. A second factor is demographic

in that the cohort of young men reaching draftable age has grown since the early 1960's, and they have generally attempted to have as many of those young men serve as possible. As I said before, I believe that their purposes are indoctrinational as well as military in keeping a high participation rate in their conscription system.

Senator PROXMIRE. That is interesting. That is the first time I have heard that explanation, that you have just got more 18-year-olds coming along. But that seems to me a very irrational way to size your army unless you want to build an enormous reserve and do what we do with the draft, give them 2 years of training and then put them in a reserve or something of that kind.

Is that what they do?

Mr. BURTON. That is certainly an important factor to them. They want to keep their reserve pool as big and current as they can.

Senator PROXMIRE. Well, then it follows that from now on in this chart you have here that there is going to be perhaps a drop in the size of the military, at least at best from their standpoint stationary.

Is that right?

Mr. BURTON. Yes.

Admiral TURNER. Yes; we are not anticipating another increase. As you see, the addition to the labor force was on the rise here in the early 1970's.

Senator PROXMIRE. Now, let me just go over one of the figures that I have mentioned, and I want to be sure I understand. Your figures show there are 590,000 Soviet troops in Eastern Europe, up by 70,000 since 1969, and up by only 30,000 since 1973.

Does it seem to you that these troop levels have been fairly stable in recent years?

Is that right?

Mr. BURTON. Yes.

Admiral TURNER. Yes.

Senator PROXMIRE. In the past 5 years, total Soviet military manpower has gone from 4.1 to 4.2 million. It has been very steady.

So you agree that that is a stable thing in the last 5 years?

Admiral TURNER. Yes.

Senator PROXMIRE. There are 590,000 Soviet troops in East Europe and about 700,000 on the Sino-Soviet border. That accounts for only a relatively small part of their 4.2 million.

Where are the remaining 3 million Soviet troops and what are they doing?

Mr. BURTON. I think I have a chart here, if I can find it.

CIVILIAN ACTIVITIES OF MILITARY MANPOWER

Senator PROXMIRE. While you are looking for that, let me ask whether or not any of these troops are employed in the defense industry or on civilian construction projects. I take it they are not, from the earlier question I posed, where you indicated that this was put on a comparable basis with our own military forces.

Admiral TURNER. The 4.2 million figure does not include defense industry or construction workers.

Senator PROXMIRE. That would not include defense workers in any way, shape, or form, including construction workers?

Admiral TURNER. That is our intent, the way we have tried to structure this, and that is probably the difference between our figures and the press figures and so on.

Mr. DIAMOND. Although part of that, Senator, and this is increasingly so, what we cannot separate out in the military manpower area is how many man-months-per-soldier they participate in nonmilitary activities each year.

Senator PROXMIRE. Why can't you separate that out?

Why can't you do that on a man-year basis? If, for example, they spend 2 months working in the fields, why couldn't we just count that as, at least for some purposes, as five-sixths of a soldier?

Mr. DIAMOND. Well, for example, we have benchmark numbers. In 1969 Brezhnev said, "Every year we have to throw into the agricultural campaign 600,000 trucks," and I don't think he used a number, but a very large number of military personnel. The problem is the sizing of that statement. What do they mean by a very large number of military personnel? If you go out in the harvests in July and return to the barracks in October, that is 3 or 4 months of agricultural activity, but we don't know whether this involves half a million men or a million men, or what.

Senator PROXMIRE. So some of them are full time and some are part time. All right, well, none are full time. None of the 4.2 million. These are pretty much full-time military personnel. You don't count any of those as more than just working part of the time in agriculture or in any other areas.

Mr. DIAMOND. It is my understanding that the construction battalions—there is very large use of military personnel in construction activity—for the most part, spend roughly one-third to one-half of their activity in military and two-thirds in transportation and normal civilian construction.

Senator PROXMIRE. Well, then, that doesn't make the figures comparable.

Mr. DIAMOND. Well, I am not sure about that.

Senator PROXMIRE. How about that, Mr. Burton?

Mr. BURTON. Construction troops are not counted in the 4.2 million total. We make no adjustments for the troops involved in the harvest.

Senator PROXMIRE. Do you have the answer to the question that I asked before?

TROOP DEPLOYMENTS

Admiral TURNER. Not very precisely, Senator. You have got 4.2 million total, 1.3 million between the Far East and Eastern Europe, so we have got 2.9 to account for. Of that, 700,000 is navy and strategic rocket forces which are either in areas we haven't discussed, or in the Soviet Union where their strategic rocket forces are.

Senator PROXMIRE. Their readiness performance is so poor, compared to ours, their number of ships at sea, the number of subs that are not in port is so small, I would think it is hard to account for that navy personnel as being at sea——

Admiral TURNER. What I am saying is they are not counted in the 590,000 in Eastern Europe or the 700,000 in the Sino-Soviet area. They are in Vladivostok in the Far East, and they are in Murmansk and that area in the Atlantic.

And so we are down to a couple of million troops that are in the Soviet Union, a high percentage of them in the western Soviet Union, ready to move into the NATO area, and counted against our overall NATO threat.

But we would be glad to get you a breakdown.

Senator PROXMIRE. Provide more details, if you can, for the record.

Admiral TURNER. All right, we can do that.

[The following information was subsequently supplied for the record:]

About 650,000 Soviet military personnel of the Ground, Air, Air Defense and Strategic Rocket Forces serve in units estimated to be targeted against China. Air and ground forces totaling 590,000 men are stationed in Eastern Europe and another 1,000,000 members of the Ground, Air, Naval and Strategic Rocket Forces are located in the Western U.S.S.R. with wartime missions against NATO. Of the remaining 2,000,000 men, some 900,000 have national air defense, intercontinental attack, or naval roles—nearly 700,000 comprise a central reserve of ground and tactical air force personnel—and roughly 350,000 have national command and support functions.

DEPLOYMENTS AGAINST CHINA

Senator PROXMIRE. You estimate that 12 to 15 percent of the dollar cost of Soviet military activities are for forces deployed against China, 12 to 15 percent.

That seems to contradict the estimates Secretary Harold Brown is reported to have given in the June 14th issue of the Washington Post where he said that one-fourth of the Soviet nonnuclear military forces are committed to the Chinese border.

How do you reconcile that apparent discrepancy? He says 25 percent of the troops. I recognize that the nonnuclear military forces account for only part of the total. But could there be that much of a discrepancy? Between 15 percent, according to you, on the Chinese border, and 25 percent according to the Secretary of Defense?

Mr. BURTON. I don't know how the Secretary of Defense got his numbers. Ours were a calculation where we took each of the units——

Senator PROXMIRE. Can you reconcile that? Will you look at that for us and see if you can——

Mr. BURTON. It is possible he is only counting forces and we are counting total expenditures.

Admiral TURNER. I thought that's what you said, that he said 25 percent of the nonnuclear manpower?

Senator PROXMIRE. That's right. It is a very different thing, and that could account for some of it. But I just wonder. First of all you said 12 to 13 rather than 15 percent of the dollar costs of the Soviet defense activities, are the forces deployed against China, and Mr. Brown says one-quarter of the Soviets' nonnuclear military forces are committed to the Chinese border. So his seems to be higher than yours, perhaps not.

Admiral TURNER. We will look at it.

Senator PROXMIRE. See if you can reconcile that.

My time is up.

[The following information was subsequently supplied for the record:]

The two figures are compatible. Secretary Brown's figure of 25 percent refers to the share of total Soviet ground troops that are on the Chinese border. Our estimate of 15 percent refers to the dollar cost of all forces disposed against China as a share of the costs of total Soviet defense activities.

Senator PROXMIRE. Senator McClure.

Senator MCCLURE. You have given a table that shows the buildup on the European front. The table shows figures on the forces in East Europe. That would be in the NATO guideline countries of Poland, East Germany, Hungary, and Czechoslavakia. It shows 1969, 520,000. Do you have a similar figure for the Chinese front in 1969 and 1973 and 1978?

Mr. BURTON. We don't have it with us but we can provide that.

Senator MCCLURE. If you would provide that, for the record, so we can draw some comparisons for that.

I have no further questions, Senator.

[The following information was subsequently supplied for the record:]

The number of Soviet military personnel assigned to forces with missions against China grew from about 400,000 in 1969 to between 500,000 and 600,000 in 1973 and about 650,000 in 1978.

SOVIET TROOPS AND TECHNICIANS IN NON-COMMUNIST COUNTRIES

Senator PROXMIRE. Now, can you give us estimates on the number of Soviet troops and technical experts in the non-Communist countries, such as in Africa and the Middle East?

Admiral TURNER. Yes.

Senator PROXMIRE. Can you tell us something about that now?

Admiral TURNER. There are something over 500 Soviet troops in Ethiopia in an advisory capacity.

Senator PROXMIRE. Is that the biggest? Is it only a matter of a few hundred troops in Africa and the Middle East?

Admiral TURNER. Anybody have any other——

Senator PROXMIRE. How about the Middle East?

Are these troops or are these civilians?

Admiral TURNER. No; we understand those are troops, but they are not like the Cubans there in a combat role, although of course, as you know, the——

Senator PROXMIRE. They are training the troops. They train the local people.

Admiral TURNER. Well, they are also in the Ministry of Defense, running their logistics outfit. They are doing a lot of the planning for them. The general, General Petrof, ran the actual campaign. I mean, he was in command of it, day to day operational command, but he didn't have his own troops out there being shot at.

Senator PROXMIRE. We have some military personnel, too, but it is a lot smaller than even that, presumably. We have military adivsers over there. We have top military officers in various countries, isn't that correct?

Admiral TURNER. Oh, yes. A country——

Senator PROXMIRE. If you compare that with their numbers, would we have more or less or the same, roughly, in Africa and the Middle East?

Admiral TURNER. Well, counting our people in Iran——

Senator PROXMIRE. Well, in Iran, we really outnumber them.

Admiral TURNER. I think we would outnumber them. In Africa and the Middle East we are very small.

Senator MCCLURE. We have a quite a number in Saudi Arabia, particularly in the Corps of Engineers.

Admiral TURNER. Yes. I am not sure, Senator, how that divides between civilian contracts. Yes, the Corps of Engineers is running it, but I wouldn't think they took a lot of troops.

Senator MCCLURE. It is less than 100, I think.

Admiral TURNER. We will supply more information on this for the record.

[The following information was subsequently supplied for the record:]

Soviet and East European military technicians in LDC's, 1977

Africa	5,715
Of which:	
Algeria	600
Angola	550
Equatorial Guinea	23
Ethiopia	500
Guinea	130
Guinea-Bissau	65
Libya	1,000
Mozambique	200
Somalia	1,500
Uganda	300
Latin America: Peru	100
Middle East and South Asia	4,435
Of which:	
Afghanistan	350
India	150
Iran	120
Iraq	1,150
Syria	2,150
Total	10,250

SOVIET STATEMENTS ABOUT MILITARY MANPOWER

Senator PROXMIRE. Admiral, let me ask you how U.S. intelligence estimates of Soviet military manpower differ from the Soviets' own estimate, their estimate. Are there major differences, and if so, how do you explain them?

Admiral TURNER. Of course, we do have a major difference with them on the MBFR negotiations where we are 200,000 different. This is one of the only ways I know that we have come into a direct comparison, where they have made a statement as to what their forces are——

Senator PROXMIRE. They are lower than we think. In other words, they are understating it; is that it?

Admiral TURNER. They are understating their case, and we believe this is largely in accounting [security deletion].

Senator PROXMIRE. Is there any Soviet publication where they say they have 4 million or 3 million or whatever? Do they ever admit that anywhere?

Mr. BURTON. No, no. The last time the Soviets spoke about their military manpower was in Khrushchev's time. That was in about 1960.

Senator PROXMIRE. I see.

Now, you conclude the Soviet civil defense program has shelters to protect the leadership, 12 to 24 percent of the work force, and 10 to 20 percent of the total urban population.

Is that sufficient to assure the survival of the Soviet Union as a nation or a viable economy after an all out nuclear war, and what would have to be done and how much would it cost to significantly increase protection of the work force and the urban population?

Testimony we have had from civil defense people, like Mr. Jones of Boeing is that their principal civil defense protection of their population is that in a first strike, it would first take 2 or 3 days to evacuate their cities and just scatter their people, harden their industrial sites, and the argument before us was that they could tough it out, we could sock them but they could stand under those circumstances, and it was argued they would only suffer a loss of 2 or 3 percent of their population compared to a 50 percent loss of ours.

Admiral TURNER. I agree that the Soviet civil defense program is totally dependent upon the evacuation process to reduce casualties to anything like an acceptable level, and that is a tough word "acceptable" but they do not have the capacity in their shelter program. Just look at these numbers we have given you.

You also have to consider that it is no coincidence, the 12 and 24, exact multiples of 2, and 10 to 20, and that is a matter of how many square meters you give to the individual, and we have got conflicting reports from refugees and from documentation of the Soviet civil defense program as to what they are planning on. If you take the higher figure, they will have a hard time staying inside those sardine cans while the other people are marching out to evacuate. So you have really got to deal, I think, with the lower figure for the shelters if you are going to keep them in there for any period of time, which makes it even more a case that they are dependent upon the evacuation.

During the initial stage of evacuation, anyway, they are: first, more vulnerable to being decimated if we target appropriately. Second, they are sure giving a major sign of concern if not intent. So there are real risks to them in the kind of massive evacuation of their urban population, that is, 80 to 90 percent of it.

Senator PROXMIRE. If they evacuate their cities, you may be very, very suspicious, but it is not clear to me what we could do about it.

Admiral TURNER. No, if you——

Senator PROXMIRE. I doubt if we would say well, that means a first strike, we will hit them first. All this talk is——

Admiral TURNER. I doubt, personally, that that would be our reaction. On the other hand, if you are a Soviet, you can't discount that danger, particularly when you know in the first, oh, day or so your vulnerability has gone up.

Senator PROXMIRE. At any rate, do you believe that they have taken these steps, these civil defense steps? Do you think they would provide for the protection of the leadership and anything from 12 percent to 24 percent of the work force, and 10 to 20 percent of total urban population? Do you think they have done that?

Admiral TURNER. Yes, we do believe that, and our estimates have increased. They started to increase just as I came to you last year and spoke about this.

Senator PROXMIRE. They have increased. In other words, more and more people now are being protected.

Admiral TURNER. Yes. We estimated——

Senator PROXMIRE. What is the difference in the last 10 years?

Admiral TURNER. Well, we went up in our estimate of what they have done from a year and a quarter ago, about 5 or 6 percent to this 10 to 20 percent, but it is really 5 or 6 versus 10 percent, because the 20 comes from the halving of the square meters. In short, we have increased the estimate of the number of shelters for the general population from 5 or 6 percent to 10 percent in the last year as a result of new data that we have garnered. We think the——

Senator PROXMIRE. We don't have any of that, is that right? So that if you compare the two, they have got a relatively small program compared to their whole population, but compared to us, it is a massive protection program. Is it correct to say we have nothing?

Admiral TURNER. Virtually, but where they are spending $2 billion in our terms on this a year of course is——

Senator PROXMIRE. We are spending——

Admiral TURNER. Something very, very small. I am not sure what.

Senator MCCLURE. On the civil defense question, it is a matter that troubles me because I know from our analysis, that I have seen, they have done two things. First of all, they took our civil defense manuals and they put them into practice. They built the shelters, they have the evacuation plans. They also have the knowledge that we have from our tests, that a hardened site can withstand a nuclear blast and be put back into commission.

We know that while our atomic bombs leveled two cities in Japan, that the reinforced structures at the center of the cities were not totally destroyed, and essential services were restored in those cities within a matter of a few weeks, so that the total destruction that we have pictured in this country is not pictured in the Soviet Union.

I have forgotten what the population figures are in the Soviet Union. It is less than 300 million, is it not, 260 or 280 million?

Mr. DIAMOND. 268 million.

PERCEPTIONS OF NUCLEAR EXCHANGE

Senator MCCLURE. And out of that they figure they can have a nuclear exchange, a full exchange with the United States with a loss of no more than 20 million of their people. That is a horrendous figure by any humanitarian standard, but they are not exactly humanitarian in the Kremlin, and therefore they have come to the conclusion that they can fight and survive a nuclear exchange.

Now, that perception, if it is real on their part, must be an incredibly important consideration in what we might do, and how we would calculate the possibility of a nuclear exchange.

Is that their perception, that they can survive a nuclear exchange?

Admiral TURNER. I have never seen any evidence that they feel that way. That doesn't mean it doesn't exist, Senator, because that is penetrating in the innermost thoughts but——

Senator PROXMIRE. Would the Senator yield at that point, because this is a very critical question. But what it seems to me this overlooks

is the capacity that we have to carry on nuclear war, not for 24 hours or for a week, but for months and even for years with our submarines and so on, and you talk about leveling Hiroshima and Nagasaki. That was just nothing compared to the way we could hit them now, and I would think they would have to calculate that they wouldn't just have to survive one hell of a week, that they would have to survive years of devastating, repetitive hammering over, and over, and over, and over again. It would seem to me that would be what they would have to calculate on, not losing 20 percent of their population in 1 nightmare week or 2, but probably losing the whole damned country once they started this thing because there would be no end to it.

Admiral TURNER. Also, all of these calculations disregard residual fallout casualties because they are just so difficult to calculate, plus, I would also say that we are estimating they had something like 20 million casualties in World War II, and it seems to me that has left a very indelible impression on the Soviets. We are talking now about more than 20 million.

Senator MCCLURE. But they, also on purpose, in the 1930's, killed that many of their own people. They were their own citizens, and it didn't seem to make an indelible impression upon their own leaders.

Mr. DIAMOND. We imagine they disagreed with the regime.

Senator MCCLURE. Well, the only reason I mentioned it is, I agree with my colleague. This has to be a central concern that we have. What would the President of the United States say or do if suddenly the red phone jangled and said, "Now your observers may notice that we are evacuating our cities, but don't be concerned about that, Comrade. This is just a civil defense test," and 24 to 36 hours later the phone rings again and said, "Now we have got all our people out of the cities; the cities are evacuated; the essential people are in hardened shelters. Now we are going to start a major incursion in Europe."

What would the President of the United States say? I don't know and I don't suppose he—I hope he never has to answer that question. But I think it introduces a variable or a factor into the calculations that both they and we have to consider that is a very, very important consideration.

Admiral TURNER. Yes, sir, we agree with what you said factually, though they do not test these evacuation plans. We think they have the plans. They have got over 100,000 people in their civil defense organization to help make them run.

It would be my personal view that trying to evacuate Moscow in 24 to 48 hours would cause pandemonium if they haven't really got it worked out.

Senator MCCLURE. Did you say they have not tested it? I have been told that each city and each family in the city has a host family in the countryside, and that their evacuation plans call for each family to know where that host family is, what route they would take to get there, and that as a matter of fact, each family in the city has made the trip at least once.

Admiral TURNER. I am not aware of that degree of detailed planning, and the only evidence I have seen of actual exercise—taking some bureaus, some of the ministries and saying you get on out—didn't work well.

Soviet Outlays Against NATO

Senator McClure. I have great respect for their ability to foul things up. That is one of the greatest assets we have, perhaps.

Senator Proxmire. Now, you estimate that the dollar cost of Soviet forces allocated against NATO, using a narrow definition of these forces, are less than 10 percent of the total Soviet forces for the 1977–78 period, and 40 percent using a broader definition of these forces.

What has the trend been during this period? Can you break down that figure by the year?

Admiral Turner. Mr. Burton, do you have that?

Mr. Burton. No; I don't have that.

Senator Proxmire. Can you get that?

Mr. Burton. Yes.

[The following information was subsequently supplied for the record:]

Under the narrow definition, Soviet forces in the NATO Guidelines Area grew from 1970–1977 at a rate of about 8 to 9 percent in ruble value terms, and 6 to 7 percent in dollar terms. For a fuller discussion of the costs of Soviet Forces in the "guidelines" area, see *"Estimated Soviet Defense Spending: Trends and Prospects"*—SR 78–10121—National Foreign Assessment Center, Central Intelligence Agency. Under the broader definition, Soviet forces grew over the 1970–77 period about 3 to 4 percent in ruble terms and 2 to 3 percent in dollar terms.

Senator Proxmire. Admiral, what portion of Soviet forces allocated against NATO would be available for conflicts in other areas, in the Middle East, Africa, Sino-Soviet area? Do they have that much mobility?

Admiral Turner. Oh, yes. There are several millions that are back in the Soviet Union, as contrasted with the 590,000.

Senator Proxmire. But I am asking about NATO forces. There are various reasons for that. I assume they are NATO forces, they probably, maybe not, but I assume they might be the most ready and the most skilled and the best trained, the best equipped.

Admiral Turner. Well, I would say this. In my personal view, I think they would be very reluctant to reduce that number significantly for two reasons. One is the posture versus NATO and the other is that a lot of these are occupation forces, in Poland and Czechoslavakia and East Germany, in effect. However, I don't think that would preclude their taking a crack regiment or brigade or something out for an emergency application.

However, in the 1973 crisis, the units that they called upon or had on alert were not those in the Eastern European area but were units from back in the Soviet Union. And it seems to me they probably have more than adequate forces in the Western Soviet Union for such application in the Middle East and Africa.

Non-U.S. NATO Defense Spending

Senator Proxmire. Admiral, you say that you have not made direct cost estimates of the dollar costs of non-U.S., that is Germany, Britain, and so forth, of non-U.S. NATO defense activities. Now, does that mean that our Government has no independent knowledge of our NATO allies' defense allocations other than the official figures released by these governments?

Mr. BURTON. That's true.

Senator PROXMIRE. We just take whatever they give us?

Mr. BURTON. Yes, but there is quite an exchange of expenditure information in NATO between the countries, but it is true, it is what they give us.

Senator PROXMIRE. But as our NATO allies have not constructed defense inflators, and as they disclose considerably less information than we do, isn't there considerable doubt about the real level of non-U.S. NATO defense spending?

Admiral TURNER. Well, you are saying disclose, publicly. We are not talking about just public figures that the NATO people put out but the figures that are shared within NATO as to their commitment. Where we get into problems are the non-NATO-allocated forces of the allies.

Senator PROXMIRE. They disclose as much to us as we do publicly?

Admiral TURNER. Well, that's a tough judgment. I think generally so. As a former NATO commander, I had a pretty good handle on what the countries I was associated with were spending on defense. But just as in the United States, not all of the military structure of the NATO countries is allocated to NATO, and there we don't have any more visibility than the public figures they issue.

Senator PROXMIRE. Well, you have had a good experience with NATO, and I have trust in your judgment.

Do you see a need to close this information gap and what can you recommend we do about it?

Admiral TURNER. I don't think it is an urgent problem, and it runs into the difficulty of spying on your allies, your close allies, is the problem. I mean, one of the ways to close it is to use some of the same techniques you get——

Senator PROXMIRE. Well, it is not a matter of spying on them so much as persuading them that it is in our common interest to understand what we have, what we have together, jointly. That it would be to their interest as well as ours so that we would understand how well or how poorly prepared we are.

Admiral TURNER. I don't think our knowledge is bad on the quantity of forces and equipment that they have. Where I think we are short is on the degree of readiness and training that they have got, and how we can estimate that, and that is——

Senator PROXMIRE. That's important.

Admiral TURNER. Yes, it is; it is very important, and——

Senator PROXMIRE. Why wouldn't it be a good idea to try to improve that?

Admiral TURNER. It would, and General Haig is trying that all the time in terms of what we can get and what we can estimate.

ANTITANK WEAPONS

Senator PROXMIRE. Now, the Warsaw Pact's numerical advantage over NATO in tanks has been widely noted, but some experts believe NATO has superiority in antitank weapons, especially since the advent of precision-guided munitions.

Can you comment on that?

Admiral TURNER. Yes.

We believe that quality- and quantity-wise we are well ahead in antitank weaponry.

Senator PROXMIRE. Enough to counterbalance their tank advantage?

Admiral TURNER. Well, that gets into a very complex strategic calculation that I don't think can be made that simply, Senator. I think it is terribly——

TANKS

Senator PROXMIRE. It is also argued that most NATO tanks are superior in quality to the Warsaw Pact's. NATO's are heavier, have longer ranges, larger ammunition loads, more accurate guns, better armor, more space for tank crews and can travel longer without breaking down than Soviet tanks.

Do you agree with that assessment or disagree?

Admiral TURNER. No, sir; I don't think it is anywhere near that black and white.

Senator PROXMIRE. Well, let's take them one by one.

NATO's are heavier. Is that correct?

Admiral TURNER. Generally, yes. That isn't necessarily good.

Senator PROXMIRE. How about larger ranges? Well, heavier, I presume, means they are better armored. Maybe not.

Admiral TURNER. That is generally correct—NATO tanks are heavier because they have more armor. For most NATO tanks the heavier weights have not hampered mobility because they have adequate power. The British Chieftain is an exception.

Senator PROXMIRE. How about the ranges?

Admiral TURNER. NATO's ranges are better.

Senator PROXMIRE. How about the ammunition loads—more?

Admiral TURNER. NATO tanks carry more ammunition. For example, the M–60A1 carries 63 rounds while the T–62 carries only 40.

Senator PROXMIRE. How about the accuracy of the guns?

Admiral TURNER. My information on that is that it varies with the tanks, and the later Soviet tanks are very good. But NATO tanks have generally been more accurate.

Senator PROXMIRE. Now, you talked about—you say heavier may not be better.

Would you agree that ours are better armored?

Admiral TURNER. Again, the NATO tanks are better armored. But the Soviets are ahead of us in fielding new tanks with improved armor. While this armor is not as good as that on the XM–1, it is better than that on most of the NATO tanks in the current inventory.

Senator PROXMIRE. How about maneuverability and speed?

Admiral TURNER. Except for the Chieftain, ours are faster and more maneuverable.

Senator PROXMIRE. How about the space for tank crews?

Admiral TURNER. You see, one of our problems is when you say heavier, now space-per-tank-crews——

Senator PROXMIRE. I shouldn't say that one. It doesn't mean anything. As you say, it could be a liability or an asset.

Admiral TURNER. Our tanks are bigger. You have to be a much shorter individual to get into a Soviet tank, and it is very uncomfort-

able, very uninhabitable for long periods of time, but it gives them a lower profile and less vulnerability. You know, the heaviness, the space-per-crew in ours is a disadvantage in terms of vulnerability.

Senator PROXMIRE. How about being able to travel longer without breaking down than Soviet tanks?

Admiral TURNER. I think that that generally is the case.

TACTICAL AIRCRAFT

Senator PROXMIRE. The Pact has more tactical combat planes in Europe than NATO, but it is pointed out that more of the Pact's aircraft are exclusively for air defense missions than NATO's and NATO's aircraft in general are far superior in payload, range, maneuverability, firepower, accuracy, deep strike, interdiction capability, and command and control flexibility, and NATO's crews are better trained and more proficient.

Do you agree or disagree?

Admiral TURNER. I think that is all true. What bothers people today is that the trends on the Soviet side have all been rapidly to close each of those gaps mentioned, but we still do have general superiority of those characteristics you mentioned.

In this unclassified report that we are giving you, this stands out markedly. Here we have graphs on the trends in estimated Soviet investment and operating expenditures by branch of service. Compared with the trend in total defense, the one for their air forces is the steepest curve above the average growth. In short, the Navy is below and the ground forces are about even.

Senator PROXMIRE. Of course, the tradeoff here has been when you get that superior plane that has improved performance, the cost of it is so big that your number of planes that you can afford is diminished. Has that been their experience as well as ours?

Admiral TURNER. No, sir.

Senator PROXMIRE. When you compare the cost of a fighter plane now with World War II—what is it, 168 times as much, even allowing for the most fantastic kind of inflation—that means about 50 times as much in real resources we are putting into the present planes. So we have to diminish the numbers. We can't afford more.

I would think that would be true of theirs, too, if they are improving the range, maneuverability, payload, firepower and so forth, that you have got to pay a price for that.

Admiral TURNER. But they do outnumber us in the number of aircraft.

Senator PROXMIRE. In what ratio?

Admiral TURNER. It is 1.1 or 1.2 to 1. It is not a big factor, but they do have more aircraft.

Senator PROXMIRE. But we do have a lead, and you say our lead is diminishing.

Admiral TURNER. We have a qualitative lead, not a quantitative lead, and it is diminishing, yes, sir, and the number of aircraft, for instance, they have that are all-weather-capable has come up markedly.

Combat Surface Vessels

Senator Proxmire. The Soviets are reported to have 450 combat surface vessels compared to 250 for the United States, but is it not correct that the Soviets have many light escort ships and the U.S. Navy has three times the tonnage of the Soviet fleet?

Is that correct?

Admiral Turner. The first is correct. The three times, I don't have it at my fingertips.

Senator Proxmire. Something like that, our tonnage?

Admiral Turner. Yes, our tonnage is greater than theirs, although I am quite sure it is not anywhere near a factor of 3 to 1.

Senator Proxmire. What is it, 2 to 1?

Admiral Turner. I would say it is less than 2 to 1.

Does anybody have that?

Mr. Burton. It is less than 2 to 1.

Senator Proxmire. What is that?

Mr. Burton. It is less than 2 to 1, but I don't have the precise number.

Senator Proxmire. Well, let us know what it is, whatever it is.

Mr. Burton. Yes, sir.

[The following information was subsequently supplied for the record:]

MAJOR SURFACE COMBATANTS (FRIGATE CLASS AND LARGER)

	Units	Tonnage	
		Tons (thousands)	United States divided by U.S.S.R.
United States	167	1,840	1.96
U.S.S.R.	261	940	

Note.—These inventories include: Carriers, cruisers, destroyers, and frigates.

Naval Aircraft

Senator Proxmire. Is it not also true that the U.S. has superior naval aircraft, a far greater capability for projecting power from its attack carriers, and superior antisubmarine warfare capabilities?

Admiral Turner. On the second two, yes. On the first one——

Senator Proxmire. Superior naval aircraft?

Admiral Turner. They don't have naval aircraft anywhere near ours that are based at sea, but you take the Backfire aircraft based ashore, which is used in a—half of them so far have been assigned to the naval role. It is a very high quality naval aircraft, but it is not based on a carrier.

Senator Proxmire. Would it be superior to ours, or equal to ours?

Admiral Turner. Well, I would say it is superior to any of our naval attack aircraft. The F–14 is——

Senator Proxmire. Well, that's a little unfair. You say in the first place that we have a great advantage in sea-based aircraft.

Admiral Turner. That's correct.

Senator Proxmire. Then if you compare their aircraft which are landbased with ours which are seabased, of course they have an advan-

tage. Well, not of course, but usually there is a great advantage. You can do all kinds of things with a landbased aircraft that a seabased aircraft, because it has to conform to be able to land on an aircraft carrier, can't do.

Admiral TURNER. Yes, that's correct. I'm just trying to put it in the right perspective, though. The way the Soviet navy operates, they have to count on land based air at this time with the exception of the two small carriers that they have got so far, and a third one under construction.

AMPHIBIOUS CAPABILITY

Senator PROXMIRE. Do you agree the Soviets have a small amphibious capability compared to the United States and have no overseas bases, and that although its ships now range in the worldwide blue water, its navy is still largely defense oriented?

Admiral TURNER. Generally, yes.

Senator PROXMIRE. There seems to be a divided opinion on various aspects of United States and Soviet conventional forces in both countries. Let me cite two pessimistic views.

ARTICLE BY ARTHUR HADLEY

In the Washington Post, June 4 and 5, 1978, issues, Arthur Hadley argues that the Soviets are superior to us in the application of technology to warfare, that they have the most sophisticated weapons and communications systems now deployed in Europe. Mr. Hadley gives examples of electronic warfare tanks and antitank weapons and control of the air.

Is he right or wrong?

Admiral TURNER. I read the article and was intrigued by it for the first 10 minutes, and threw it way after the second 10 because he has got such broad generalizations that I think they are more harmful than useful.

Senator PROXMIRE. So overall you wouldn't agree with the article as far as the breakdown is concerned, electronic warfare that is superior.

Admiral TURNER. Well, Secretary Brown the other day said "No." I would not be quite as categoric. I am just trying to show that there is a wide variety of opinion here and it is very difficult to measure. I think the Soviets pay more attention to electronic warfare than we do, probably train more in that field, and are better prepared. I would suspect we have more sophisticated equipment in many areas than they do, you know—on our airfields. We have been very resourceful in the electronic category. In Vietnam and Korea we were very responsive in terms of coming up with countermeasures—jamming and detection of missiles and that kind of thing. I think we are very good there. I think in overall jamming of communication links and so on, the Soviets are better than we are. It is a mixed bag when you use a term as broad as that.

Senator PROXMIRE. Also it is a mixed bag on tanks I take it. They have more tanks. Our tanks may have advantages in many respects. At least that was your previous answer.

Admiral TURNER. That is the general thrust of my previous answer, although the current improvements in the Soviet tanks are coming along very rapidly. The new model T-64's are being introduced in Eastern Europe very rapidly, and now the T-72, which is not yet deployed to Eastern Europe but has come along in western Soviet Union. It is a very high quality tank. But until we get our next generation of tanks, I think they are superior in quality as well as quantity.

Senator PROXMIRE. Hadley also mentions antitank weapons as an advantage the Soviet Union has over us.

Now, that seems to contradict what was just told us, at least about the NATO area, where our antitank weapons are better than theirs.

Admiral TURNER. That is correct. We believe——

Senator PROXMIRE. He's wrong about that. OK.

How about control of the air? He says they control the air, they have the advantage in control of the air.

Admiral TURNER. No; I don't think that is the case either.

ARTICLE BY FRED KAPLAN

Senator PROXMIRE. I was going to say that Fred Kaplan, in the June 12, 1978, issue of Inquiry takes a contrasting view. He quotes Soviet Gen. I. G. Pavloky, who, in the "Soviet General Military Herald," complains about the deficiencies in army combat training. According to General Pavloky, army officers "have still not learned to firmly control the actions of subordinates in battle or maneuver with them to properly use armored transport." Talking in general about the Soviet Army, he says, "means of fire suppression or antitank weapons." Kaplan concludes that NATO is superior to the pact in training, tactics, strategy, manned control, logistics, and reinforcement.

Do you agree or disagree?

Admiral TURNER. That is just too broad——

Senator PROXMIRE. Well, I'll just take them one at a time.

Admiral TURNER. It's difficult to simply agree or disagree, Senator.

Senator PROXMIRE. How about the training?

Admiral TURNER. These are very subjective judgments, Senator. My feeling would be that U.S. training is better, European training is poorer than the Soviets.

Senator PROXMIRE. All right.

Admiral TURNER. That is, excepting the British and the West Germans.

Senator PROXMIRE. How about tactics and strategy?

Admiral TURNER. I think that is a standoff because we are talking two different sets of tactics, a defensive one and——

COMMAND AND CONTROL

Senator PROXMIRE. How about command and control?

Admiral TURNER. My reaction is the Soviets would be ahead of us in command and control.

Senator PROXMIRE. Would be ahead of us?

Admiral TURNER. That they put much more emphasis on duplicatory lines of communication for command.

Now, where they would be at a disadvantage is if their plan broke down. I think our leaders are trained to be more flexible in command and control and to take charge of things if they lose control. The Soviets have a command structure that goes all the way up the line and is very tightly controlled because of the different kind of society that they live in. If we can break their command structure in an early stage of a war, they probably are less flexible in responding, though they do, in contrast to that, have more redundancy in their system than we do. They probably have more alternate command structures. But I suspect the individual—to put it in my own terms—ship captain out at sea is on a much tighter tether than would be ours.

Logistics and Reinforcement

Senator Proxmire. How about logistics and reinforcement?

Admiral Turner. We have fairly slim information about the Soviet logistics capability, but are inclined to think they are pretty good. U.S. logistics is good. Most European logistics is very deficient. So on balance, I think that is a very subjective area in which we are not able to make good comparisons, and I wouldn't think there was an edge in one side or the other of great significance.

Reinforcement, it is our view that in 30 days NATO reinforcement will be greater than the Warsaw Pact reinforcement. Clearly ours is largely dependent on airlift and sealift and theirs on rail.

MIG–25

Senator Proxmire. Now, to get back to the Hadley article, Hadley says, "The examination of the MIG–25 flown to Japan revealed its electronic equipment to perform better than our own." For example, he says that "information to MIG–25 pilots comes in data bursts powerful enough to burn through jamming while U.S. pilots must still rely on voice transmission that is easily jammed."

Would you comment on Hadley's charges and also discuss more fully what the examination of the MIG–25 revealed?

Admiral Turner. Mr. Burton, are you an expert on the MIG–25? We have got a paper on it here.

Mr. Burton. No; I am not an expert, but I think I can.

I think in the response that we made to you, we pointed out that it was a kind of a mixed bag. There were some things that surprised us, or some things were better than we thought and others were worse.

Senator Proxmire. Did you come to any kind of an overall conclusion on electronic equipment?

He claims it is better.

Admiral Turner. Well, we found out that it definitely did not have a look-down capability, which we had predicted, while many of our aircraft do. We found that it had more elementary electronics, tubes in it in some cases, than ours, and yet the other half of what he says, that it was very powerful and our jamming of it would be more difficult is also true. It goes back to what we were talking about before, Senator, that they do with a sledge hammer what we do with a more refined tool in many cases.

Senator PROXMIRE. Does that make the jamming extremely difficult or make it impossible?

Admiral TURNER. I don't think it is ever impossible to jam anything, myself; if you bring enough power to bear in the right direction and focus it well enough, you can interrupt most any kind of electronic emission if you work on it. So I don't think it is that bad; no.

Senator PROXMIRE. Hadley also charges, because the Defense Department has kept quiet about the Soviet lead in jamming equipment and beam guiding missiles, the public is unaware of other areas of Soviet excellence.

What is your comment on that?

Admiral TURNER. Because the——

Senator PROXMIRE. He says because the Defense Department has kept quiet about the Soviet lead in jamming equipment and in beam guiding missiles.

Admiral TURNER. Oh, lead.

[Pause.]

Admiral TURNER. I don't know that——

Senator PROXMIRE. Has that information been suppressed?

Admiral TURNER. Well, what we should release in an unclassified version to the public is another issue here, and I don't know that substantial information not released——

Senator PROXMIRE. Well, it would seem to me that in general, and of course, I am sure there are many exceptions, but in general, if we know, as a matter of fact, that the Soviets are ahead of us in a particular area, we could find a way of making that known and that would serve the interests of alerting Congress and the public to our need to be sensitive to that, and to support whatever it takes to correct it if we can do so at reasonable cost. If we don't know that—if we are ignorant of it—we can adopt policies that are unwise because they are based on inadequate information.

Admiral TURNER. Well, but there is a difference between informing the Congress, which you can do on a classified basis, and informing the public and thereby alerting the Soviets to the fact that they have an advantage.

Senator PROXMIRE. It is pretty hard to inform the Congress on a classified basis.

Admiral TURNER. You are not going to disillusion me on this, are you, sir? I am up here all the time giving out information.

Senator PROXMIRE. Well, you can talk to individual Members of Congress, I am sure, with complete assurance that they are not going to disclose it, but I am talking about informing 400—535 Members of Congress, 100 Senators and 435 Representatives, so when they vote on these measures, and they all have to, we know what we are doing. It seems to me it is almost impossible to inform the full Congress without informing the public.

Admiral TURNER. Well, we certainly inform a lot of committees, like this one.

Senator PROXMIRE. Yes.

Admiral TURNER. On a classified basis and——

Senator PROXMIRE. Well, I think you can do that with good security. I think there is a difference in coming up, as you do, very well, and informing this subcommittee and the Armed Services Committees and the Appropriations Committees and so forth, and making a public release which can be useful in letting all Members of Congress have a better understanding of what our defense position is.

Well, let me go on.

MANPOWER TRAINING

Returning to Mr. Kaplan's article, he maintains that because Soviet conscripts are trained within their divisions in the field, at any given time, almost one quarter of the Soviet forces in Eastern Europe are undertrained, if trained at all, for combat. He is talking about Eastern Europe, in the Soviet and the Warsaw pact forces.

Is that right or wrong, that is, that almost one-quarter of the Soviet forces in Eastern Europe are undertrained, if trained at all, for combat.

Admiral TURNER. Anybody know anything about that? I don't know that one.

Mr. BURTON. The Soviet forces in Eastern Europe go through a regular training cycle. It is true that there is a troop rotation twice a year, so it is true that about one quarter of the force is replaced.

These are new forces coming into Eastern Europe. This is not to say however, that they have not had training before they get there.

Admiral TURNER. I don't think we are answering your question directly as to whether the units in Eastern Europe have raw conscripts in them. They rotate a percentage of the forces there every 6 months, but that doesn't necessarily mean they are raw troops.

Mr. GRAYBEAL. They are well trained. The Soviet forces are well trained. Of course, there is a temporary degradation of the average training level after each troop rotation.

Senator PROXMIRE. So the argument that Soviet—a quarter of the forces are not well trained or are undertrained is not in fact correct—what is your name there, sir?

Mr. GRAYBEAL. Sidney H. Graybeal, Senator.

Senator PROXMIRE. Thank you.

[The newspaper and the magazine articles referred to by Senator Proxmire in his above colloquy follow:]

[From the Washington Post, dated June 4 and 5, 1978]

OUR UNDEREQUIPPED, UNPREPARED NATO FORCES

The Surprising Soviet Lead in Technology and Tactics

(By Arthur T. Hadley)

The conventional wisdom in Washington is that NATO, outnumbered in tanks and planes by Soviet and Warsaw Pact forces, nonetheless can defend western Europe because of the superiority in electronic warfare, computer-guided weapons and better-trained personnel. "We need not match the enemy tank for tank," says Defense Secretary Harold Brown. "We retain a qualitative edge."

As a society, the West is far ahead of the Soviet Union in computers and electronics. But in the application of technology to warfare it is the Russians, not the Americans, who have the most sophisticated weapons and communications systems now deployed in Europe. Many of our most modern systems either are

still on the drawing boards, don't work as advertised or are so complex that the troops can neither use nor maintain them and the generals don't understand them.

There are three main areas in which NATO must have a "qualitative edge" to offset the Warsaw Pact's numerical advantages: electronic warfare, tanks and guided antitank weapons, and control of the air. In all three areas, the Soviet forces are qualitatively as well as quantitatively ahead. We have been forced back into the world of John Foster Dulles, where we must rely on nuclear weapons to check a Soviet advance into western Europe. But the Soviets now also have quantities of nuclear weapons. So western Europe and even the American heartland are placed in jeopardy from nuclear war because our conventional forces are inadequate for the new electronic precision warfare.

The key to an understanding of the present military balance in Europe lies in the 1973 Middle East war, when Soviet and American weapons were last used against each other in combat. I went to Europe this spring for a month of intensive reporting to see how NATO and the U.S. Army and Air Force were absorbing the lessons of that war. I expected to find new precision-guided weapons being used to hit distant targets, new methods of controlling and massing forces, new systems and tactics for surveying the battlefield so that commanders could locate the enemy and select targets accurately. I found none of this. In fact, I found that the newer weapons and tactics were on the enemy side.

I made few "official visits" to any headquarters. By and large, I traveled along an old-boy network, which has dangers as well as advantages. These were people I had known since they were young majors or captains when I covered the Pentagon during the Korean War, or instructors or cadets at West Point when I lectured there, or officers whom I had met and come to respect in Vietnam. I have taken great care in this article both to protect their identities and to check everything I was told.

OUR VULNERABLE FIST TEAMS

The first area in which NATO has fallen behind is electronic warfare. Electronic warfare (EW for short) includes a variety of weapons and weapons systems. There is radio and radar jamming so that the enemy can't communicate with his units or locate your tanks and planes. There is eavesdropping on enemy radio communications and finding targets by various means. EW also includes our ability to get our own radio messages and other forms of data transmission through so we can control our outnumbered units more efficiently than the Russians control theirs.

In this field of electronic warfare, the experience of the 1973 Yom Kippur war points to a surprising and unpublicized edge for the Russians. Within the first half hour of their attack, the Egyptian forces had stripped the Israelis of virtually all their radar and air-ground communication and most of their long-range ground communication. The Israeli radars and radios either were destroyed by Soviet-made beam-riding missiles or jammed by both ground-based and airborne equipment. After that, the Israeli pilots could not be guided to targets from the ground, or hear the cries of ground commanders for help.

Yet, in spite of the fact that one of the major lessons of the Yom Kippur war is that ground-based radars and ground-to-air communications will not be present, NATO continues to maneuver and plan as if there was no threat from beam-riding missiles or Soviet jammers. Front-line Army and Air Force commanders know this planning is foolish, and it makes them both apprehensive and angry.

The basic unit of U.S. combat communications is the Fire Support Team, or FIST team—six or seven men with special radios deployed at army company level all along the front lines to direct artillery fire, missiles and aircraft at attacking enemy tanks and artillery. Because the radios they use for air-ground communication operate on a unique set of frequencies, the Russians will have an easy time locating them.

"Do you really expect many FIST teams to be alive after the first day?" I ask one officer, walking through his brigade area late at night.

This is a complicated question, he replies. Since our published doctrine calls for the FIST teams to be at the front lines with each infantry and tank company, the Soviets know that by locating our FIST teams they know just where our front is. Indeed, he adds, with our poor communications, the Russians will probably have a better idea of where our front is then we will. (He was not the only commander to say this.) So it is to the Russians' advantage to keep the FIST teams alive and merely jam their radios so they can't communicate. On the

other hand, the teams' artillery radios are good enough so that some artillery communications may get through. So it may be to the Russians' advantage to kill FIST teams. He doesn't know which they will do.

At another base in Germany, drinking coffee with a group of Air Force colonels and captains, all of whom have flown over North Vietnam, I ask one, "Colonel, do you expect to be talking to the FIST team after the first half hour?"

"Hadley, I don't expect to be able to talk to my wing man after the first 10 minutes." The other pilots rock back and forth on their chair legs or nod in agreement. They look slightly nervous in talking to a stranger about what they only hash over in secret.

WORDS VERSUS DATA BURSTS

Because the Defense Department has kept quiet about the Soviet lead in jamming equipment and beam-riding missiles, the public is unaware of other areas of Soviet excellence.

For instance, the United States has maintained that the electronic warfare equipment on the Mig–25 flown to Japan by a defecting Soviet pilot in September 1976 was markedly inferior to our own. In fact, its electronic equipment performed better. While its radar uses tubes, not modern transistors, it puts out more power to penetrate enemy jamming than does the radar carried by our fighters. The "black box" used to separate friend from foe was so sophisticated that it stumped our code-breakers, and only after months of work did the Japanese crack its secrets.

Our fighters are still guided to their targets by words over radios: "Two bogies, at 3 o'clock, speed 400 knots, 12 miles." Even the old Soviet equipment used by the Egyptians in 1973 prevented such transmissions. The "inferior" Mig doesn't rely on words from the ground; its information on where to go and what to attack comes in a data burst, brief enough (less than a second) and powerful enough to burn through jamming. The data is displayed on the pilot's windshield: an arrow for the direction to fly, a symbol for the target and numbers for the target's direction and speed. The pilot's acknowledgement of the message also is data-coded.

I asked two senior defense officials whether what I had learned about the Mig from sources in Europe were true. Both will only talk for background. Both squirm in their chairs, lace and unlace their fingers, look at the ceiling. Finally one asks me to keep quiet in the "national interest." The other insists that voice transmission is an advantage since it provides command flexibility and is the American way—even if the voice won't reach the aircraft.

FINDING THE TARGET

Another area in which NATO, with its access to the West's advanced communications industry, should be decisively ahead of the Russians is electronic target location. In fact, we are decisively behind—by "five years," as two generals, one at NATO headquarters, the other at a forward air base, put it.

The Russians have two mobile radio direction-finding units in each division and are about to go to four. These vital pieces of equipment locate the radios being used by enemy headquarters, artillery batteries, or FIST teams, so that fire can be dumped on them. We have none.

The Russians have several mobile radio and radar jamming units with directional antennas in each division. More primitive models of these tied up the Israelis in 1973. We have none.

The Russians have mobile listening stations and have trained their crews in how to distinguish between targets like tank battalions and intelligence sources like brigade headquarters. Our equipment is mostly static and many of its operators understand Vietnamese, not Russian. "I have no one in this headquarters who can tell a tank battalion headquarters from an artillery battery," says a division intelligence officer.

In a maneuver in Texas last summer, the 1st Cavalry Division was loaned special electronic equipment so that it could fight like a Soviet division. Its opponent, the 2nd Armored Division, relief on its regular electronic warfare equipment. The 2nd Armored was wiped out. The journal Military Intelligence drew these conclusions: "The [American] divisional EW equipment was judged, to a large extent, unsuitable for combat. The antennas and vehicles are the wrong type, the system is manpower-intensive, and there is no tactical DF [direction finding]."

When asked about such problems, even on background, senior officials at NATO headquarters and the Pentagon do what I have come to call the "rain dance." They compare the weapons the Russians now have in use in Europe to some American weapon still in the design stage, and the American weapon always beats the Soviet weapon hollow. The trouble is that the American weapons' actual production date is three to five years away, and by then the Soviets may be fielding something better. And many weapons systems when put in the field don't work as well as claimed.

INFRARED AND COMMUNICATIONS

Even when the tools of electronic warfare are available, they are so new and their operations often so complex and expensive to practice that people from privates to generals rarely understand how to employ them.

A division commander lets me interview the four captains who make up his "All Source Intelligence Center." He is proud of the center, which he and his staff perfected to pull together information from radar, scouts, prisoner interrogation, electronic eavesdropping, secret agent reports from higher headquarters photographic and sensor intelligence, etc. Yet "All Source" is something of an exaggeration, for the center receives no space satellite information, which is so secret that it is kept from front-line troops.

The captains show me some infrared photos, taken for them by the Air Force on recent maneuvers using a new system called FLIR for (Forward Looking Infra Red) which can pick out parts of a landscape that give out more radiation than others. (A well-known advertisement uses infrared photography to show the differences between a well-insulated house and a poorly insulated one.) The Air Force-Army cooperation is impressive, but it takes 8 hours from the time the request is made until the information comes into the intelligence center. And the information comes in the form of coordinates and data printouts, so that senior commanders, inexperienced with FLIR, cannot judge its reliability.

The day after the data arrive, the pictures themselves come in. That is what the captains have declassified to show me. It all looks something like snow on an old black-and-white TV set. But right in the middle of one photo is this big, luminous square.

"What's that?" asks the colonel, who is monitoring our meeting.

"That's what we've been trying to explain to you, sir. That's your headquarters, hidden inside that farm house. Remember, we told you all those generators in that building would make it stand out."

"No. They must have found out some other way, then took the picture."

The captains and I exchange glances. Later one of them shows me all the infrared strips. Sure enough, in one of them there is this little pinpoint of light, crying, "notice me, notice me," to some specialist. When it was blown up that bright dot revealed the barn and the division headquarters.

Later I ask one of the specialists if he can tell the difference between a tank and a truck. "Oh, yes, and between a tank with its hatches open or closed. Sometimes I can spot the commander's tank and tell if the tanks have been recently refueled."

"People ask you for this information much?"

"No."

And how would he transmit this information to where it is needed if he were asked? The transmission of information about where we and the enemy are is meant to be one of our strengths—a "combat multiplier," to use the jargon of the trade. But the multiplier is working in favor of the Soviets, who, unlike us, use jam-proof data bursts and often maneuver in a jammed environment.

NATO has as its number one scientific priority a highly classified project to develop secure voice communication for commanders. All the scientists I talked to regard this project as a waste of time and money. Voice communication is expensive, difficult to make secure, relatively easy to jam and takes up a large portion of the radio spectrum. It also relies on language, and there are many languages in NATO. Data is universal, it is transmitted in short bursts that cut through jamming, is so quick that it can't be located by direction finding, and has no voice signature to tell the enemy who is talking to whom.

Yet the senior U.S. commanders both in NATO and the Joint Chiefs have insisted on voice. They claim they want to get the "feel" of their subordinates.

THE CAMOUFLAGED SENSORS

Our problems in electronic warfare extend to the smallest things. Sensors, for instance. Sensors are small tubes, about 3 inches in diameter and a foot long, that are inserted in the ground behind enemy lines by hand or from the air to measure movement, vibrations, sounds and changes in the electromagnetic field, and broadcast this information automatically so that intelligence officers can gain insight into troop movements they cannot see.

Owing to a painful bit of recent history, the air-dropped sensors are disguised as small palm shoots. Neither the Army nor the Air Force has found the money to change this camouaflge. Yet surely a Soviet lieutenant attacking through the pines and snows of Germany will at least blink when his eye lights on a group of baby palm trees along his route.

Next, the sensors broadcast over the same frequencies as German taxis and other private radios. This means no one gets a change to practice with them. Yet emplacing sensors correctly and interpreting their data is a complex and demanding process. Do we really believe we can do these things right without constant practice?

THE TANK GAP

In tanks, NATO is outnumbered, 3 to 1. Here again, the Warsaw Pact forces also have a qualitative edge. Here again, the American forces in NATO are not well enough trained to use effectively the weapons they do have.

In no other area is the rain dance—the technique of comparing drawing-board U.S. weapons to actively used Soviet weapons—as prevalent. The entire military and civilian high command of the Defense Department compares the Soviet T72 tank, which is now in the field, to the U.S. XM1 main battle tank, which will not arrive in NATO until 1982 at the earliest, and whose gun will not have the killing power of the Soviet tank's.

Even the tanks we do have are so complicated that today's volunteer Army does not use them very well. On a recent three-day maneuver, the 3rd Armored Division had mechanical failures on 150 major systems on its tanks, almost one-third of its total. The problem, as a German staff officer put it, is that "today's weapons are too complex for today's soldiers."

The tank now costs three times as much in constant dollars as the World War II fighter plane; it has more complex weapons systems and is harder to maintain. Yet that fighter was commanded by a lieutenant with two years of college or the equivalent; today's tank is commanded by a sergeant who may well not be a high school graduate.

Or, to look at the problem another way, a tank and a helicopter cost about the same and are equally complex. Yet the helicopter is flown by two warrant officers and maintained by a crew headed by a senior sergeant. But the tank is still commanded by a sergeant and maintained by privates.

Turnover is an other part of the problem. A high school dropout comes into the Army, matures and develops into a leader and a great tank commander. After three years, or maybe five, he gets a high school diploma and says to the Army, "Thank you for what you have done for me. I'm getting out now, going to college, to make something of myself." Although both the Army and Air Force put heavy pressure on junior officers to talk their men out of leaving the service, the incentives for the ablest to use the GI Bill to go to college are greater than the rewards for staying in.

The results are predictable. In a recent NATO tank crew competition, the best American crews finished last in gunnery behind such minor powers as the Dutch and the Belgians. The Germans point out, and honest American commanders admit, that the level of tank-driving skill in the U.S. Army is so low that the tanks don't know how to maneuver individually—and can only charge in massed formations. On the tank-firing qualification range—in the battalion I watched, at least half the tanks had major defects—the crew gets a passing score, if they identify a pop-up target and shoot at it in 40 seconds. Actually they are allowed about a minute. In the real world you get 10 seconds.

All over NATO, commanders fudge their figures a bit in an effort to make the mating of today's personnel and modern weapons look better than it is. You can't help but recall those Hamlet Evaluation statistics out of Vietnam. For example, a division commander told me proudly, and his battalion commanders

confirmed, that his men scored 95 per cent hits with the hand-held antiaircraft missile, the infrared-guided Redeye. I found that the reason for the good score was that the target had been slowed down to 60 miles an hour. At speeds closer to that of an attacking aircraft most soldiers missed the target.

"THAT DRAGON KICKS A BIT"

Another paramount lesson of the Yom Kippur war is the importance of precision-guided infantry antitank weapons, like the Soviet Saggers with which the Egyptian infantry destroyed charging Israeli tanks. The primary U.S. infantry weapon in this field is the wire-guided Dragon. The infantryman has to keep his Dragon sight on the target and the missile will automatically correct its course to make a bull's-eye. I never found a single soldier in NATO who had fired a Dragon, though commanders were always assuring me that most of their men had qualified.

Furthermore, the Dragon has grave problems. It is too heavy to fire standing up, and if it is fired the best way, lying down, its blast burns off the firer's buttocks. Its sight is so delicate that it must be sent to the rear for recalibration every seven days, and there is no device on the weapon to tell the soldier whether the sight needs adjustment.

I watch a test Dragon firing, in which an excellent electronic simulator is used for training. Even with the simulator, everyone has trouble hitting the target. I ask the sergeant training the recruits whether he has ever fired a Dragon. The sergeant, an old-timer, says he hasn't, but he once saw one fired. He was at a special Dragon school and the top man in his class, a Marine captain, got to fire the school's one Dragon. "Did he hit the target?" I asked. "No," says the sergeant in his soft Kentucky twang, the poor fellow didn't. The recruits cluster around listening, leaving their simulator tubes. "He was a big man, sir, real big. But that Dragon kicks a bit. Oh, sir, you should have seen what it done to his neck."

Slightly bigger than the Dragon is the TOW (for tube-launched, optically tracked, wire-guided) antitank missile, which is fired from the M113 infantry carrier or the Cobra helicopter. You can hit a target with a TOW missile, and I found quite a few people who had fired one or even two rounds (supposedly every TOW gunner gets to fire one round every other year). But the man who fires it is my candidate for the bravest man in the world. He sits *on top* of the M113, behind a tripod that pops up through the roof. He has to hold his breath as he fires, because the mount is so delicate that his breathing throws the missile off target. The Soviets fire their TOWs from *inside* their infantry vehicles.

The TOW fired from the Cobra helicopter is one of the most sophisticated antitank weapons actually deployed in NATO. A gunner in the nose of the helicopter works a small joystick about the size of an index finger to keep the crosshairs in a 14-power telescopic sight lined up on the target, while the pilot in the rear seat maneuvers the helicopter. It is an accurate and easy-to-handle weapon. Whether the TOW-Cobra system can survive under the massed artillery fire the Soviets employ is a question NATO commanders are loath to face. But then, they have so little else that works.

PRACTICE COSTS MONEY

The pilots flying these Cobras average 110 flying hours a year. According to Air Force fighter pilots and some of their commanders, the men flying NATO's complex speed-of-sound fighter planes like the F4s and F15s average only 115 hours a year. In at least one squardon, cross-wind landings have been forbidden because pilots are not getting enough flying time. The Pentagon's computers insist that the average front-line pilot is flying 170 hours a year, but, as in Vietnam, I would rather trust the evidence from those on the spot.

Even if the figure is 170 hours, consider that both the federal government and the insurance companies believe that I, who fly a far simpler and slower aircraft here in the United States, need at least 200 hours a year in order not to be a danger to myself.

The low flying time for fighter pilots comes about because the fuel is so expensive and the planes so precious. And since the weapons are also expensive, no one gets to fire them often enough to develop confidence. And the little fixes necessary to mate weapons, men and machines don't get made.

For example, one of the vital precision-guided weapons on which the defense of NATO rests is the air-to-ground killer called the Maverick, a fighter-carried missile with a TV camera in its nose. Once the pilot has locked the missile onto the target, the missile follows its own TV picture on down. This is the weapon

credited by the Israelis with helping turn the tide of battle once their ground troops had dealt with the Egyptian antiaircraft defenses. But the Israelis found that the missiles, which cost $30,000 apiece, were being wasted by knocking out the same tanks again and again, because the TV pictures seen by the pilots could not distinguish between dead and live tanks.

Now a passive infrared device has been added to the Maverick's TV camera to identify live tanks. But it took the 1973 war to lead to this vital fix. The missiles were so expensive that the Air Force had not practiced enough with them to discover the problem. Today, our pilots get to fire one every other year on a range in the Iranian desert.

All through NATO, the expense, complexity and lethality of weapons combine to leave weapons unperfected and men untrained in their use. Since intensive jamming would knock out European radios, aircraft radars and TV broadcasts, no one maneuvers in a jammed environment. The Army crews that fire the Chaparral antiaircraft missile get to fire one missile every other year from a base in Crete. And how does a tanker learn to maneuver in a town, when the best maneuver is to blast out part of a building wall and snuggle into the rubble?

The answer to such problems is to make massive use of simulators. That's what U.S. commercial airlines do. And both the British and Germans make more use of simulators than we do. But the Defense Department and Congress have been slow in asking and voting funds for simulators. They tend to ask: "You want weapons or simulators, general?" And the general replies, "Weapons."

WHO WOULD CONTROL THE AIR?

What about the final area of NATO's presumed "qualitative edge": control of the air? Even if our pilots lack flying time and can't talk to the ground, are not both they and their planes far superior to the Russians'?

Again, the lessons of the Arab-Israeli war paint a dark picture. The Israelis found they couldn't get through the barrage of missiles and antiaircraft fire protecting the Egyptian and Syrian forces until their tanks and artillery had knocked out the Soviet antiaircraft missiles and gun radars.

The West Germans, who have been much quicker to adopt the lessons of the Yom Kippur war than we have, are particularly concerned about our unquestioned belief that we are superior in this area. "The Soviets are decisively ahead in the air," said one of the highest officials of the German Defense Ministry.

When Soviet armored divisions attack, they advance under something our pilots call "the bubble." That's a protective covering of SAM6 antiaircraft missiles for high-altitude work and ZU23 self-propelled, four-barrelled antiaircraft guns with their own radar, by far the best antiaircraft guns in the world. There are 140 such weapons in a Soviet armored division. The way our aircraft are supposed to penetrate this "bubble" to get at the tanks is to stay below 200 feet, while the Army fires at the radars and jams them to make a corridor through which the aircraft can fly to hit the enemy tanks and then get back out. But in the real world, the Army doesn't have the jamming equipment and the locators to find the enemy radar. The Army and the Air Force have not practiced the split-second timing necessary in this maneuver.

There are special Air Force squadrons called Wild Weasels that have F4 jets with onboard jamming equipment and computers to throw off enemy guns and missiles. But the Wild Weasels lack effective beam-riding missiles to take out the radars. When questioned about this problem, high defense officials do the rain dance again: "HARM takes care of that." But HARM (for High Speed Anti-Radiation Missile) will not be ready until the early 1980s at best.

Another way to keep our planes alive is to have them stay away from the front lines, and lob their weapons in from low altitudes outside the bubble. The weapons would be laser-guided to their targets by the FIST teams. But the planes don't have the beam-riding bombs and the FIST teams don't have the laser designators.

Many NATO fighter pilots also complain that the Air Force is building the wrong type of fighters. They don't believe that one man can operate all the equipment necessary to stay alive at 200 feet while flying 400 knots in a hostile environment. They contend that the F15 has the space and power to have been a two-pilot aircraft, but that the old fighter types at the top of the service kept it a single-pilot plane. This is a serious charge, vigorously denied by most senior Air Force generals, who insist that the F15 is so fully automated that it is easier to fly than a World War II fighter.

TELLING FRIEND FROM FOE

The final area of air control in which NATO falls apart is called IFF (for Identification Friend or Foe). In modern battle all those planes, ours and the enemy's, are going to be mixed together in the air, attacking targets on the ground, often moving at supersonic speeds or within 200 feet of the surface. Helicopters of both sides will be everywhere. Until now, shooting at your own people didn't matter so much because most shots missed. But modern weapons hit the target. Identification is now the ball game.

But in their last two NATO maneuvers, the German air force discovered that its own troops had shot it out of the air after two days. The British Royal Air Force is so short of funds that it has no hope of putting effective IFF equipment on its planes; as a result, the Germans, Americans and even the French have had to quietly insist that if there is a real war the RAF had better stay out of it lest it be shot out of the skies by its allies. Finally, the U.S. medium-range anti-aircraft missile system, the Chaparral, requires a man with field glasses to stand in front of the launcher; after the radar picks out a target, he tries to find it in his glasses and tell if it's friend or foe. That's the way it was done in 1944.

On IFF the Defense Department does the rain dance again and talks about JTIDS (for Joint Tactical Information Distribution System). The concept is brilliant, simple and workable: a network of some 600 radios is linked by computers that shift their frequencies roughly 10 times a second. Each time a radio comes on it fires off a burst of data that says roughly: "Here I am, I am doing this, I will need that." The data bursts are almost impossible to jam, the codes virtually unbreakable.

But JTIDS is already over three years late. It is so far behind schedule because the Navy is holding out for a more complicated model that will also tell where its submarines are, and no one in the Defense Department has the courage to take on the Navy and its friends in Congress.

THE VITAL "TAIL"

Yet suppose all the weapons work. After two days the Russians, East Germans and Czechs have been fought to a virtual standstill in the most deadly conventional warfare in history. What happens on the third day?

The Yom Kippur war proved that in the electronic precision-guided munitions age the losses are horrendous, approaching those of nuclear warfare. NATO war plans call for each American division to fire 5,000 tons of ammunition on the first day, and 3,000 tons a day thereafter. At these rates of fire, artillery gun tubes will last less than a week. But there are not enough trucks or drivers to bring such masses of supplies forward. Nor does NATO have the mechanics to do the repairs. With agony on his face, one officer responsible for this problem tells me he will be 500 rounds short for every gun in his division by the third day.

The fault lies in Washington. No one in the Defense Department will ask Congress for funds for trucks, fork lifts or mechanics. Why? Because those are noncombat troops or "tail." And Congress and President Carter want the military to cut noncombat "tail" in favor of combat "teeth." But as the teeth get more deadly, you must increase the tail, as both the Israelis and West Germans have done since 1973.

If the lessons of the Yon Kippur war are correct and we lose tanks the way the Israelis did, 300 new tanks are going to have to be brought forward in the first two days for each 300-tank armored division. As a result of the 1973 war, the Germans have vastly increased their forward stocks of new tanks. We have not. Nor do we have the tank carriers and crews to move the new tanks forward. Congress has turned down Defense Department requests for mobile steam cleaners to get the mud off and the charred flesh out of damaged tanks so they can be rebuilt. The Israelis and West Germans now have these. Nor do we have the spray to mask the smell of burned flesh which the Israelis developed so mechanics can work inside damaged tanks.

NATO plans call for M60 tanks, stored in climate-controlled warehouses to be issued to troops that will be flown in from the States in recent maneuvers, these tanks worked better than those in daily use. But they are stored on the wrong side of the Rhine, the west bank. Will the bridge they must cross still be intact? And the tanks have no radios, the radios are stored in a warehouse miles away, and they don't fit the tanks without a special bracket that takes two days to make.

Another general tells me about the night sights for the division's machine guns, sights which are so delicate and valuable that they have been kept in those warehouses since their arrival five years ago. He has just checked and found out that the sights don't fit his divisions machine guns. He can build several thousand $65 brackets to fit the sights, but he has been told that the division will get new machine guns two years from now. What should he do?

Over and over one finds examples like this. There is a bitter private jest heard throughout NATO that U.S. plans to fight a war in Europe are based on flying imaginary troops in nonexistent planes to airbases that are destroyed at the command of headquarters no longer in action.

The jest has tragic overtones because neither the qualitative deficiencies nor the wide gaps in training need occur. The West does have the better technological base. The electronic revolution is more advanced in NATO. But we cannot apply the knowledge and power we have to problems we claim do not exist.

[From the Inquiry, dated June 12, 1978]

NATO AND THE SOVIET SCARE

Exaggerated Fears of Soviet Military Forces in Europe Can Only Lead to a Costly and Dangerous U.S. Build-up

(By Fred Kaplan)*

With Vietnam out of the way, Europe is once again the focus of United States foreign and defense policy. Much of the new concern over NATO derives from perceptions of a growing Soviet military threat in Europe. Senators Sam Nunn and Dewey Bartlett, in an influential January 1977 report to the Senate Armed Services Committee, state bluntly that the Warsaw Pact is "rapidly moving toward a decisive conventional military superiority" over NATO. They claim that the Pact forces could launch a "devastating invasion of Europe with . . . a few days' warning," and sweep through defending forces, conquering much of Western Europe before the United States could deploy effective reinforcements from North America. To counter this threat, Nunn and Bartlett urge a crash military build-up which would make it possible to reinforce NATO fully within two or three days of a warning of Soviet attack.

This general alarm echoes, though less shrilly, through the statements and programs of the Carter administration. "While there is work ahead of us, there are no grounds for panic or crash efforts," wrote Secretary of Defense Harold Brown in his annual report this January. Still, the "work ahead of us" is considerable and costly. About $60 billion of Brown's $126 billion defense budget is NATO-related. Included in this budget are requests for funds to develop or procure several major new weapons systems for NATO; if Congress approves these requests, American spending for Europe is certain to rise still higher and faster in the coming years.

From a strictly military perspective, some of this alarm about Soviet power in Europe is warranted: While the U.S. military was bogged down in Vietnam—diverting material, weapons, and manpower from Europe to the Southeast Asian quagmire—the Soviets were just beginning to modernize their ground and tactical air forces. Since the demise in October 1964 of Nikita Kruchchev, an advocate of defense through "cheap nuclear deterrence," the Warsaw Pact has become a far more formidable military opponent. It has doubled the number of its artillery launching tubes, added 25 percent more aircraft to air units, put an extra motorized-rifle division in each tank army, and increased the manpower of divisions from one-fifth to one-third.

But what is the significance of this build-up? How does it affect the current balance of forces in Europe? How prepared is each side—politically and militarily—for initiating and sustaining war? In short, can NATO, now and in the foreseeable future, defend itself?

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In attempting to answer these questions, many journalistic and official reports merely count and compare the number of soldiers, divisions, tanks, planes, and ships on each side. Yet these statistics alone clearly do not help us calculate whether a war will break out, or who will win it, which is, after all, why we study such statistics in the first place. Instead, what we need to do is determine how these raw numbers convert into usable military power. Only this kind of assessment will yield us a true picture of the military balance in Europe.

For instance, it is often noted that the Soviet military has 4.4 million men, compared with the U.S. military's 2.1 million. Yet more than half of Soviet forces engage in activities unrelated to American foreign-policy interests: construction work, internal security, defense of the long Chinese border. When we measure the forces that could be brought to bear in a conflict, the Soviet and U.S. military stand virtually equal. And if we compare all active forces of NATO (including the United States) and the Warsaw Pact (including the USSR), the score is about equal, at roughly 4.8 million each. In ground forces alone, NATO outnumbers the Pact, 2.8 to 2.6 million.

Several analysts look at the number of divisions on each side as an indicator of comparative strength. At first glance, the picture looks gloomy for the West: 226 divisions for the Pact, 41 for NATO. This first glance, however, is misleading. Of the 168 Soviet divisions in this total, 61 are deployed in the Far East for possible war with China. (Indeed, over the past decade the big leap in Soviet forces, an increase of 48 divisions, has occurred in the Far East. The only other new divisions deployed in this time span have been the five sent into Czechoslovakia in 1968, and they have never been pulled out.)

Still, that leaves 86 Soviet and 31 non-Soviet Pact divisions, and that seems like a lot. However, other factors must be considered. Soviet and Pact divisions are placed in three categories: Soviet Category I divisions are 75 to 95 percent fully manned. Soviet Category II (and non-Soviet Pact Category I) divisions are 50 to 75 percent combat-ready; they lack some armored personnel carriers, and many of their trucks would have to be taken from the civilian economy. Soviet Category III (and non-Soviet Category II) divisions are only 25 to 50 percent ready; their reinforcement troops are untrained, they have old equipment, and lack many weapons. Says Representative Les Aspin (D.-Wisc.) about the non-Soviet Category I forces: "If a U.S. division were manned at that level, it would be given the lowest rating of C–4, which means not ready." And of the 86 Warsaw Pact divisions in the Central Region of Europe, only 30 are as much as 75 percent ready.

Pact divisions are also structured differently from NATO's. Even when fully manned and equipped, they have from one-third to one-half the manpower, fewer weapons, and far less firepower than their NATO counterparts. On M-Day—the first day of pre-attack mobilization—the ratio of Warsaw Pact to NATO forces would be 1.96:1 in divisions, but only 1.08:1 in ground forces manpower and 1:1 in firepower potential. Since a successful offensive requires decisive superiority of forces, there seems good reason to doubt the pessimistic scenario of Senators Nunn and Bartlett.

Other numercial comparisons are also misleading. For example, in the Central Region of Europe, where the opening salvos of a future European war are likely to be fired, the Pact could mobilize 20,000 tank against NATO's 7,000. Yet on the battlefield, tanks are hit not only by other tanks, but also by antitank guns and missiles. On this score, NATO is substantially superior to the Pact. Modern U.S. antitank weapons have a high chance of knocking out modern Soviet tanks with a single shot from 3.5 kilometers or more, while Pact tank cannons have ranges from about 2 kilometers. U.S. infantry antitank weapons can penetrate up to 20 inches of armor from their maximum lethal ranges, whereas Pact tank armor is only about nine inches thick. The intrinsic advantage that antitank weapons have over tanks—e.g., the defense can hide, while the offense must expose itself maneuvering—amplifies NATO's antitank superiority.

Furthermore, Pact tanks are, by and large, qualitatively inferior to NATO tanks. Most of them are lighter, have shorter ranges, smaller ammunition loads, less accurate guns, and thinner armor. The crew space in Soviet tanks is very cramped. The widely deployed T–62 tank can travel, on the average, only 100–125 miles before breaking down. Even if a T–62 were to start out at the western-most military base in East Germany, it probably could not reach any major economic center in West Germany without breaking down. And recovery-repair facilities of the Soviet army's technical support and logistics crews are neither

extensive nor designed for heavily damaged vehicles. By comparison, NATO tanks tend to break down after 150–200 miles of use; and NATO does not plan on maneuvering tanks over vast stretches of territory.

In its air forces, the Pact has about 5,300 tactical combat planes in Europe, against NATO's 2,900. But more Soviet and Pact aircraft are designed exclusively for air-defense missions than are NATO's. NATO aircraft far exceed the Pact's in payload, range, air-to-air fighting capability, maneuverability, munitions-delivery accuracy, crew effectiveness and training, command-control flexibility, and deep-strike interdiction capability. NATO would have little difficulty in carrying out its prime missions of air superiority, air interdiction, and close-air ground-attack support.

The Soviets have a larger navy than the United States, with an estimated 450 combat surface vessels and attack submarines, against America's 250. However, the Soviet navy includes many light escort fleets, while the U.S. Navy has three times the tonnage of the Soviet fleet. The United States also has better naval aircraft (the Soviets have hardly any air support for naval missions), better sonars for antisubmarine warfare, and more creative and aggressive tactics. The U.S. Navy can fulfill a wide variety of missions with great flexibility, while the Soviets, hampered by inferior technology and constricting geography (and a lack of foreign bases), is largely a "fortress fleet" that is developing increasing sea-*denial* capability, but very little amphibious-assault and no power-projection capacity.

In short, a close look at simple quantitative indicators reveals a Warsaw Pact which, while *numerically* superior to NATO, is not *decisively* superior in military power and is, in fact, markedly inferior in quality and scope of mission.

But there is more to warfare than mass. There is also training, tactics and strategy, command and control, and logistics and reinforcement. While these issues are more complicated and subject to dispute, it appears that NATO is adequate or excels in these areas as well.

There is no more illuminating evidence about the state of Soviet training than an article in the Soviet journal *Military Herald* by Soviet General of the Army I. G. Pavlocky: ". . . it would be an unforgiveable mistake to keep silent about the deficiencies in combat training. . . . Commanders and officers . . . have still not learned to firmly control the actions of subordinates in battle, to maneuver with them, and [in exercises] have not always correctly used armored transporters and combat machines of the infantry in breaking through a prepared defense. . . . [There has also been] poorly organized cooperation of means of fire suppression and . . . [lack of] energetic measures to destroy antitank missiles and . . . guns."

These deficiencies are all the more remarkable when we consider the fact that Pact military maneuvers are notorious in U.S. intelligence circles for their rigidity, their misjudgments of NATO's power and effectiveness, and, in the words of one State Department military expert, their "ludicrous staginess." Unlike NATO training, which allows for tactical flexibility, Pact exercises neglect the "free-wheeling maneuver." Initiative on all levels below top command is explicitly discouraged.

Pact forces use the same equipment over and over in exercise until it breaks down. NATO trains with the actual equipment that would be used in a war. The Pact's method is cheaper, but it gives the troops little experience with their real weapons. In general, the Pact uses only 20 percent of its actual equipment in field training; the rest is kept in warehouses, much of it on concrete blocks. Even the Ground Soviet Forces in Germany, the cream of Soviet forces, uses only one-third of its assigned equipment, and some of its combat units are not even allowed to train with tanks.

Furthermore, the Pact is hardly a war-ready force. Conscripts are trained within their divisions, on the field, during their two years of mandatory military service. Every six months, 60,000 troops are moved in and the same number moved out. That is to say, at any given point, almost one-quarter of the Soviet forces in Eastern Europe are undertrained—if trained at all—for combat. Training time in recent years has been cut from three years to two; the time for some programs has been cut in half.

The operational tactics of Soviet military doctrine worry many Western analysts. Soviet doctrine states that, however a war may begin (and it is always phrased, "if the imperialists unleast one"), the initative must be taken as swiftly as possible. The heavily armored force structure of the Pact armies

supports this doctrine (although, as the Soviets demonstrated in the early stages of World War II, tanks can be used for deep-defense and counteroffense, too). Once the offensive is taken, however, high speed maneuvering, and deep-penetration are the rule. Tanks are to be used for piercing through defenses, while continous barrages of artillery fire saturate enemy forces. Tanks are to be followed by armored personnel carriers, followed by antitank weapons, followed by anti-aircraft weapons.

Heavy reliance on the tank as the main striking force is one of the lessons the Soviets learned from World War II. Although some Soviet officers have written a good deal lately about tank vulnerability, their planned mode of military operations is still rooted in 1941–1945. Command and control of troops is heavy centralized at the top. In exercises, everything is done "by the book." If something in a war were not to go according to plans, there would be little that officers in the field could do about it. When things went slightly wrong in the 1968 Czechoslovakia invasion—with no military opposition at all—Soviet tanks and armored personnel carriers blithely poured into narrow bottlenecks, causing, as Les Aspin has noted, "rush-hour traffic jams that would have provided tempting targets in a real war."

A fundamental prerequisite for waging successful conventional war—especially a successful deep-penetration, highly mobile offensive—is the establishment and maintenance of an adequate logistics infrastructure, including a supply base and transportation network. Yet, as Jon Erickson, Britain's leading expert on the Soviet military, has commented, "logistics have always been one of the weakest parts of the Soviet system." In the 1968 Czechoslovakia intervention, the Soviets outran their supply lines upon crossing the border. Some units went without fuel or hot food for days. Before the attack, the Soviets had to commandeer civilian trucks from throughout European Russia. The resulting shortage of civilian trucks contributed greatly to that year's harvest failure and manufacturing difficulties. Civilian resistance was minimal, but it was enough to prevent the Soviets from seizing Czech fuel and supplies. And this was a very limited occupation-invasion against a country half the size of West Germany, with no military resistance and with three months' preparation before the attack.

Granted, that was a decade ago. Soviet logistics have improved. The Soviets now have more heavy amphibious trucks, folding-bridge stock, and petroleum tankers. Still, several State Department military specialists maintain that none of these improvements has markedly improved the Pact's ability to sustain an attack.

Some say, however, that even with all the aforementioned inadequacies, a Warsaw Pact offensive could succeed if it caught NATO off-guard. Senators Nunn and Bartlett call this scenario a "come-as-you-are war." Indeed, Soviet doctrine stresses surprise tactics: concealment, night maneuvering during mobilization, detailed cover. Just before the 1968 Czechoslovakia invasion, large concentrations of troops moved under cover of electronic screens that impeded Western radar surveillance and kept radio traffic signals to a minimum. The intended effect was to mask Pact movements.

It seems doubtful, though, that NATO could be surprised. Former Defense Secretary James Schlesinger once testified: "The total list of potential indicators of a Soviet attack in Europe is long—several hundred items." A 1976 Pentagon report concluded: "We would almost certainly be aware of a [large] mobilization and reinforcement . . . in a matter of hours." Even during the Czechoslovakia invasion's mobilization period, the United States and other NATO nations kept abreast of the situation at every stage. As R. Lucas Fischer noted in a highly regarded study of the NATO-Pact balance in 1976, "It is hard to see that a [covert] mobilization . . . could add much to Warsaw Pact strength without clear detection by a variety of means."

Still, many Western analysts worry that a highly concentrated Soviet attack, even if it were detected, could overwhelm NATO's conventional defenses. They suggest that if Pact forces had marginal theater-wide superiority of forces, the Soviets could deploy them to give a 1:1 ratio along most axes of the battleline, and in a few relatively narrow sectors, could amass great superiority. At these decisive points, the analysts claim, the Soviets could break through.

Several factors would hinder the success of such an operation against NATO, however. For one, breakthrough tactics can probably be pursued with confidence only if the attack maintains substantially better than 1:1 ratios

along the non-breakthrough sectors, as well; the Soviets would probably not be capable of doing so. Second, it would take a great deal of maneuvering to amass such force along a few sectors. The effort would be noisy and time-consuming, allowing for detection and much counter-preparation by NATO. The concentrated mass of forces would also strain an already feeble logistics network, which would also have to be concentrated and would, therefore, be highly vulnerable to NATO air interdiction. Third, such intensive concentration would be a very tempting and lucrative target for NATO's tactical nuclear weapons in Europe—a prospect that the Pact would surely want to avoid.

In addition to these military considerations, there are political factors that make a Soviet attack less likely and, if it did occur, less effective. First, in an attack, the Soviets would have to count upon unreliable allies like Poland or Czechoslovakia. Recent Warsaw Pact exercises show a national "division of labor" among Pact forces: a single army or "front" combines, for example, Soviet motorized rifle units, Polish armor, and Czech air units. Hence, in the event of war, the noncooperation of even a single country could deprive the Pact of crucial force elements and hamper the war effort far more than mere numbers would indicate. Of course, NATO has its share of reliability problems, too, especially from the French and the Dutch. Still, if NATO were on the defensive against a Soviet invasion, it would be likely to have the political advantage. Even if some allies did not participate, the United States and West Germany would not have to divert forces for occupying, say, France or the Netherlands; the Soviets have no such assurance. In short, as Jeffrey Record observed in a Brookings Institution study: "It is doubtful that . . . [Eastern European] armies would remain politically reliable in a sustained offensive operation. . . . [They] might even prove a liability."

Second, there is the broader issue of political intentions. Why would the Soviets want to take the risks involved in invading Western Europe? Certainly, they, like the Americans, would not mind spreading their influence and power. But from Lenin to Brezhnev, all Soviet leaders have dismissed the feasibility or wisdom of "Revolutionary War" as a means of spreading Communism. Such a notion, after all, is associated with that long-reviled "renegade," Leon Trotsky. And certainly, given the Soviets' problems with maintaining order in their own bloc, one cannot imagine any sizable net gains they would accrue from occupying Western Europe, with its strong democratic traditions, or from engaging the United States in a new conflict, either hot or cold, which would inevitably be the result.

None of this denies that there are some military weaknesses in NATO. These flow not from shortages of forces but from the poor deployment of these forces and lack of coordination between them. Because of the position of armies at the end of World War II, the Soviets' crack forces are located in the northern and central regions of East Germany, while U.S. forces are deployed in the southern part of West Germany. NATO aircraft are less sheltered on airfields than Pact planes. NATO also suffers from problems in standardization and interchangeability of equipment. Logistics lines of each nation are separate. Because France is not formally a part of NATO, the lines of communication for all NATO countries run from north to south and, in some areas of West Germany, come dangerously close to the East German border. Prepositioned supply stocks have also been low, and are excessively centralized. There are some weapons shortages as well, particularly in antitank weapons, heavy artillery, and ammunition.

The Carter administration is addressing these problems; in the past few years, in fact, the United States has been making substantial improvements in these weak areas. The ratio between combat and support troops has been increased; this has permitted the United States to create two new combat brigades, one of which has been deployed in the northern part of West Germany. Airfield sheltering is now almost complete. Arrangements are pending that would centralize NATO military communications. To avoid the possible delay in airlifting heavy equipment such as tanks from the United States to Europe upon warning of Pact mobilization, the U.S. Army is presently testing the idea of adding special antitank battalions—which can be flown to battle more easily—to reserve forces with a very high degree of readiness. The stockpile of artillery ammunition is being increased. Belgium has recently added four antitank brigades to its two divisions in Germany. Airfields throughout Western Europe can now fuel and supply aircraft from virtually all the

NATO countries. Prepositioned stocks have been low primarily because supplies were taken from them to reinforce Israeli forces during the 1973 war; they are now virtually back up to pre-war levels.

Carter and Harold Brown are continuing and, in some cases, accelerating programs started by the Ford administration. Brown is asking this year for 18,000 more antitank guided missiles for the Army, a million more rounds of conventional artillery fire, and several types of new-geeration aircraft, while NATO allies are also stepping up their defense efforts somewhat. Brown also wants to increase the amount of prepositioned equipment in Europe so that more reinforcement troops from the United States can meet up with their materials near the battle zone rather than having to rely so heavily on highly expensive, undependable cargo aircraft, such as the infamously fragile C–5A, to airlift everything to Europe. Carter and Brown are also continuing to harden and disperse air bases.

However, in a number of his budget requests this year, Brown has far exceeded what can be justified by a calm analysis of the military balance in Europe. Currently, within ten days, the United States can augment its five and two-thirds divisions and 28 tactical air squadrons in Europe by an extra division and 40 squadrons. By 1983, Brown wants to be able to add five divisions and 60 tactical air squadrons in the same time period. Not only is this excessive—unless one accepts a host of misleading claims about Soviet military capability—it could appear provocative to Soviet military planners, thus increasing tension in the region.

Over the next few years, Brown also wants more than 700 XM–1 tanks (totalling $1.3 billion), 1,388 F–16 air-superiority aircraft ($11 million each), 729 F–15 air-superiority fighters ($18 million each), 733 A–10 anti-armor combat planes ($5.7 million each), 521 F–14 naval air fighters ($24 million apiece), and more. In fiscal 1979, Brown wants to spend almost $24 billion on major army, air force, and naval air weapons procurement and modernization programs alone.

Much of this is unnecessary. The luxurious gold-plated XM–1 is not at all cost-effective on the battlefield compared with other weapons, including the presently deployed M–60 tank (upon which Brown wants, in any event, to spend nearly $950 million over the next two years for "continued modification and procurement"). The outrageously costly F–14 is designed primarily to protect aircraft carriers, since carriers are growing obsolete, the F–14 is superfluous. The F–15 a program whose cost-overruns and overloaded technological "extras" are also growing out of hand, should simply be halted; four wings (288 planes) have already been deployed for NATO missions, and that is probably enough, if mixed with other planes.

The F–16 is a useful, multi-purpose plane to replace the aging and limited F–4 fighter. The A–10, aside from displaying some technical problems with its engine which should be remedied, is a flexible airborne tank-killer that is hard to shoot down. Still, it is highly questionable whether so many of these planes are actually needed for the security of Europe, especially since the Air Force continues to modify, rather than junk or sell, existing aircraft.

Much money could be saved if extravagant claims about the Soviet military threat were toned down to more realistic levels. A recent report by former Assistant Secretary of Defense Townsend Hoopes and former CIA Deputy Director Herbert Scoville, published by the Council on National Priorities and Resources, estimates—correctly, I think—that more than $30 billion (in constant 1978 dollars) could be cut over the next four years from the planned budgets for nonnuclear military forces without reducing conventional deterrence or warfighting effectiveness.

Because the United States ignored Europe during the Vietnam years, supporters of NATO have a good case when they argue that it is time to correct some of the alliance's glaring military weaknesses and to modernize some of its weaponry. But both conservatives and, to a lesser extent, the Carter administration have invoked an exaggerated specter of the Soviet threat in Europe, and they have used this specter to justify accelerated production of costly and sometimes unneeded weapons systems. They have done so even though a close analysis of the balance of military power in Europe shows that NATO could today readily defend itself with conventional forces against a Warsaw Pact attack. If Congress accepts this exaggereated view, American taxpayers will be saddled with new burdens, detente will be threatened, and the arms race in Europe will speed dangerously ahead.

Senator PROXMIRE. Admiral, I just have a few more questions, and I realize the hour is late. You have been extremely patient.

Soviet Readiness

Last year Gen. Samuel Wilson testified about Soviet readiness and alert levels. The testimony showed that the Soviets deploy a far smaller percentage of their strategic submarines and surface vessels than we do. Their ships are at anchor much more than ours, their pilots fly far fewer hours per month, and much of their ground equipment, including tanks assigned to combat units in Europe, is kept in storage. Some experts believe that combat units use only 20 percent of their equipment in field training, keeping the rest in warehouses or up on concrete blocks.

Do you agree with these observations and can you give us a rationale for that practice of having such little readiness?

Admiral Turner. Generally speaking, I agree with the view that their readiness is not as great as ours. Certainly as a naval officer I have watched them, in the Mediterranean, stay at anchor large percentages of the time, much more than we would.

It has worried me, if they are able to do that not only with their navy but their other forces, and maintain a level of combat capability, they are smarter than we and we are spending money in the wrong areas. If they are not smarter, then they are just maintaining a lower level of readiness and counting on strategic warning. I am inclined to think that that is partly it, that they are not as concerned as we with day-to-day readiness, in part because we know we are not going to start the war, and they maybe recognize that, and therefore they can count on some——

Senator Proxmire Doesn't that also suggest a lower level of capability? After all, regardless of the activity you are in, if you don't practice it, if you don't work at it, if you don't have training exercises constantly, you can't just come along and perform at the same—anything like the same—level of competence as you can if you are constantly working at it, training, if you are flying a lot.

Admiral Turner. That is certainly my view as a military officer, that you have to maintain that level of readiness in order to be any good. Obviously if you have x number of months, you can get up to peak readiness, with x being different amounts in different technical areas.

I am still somewhat concerned as to whether they have devised synthetic ways of training that are smarter than ours.

Senator Proxmire. Any indication of that at all?

Admiral Turner. Only one indication that bothers me. We have a Lieutenant Balenko, you know, in this country. We put him into our simulators, and he performed superbly, and is a comparable pilot with ours in simulated combat, and yet he is astounded personally at the amount of training and the quality of it that we give to our pilots compared with what he has seen in the Soviet Union.

In short, you know, if you talk to our Air Force people about this—on the one hand, Balenko is in great admiration of our training system: and on the other hand, Balenko is as good a pilot as our people.

Senator Proxmire. Of course, he is an unusually smart fellow, I think, to defect from them to us. [Laughter.]

Mr. Graybeal. May I add a comment to that?

Admiral Turner. Please, Mr. Graybeal.

Mr. Graybeal. I think it is a little dangerous to generalize too much in this area about training versus readiness. You can have a pretty high degree of training and not necessarily maintain the comparable

readiness as we do, that is, the Navy. They maintain lower readiness, they count on warning.

In the case of their ICBM's, though, they do exercise their ICBM force, in some respects much greater than we do. They fire operational ICBM's out of operational silos into Kamchatka, something the United States has not done. So I think it is a little risky to equate the readiness factor with the training factor and across the forces in total.

Senator PROXMIRE. Well, I guess that is a very helpful distinction. You indicate in the strategic area they may have a greater degree of readiness than we have. In conventional forces, they seem to have less.

Mr. GRAYBEAL. And certain elements, in their ICBM force as well. We believe they maintain a certain portion of that force in a high state of readiness, whereas they count on strategic warning, only a few days, to bring other parts of the forces up.

My main point is it is dangerous to equate this purported lack of readiness of many of their forces to a lack of training in those comparable forces. It is particularly true in the strategic area.

Senator PROXMIRE. Admiral, is it also true that the ground Soviet forces in East Germany use only one-third of its assigned equipment, and some of its combat units are not allowed to train with tanks?

Admiral TURNER. I don't know that.

Can anybody confirm or deny that?

Mr. GRAYBEAL. I don't know that. I don't have those details.

Senator PROXMIRE. For the record, see if you can provide that.

Mr. BURTON. I don't know the precise figure but in general they do keep a sizable part of their equipment up in storage, but I don't know about two-thirds.

Senator PROXMIRE. You don't know whether they are not allowed to train with tanks, right?

Mr. BURTON. Senator, we will supply that for the record.

[The following information was subsequently supplied for the record:]

As a standard practice the Soviets try to keep two-thirds or more of their combat equipment in short-term storage. In this status it is maintained by the responsible crews but is only used for major exercises once or twice a year. The Soviets consider that this improves the readiness of the units since the equipment is not used-up and is always ready for operational use. In fact, of course, there may be some problems both with equipment that develops hidden defects while in storage and with crews lacking familiarity with the particular item of equipment they will use in combat.

The Soviets use the other one-fifth to one-third of their equipment for day-to-day training which appears to be adequate although certainly not extensive. We do not think there are any Soviet units in Eastern Europe that are denied an opportunity to train with tanks if such training is appropriate for them.

WARNING TIME

Senator PROXMIRE. Now, I understand while most Soviet forces are kept at the lower preparedness levels than ours, that parts of their ICBM force and their air and ground forces are able to respond quickly to an attack from the West. That seems to imply the West should have considerable warning time, because Soviet attackers would have to bring equipment out of storage in order to mobilize their forces.

What is the likely warning period implied from the Soviets' low level of preparedness?

Admiral TURNER. Our estimate is that the Soviets would want at least 4 and more likely 8 or more days to prepare for an attack in Western Europe, and that we would detect their preparations from that at the end of about the first day, not that we would be able to come and say to you, you know, they are going to go to war in 3 or 4 days, but we would say there is a level of activity over there that is putting them on a footing that will enable them to go to war in a few days if they want. We figure that the minimum size force that they want to make an attack with would be—would take about 8 days to bring together and be ready to go.

Senator PROXMIRE. How do you calculate that? It seems to me with all that equipment in storage and with the lack of training and a lack of experience and exercise and so forth, that seems pretty pessimistic, to think that the other side could get ready in 4 to 8 days.

Admiral TURNER. It is not our view that it is as bad as this author is indicating as to their readiness of the units deployed forward in Germany.

Senator PROXMIRE. Well, you just confirmed, Mr. Burton just confirmed the fact that they do that, that they do have a considerable amount of tanks in storage.

Mr. BURTON. That doesn't mean that they can't bring them right out. What happens is that they keep part of their tanks in a ready storage.

ECONOMIC CONSEQUENCES OF A SALT II AGREEMENT

Senator PROXMIRE. Now, in your written response to my question about the consequences of a SALT II agreement, you said that the agreement would reduce the growth of Soviet defense spending by only about two-tenths of 1 percent per year, and the impact on the Soviet economy would also be small, maybe negligible.

Does that mean that the Soviets probably do not believe that they are under economic pressure to sign an agreement? Economic pressure.

Admiral TURNER. Yes. I don't believe that there is a strong economic factor pushing them here, unless they are looking out to the long term. It is not a short-term economic savings that they are looking for. Whether they are looking to the dangers of our going on to a couple of thousand——

Senator PROXMIRE. Would that same reasoning apply to the United States, there would be few, if any, budgetary savings and economic impact from a SALT II agreement here in this country?

Admiral TURNER. A SALT II agreement, as being currently negotiated, my quess at that—and you are really outside my field, Senator—would be yes, there would be very few savings, because the Soviets do have to decommission a couple of hundred missiles to get down to the proposed SALT ceiling, whereas we don't.

Senator PROXMIRE. So any effect would be long range. Would it be after 3 or 4 years?

Admiral TURNER. It would be developmental programs. If we all rule out mobile missiles, you know, that would rule out the M–X, or at least the commonly accepted version of it, and the question is what do we do instead, if anything.

Senator PROXMIRE. And the last question I have is really for the record, but I want to read it for you because I think it is an important question.

Your reports on the dollar cost of Soviet defense spending are always helpful. We would find it even more helpful if we could obtain the tables that go along with the charts in that report in unclassified form. If we had the tables, we could do our own calculations to obtain answers to questions such as the following: First, how large is Soviet general purpose spending, including personnel costs relative to the United States? Second, how large is Soviet general purpose investment cost relative to the United States? Third, how large are Soviet general purpose operating costs relative to the United States? Also can you compare United States and Soviet dollar outlays for mobility, naval forces, tactical air and land forces, and can you compare United States and Soviet dollar outlays for investment for mobility, naval forces, tactical air and land forces, and finally, make the same comparison for operating costs.

What I am asking you is if you will provide answers to those questions for the record, and also give us the tables I mentioned, as well as the charts.

Admiral TURNER. We will do our best.

Senator PROXMIRE. If we could have that.

[The following information was subsequently supplied for the record:]

ESTIMATED DOLLAR COSTS OF SOVIET GENERAL PURPOSE FORCE ACTIVITIES AS A PERCENTAGE OF COMPARABLE U.S. DEFENSE OUTLAYS[1]

[United States equals 100]

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1967–77
General purpose mission:												
Land	76	84	95	123	170	225	248	241	251	256	229	156
Tactical air	23	20	22	35	53	75	87	78	74	65	68	49
Excluding naval tactical air	32	28	33	53	82	125	151	139	127	105	103	77
Naval	111	107	107	115	126	125	122	122	121	120	133	118
Including naval tactical air	76	72	72	80	88	86	84	83	85	86	97	82
Mobility	66	70	72	83	96	132	200	223	223	242	255	120
Total general purpose mission	66	68	75	92	19	145	157	155	155	152	152	112

[1] The dollar costs of Soviet activities are estimates of what it would cost in the United States to develop, procure, and man forces of the same size and with the same inventory of weapons and equipment as the Soviet general purpose forces and to operate those forces as the Soviets do. The U.S. outlays are developed from appropriate editions of "The Five-Year Defense Program, the Budget of the United States Government," and related data. Both Soviet and U.S. data are for calendar years and in 1977 dollars prcies. They include the costs of military personnel, procurement of hardware, construction facilities and operating expenses. R.D.T. & E., nuclear weapons, and retirement costs are not included. General purpose forces and missions are defined according to the Department of Defense "Defense Planning and Programing Categories" of August 1977. Tactical air forces include aircraft carriers and their aircraft but not ASW carriers and aircraft. Naval forces do not include the ballistic missile submarines. Mobility forces included here are airlift and sealift forces.

Senator PROXMIRE. Admiral, and gentlemen, I want to thank you very much. It has been a most helpful and very interesting and responsive hearing, and I think you did a superlative job, and it was very good of you for coming, and you can be sure that this will be held confidential.

Admiral TURNER. Thank you, sir.

Senator PROXMIRE. The subcommittee is adjourned.

[Whereupon, at 1:18 p.m., the subcommittee adjourned, subject to the call of the Chair.]

[The following information was subsequently supplied for the record by Senator Proxmire:]

[From the June 26, 1978, issue of the Washington Post]

U.S. EXPORT LICENSES ARE LINKED TO SOVIET COOPERATION

(By Fred Barbash)

A senior National Security Council official, in remarks meant to be off-the-record, has called for the concerted use of economic trade as a U.S. lever on Soviet military and economic policy.

Dr. Samuel Huntington, an NSC specialist on Soviet affairs, suggested that the council help wield that lever by reviewing export licenses requested by American businesses. The council is headed by presidential adviser Zbigniew Brzezinski, with whom Huntington maintains an eceptionally close relationship.

Huntington made the remarks to a select gathering of about 50 businessmen, academics and government officials at a conference on trade and national security at West Point 10 days ago. Those attending were told that the speech was to be treated confidentially but a number agreed to describe it to The Washington Post when asked.

Huntington reportedly told the group that it should be made clear to the Soviets that the current and future flow of a broad variety of exports could be turned on or off according to the Russian willingness to cooperate with the United States, be it in Angola or in arms limitation talks.

The United States should assume a posture of "conditioned flexibility" for application in the currently deteriorating state of Soviet-American relations, he said, according to notes taken of his remarks. Trade should be "conditioned on the achievement of political and security objectives," he said. The United States should "hold out the prospect that if the Soviets are cooperative in other areas, the doors [to trade] could be open, but if they are not, if they engage in military adventurism, the doors could be closed."

Although Huntington stressed that he was speaking only for himself and not for the administration, some of the businessmen attending bristled at the speech. Except for militarily useful items, American companies can and do sell almost anything they please to the Soviets—from Pepsi-Cola to computers. Nearly $2 billion worth of goods flow back and forth between the two countries with limited regard for Soviet foreign or political policy.

The businessmen, who asked not to be quoted, said that they read into the speech the prospect of future government intervention in their commerce.

Other observers suggested, however, that Huntington's remarks represented the continuing intense debate within the government over the broad scope of American policy and that while his ideas have been discussed, there is no plan to implement them.

They are considered extreme and "hawkish" by many, and, should implementation be seriously contemplated, it would undoubtedly meet vigorous opposition not only from exporters but from farm interests that are heavily dependent on sales to the Soviet Union and from Congress, where legislation would be required.

The use of trade for leverage has been tried recently, most notably through the Jackson-Vanik amendment that tied most-favorite-nation status for the Soviet Union to Jewish emigration. But the Carter administration, even as the rhetoric has escalated, has yet to propose anything similar to Huntington's proposals.

Huntington, who is on leave from his Harvard professorship, has been known as a "hard-liner" both before and after he entered the administration. His close relationship with Brzezinski is attested to by their collaboration in 1964 on the book "Political Power: USA/USSR," and by the fact that Huntington accompanied Brzezinski on a recent trip to China.

Huntington declined to comment publicly on the speech. But others said that, at the outset, he placed it in the context of the current period of U.S.-Soviet relations and the administration's reassessment of its policies over the past year.

U.S. trade policy has not adjusted to the need to counter Soviet expansion, as exemplified by Communist activities in Africa, and to encourage cooperation in such areas as the strategic arms limitations talks (SALT), he told the group.

Instead, the country has swung broadly from one extreme to another: from the "denial" of trade during the Cold War years of the '50s and '60s to a "laissez faire" posture of relatively uninhibited trade.

Huntington said that neither approach was right for the moment at hand. He cited one recent illustration: In October, the Agriculture Department decided to

allow Soviet purchases of nearly twice as much corn and wheat as authorized in the two countries' grain agreement. Huntington told the group that the NSC ultimately read of this decision in the newspapers.

He suggested a mechanism by which the NSC could review such future decisions before they are made.

The Soviets badly need U.S. technology, for example, to exploit their vast Siberian natural gas reserves, for which $6 billion in U.S. and Japanese capital is slated. Such needs open up to the United States equally vast areas of leverage either to help the Soviets or hurt them, to hold out the carrot or the stick, he said.

Currently, the United States is "not in a position to offer the Soviets much of a carrot or threaten them with much of a stick," he said.

Last March, in a speech Huntington reportedly helped draft, President Carter warned that Soviet actions could rebound against U.S.-Soviet cooperation "toward common social scientific and economic goals. . . ." Should the Soviets "fail to demonstrate restraint in missile programs and other force levels and in the projection of Soviet or other proxy forces into other lands and continents, then popular support in the United States for such cooperation will erode," he said.

Similarly, in his June 7 Annapolis speech on Soviet-American relations, Carter said the administration had "no desire" to link the SALT negotiations "with other competitive relationships nor to impose other special conditions on the process. In a democratic society, however, where public opinion is an integral factor in the shaping and implementation of foreign policy, we recognize that tensions, sharp disputes or threats to peace will complicate the quest for an agreement."

Huntington's sentiments are not new expressions. Former secretary of state Henry A. Kissinger last month advocated the development of a "code of conduct for both the type of economic relations and the type of political conditions they [Western nations] want to attach to it" in relation to the Soviet Union.

[From the Washington Post, June 26, 1978]

Soviet Grain Harvest Under U.S. Scrutiny

Uneasy Moscow Acquiesces in Data Probe by Survey Teams and Satellites

(By Kevin Klose)

Moscow.—With the return of summer to the vast northern lands of Russia, the United States has begun anew to peer intently at the fields and furrows of Soviet croplands in hopes of estimating accurately the eventual harvest.

Using satellites and ground survey teams, the United States assembles information on soil moisture, germination, plant growth and other critical factors to arrive at the estimate.

It is sensitive business, underscoring the interdependence, however uneasy, that has evolved in recent years between the two countries: America with its superabundant farms and the Soviet Union with its struggling, problem-ridden agriculture.

The Soviets don't like satellites looking down from above or expert foreign agronomists walking their fields, seeking out problems. "They like to lead from the assumption of self-sufficiently," said one Western expert.

But the Soviet Union is only marginally self-sufficient in feed and fodder and its shortcomings in recent years have forced it to spend hard currency in the West—principally in the United States—to make up the differences as it struggles to increase meat supplies for its millions. Under its current five-year plan, per capita consumption of meat and meat products is to reach 165 pounds from the current 121 pounds. The only way it can achieve the needed increase in its livestock and poultry is to supplement its own harvests with imports.

The bilateral trade with the United States is more a function of necessity than of detenté, although the easier reactions between Moscow and Washington several years ago surely added impetus to the signing of the agreement. "The Soviets like to be totally free to buy when they choose," said one source.

The 1975 agreement requires the Soviets to purchase a minimum 6 million metric tons of grain annually from the Unted States and to notify Washington in advance if it needs more than 8 million tons. The agreement, which will run through the harvest of 1981, will add billions to U.S.-Soviet trade totals, regardless of the state of political relations.

The trade agreement grew out of the disastrous 1972 Russian harvest when unforeseen, massive Soviet purchases of American grain triggered surprise shortages and spiraling consumer costs for bread, meat and poultry in the United States.

The 1972 difficulties emphasized the U.S. need for crop information from the Soviets. "The more information the West has on crop production, the better it can plan for major demands from here," a source said. "The ideal situation is to get requirements estimates ahead." At the same time, too much information could place the Soviets at a disadvantage in the world market, where prices could rise on accurate advance word of a Soviet harvest short fall. The Soviets, who are notoriously tough businessmen, are not forthcoming about harvest shortcomings.

U.S. crop experts for a number of years have traveled in old Russia, west of the Urals, inspecting grain-lands periodically through the growing season. "They've been accepted by the Soviets with the full knowledge of why they are there," one Western expert said. "The survey team—an agronomist, an experienced farmer and an official of the Agriculture Department's crop reporting service—are accompanied constantly by Soviet authorities on their car travels through the region, which may last two or three weeks.

One such group now is coming to the end of its survey of old Russia and will return home over the July 4 weekend. "The information they will be carrying is considered so sensitive to world commodity markets that it will be assessed thoroughly in Washington before any of it is made public, despite the fact that the growing season has many weeks to go.

"Things look good now," one expert observer said. The Soviet press, while saying there have been sowing difficulties generally in the country due to a cold, wet spring, have reported a good start on most crops and higher than normal soil moisture east of the Urals. But much can happen between now and harvest time in a country which has had bizarre swings in harvests in recent years.

American surveys of European Soviet Union have been accurate within a few percentage points of the actual harvest reported by the Soviets. Last year, for example, the U.S. forecast in the Ukraine, traditional breadbasket of the Soviet Union, was within 3 per cent of the actual harvest.

Nevertheless, the Department of Agriculture and the Central Intelligence Agency overestimated the total Soviet grain harvest by 19 million metric tons, at 215 million when actually it was about 195.5 million. The discrepancy was not known until Soviet President Leonid Brezhnev announced the harvest results at a Kremlin rally marking the 60th anniversary of the Bolshevik revolution last November.

The United States was caught by surprise in part because it has had only limited access to the "new lands," where 89 million acres is under grain tillage in Kazakhstan and the southern Urals. Large portions of this territory is off-limits to foreigners.

These lands, subject to frequent fierce summer drought and harvest-time rain that rots crops, are the key to Soviet agricultural sufficiency. The government has earmarked billions of rubles for better farm machinery and more fertilizers in the current five-year plan, so far with indifferent results. A U.S. survey team will be shown selected sites there soon, and what they see may help the United States get a better picture of overall harvest prospects.

During his visit here last month, Agriculture Secretary Bob Bergland had only limited success to expand U.S. access to Soviet crop information and growing lands. Grain purchases by the Soviet Union last year to make up its harvest shortfall helped somewhat to deplete the immense wheat and corn surpluses that had brought U.S. crop prices to a five-year low last summer because of slack demand abroad.

Bergland succeeded in setting up a special joint committee that may help to reduce the secrecy of Russian harvests. The current preliminary U.S. Agriculture forecast is for a Soviet harvest of better than 205 million metric tons. But it may be months before any one—other than the Soviets—knows how accurate that is.

National
Foreign
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Center

A Dollar Cost Comparison of Soviet and US Defense Activities, 1967-77

A Research Paper

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A Dollar Cost Comparison of Soviet and US Defense Activities, 1967-77

Central Intelligence Agency
National Foreign Assessment Center

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Introduction

The military establishments of the USSR and the United States are difficult to compare because they differ so much in missions, structure, and characteristics. Any common denominator used for comparative sizing is inevitably imperfect, and its limitations must be understood in interpreting such comparisons. The approach taken here is to compare the defense activities of the two countries in resource terms. The common denominator is dollar cost.

This report presents estimates of the costs in the United States of producing and manning a military force of the same size and with the same inventory of weapons as that of the Soviets and of operating that force as the Soviets do. It then compares these estimates with US defense outlays. The utility of this approach is that it provides a general appreciation of the overall magnitudes of the defense activities of the two countries. Dollar cost data also provide a means for aggregating elements of each country's military programs into comparable categories and thus can show trends and relationships between the two defense establishments that are difficult to discern and measure in other ways.

Definitions

The defense activities used in this comparison encompass the following:

- National security programs (less foreign military assistance) that in the United States would be funded by the Department of Defense.
- Defense-related nuclear programs such as those funded in the United States by the Department of Energy.
- Selective Service activities.
- The activities of the US Coast Guard and Soviet Border Guards.

The following activities are not included in this comparison:

- Space activities that in the United States would be funded by NASA.

- Civil defense, except for the pay and allowances of uniformed personnel engaged in such programs.
- Veterans' programs.
- Soviet Internal Security Troops.

US Data

US dollar cost data are in terms of outlays derived from the US Budget and *The Five-Year Defense Program* issued by the Department of Defense in October 1977. The US data have been converted to calendar year terms and have been adjusted to achieve accounting coverage comparable with the dollar estimates made for the USSR. The US figures in this report, therefore, do not match actual budget authorizations or appropriations.

Estimates of Soviet Defense Activities

The dollar costs of Soviet defense activities are developed for the most part on the basis of a detailed identification and listing of Soviet forces. The force components so listed are multiplied by estimates of what they would cost in the United States in dollars. The results are then aggregated by military mission and by resource category.

The reliability of the estimates depends on the precision and accuracy of our estimates of the Soviet activities and the cost factors applied to that data base. The margin of error can be substantial for some items. We are more confident in the higher levels of aggregation than in the lower ones. Within the lower levels, our confidence varies from category to category, depending on our assessment of the reliability of our estimates of the size and characteristics of Soviet military forces and on the accuracy of the prices applied to those estimates.

We place our greatest confidence in the investment category—procurement of weapons and equipment and construction of facilities—which makes up about 30 percent of the total estimated dollar cost of Soviet defense activities for the period. These dollar costs are based for the most part on detailed estimates of Soviet weapon characteristics and construction practices that can be ascertained with reasonable confidence through intelligence methods.

Manpower costs, comprising about 35 percent of the total estimated dollar costs of Soviet activities, are the largest and most reliably estimated component in the operating category. These are obtained by applying US factors for pay and allowances to estimates of Soviet military manpower. For other operating costs, representing some 20 percent of the total dollar costs of defense activities, the information is scarcer and less reliable.

Finally, we believe the estimated dollar costs for Soviet research, development, testing, and evaluation (RDT&E), which are derived in the

aggregate using a less certain methodology, should be regarded as significantly less reliable than those for either investment or operating. The level and trend of these estimates, however, are consistent with the judgment, made with high confidence, that the Soviet military RDT&E effort is large and growing.

We believe that the overall dollar cost estimate for Soviet defense activities is unlikely to be in error by more than 15 percent. This judgment, while informed, is nonetheless subjective and not the result of statistical measurement.

Limitations

Because of the problems of comparing disparate activities, the uncertainties of the estimates of Soviet costs, and the organization of the US data, the comparisons in this paper should not be considered precise measurements. Any conclusions drawn from this dollar cost analysis must be tempered by an appreciation of what it does not do:

- Because it measures only resource inputs it cannot be used alone to draw inferences about the relative military effectiveness or capabilities of US and Soviet forces. These judgments must be based on other data such as the size and technical characteristics of the forces, the geographical locations of the two countries, their allies' capabilities and requirements, strategic doctrine and tactical concepts, morale, and command and control capabilities.
- It does not measure actual Soviet defense expenditures or their burden on the Soviet economy. These questions are addressed by different analytical techniques yielding estimates of the ruble costs of Soviet military programs.
- It does not reflect the Soviet view of the distribution of the USSR's defense effort. The price structures in the two countries are substantially different. Additionally, neither the system of accounts nor the structuring of expenditures by military mission is the same for the Soviet Ministry of Defense and the US Department of Defense.

Index Number Problem

Dollar cost calculations tend to overstate Soviet defense activities relative to those of the United States because of a basic measurement problem common to all international economic comparisons and known to economists as the index number problem. Given different resource endowments and technologies, countries tend to use more of the resources that are relatively cheap—and less of those that are relatively expensive—for a given purpose. A comparison drawn in terms of the prices of one country thus tends to overstate the relative value of the activities of the other. This tendency is more pronounced the greater the disparity between the economies.

The degree of overstatement of Soviet defense activities relative to those of the United States that is inherent in the dollar cost comparison cannot be measured with precision. An appreciation of the magnitude of the index number problem can be obtained, however, by calculating the other extreme—that is, by examining the ratio of Soviet to US defense activities measured in ruble cost terms, which overstates US activities relative to Soviet. The dollar cost comparison shows Soviet defense activities to exceed those of the United States by about 40 percent in 1977. If both are measured in terms of estimated ruble costs, the Soviet activities are about 25 percent larger than the US activities. Thus, the effect of the index number problem is not large enough to alter the basic conclusion that Soviet defense activities overall are currently larger than those of the United States.

Price Base

The data presented here are expressed in constant dollars which represent the average purchasing power of the dollar for defense goods and services during the first quarter of 1977. Constant dollar figures are used so that trends in the cost estimates will reflect changes in military forces and activities rather than the effects of inflation.

Dollar Cost Comparisons

Aggregate Defense Costs

For the 1967-77 period as a whole, the cumulative estimated dollar costs of Soviet defense activities were about the same as US outlays for defense. The trends of the defense activities of the two countries, however, were quite dissimilar. When expressed in constant US prices, which measure growth in real terms, the trend of the dollar costs of Soviet defense activities was one of continuous growth throughout the period, averaging about 3 percent a year. Growth was evident in nearly all the major elements of the Soviet defense establishment.

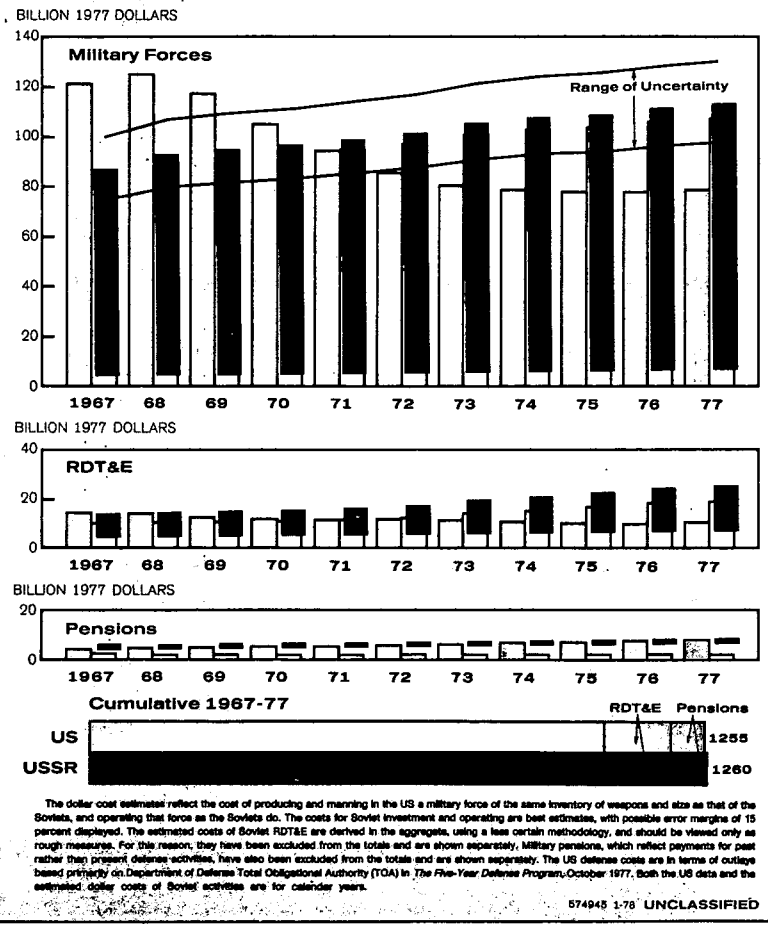
The trend of US defense outlays during this period was quite different. Despite increases in current dollar terms, US outlays in constant dollars declined continuously from the Vietnam peak of 1968 through 1976. US outlays grew slightly in 1977 as increases in weapons procurement and RDT&E offset a continuing decline in personnel costs.

As a result of these diverging trends, the estimated dollar costs of Soviet defense activities caught up with US defense outlays in 1971 and exceeded them by a widening margin in each succeeding year. At about $130 billion, the estimated costs of Soviet defense activities for 1977 were about 40 percent higher than the US outlay of $90 billion. If pensions are included—adding the costs of some past activities on both sides—the estimated dollar costs of Soviet activities in 1977 exceed those of the United States by about one-third.

Total US and Soviet Defense Activities, 1967-1977

A Comparison of US Outlays with Estimated Dollar Costs of Soviet Activities if Duplicated in the US

FIGURE 1



The dollar cost estimates reflect the cost of producing and manning in the US a military force of the same inventory of weapons and size as that of the Soviets, and operating that force as the Soviets do. The costs for Soviet investment and operating are best estimates, with possible error margins of 15 percent displayed. The estimated costs of Soviet RDT&E are derived in the aggregate, using a less certain methodology, and should be viewed only as rough measures. For this reason, they have been excluded from the totals and are shown separately. Military pensions, which reflect payments for past rather than present defense activities, have also been excluded from the totals and are shown separately. The US defense costs are in terms of outlays based primarily on Department of Defense Total Obligational Authority (TOA) in *The Five-Year Defense Program*, October 1977. Both the US data and the estimated dollar costs of Soviet activities are for calendar years.

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If all personnel costs are removed from both sides, US defense outlays exceed the estimated dollar costs of Soviet defense activities by about 5 percent over the 1967-77 period as a whole. By 1977 the Soviet level is about 25 percent greater than the US. If RDT&E (for which estimates are considerably less reliable than those for other activities) are subtracted from each side, the estimated Soviet figure in 1977 is about 35 percent higher than that of the US, and the cumulative totals are about the same.

Military Mission Comparison

US accounts array defense authorizations by the missions they are designed to support. The mission definitions in this report accord with the guidelines outlined in the *Defense Planning and Programming Categories* issued by the Department of Defense in August 1977.

Strategic Forces

Strategic forces include all those assigned to intercontinental and peripheral attack, strategic defense, and strategic command, control, and warning. Over the 1967-77 period as a whole, the level of Soviet activity for strategic forces (exclusive of RDT&E) measured in dollars was almost two and a half times that of the United States. Soviet activities have been growing following a slight dip in the early seventies, while US activities declined steadily before leveling off after 1975. As a result, in 1977 the Soviet level was about three times that of the US.

Within the strategic forces mission, Soviet forces for intercontinental attack accounted for about 40 percent of the total for the period. US outlays for intercontinental attack forces, while only two-thirds of the estimated dollar cost of the Soviet forces, accounted for about 60 percent of US strategic forces outlays for the period. Peripheral attack forces, for which the United States has no counterpart, accounted for about 15 percent of the total Soviet strategic mission.

Within the respective intercontinental attack forces, a substantial difference in emphasis on weapons is apparent. Almost 60 percent of the estimated dollar costs of Soviet activities during the period were for the ICBM force, compared to only about 20 percent for the US. On the other hand, outlays for the US bomber force comprised about 40 percent, compared to a Soviet share of less than 5 percent.* While the Soviets exceeded the US level of activities for ICBMs in every year of the period and for submarines in all but two, US outlays for bombers were higher every year.

General Purpose Forces

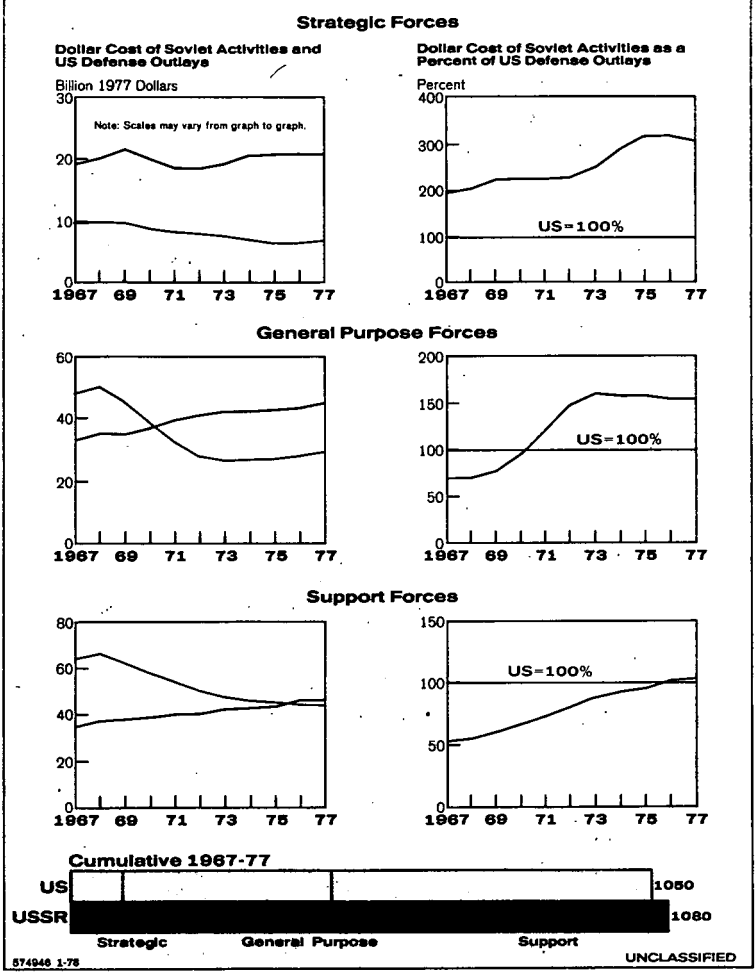
General purpose forces include all those assigned to ground, tactical air, naval, and mobility (airlift and sealift) forces. Estimated dollar costs of Soviet

* Backfire aircraft assigned to Long Range Aviation are included in peripheral attack forces, and those assigned to the Navy are in general purpose forces.

US and Soviet Major Missions, 1967-1977

FIGURE 2

A Comparison of US Outlays and Estimated Dollar Costs of the Soviet Activities if Duplicated in the US



activities for general purpose forces (exclusive of RDT&E) exceeded US outlays starting in 1971, and for the period 1967-77 as a whole were about 10 percent higher than US outlays. Since 1973, Soviet activities measured in dollars have been about 50 percent higher each year than comparable US outlays.

Within both the Soviet and US general purpose forces, land forces took the largest share of the cost. The estimated dollar costs of Soviet land forces increased steadily throughout the period. Outlays for US land forces fell sharply following the Vietnam peak in 1968 but have grown since 1973. In 1977, the Soviet level of activity for these forces, measured in dollar terms, was more than twice that of the United States.

The costs of general purpose naval forces (excluding attack carriers) were relatively constant for both countries over the period. In 1977, estimated dollar costs of the Soviet activities were about one-third higher than US outlays. (If the costs of attack carriers and their aircraft were included, US outlays would be about 45 percent higher and would average 20 percent more than Soviet costs throughout the period.)

The US outlays for tactical air forces (including attack carriers) were more than twice the estimated dollar costs of comparable Soviet forces for the period 1967-77. The trends for the two countries, however, were quite different. Despite some increases in recent years, the overall US trend was downward, and the 1977 level was roughly a third less than that of 1967. On the other hand, the Soviet 1977 level was about twice that of 1967. As a result, US annual outlays, which once were five times that of the Soviets, were only about 50 percent greater in 1977.

Support Forces

Support forces comprise those falling within the categories outlined in the *Defense Planning and Programming Categories* as auxiliary forces, mission support forces, and central support forces. Included are military space programs, the US Coast Guard, Soviet Border Guards, major headquarters, all logistic support activity, and military personnel assigned to civil defense. Over the period 1967-77 the US level of support activities exceeded that of the Soviets by about a third when measured in dollar terms.

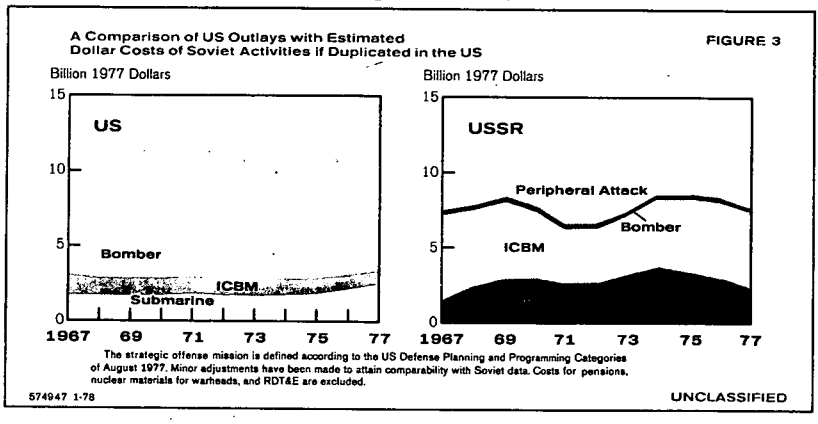
For the US, support activities accounted for almost 50 percent of cumulative defense outlays during the period; while for the Soviets the share was about 35 percent.

Resource Comparison

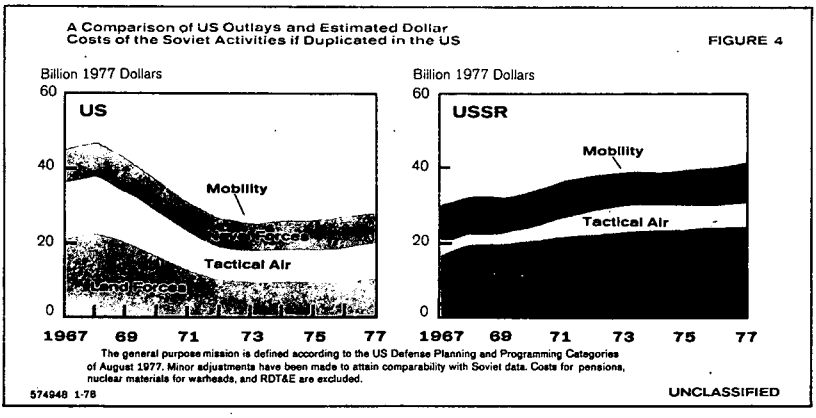
Soviet and US defense activities can also be compared in terms of major resource categories: military investment, operating costs, and RDT&E costs.

- The investment category covers the dollar costs of activities to modernize or expand forces through the procurement of equipment, including

US and Soviet Forces for Strategic Offense, 1967-1977



US and Soviet General Purpose Forces, 1967-1977



major spare parts, and construction of facilities. Investment costs represent the flow of equipment and facilities into the defense establishment. It is not an indication of the size of the force in any given year.

- Operating costs are those associated with maintaining current forces, including personnel costs. Operating costs are directly related to the size of the forces and to their level of activity.
- Dollar costs for RDT&E are those for activity devoted to exploring new technologies, developing advanced weapon systems, and improving existing systems.

Military Investment

The trends in the costs of military investment followed closely those for total defense costs in both countries. For the 1967-77 period as a whole, the estimated dollar costs of Soviet investment were about 20 percent greater than US outlays for military investment programs. Soviet investment increased continuously over the period, driven primarily by the introduction of advanced weapon systems, particularly succeeding generations of missile programs and, in the 1970s, introduction of a new generation of tactical aircraft. US investment declined sharply after the Vietnam buildup—to about half the 1968 level by 1975—before turning up in 1976 and 1977. As a result of these divergent trends, the estimated dollar costs of Soviet investment exceeded US outlays by an increasing margin after 1970 and since 1975 have been about 75 percent greater than the US level. For the 1970-77 period, the Soviet total was almost 50 percent greater than that for the United States.

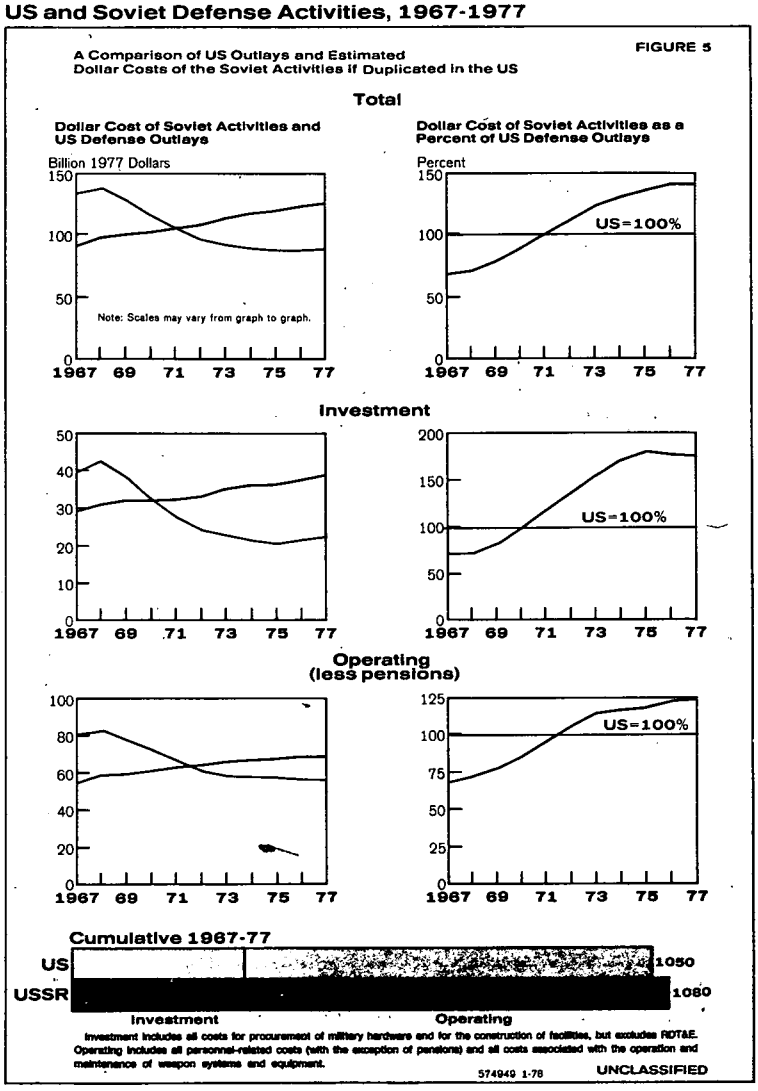
Operating Costs

Operating costs made up the largest share of the total defense figure for both countries. US outlays declined rapidly after 1968, reflecting the scaling down and eventual termination of the Vietnam involvement. Estimated Soviet operating costs grew continuously during the period, keeping pace with growing force levels. Soviet costs exceeded those of the United States by a widening margin after 1971. By 1977, the estimated dollar cost of Soviet operating activities was more than 20 percent above US outlays.

RDT&E

Estimates of the dollar cost of reproducing Soviet RDT&E activities are derived in the aggregate using a less certain methodology and are less reliable than the other estimates in this report. Nonetheless, it is clear from the number and increasing complexity of the weapon systems deployed and under development that the Soviet activities were both large and growing during the period under review. US outlays for RDT&E, on the other hand, declined steadily over the period before turning up in 1977. As a result, Soviet RDT&E activities in 1977 were substantially larger than those of the United States.

US and Soviet Defense Activities, 1967-1977

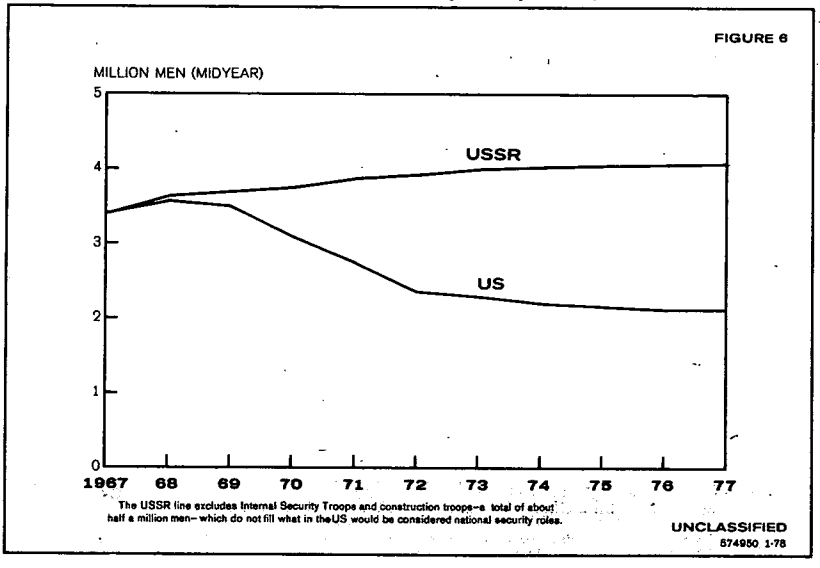


Military Manpower Comparisons

Military manpower trends paralleled those for total costs in the two defense establishments. Estimated Soviet military manpower grew throughout the period, increasing by more than 700,000 men between 1967 and 1977, to about 4.1 million men. Most of this increase was in the ground forces, although growth occurred in the other force components as well. By contrast, the level of US military manpower has fallen steadily since the peak of the Vietnam buildup in 1968.

The Soviets historically have maintained a large standing force that has a broader range of responsibilities than does the US military. Soviet military manpower in 1977 was about twice the US level for that year. The Soviet figure includes the five armed services of the Ministry of Defense and the Soviet Border Guards, who are subordinate to the Committee for State Security but have some military responsibilities. Some half million additional men serve in military construction units and the Internal Security Troops of the Ministry of Internal Affairs. These men were not included in the comparison because they do not fill what in the US would be considered national security roles.

US and Estimated Soviet Active Military Manpower, 1967-1977



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Comparison with Previous Estimate

Estimates of the dollar costs of Soviet defense activities are revised each year to take into account new information and new assessments of the size, composition, and technical characteristics of the Soviet forces and activities as well as improvements in costing and methodologies. The US data used for comparative purposes is similarly revised each year to take into account changes in *The Five-Year Defense Program*. Both the Soviet and US data are updated annually to reflect the most recent price base possible.

Principal changes in this year's estimate of Soviet activities include improved estimates of the costs of POL, equipment maintenance, and RDT&E; reallocation of some manpower costs between combat forces and support forces; an increase in our estimate of civilian employees of the Ministry of Defense; and deletion of personnel—such as those of Internal Security units—whose main function is not military. Additionally, new intelligence and improved costing methodologies have caused numerous changes in estimates of production and costs of Soviet equipment. In sum, however, the net change in aggregate costs resulting from these adjustments was slight, and the differences in this year's totals are attributable almost entirely to the conversion from 1975 to 1977 dollars.

The changes on both sides result in some changes in the relative activity levels for individual missions and resource categories but have not had an appreciable effect on the overall comparisons of the defense activities of the two countries during the period. This year we estimate, as we did last year, that dollar costs of Soviet defense activities—less military pensions—are currently about 40 percent greater than those of the United States. Moreover, our general assessment remains the same in its essential aspects—cumulative costs for the two countries over the past decade are essentially equal; the Soviet level began to exceed that of the United States in the early 1970s, and since then the margin has increased steadily.

National
Foreign
Assessment
Center

The Soviet Economy in 1976-77 and Outlook for 1978

A Research Paper

ER 78-10512
August 1978

The Soviet Economy in 1976-77 and Outlook for 1978

Central Intelligence Agency
National Foreign Assessment Center

August 1978

Highlights

Gross national product increased at an average annual rate of 3.8 percent during 1976-77, about the same as the preceding five-year average. This aggregate measure, however, reflects the combined impact of a marked slowdown in industry, construction, and transportation and a marked recovery in agricultural production:

- Industrial production—the traditional mainstay of GNP growth—slowed sharply from an average annual growth rate of 6.0 percent in 1971-75 to 3.9 percent in 1976-77. Shortfalls in the production of key industrial commodities—especially steel—were the principal causes of this slowdown. These shortfalls can be traced mainly to the increasing Soviet dependence on less accessible and lower quality ore plus past failures to build sufficient processing capacity.
- Shortages of steel impinged on machinery output, a key source of technological progress and productivity gains. Machinery production—which accounts for one-third of industrial output—increased by 5.9 percent annually during 1976-77 after an average of 8.2 percent in 1971-75.
- In the energy sector, only a major push in West Siberia kept growth in primary energy near 5 percent in 1976-77, about the same as in 1971-75. Some gains in energy conservation were achieved last year as the slowly rising rate of energy consumption per unit of output was brought to a standstill. Nevertheless, growth in energy production—particularly oil—is slowing. Furthermore, the major efforts to exploit the oil-producing fields of West Siberia over the past two years will shorten their producing lives and consequently may cause a sharper slowdown in the years immediately ahead.

Growth of construction activity slowed sharply, and completion of new plant and equipment failed to meet the leadership's expectations in 1976-77:

- While investment grew near the rate planned for 1976-80, runaway growth in the backlog of uncompleted investment projects in both years sharply curtailed the increase in additions to new capacity. The leadership had been counting heavily on reducing the volume of unfinished projects as a major source of increments to new capacity, and we expected that some success would be realized in this area.

Large swings in crop production during 1976-77 continued to cause annual fluctuations in net agricultural production:

- After rebounding in 1976 from the disastrous grain crop of 1975, the growth of farm output fell back to its long-term trend of about 3.5 percent last year—a sharp upturn in livestock production more than offsetting a decline in the production of crops. Some buildup in livestock inventories was facilitated by a liberalized government policy toward private agricultural holdings.
- Per capita meat production in 1976 was set back to levels of the early 1970s as a result of the poor harvest in 1975. Despite a rebound in meat production in 1977, severe shortages persisted, leading to longer queues and scattered reports of protests against food shortages.

These problems are now being joined by a downturn in growth of the working-age population, which will begin to be felt this year and will continue until the mid-1980s:

- Soviet leaders are exhorting management and labor to accelerate productivity growth in order to offset labor shortages but have failed to alter incentive systems to induce such change.

One area in which the Soviets achieved major success in 1976-77 was in reducing the hard currency trade deficit:

- The trade deficit was cut from $6.3 billion in 1975 to $5.5 billion in 1976 and $3.3 billion in 1977.

The Soviet leadership has outlined a scenario of continuing slow growth for 1978. Although modest by Soviet standards, the 1978 plan nevertheless will require better-than-average weather for agriculture as well as success in dealing with the problems of steel and energy. The Soviets must break the bottleneck in steel output, for example, if they are to meet their output plans for industry as a whole and for machinery in particular.

Prospects for economic growth through first half 1979 are heavily dependent on developments in agriculture, which in turn is still at the mercy of the weather:

- A very good crop this year will stimulate industrial growth next year by providing sufficient raw materials while at the same time helping

the nation's hard currency position by reducing the need for grain imports.

- A poor crop, however, will result in a further slowing of economic growth, leading to increased spending for foreign grain and making gains in consumption even harder to achieve.

The Soviet hard currency deficit, also heavily dependent on developments in agriculture, probably will land between $2 billion and $3 billion in 1978.

- Imports of machinery and equipment from the West will drop sharply, reflecting last year's decline in orders; but orders should stage a comeback in 1978-79.
- Imports of Western grain in 1978 probably will be in the neighborhood of $2.5 billion to $3.0 billion.
- A poor crop in 1978, however, would increase import requirements in 1979 and possibly hard currency borrowing.

The slowdown in economic growth has been much sharper than Soviet leaders anticipated and means that a smaller volume of goods and services is being added each year to be divided between consumption, investment, and defense. So far, investment growth appears to have borne the brunt of this slowdown—falling from an average annual rate of 7.0 percent in 1971-75 to about 4 percent in 1976-77. Whether this trend will continue remains to be seen. If it does, and Soviet plans seem to imply just that, the Soviets will find it increasingly difficult to maintain even the present pace of economic growth.

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PREFACE

This paper is the first review of current Soviet economic performance since publication of our comprehensive assessment of longer term trends and prospects for the Soviet economy through the mid-1980s, CIA ER 77-10436U, *Soviet Economic Problems and Prospects*, July 1977, which was also published by the Joint Economic Committee of the US Congress, 8 August 1977. Economic events in the USSR during 1976-77 support the general trends projected in our earlier study, and we conclude that the central findings of the earlier study remain valid.

The Soviet Economy in 1976-77 and Outlook for 1978

Economic Performance in 1976-77

Growth in gross national product during 1976-77 was influenced primarily by a general upturn in farm output and a marked slowdown in industry, construction, and transportation. Because of these offsets, the average annual rate of growth for the two-year period—3.8 percent—was roughly the same as for the first half of the 1970s (3.7 percent). Growth was somewhat more rapid in 1976 than in 1977, reflecting primarily a strong recovery in farm output—highlighted by a record grain crop—after the previous year's harvest failure. Growth in industry, construction, and transportation was sluggish in both years (see table 1).

The slowdown in industry in 1976-77 is only partially explained by the dislocations stemming from shortages of agricultural raw materials. In both years, the investment program was far behind in completing new plant and equipment, with a pronounced adverse effect on both industrial materials and machinery production.

Also, the poor progress in 1976-77 reflected both the relatively slow increase in the supply of factors of production (man-hours of labor, capital stock, and agricultural land area) and near stagnation in overall factor productivity (see table 2). Inability to raise productivity is now the key problem confronting the leadership in its quest for sustained economic growth.

Table 1

USSR: Growth of GNP, by Sector of Origin [1]

	Average Annual Percent Change		
	1966-70	1971-75	1976-77
GNP	5.3	3.7	3.8
Agriculture [2]	4.5	−0.6	5.5
Industry	6.3	6.0	3.9
Construction	5.5	5.3	2.8
Transportation	6.8	6.6	4.1
Communications	8.9	7.2	6.1
Trade	6.5	4.8	3.7
Services	4.3	3.6	3.1
Other	4.4	2.9	2.5

[1] Calculated at factor cost.

[2] Excluding intra-agricultural use of farm products and not making an adjustment for purchases by agriculture from other sectors. Value added in agriculture grew by 4.2 percent in 1966-70, −2.1 percent in 1971-75, and 5.5 percent in 1976-77.

Table 2

USSR: Growth of GNP, Factor Supplies, and Factor Productivity

	Average Annual Percent Change			
	1961-70	1971-75	1976-77	1976-80 Plan
GNP	5.1	3.7	3.8	5.0
Factor supplies	4.3	4.2	3.5	3.5
Man-hours	1.8	1.9	1.2	1.5
Capital stock	8.1	7.9	7.1	6.5
Agricultural land	0.4	0.8	0.1	0.5
Factor productivity	0.8	−0.6	0.2	1.5

As shown in table 3, the downturn in growth of major producing sectors of the economy has not yet affected the shares of GNP going to consumption, investment, and defense. Each of the three major claimants is growing at about the same rate as GNP.

Growth in personal consumption slowed in 1976-77 mainly because of a setback in food availability. Demand for meat in particular far exceeded supply, resulting in long queues and scattered reports of protests against meat shortages late last year. Other consumer items, such as automobiles, television sets, and refrigerators, maintained their slow but steady expansion in output, sales, and cumulative inventories held by Soviet households.

Agriculture

After rebounding in 1976 from the disastrous grain crop of 1975, the growth of farm output in the USSR fell back to its long-term trend of about 3.5 percent last year. A decline in crop output in 1977 offset much of the rebound in output of livestock products after two consecutive years of decline. The record grain crop in 1976, coupled with the continuation of large grain imports, assured abundant forage for livestock in 1977 and accounted in large part for the increase in meat, milk, and wool output (see table 4). Moscow imported approximately 11 million metric tons of grain from the West in 1977, augmenting its record 1976 grain harvest by about 5 percent. About two-thirds was purchased from the United States.

Table 3

USSR: Shares of GNP

Percent

	1970	1975	1977
Consumption	58	58	57
New fixed investment in plant and equipment	20	23	24
Defense	11-13	11-13	11-13
Other [1]	9-11	6-8	6-8

[1] Including capital repair, administration, civil research and development, and net additions to livestock.

Table 4

USSR: Production of Major Crops and Livestock Products

	1971-75	1976	1977
	Average Annual Percent Change		
Major crops [1]	−1.9	22.1	−5.5
Livestock products [2]	3.6	−5.6	7.3
	Million Tons		
Grain [3]	181.6	223.8	195.5
Potatoes	89.8	85.1	83.5
Sugar beets	76.0	99.9	93.3
Sunflower seed	6.0	5.3	5.9
Cotton	7.7	8.3	8.8
Vegetables	23.0	25.0	23.0
Meat (slaughter weight)	14.0	13.6	14.8
Milk	87.4	89.7	94.8
Wool	0.44	0.44	0.46
	Billion		
Eggs	51.4	56.2	61.0

[1] Net of seed and estimated waste.
[2] Excluding changes in inventories of herds.
[3] Measured in "bunker weight," that is; gross output from the combine, which includes excess moisture, unripe and damaged kernels, and weed seeds, and other trash. In order to compare Soviet grain output with that of other countries, a downward adjustment of about 11 percent is in order.

To maintain momentum in the growth of livestock output in the face of a slow recovery of this sector on state and collective farms, the government has relaxed somewhat its restrictions on private agriculture. The persistent shortage of meat and dairy products following the poor 1975 harvest apparently was the impetus for the latest policy swing favoring private agricultural activity. Press articles in 1976 and 1977 not only officially sanctioned private farming but also promised aid, including the all-important provision of a steady supply of feed from state sources. The Ministry of Agriculture issued an order in October 1977 ordering local authorities to explore the possibility of higher quotas for privately held livestock;[1] such quotas have remained unchanged since the early 1960s.[2]

As shown in table 5 and figure 1, the private sector has begun to respond to these official initiatives. Inventories of all livestock were higher on 1 January 1978 than a year earlier, with private holdings actually registering a gain—its first since 1970. Hogs, for example, have relatively short gestation and maturation periods and provide a good leading indicator of the private sector's direction. The number of privately held hogs was 25 percent larger on 1 January 1978 than on 1 January 1977.

In addition to encouraging private farming activity during 1976-77, the USSR continued to allot a relatively large share of its investment resources to farming. Investment in agriculture increased by an average of 9 percent annually, compared with only 2 percent for the rest of the

[1] The private agricultural sector supplies more than 25 percent of the USSR's total farm output, including more than 30 percent of its livestock products. It is almost exclusively composed of individual holdings of one-half hectare or less, frequently combined with the ownership of one or two head of livestock and small flocks of chickens, geese, or ducks.

Because the government considered private farming to be ideologically inferior to socialized farming, it has treated private farming as no better than a necessary evil. Thus, after a series of average or above-average harvests when the leadership feels optimistic about the agricultural situation, the private sector is repressed. After production setbacks, the leadership recognizes the need for the additional output of the private sector and promotes its expansion.

[2] One of the first—and certainly most popular—acts of the Brezhnev-Kosygin leadership was to relax Khrushchev's restrictions on private farming. In 1965—the first year in which the more lenient policy was operative—there was a spurt of 13 percent in private livestock holdings (see figure 1).

Table 5

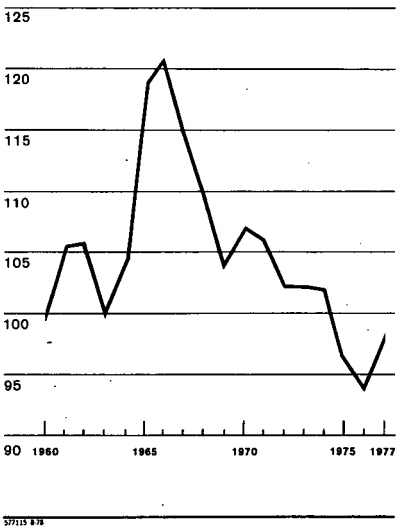
USSR: Livestock Inventories

	1971	1975	1976	1977	1978
	Index:[1] 1971 = 100				
Livestock	100.0	109.0	106.1	106.9	110.6
Socialized	100.0	113.6	111.5	113.4	116.9
Private	100.0	95.2	89.9	87.3	91.8
	Million Head[2]				
Cattle	99.2	109.1	111.0	110.3	112.5
Socialized	74.3	84.6	87.6	87.5	89.3
Private	24.9	24.5	23.4	22.8	23.2
Hogs	67.5	72.3	57.9	63.1	70.3
Socialized	50.9	58.6	45.7	51.3	55.6
Private	16.6	13.7	12.2	11.8	14.7
Sheep and goats	143.4	151.2	147.1	145.3	146.2
Socialized	110.2	119.2	117.7	116.5	117.3
Private	33.2	32.0	29.4	28.8	28.9

[1] Weighted by average prices of all producers in 1970.
[2] As of 1 January of the stated year.

USSR: Value of Livestock in Privately Owned Herds

Figure 1



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economy. Agriculture's share of investment increased from 22 percent in 1970 to 27 percent in 1977.[3] Deliveries of mineral fertilizers to agriculture, however, increased only about 2.5 percent annually, compared with a yearly average of 10 percent during 1971-75, as new capacity for fertilizer production has been slow coming on-stream. Most of the increase in agriculture's share of investment occurred prior to 1976 and reflects the Brezhnev regime's high priority to improving food production—a policy that Brezhnev has stated will continue.

Industry

Industrial output—the traditional mainstay of Soviet economic performance—slowed abruptly in 1976-77, registering an average annual growth rate of 3.9 percent. Production of an unprecedented number of commodities fell short of target—particularly in 1977. Output of industrial materials increased less than 3 percent, with record low growth rates posted by ferrous metals, construction materials, electric power, and crude oil (see table 6). Although recurrent shortages are endemic in the Soviet economy, the stringencies occurring during the last two years have been unusually severe:

- Shortfalls in drilling and prospecting work, due to insufficient drilling crews and equipment, slowed oil production.
- Tight fuel allocations slowed progress across a broad spectrum of industries and transportation facilities.
- Bottlenecks in rail transportation disrupted deliveries of industrial products.
- Tight iron ore supplies and scrap shortages impeded steel output.

Energy

Total primary energy production in 1976-77 was sustained at about the 5-percent annual rate of the past decade (see figure 2) largely because of unrepeatable increases in gas capacity and production. Growth of oil production continued to slow down. The high priority given to raising energy exports for balance-of-payments reasons and increasing concern about future energy supplies led Moscow to enforce stringent energy conservation measures.

Oil. The increase in oil output in 1977 was about 500,000 barrels per day, the smallest absolute amount since 1972 and the lowest percentage growth (5 percent) in three decades. Only in the new far northern oil regions—West Siberia and the Komi ASSR—did production increase substantially. In the older regions, output declined by 3 percent instead of the drop of about 1.5 percent anticipated by Soviet planners.

The increase in West Siberian production in 1977 was the highest for any year since commercial production began in 1964. West Siberian output now equals that in the Urals-Volga region, long the nation's major producer. Production at West Siberia's Samotlor field, the largest in the country, reached a level of almost 130 million tons (2.6 million b/d) in 1977 and accounted for almost one-fourth of national output.

Table 6

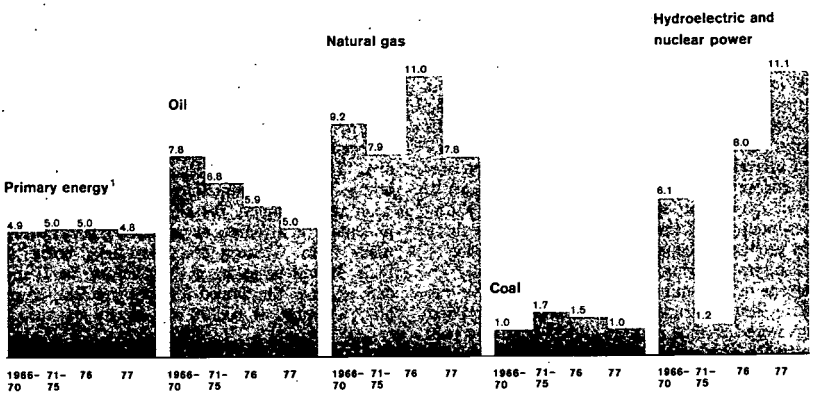
USSR: Industrial Production

	Average Annual Percent Change		
	1971-75	1976	1977
Industrial production	6.0	3.7	4.1
Industrial materials	5.4	3.6	2.8
Ferrous metals	3.8	2.7	1.3
Crude steel	4.0	2.5	1.7
Rolled steel	4.1	2.8	0.7
Steel pipe	5.1	5.3	1.2
Primary energy	5.0	5.0	4.8
Coal	1.7	1.5	1.0
Oil	6.8	5.9	5.0
Gas	7.9	11.0	7.8
Electric power	7.0	7.0	3.5
Construction materials	5.1	3.2	1.0
Cement	5.1	1.8	2.2
Slate	4.8	3.5	−10.0
Soft roofing	5.7	7.1	−3.0
Machinery	8.2	5.9	5.9
Consumer nondurables	3.4	−0.6	3.4
Food	4.2	−4.5	4.8
Soft goods	2.6	3.9	1.9

[3] This includes productive investment, such as the purchase of agricultural machinery, as well as investment for "nonproductive" purposes such as municipal and communal facilities, schools, and rural roads. Alone, productive investment in agriculture amounts to about 20 percent of the economy's total investment. In the United States, productive investment in agriculture is less than 5 percent of total investment.

USSR: Energy Production Figure 2

Average annual percent change



[1]Oil, coal, natural gas, peat and firewood, hydroelectric and nuclear power.

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This field, however, should reach peak output this year, and purchase of expensive Western gas-lift equipment, which would extend its producing life, currently is being negotiated. Development of other small West Siberian fields is lagging behind plan. During 1976-80, at least six to eight new fields per year were to begin commercial production to compensate for the leveling off of Samotlor's output. However, in 1976 and 1977 only about five fields per year were added, mainly because of failure to meet schedules for massive drilling and infrastructural tasks.

Meanwhile, declines in output in 1976-77 were recorded in the Urals-Volga region, the Caspian region, and Central Asia. Most of the Urals-Volga oil-producing fields are in late stages of production so that the decline will continue in the years ahead.[4]

Natural Gas. In 1976 and 1977, annual output goals for natural gas were overfulfilled, something that had never happened previously. The 1976 increase—31.3 billion cubic meters[5]—was a record and was 8 billion cubic meters above plan. In 1977, output reached 346 billion cubic meters, 25 billion cubic meters over 1976 and 4 billion cubic meters above plan. This unprecedented two-year expansion resulted primarily from new fields coming onstream in West Siberia and the completion of pipelines to the principal consuming regions—the Urals and European USSR.

Maintaining such growth, however, will be difficult. The cost and physical difficulty of developing the major untapped Soviet gas reserves exploitable over the next decade—located in northern Tyumen Oblast—is unprecedented in the history of the world's oil and gas industries and poses problems not previously encountered in

[4] Production problems during 1976-77 apparently prompted the USSR to reduce its statistical reporting on the oil industry. In 1977, for example, conflicting data were issued for West Siberian oil production while output figures were withheld for older regions where output is declining. For the first time in this decade, no quarterly or annual output figures were reported for three republics—Azerbaidzhan, Turkmenistan, and Kazakhstan.

[5] To convert to cubic feet per day, multiply by 0.096753.

either the USSR or the West. Meanwhile, combined gas production from the country's non–West Siberian gas regions peaked in 1977 and will begin declining this year, forcing West Siberia to cover increasingly large losses in national output.[6]

Coal. Efforts to accelerate the growth of coal output in 1976-77 were unsuccessful as the USSR failed to reach production targets in both years. As with oil and gas, many of the deposits in European Russia are nearing exhaustion and are becoming more costly and difficult to work. Other major bottlenecks include rail car shortages, poor use of the labor force, and inadequate new production capacity to offset the depletion of old mines. During 1971-75, for example, an average of 22.8 million tons of new capacity was put into operation annually, but only 12.5 million tons were installed in 1976 and 17.4 million tons in 1977. At the same time, old mines in the Donetsk and Moscow basins were closing at an accelerating rate. Output has been declining in the Moscow basin for several years, but 1977 marked the first year since 1961 that output declined substantially in the Donetsk.

Electric Power. Growth in electric power production fell to an all-time low last year, and for the first time since World War II, power consumption grew at the same rate as GNP—about 3.5 percent—and below the rate of industrial output.[7]

Most of the marked slowdown in growth of electric power use reflected some success in the conservation campaign to reduce consumption of power per unit of industrial output. However, a shortage of generating capacity in the European USSR appears also to be a problem. During 1971-75, electric power output rose 40 percent while power plant capacity increased only 31 percent. The Minister of Power and Electrification noted in early 1976 that an imbalance had reduced the reserve capacity and lowered the reliability of power supply. Subsequently in 1976, capacity rose by only 5 percent whereas output increased 7 percent, creating further strain on available capacity.

In addition to insufficient generating capacity, providing adequate fuel for thermal power plants is becoming more difficult in the energy-short European USSR. Consequently, Soviet planners regard nuclear power as the most promising source of growth in electricity production in this area. However, the nuclear program is lagging badly. The Soviet machinery industry has not yet been able to supply the planned volume of components, and attempts to purchase nuclear equipment from Western countries have borne no fruit. It will be at least 1990 before the USSR can achieve the hoped-for new nuclear power plant capacity of 10,000 megawatts per hour.[8]

Energy Conservation. The tightening supply of energy resources—together with Moscow's desire to expand exports of oil to hard currency countries in the West—led to stringent domestic fuel allocations last year, which in turn contributed to unusually frequent and widespread fuel shortages.

Recognizing that energy resources must be conserved, the government has recently initiated a program of long-term energy conservation aimed at widespread areas of the economy. The new emphasis on conservation contrasts with the earlier Soviet line that the USSR was insulated from world energy shortages by immense domestic resources.

Unlike the pattern in most Western countries, energy use in the USSR has been growing more rapidly than GNP. However, energy conservation efforts apparently had a measurable effect in 1977. After increasing by about 1 percent per year in 1971-76, energy consumption per unit of GNP leveled off in 1977. In large part, this "energy savings" reflects structural changes in the growth of GNP: specifically, the sharp declines in the growth of energy-intensive branches of industry—ferrous metals, construction materials, and machinery. While a continuation of this trend would further reduce energy consumption

[6] For more details on the prospects of the Soviet gas industry, see CIA ER 78-10393, *USSR: Development of Gas Industry*, July 1978.

[7] Because of the rapid growth in the stock of machinery and industrial processes dependent on electric power, the rate of increase in electric power consumption has normally exceeded the annual boost in GNP by 2 to 3 percentage points.

[8] Even with this capacity, nuclear energy is likely to provide less than 5 percent of total energy.

per unit of GNP, it also would mean a smaller increment to the output of producer goods for future investment and/or defense programs.

The pattern of energy consumption, which is substantially different from that in Western industrial countries, makes large energy savings through efficiency gains more difficult. In Western countries, transportation and residential energy use is large, and the potential for energy savings in these uses is great. In the USSR, many of the techniques now being discussed in the West to save energy in industry and households are already employed on a wide scale. Most urban space heating in the USSR, as well as large amounts of industrial process heat, is provided through cogeneration. In the West, only a relative handful of cogeneration plants exist—in Sweden and West Germany—while the USSR has more than 1,000. The overwhelming bulk of intercity traffic in the USSR is shipped on electrified rail lines rather than by truck. As for passenger autos, the USSR has one for every 40 to 50 inhabitants, compared with more than one for every two inhabitants in the United States and Canada and one for every four to five in Western Europe.

Because of the consumption structure, major energy gains will have to be largely obtained by upgrading industrial technology—a very time-consuming, capital-intensive process—or by major shifts away from heavy industry and toward light industry and services—a shift contrary to the view of dominant Soviet interest groups. Notably, Soviet output of highly energy-intensive products such as iron, steel, and cement is substantially larger than comparable US output. Iron and steel, for example, account for nearly 13 percent of Soviet energy consumption, compared with only about 3 percent in the United States.

Steel

Growth of steel production fell sharply in both 1976 and 1977 (see table 7). Growth has slowed because of inadequate investment in steelmaking facilities and insufficient supplies of high-quality raw materials. A steady decline in the quality of Soviet iron ore has forced the diversion of investment funds to ore-mining and ore-beneficiating projects. Tight supplies of iron ore have hampered production of pig iron. Scrap—the other major steelmaking ingredient—also is in short supply.[9]

Table 7

USSR: Steel Production

	Average Annual Percent Change		
	1971-75	1976	1977 [1]
Crude steel	4.0	2.5	1.7
Finished rolled steel	4.1	2.8	0.7
Steel pipe	5.1	5.3	1.2

[1] Estimated.

Inability of the Soviet steel industry to produce cold-rolled sheet, tinplate, large-diameter pipe, and even structural steel in sufficient quantities has transformed the USSR into a net steel importer at a substantial cost in hard currency. Moscow spent $2.3 billion on steel imports from the West in 1976 and at least another $2 billion in 1977.

The USSR's dependence on imported steel probably will continue or even increase. Construction of new steelmaking capacity has lagged badly, and most of the potential for squeezing additional output from existing plants has already been tapped. Meanwhile, programs to accelerate resource development in the eastern regions of the country are gaining importance and will spur demand for types of steel already in short supply.

Other Industries

There are growing signs that the shortfalls in domestic steel output, coupled with a hard currency constraint for expanding steel imports, have begun to hurt machinery production, especially the output of spare parts. Production of machinery—the source of producer's equipment, defense hardware, and consumer durables—increased by 5.9 percent annually during 1976-77, down from the 8-percent average annual rate of growth in the first half of the 1970s. The decline

[9] The Soviets launched a campaign in 1977 to press industrial enterprises to meet their quotas for turning in scrap. The pressure was so intense in some quarters that managers were known to turn in as scrap machinery imported several years ago but never installed or used.

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in freight car and diesel locomotive production aggravated the existing bottleneck in railroad transportation. During 1977 the Soviet press blamed freight car shortages for limiting deliveries of a wide spectrum of industrial materials. Below-plan output of generators, electric motors, machine tools, and oil equipment last year will also spawn problems of capacity expansion in the industrial materials sector in 1978.

The number of metalcutting machine tools increased during 1976-77 at about the planned average annual rate of 1 percent. Production of numerically controlled machine tools was scheduled to increase by about 9 percent annually in value terms during 1976-80 but increased only 6.7 percent annually in 1976-77. This shortfall—caused by a lack of critical mechanical components—suggests that the Soviets continued to have problems shifting the product mix toward high-precision, automatic, and semiautomatic machine tools—a key element in the leadership's program to modernize the industrial sector.

The Soviet computer industry is on the threshold of a major new advance in computer technology as a new family of data-processing computer systems patterned after the IBM 370 is now moving into production. These RYAD-II computers are faster and much more versatile than the models they will replace, but the need for high-grade associated software and technical manpower, as well as the ineffective employment of advanced computers at the enterprise level, will severely limit their usefulness.

Resource Availability and Use

Labor Force

Anticipating a slowdown in labor force growth this year, Soviet planners have been urging more efficient use of the work force. Despite official concern with the impending labor shortage, enterprise managers continue to ignore the leadership's appeals for introducing labor-saving innovations; current managerial "success indicators" still make it profitable to squirrel away extra labor resources and to avoid innovations. As a result, the size of the industrial labor force in 1977 already exceeded the 1980 plan, and the total number of wage and salary workers at all state-owned enterprises was only slightly below the 1980 plan target. The rapid employment growth was made possible by the continuing expansion of the working-age population (men ages 16 to 59 and women 16 to 54) in both 1976 and 1977 and by continuing transfers from collective farms to industrial and other state-owned establishments.[10] This trend will change abruptly, however, as a marked slowdown in the growth of the overall labor supply starts taking effect this year.

To prepare for the slowdown in labor force growth in 1978, Moscow modified its education system to ensure that secondary school graduates would be ready for immediate entrance into the work force. In recent years, the share of general secondary school graduates admitted to full-time higher schools has declined, and increasing numbers of secondary school graduates were untrained and unemployable. Many of these students enrolled in parallel secondary school systems where they spent an extra year or more and thus delayed entering the labor force.

To deal with this problem, Moscow ordered in late 1977 that vocational training in general secondary schools (grades 9 to 10) be increased from two to four hours each week. In addition, eighth-grade graduates were to receive expanded counseling services, and local commissions would help them choose one of four alternative paths of secondary education:

- Vocational technical schools with three-year programs that provide a specific skill but only a slight chance for admission to higher schools.
- Secondary specialized schools with three- or four-year courses for technicians and other semiprofessionals.
- General secondary schools with the traditional two-year program that is the path to higher education.

[10] The working-age population increased at an average annual rate of close to 2 percent, and the annual increments to that population—about 2.8 million persons—were the largest in almost 25 years. Meanwhile, collective farm employment dipped from 15.4 million in 1975 to 14.7 million in 1977, about a 2-percent annual decline and about the same as the average annual decline during 1971-75.

- Schools for working youth, which provide part-time general secondary education intended mostly for those in rural areas.

If effective, these changes should expedite the hiring of teenagers and increase their share of the labor force.

Capital Formation

Problems in investment programs over the past two years are harbingers of continued poor growth performance. Despite efforts to concentrate on completion of projects already begun, the increase in gross additions of new plant and equipment—a measure of the amount of new capacity brought onstream—fell to a record low of 1.4 percent in 1976; progress was a little better last year (see table 8). Meanwhile, as additions of new plant and equipment faltered, the inventory of uncompleted projects—"unfinished construction" in Soviet terminology—increased by more than 20 percent during 1976-77.[11] Project completions continue to be frustrated by endemic bottlenecks in the supply of components—particularly machinery—and a lack of incentive in construction organizations, where bonuses are based largely on the value of work completed. Basic construction work has a high ruble value, but finishing work does not.

A key plank in the regime's current investment strategy is a halt in the growth in 1976-80 of unfinished construction and an acceleration of completions, emphasizing projects involving more new equipment and less new construction. Thus, a continued slide in growth of machinery output could dash the leadership's investment plans and, in turn, jeopardize needed gains in productivity.[12] In addition, major investment projects are becoming longer term and costlier, requiring large amounts of supporting infrastructure before they can become operational. For example, the Soviets are becoming increasingly dependent on the natural resources of Siberia where transportation, housing, and other facilities are lacking and where construction costs range from 30 percent higher to more than double those in the European areas. Therefore, the construction component of new investment likely will remain large.

Table 8

USSR: Indicators of Capital Formation

	Average Annual Percent Change		
	1971-75	1976	1977 [1]
Total new fixed investment [2]	7.0	4.5	3.3
Gross additions of new plant and equipment [3]	6.7	1.4	2.8
Backlog of unfinished construction [4]	7.9	9.6	11.2

[1] Estimated.
[2] Gross additions of new plant and equipment (capital stock) differ from gross fixed investment in that they include only those investment projects that were completed.
[3] Some equipment installed in unfinished plants is included in this category.

Inability to bring new capacity onstream more rapidly will lead to continued slowdowns in capital formation. This will depress the growth of output even further—particularly if no gains are made in raising the productivity of the stock of plant and equipment. Here the Soviet record is not encouraging.

Changes in Efficiency of Resource Use

From New Plant and Equipment. Because the principal carrier of new technology into the production process is new machinery and equipment, Soviet planners had hoped that by stepping up the rates for replacing obsolescent machinery with new machines, they would be able to rely more heavily on productivity gains as the major source of growth. However, although the ratio of replacement of used machinery to investment in

[11] The resultant backlog of uncompleted projects has tied up enormous sums of investment resources and contributed to a further decline in the productivity of investment. The volume of unfinished construction amounted to more than three-fourths of total investment in 1977. In industrial investment the ratio of uncompleted construction to total investment in the USSR is about double that for the United States. Soviet sources indicate that the elapsed time between project initiation and full-scale production averages seven to eight years for large enterprises; comparable installations in the developed West average only one-half as much time. Even if the Soviets managed to halt the growth in unfinished construction completely, the addition to the stock of plant and equipment that this measure would provide by 1980 would amount to 1.7 percent of the level of capital stock in 1977.

[12] Most gains in productivity result from technological advances embodied in new machinery and equipment. When introduced into the production process, the new machinery and equipment usually results in a direct saving of labor and/or materials per unit of output.

new "green field" sites is increasing, much of the new equipment is technologically similar to that already in existence. Moreover, the acquisition of foreign technology and equipment has not provided a dramatic boost to the productivity of capital. The USSR will continue to benefit from imports of Western machinery and equipment in selected areas such as chemicals, high-quality steels, and oilfield equipment. But the overwhelming share of the USSR's producer durables must come from domestic production, and as long as the domestic economy remains no more capable than in the past of generating its own technical progress, productivity gains are likely to remain small.

From Managerial Reform. Despite lipservice to economic reform by the top leadership and by prestigious economists during 1976-77, no significant steps were taken to focus incentive systems toward more efficient production, accelerated introduction of new technology, and improved product quality. The near stagnation in productivity growth in 1976-77 reflected at least in part the perpetuation of inefficiencies in planning and management. Bonuses still depend directly or indirectly on gross output, encouraging lavish use of inputs and discouraging introduction of new products or production techniques.

At the 25th Party Congress in February 1976, President Brezhnev acknowledged the need for an overhaul of the incentive system but offered no specific alternatives. Thereafter, the Soviet media unleashed a barrage of criticism against the existing incentive system and suggested that some form of "net output" success indicator replace "gross output."

The difficulties of successfully integrating new technology into the Soviet economy also result in large part from perverse incentives. Enterprise managers resist introducing new processes or equipment because it disrupts production schedules, thereby reducing "gross output." In December 1977 *Pravda* appealed to economists to find an incentive system that would speed the introduction of new technology because the fear of financial loss clearly deters the use of new technology. So far, however, no major changes have been forthcoming.

Consumer Welfare

The gap between consumer expectations and the availability of goods probably widened during 1976-77, largely because food shortages stemming from the poor 1975 harvest persisted in both years. Supplies of nonfood consumer goods and services continued to grow at moderate rates. Aside from agriculture, which has received an increasing share of investment resources, the consumer industries have not risen from their traditionally humble position in the investment pecking order. Consumer-related machinery imports, for example, are a relatively small percentage of total machinery imports from the West.[13]

The leadership's pledge to increase the variety and quality of the diet continued to be one of its most expensive and elusive goals. Increasing meat output in particular has become the key target and the one by which the Soviet consumer tends to measure his relative affluence. Yet over the past two years, despite massive feed imports, Soviet agriculture was not able to maintain meat output at the 1975 level. Meat output fell sharply in 1976, then recovered in 1977, leaving per capita meat output in 1977 slightly below that in 1974 and 1975. Meat shortages were frequent and widespread, especially in 1977, occurring in small cities and towns as well as in major cities.

In contrast with food supplies, the availability of nonfood consumer goods and services continued to improve. Nevertheless, poor quality and design, coupled with the lack of assortment, constrained the growth in sales of such goods, and inventories of unsold goods probably rose in the last two years.

Defense [14]

Although continued worsening of the economic scene is likely to trigger debate in Moscow over the future levels and patterns of military expenditures, to date the defense sector apparently has not been affected by the changes in the rate of economic progress. Defense programs

[13] In 1976-77 consumer-related machinery imports constituted 2 percent of all machinery imports from the West.

[14] For a more detailed treatment of recent Soviet defense spending, see CIA SR 78-10121, *Estimated Soviet Defense Spending: Trends and Prospects*, June 1978.

have great momentum as well as powerful political and bureaucratic support, and major military programs have been well funded.

During 1976 and 1977, estimated Soviet defense spending in constant rubles grew at an average annual rate of 3 to 4 percent. Although this pace is slightly below the average growth of 4 to 5 percent for the past decade, it does not signal a major policy shift, nor is it related to economic difficulties. Rather, it reflects the fact that several major weapons procurement programs, such as the D-class SLBM program and tactical fighter aircraft programs, are winding down.

As in earlier years, defense spending during 1976-77 had a significant economic impact:

- The defense effort consumed between 11 and 13 percent of Soviet GNP.
- Defense consumed about one-third of the final product of machinebuilding and metalworking, the branch of industry that produces investment goods as well as military hardware.
- In addition, the defense sector siphoned off a large share of the economy's best scientific, technical, and managerial talent and large amounts of high-quality materials, components, and equipment.

During the 1976-77 period, about one-half of total Soviet defense spending went for investment—which includes spending for procurement of new equipment and major spare parts as well as for construction of facilities. Operating expenditures—which include spending for military personnel and for the operation and maintenance of military equipment and facilities—received a little more than one-fourth of total defense spending. Slightly less than one-fourth of total defense spending went for military research, development, testing, and evaluation.

No major shifts were evident in the shares of defense spending allocated among the military services. The Ground Forces and Air Forces continued to claim the largest shares, while the Strategic Rocket Forces continued to claim the smallest share.

During the 1976-77 period, Soviet uniformed military manpower, including militarized security forces and Construction and Transportation Troops, totaled more than 4.5 million men—almost 3.5 percent of the total labor force. The Ground Forces claimed the largest share of military personnel—almost 40 percent.

Foreign Trade

During 1977 Moscow virtually eliminated its short-term hard currency payments problems, although hard currency debt increased to $15 billion to $16 billion (see figure 3). Soviet foreign trade data for 1977 indicate that a substantial reduction in the trade deficit reduced the current account deficit to its lowest level in three years. In 1978, current account transactions will probably be roughly in balance.

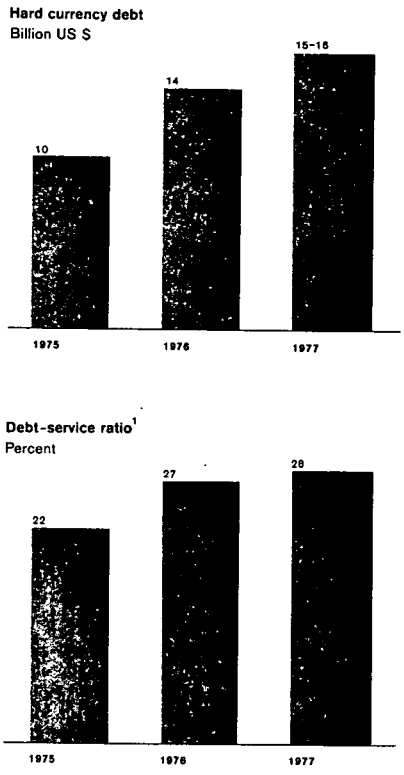
After a record $6.3 billion hard currency trade deficit requiring heavy borrowing in 1975, Moscow started to tackle its balance-of-payments problems. In 1976, the Soviets reduced their hard currency trade deficit to $5.5 billion and did even better in 1977, cutting it to roughly $3.3 billion (see table 9). Soviet hard currency grain imports fell from a record high of $2.6 billion in 1976 to about $1.4 billion last year. Grain imports from the United States declined from $1.58 billion in 1976 to about $810 million in 1977. Equipment imports also grew more slowly in 1977, rising by an estimated 5 percent to $5.2 billion.[15]

As a major world supplier, the USSR took advantage of higher nonfarm commodity prices in 1977. Oil earnings rose to $5.6 billion on the strength of both higher prices and export volume. The Soviets also reaped the benefits of higher world prices for diamonds and platinum-group metals—traditional hard currency earners. Soviet natural gas exports jumped from $358 million in 1976 to roughly $568 million last year, mainly because of increased volume.

Moscow's hard currency earnings from other sources—arms sales, tourism, and transportation services—have risen substantially in recent years. Shipments of military equipment paid for

[15] Excludes purchases of Western equipment for the Orenburg pipeline bought by Moscow on behalf of Eastern Europe.

USSR: Hard Currency Debt and Debt-Service Ratio Figure 3



[1]Defined as principal and interest payments as a share of hard currency exports.

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in hard currency probably reached $1.5 billion in both 1976 and 1977, up from $800 million in 1975. Major recipients have included Algeria, India, Iraq, Libya, and Syria. Net receipts from transportation and tourism were an estimated $790 million—up from $600 million in 1976, primarily because of a decline in grain imports carried on Western ships.

These trends have reduced Moscow's hard currency debt problems, which had become worrisome by the end of 1975. Net borrowing has fallen from $5 billion in 1975 to $4 billion in 1976 and to between only $1 billion and $2 billion last year.

The Soviets have also reduced their reliance on Western commercial credits in an effort to counter adverse publicity on the size of their debt and to avoid paying what they considered unacceptable interest rates on further bank loans. Moscow has increasingly favored government-guaranteed supplier credits and direct government loans, which usually contain more attractive terms. The Soviets stepped up gold sales, which produced about $1.4 billion in revenues in 1976 and roughly $1.6 billion in 1977.

Soviet orders for Western machinery and equipment fell sharply to $3.7 billion in 1977, the lowest level in three years (see table 10). Roughly $1 billion of the $2.3 billion fall in orders from their 1976 level can be accounted for by the fact that the USSR placed a major share of its equipment orders for the Orenburg natural gas pipeline in 1976. The magnitude of the overall drop in orders also reflects Moscow's desire to further curb future hard currency trade deficits and thus improve its balance-of-payments position in 1978-79. The decline in Soviet imports of Western equipment expected for 1978 would not necessarily damage short-term Soviet industrial performance; indeed, it may facilitate Moscow's efforts to reduce the backlog of unfinished construction and uninstalled machinery discussed above.

The timing of orders for Orenburg (reflected in "oil and natural gas" in table 10) accounted for almost one-half of the drop in total 1977 orders. Metalworking and metallurgical equipment also fell sharply from $1 billion in 1976 to $600 million in 1977. More than one-half the 1977 total orders for this category was made up of yearend orders for West German direct reduction and pelletizing equipment for the Kursk steel combine.

Table 9

USSR: Hard Currency Balance of Payments

	1975	1976	1977 [1]
	Million US $		
Trade balance	−6,335	−5,517	−3,279
Exports, f.o.b.	7,794	9,721	11,354
Imports, f.o.b.	14,129	15,238	14,633
Gold Sales	1,000 [2]	1,400	1,600
Invisibles and hard currency trade, nes [3]	900	1,200	1,200
Current account balance	−4,435	−2,917	−479
Net medium- and long-term credits [4]	3,020	2,188	1,200
Basic balance	−1,415	−729	721
Net short-term credit [5]	1,980	1,812	200
Errors and omissions [6]	−565	−1,083	−921
	Billion US $		
Net hard currency debt	10	14	15-16
Debt service [7]	1.7	2.6	3.1
	Percent		
Debt-service ratio [8]	22	27	28

[1] Estimated.
[2] Including a rumored $250 million sale to Middle Eastern countries.
[3] Including net interest payments, net receipts from tourism and transportation, net official transfers, and arms deliveries.
[4] Excluding medium-term borrowing by the International Investment Bank and the International Bank for Economic Cooperation, which borrow on behalf of countries of the Council for Mutual Economic Assistance (CEMA). The extent to which the USSR has borrowed from these CEMA banks (if at all) is unknown.
[5] Including estimated short-term bank-to-bank borrowing, payments deferments obtained from suppliers, and possible borrowing from Middle Eastern countries.
[6] Including intra-CEMA hard currency trade and other hard currency payments.
[7] Principal repayments on medium- and long-term debt plus interest payments on all debt.
[8] Debt-service payments as a share of merchandise exports.

Table 10

USSR: Machinery Orders Placed With Hard Currency Countries

	1976	1977 [1]	Percent Change
	Million US $		
Total	5,957	3,652	−39
Of which:			
Chemical and petrochemical	1,818	1,615	−11
Oil and natural gas	1,685	303	−82
Metalworking and metallurgy	1,015	587	−42
Timber and wood	146	65	−55
Automotive	355	183	−48
Ships and port equipment	283	67	−76
Consumer goods equipment	121	75	−38
Mining and construction	120	147	22

[1] Estimated.

Orders for Western chemical equipment declined by roughly $200 million. New contracts were concentrated on machinery for the manufacture of (a) petrochemicals, particularly intermediates for the production of plastics and synthetic fibers, and (b) chemical fertilizers, which are needed in tremendous quantities to implement plans for agricultural growth. Large purchases included three chemical fertilizer plants and 10 ammonia plants totaling $380 million from Japan and two methanol plants worth $250 million from the United Kingdom. Moscow also gave the British orders for a $139 million materials processing plant for tires and for an $86 million polyethylene plant.

Soviet Perceptions of Economic Problems

Soviet leaders clearly have been disappointed with the economy's recent performance. Although Moscow anticipated some slowdown as reflected in their plans for 1976 and 1977, actual growth has fallen more sharply than they expected (see table 11).

The leadership is particularly concerned about their inability to get more capital onstream quickly. They see the continued slide of return on investment and the sharp slowdown in industry, construction, and transportation.

The economic plan for 1978, announced in December 1977, reflected the tacit recognition by the Soviet leadership that key targets of the 10th Five-Year Plan (1976-80) were unattainable (see figure 4). We calculate that an industrial growth rate of 8 percent annually would be required to meet the 1980 goal, but the 1978 Soviet plan called for an increase of only about 4.5 percent. More specific plan cutbacks are apparent in the critical energy sector as well as in machinery production (see table 12).

Also in December 1977, the Central Committee called for more concentration of resources on oil and gas development in West Siberia's Tyumen Oblast, which possesses virtually all the major untapped Soviet reserves feasibly exploitable in the next decade. This policy reflects the government's concern about (a) the peaking of the Samotlor oil and Medvezhye gas fields in Tyumen, (b) the critical rundown of oil reserves because of a decade of insufficient geological exploration, and (c) the steeply rising resource costs associated with drilling wells in increasingly less productive deposits farther away from established bases of support and transportation.

Soviet responses to the CIA analysis of Soviet oil production—issued during the spring and summer of 1977—had already demonstrated that Soviet authorities were well aware of their energy difficulties. Even the most optimistic responses leaned heavily on the assumption that Siberia holds huge stores of yet undiscovered or unexploited energy resources.

According to planning officials, during the past 18 months the USSR's efforts to formulate a 15-year plan (1976-90) hit a snag because of serious difficulties in estimating and allocating energy resources and other raw materials. Their remarks indicated that the long-term economic plan was far from complete. In addition, public information on the 15-year plan as well as more detailed information on the five-year plan for 1976-80 is likely to be limited.

Meanwhile, at the recent July session of the Supreme Soviet, Premier Kosygin announced that the Council of Ministers has formed a high-

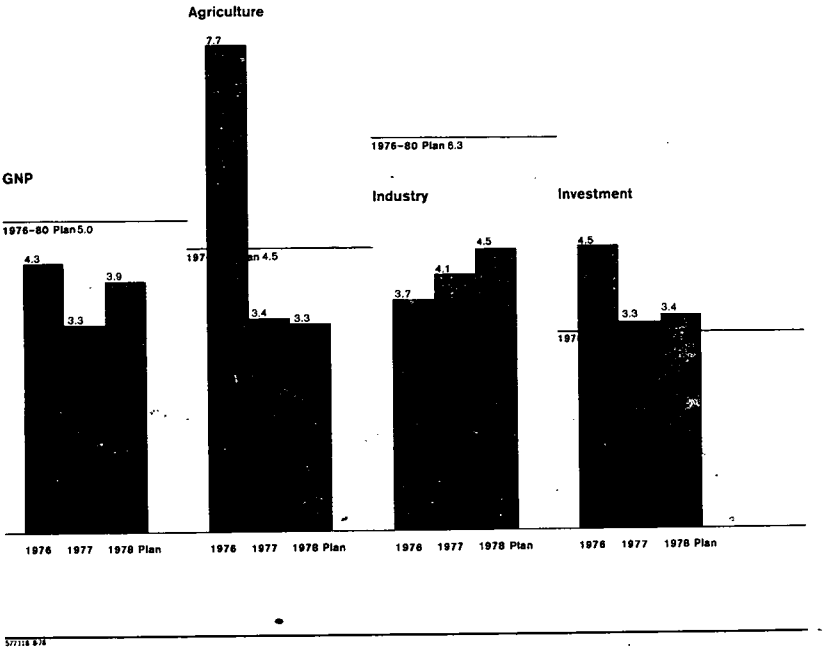
Table 11

USSR: Planned and Actual Growth

	1971-75		1976		1977	
	Plan	Actual	Plan	Actual	Plan	Actual
	Average Annual Percent Growth		Percent Growth			
GNP	6.0	3.7	4.5	4.3	5.3	3.3
Industry	8.0	6.0	4.3	3.7	5.6	4.1
Agriculture	3.5	−0.6	8.5	7.7	7.5	3.4

USSR: Selected Indicators of Economic Performance Figure 4

Average annual percent change



level commission to "solve current questions of economic growth" and to check on fulfillment of the state plan and budget. This action appears to be another indicator of the government's concern over increasingly serious economic problems.

Soviet perceptions of their own economic problems are necessarily reflected in their economic policies toward their allies in Eastern Europe. The latter had been told early in the 1970s of the Soviet intent to limit 1976-80 oil exports, clearly because of anticipated production constraints. The Soviets subsequently eased these limitations mainly because of severe hard currency shortages in parts of Eastern Europe, which limited its ability to purchase oil in the West. The less restrictive energy export policy, however, was conditioned on Eastern Europe's participation in resource development in the USSR.

Despite its own energy problems, the USSR plans to honor its commitments in 1978 to supply Eastern Europe with the volume of oil established for that year in the current five-year plan (1976-80). This is important to the East Europeans, who depend on Moscow for more than 75 percent of their oil consumption. According to an official of the Soviet oil trade organization, total

Table 12

USSR: Industrial Growth Plans in Perspective

	Average Annual Percent Change			
	1976-80 Plan	1976-77 Actual	1978-80 Required	1978 Plan
Total	6½	4	8	4½
Energy				
Coal	3	1	3½	3
Oil	5½	5½	5½	5
Gas	8½	9½	8	7
Electric power	6	5	6½	5
Ferrous metals				
Crude steel	3½	2	4½	4
Rolled steel	3½	1½	4½	4½
Steel pipe	4½	3	5	4½
Construction materials	5½	2	7½	NA
Cement	3½	2	4½	NA
Machinery	9	6	11	7½
Consumer nondurables	4½	1½	7	4
Chemicals	10½	5½	13½	NA

oil deliveries to Eastern Europe are expected to reach 1.56 million b/d by 1980.

Finally, decisions and activities of the Soviet leadership in first quarter 1978 suggested strongly that Moscow perceived the severity of its long-term energy problem and was developing appropriate conservation policies. A Communist Party Central Committee resolution in March 1978 commissioned research and development institutes to step up production of technology for long-term energy saving. In the same month, Andrey Kirilenko, Second Secretary of the Communist Party Secretariat, convened a special conference in the Kremlin attended by other high-level party and industry officials. He called for a speedup in "the creation of new, progressive types of internal-combustion engines—reducing the amount of metal used in their manufacture and, above all, enhancing their economy of operation."

The Outlook for 1978 and Early 1979

The economic plans for 1978 (see table 13) are among the lowest ever set by the USSR. However, the overall performance of the Soviet economy this year could be better than the rate of about 3½ percent posted in 1977 if the USSR were able to:

- Break the bottleneck in steel output.
- Arrest the growth of uncompleted projects for new plant and equipment.

Table 13

USSR: Aggregate Growth Performance and Plans [1]

	Average Annual Percent Change		
	1976	1977	1978 Plan
GNP	4.3	3.3	3.9
Agriculture [2]	7.7	3.4	3.3
Industry	3.7	4.1	4.5
Construction	3.4	2.2	5.0
Transportation	4.5	3.8	5.0
Communications	6.4	5.8	6.0
Trade	2.9	4.0	3.9
Services	3.0	3.3	3.5
Other	2.9	2.1	4.3

[1] Calculated at factor cost.

[2] Excluding intra-agricultural use of farm products and not making an adjustment for purchases by agriculture from other sectors. Value added in agriculture grew by an average of 8.4 percent in 1976, 2.3 percent in 1977, and will grow by 2.4 percent in 1978 if plans are realized.

- Lift substantially larger quantities of oil from West Siberian fields.
- Luck out with better-than-average weather for agriculture.
- Achieve major efficiencies in the use of material resources, especially energy and metals.
- Minimize disruptions caused by deficiencies in rail transport.

The Soviets are critically dependent, for example, on an acceleration in steel output if they are to meet their 1978 plan for industrial production, particularly for machinery output and in construction. Even though the 1978 target for steel output of 152.6 million tons is practically the same as the 1977 goal, it will require an increase in production of more than 5 million tons since output fell so far below planned levels last year. Steel production increased by 3.5 million tons in 1976 and only 2.5 million tons in 1977. A large capacity was completed at the end of 1977, but startup problems and shortages of iron ore and scrap are likely to result in a failure to reach output goals in 1978.

Once again, Soviet planners are counting heavily on maintaining growth in plant and equipment by holding down the backlog of uncompleted construction projects. Investments in new plant and equipment are to continue rising at about 3.5 percent—one-half the annual rate of growth in 1971-75—with emphasis remaining on replacing obsolescent machinery and equipment. This strategy—cutting back on new "green field" construction in favor of replacement machinery and equipment—may need to be revised, however, in order to provide the supporting infrastructure for enhanced development of oil and gas resources in Siberia.

Energy production is continuing to slow. Thus far in 1978, output of both coal and oil has slowed still further, and total energy production growth is likely to be less than 4 percent in 1978. Based on the monthly production data released so far, we believe that oil production this year is unlikely to exceed 11.3 million b/d, for growth of only 3 to 4 percent. With a peak and subsequent decline in oil production almost certain by the early 1980s, a further sharp slowdown in total energy production is likely to occur.

The most striking information in the 1978 plan is that the Soviets expect only five of the 26 oil-producing regions to boost their output in 1978. Of these five, only West Siberia is committed to a large increase—700,000 b/d. The other four regions together are likely to increase their production by only 100,000 b/d. The USSR obviously expects sharp declines in a number of the older producing regions, where many deposits tapped for more than 30 years are being depleted.

Such heavy dependence on West Siberia for the bulk of future increases probably means that the Samotlor oilfield will have to be pushed beyond earlier planned peak output levels. Other smaller West Siberian fields also may have to be operated above maximum efficient rates of recovery to achieve output targets. This will result in still shorter producing lives for these fields, but the Soviets have no practical alternative until they are able to make large new oil finds.

Output of gas during 1978 will probably total about 370 billion cubic meters as planned. The five-year plan calls for 1980 output of 400 billion to 435 billion cubic meters, and the USSR should be able to fulfill that target. However, the task will not be easy. Beginning in 1977, output of gas from all of the older producing regions (particularly the Ukraine and Central Asia) began to decline, and all of the growth had to be provided by the enormous reserves located in the far northern portion of West Siberia, where infrastructure problems and massive pipeline requirements will limit growth of output and sharply boost the costs of production and transport.

Coal is doing poorly. In first half 1978, coal output was unchanged from the corresponding 1977 output, and 1978 annual output may not much exceed 1977's 712 million tons. Soviet spokesmen are also less bullish on coal over the longer term, perhaps reflecting the growing problems of maintaining output in the old European

areas and the massive transport difficulties involved in a large expansion of Siberian coal output.[16]

Stringent goals for economizing on steel and fuel have been set for all sectors of the economy. Although few tangible figures are available, the conservation theme runs throughout the plan and budget announcements.

The 1978 plan calls for grain production of 220 million tons, up from the 195.5 million tons harvested last year. This level of output has been attained only twice before and can be achieved only if the weather proves highly favorable. In 1977, grain output fell nearly 20 million tons short of the goal even with above-average precipitation in important grain-producing areas.

Even with favorable weather for agriculture, the actual downturn in forage crop production in 1977 could adversely affect growth in the livestock sector in 1978. Production of these crops—including corn for silage, fodder roots (beets, turnips, and carrots), and hay—dropped 4 percent in terms of nutrient value from 1976 levels. The reduction in forage supplies will need to be offset by additional feeding of grain. Grain supplies, down because of the smaller 1977 grain crop, already are being squeezed in the socialized sector as farms comply with official directives to guarantee private owners adequate grain for their livestock holdings.

Even if a record grain crop is achieved this year, the Soviets will still have to import 15 million to 20 million tons of grain in the fiscal year beginning 1 October 1978 and will almost certainly be forced to import comparable quantities in the following years unless better-than-average weather conditions prevail. Meanwhile, the resource allocational policies in support of agriculture for the 1976-80 plan period appear to remain intact. In a major address on long-range agricultural policy to the Central Committee Plenum in early July, Brezhnev indicated no new initiatives in the intermediate term of 1978-80 and, indeed, implied continuation of recent trends in resource use in the 1981-85 period. He also repeated his admonition, first voiced in October 1976, that greater attention and assistance must be given to private farm plots. Brezhnev confirmed that there has been an important policy change—the scuttling of ambitious plans for high-rise urban-type housing in the countryside—as a result of renewed official interest in providing families in rural areas with separate houses surrounded by garden plots and outbuildings for livestock and poultry.

The Soviet leadership apparently expects consumption to make substantial gains this year. Meat output in particular is expected to do well, increasing by about 5.5 percent over 1977. A good increase in herd size, according to the 1 January 1978 census, makes this number attainable if feed supplies can be maintained.

Growth in employment—a topic not covered in the plan announcement—will almost certainly decline as the number of persons reaching working age drops for the first time in 18 years. As a result, the planners are restating their perennial hopes for large gains in labor productivity. In this connection, 1978 was named the "year of shock labor" by the planners, and a more intensive use of labor and equipment a primary slogan. In addition, Soviet leaders may be counting on a boost in total man-hours worked by encouraging larger holdings of crop land and livestock herds by the private sector. This is probably the least costly and most effective method of simultaneously augmenting a declining labor force and providing a boost to consumption.[17]

During the period 1978-80, Soviet defense spending probably will grow temporarily at a lower rate than the long-term average of 4 to 5 percent. This will result primarily from the trailing off in procurement cycles of several major weapons systems currently in production. These procurement cycles do not, however, signal changes in resource allocation policy but rather the phasing in and out of weapons production programs.

[16] In the past year the Coal Minister postponed the time at which output will reach 1 billion tons from 1990 to the year 2000.

[17] On balance, an expansion of labor use in private agriculture will provide mostly a net gain in overall man-hours used in economic activity. For the most part, for member of households in both agriculture and nonagriculture it will be a substitution of labor for leisure rather than a reduction in hours in either socialized agricultural or other economic activity.

During the early 1980s, we expect the Soviets to begin testing and deploying a number of new weapons systems, including the next generation of strategic missiles, aircraft, and ballistic missile and attack submarines. These programs probably will cause defense spending to increase to a pace more in keeping with the long-term growth trend.

The atmosphere in Moscow with regard to defense and the economy will be one of concern in which the leadership may consider making marginal—but not substantial—alterations in military force goals. Marginal alterations, however, would have little impact on the growth of either defense spending or GNP. For example, changes such as those envisaged by a SALT II agreement would produce a savings of only about 1.5 percent of total defense spending for 1978-85 and boost GNP by only about 0.2 percent.

The Soviet hard currency deficit is likely to be between $2 billion and $3 billion in 1978. Because repayments on past loans are catching up to new drawings, the growth in debt should be further slowed this year. Imports of Western grain are expected to be between $2.5 billion and $3.0 billion, unless the Soviet harvest falls well short of current estimates. Imports of machinery and equipment are expected to decline because of the large drop last year in machinery orders.

In light of the sluggish economic recovery in the West, Soviet exports are not likely to rise as much as in 1977. The volume of hard currency oil exports may rise only slightly this year if at all. Increased oil exports in 1976 and probably 1977 were made possible by restrictions on the growth of domestic oil consumption and the drawing down of fuel stocks. A further slowing in the growth of oil production appears almost certain this year.

Given our estimate of a 1978 trade deficit of $2.0 billion to $3.0 billion, Moscow should not experience any difficulty in meeting its financial obligations in 1978 even though they include about $3.5 billion in debt service. The current excess liquidity in the Eurocurrency market and the high price of gold give Moscow financial flexibility. In this context the USSR recently obtained a $400 million syndicated Eurocurrency loan—its first since July 1976—at a very attractive interest rate.

Soviet orders for Western machinery, particularly oil and gas equipment, probably will make a comeback in 1978. Large quantities of exploration and development equipment are needed if Moscow expects even to maintain current levels of oil production over the next several years. In addition, further purchases of compressors, valves, and large-diameter pipe will be required to sustain the growth in gas output.

By the spring of 1978, the volume of oil equipment orders had already exceeded the previous full-year record due largely to a $158 million order for the expansion of the drill bit plant at Kuybyshev. Negotiations were under way on several large contracts, including the purchase of gas-lift equipment—which could reach $1 billion over a five-year period—for the giant Samotlor oilfield and the Fedorovo field in West Siberia. Moscow was reportedly shopping for offshore oil equipment to be used in the Caspian Sea, the offshore areas of Sakhalin, and eventually the Barents Sea.

Orders for the metalworking and metallurgy industries in 1978 are expected to pick up from 1977 levels. Moscow could sign some large contracts for electric furnaces, continuous casting facilities, and rolling mills, all for the $1 billion Kursk metallurgical combine; this equipment is designed to bolster the production and quality of finished steel products. In addition, the Soviets after several years of shopping may finally place an order for a $1 billion aluminum plant to be located in Sayan-Shushensk, West Siberia.

Although hard currency trade prospects appear good in 1978, the outlook is much dimmer over the longer term. We expect a decline in Soviet oil exports possibly as early as 1979 and accelerating thereafter. Unless oil prices rise drastically, Moscow will be hard put to achieve more than offsetting increases in other exports. The impact of new credits on Soviet import capacity is likely to be minimal. Repayments on past medium- and long-term borrowing are expected to rise and may nearly offset new drawings in 1978. Thanks to their healthy balance-of-payments position, the Soviets could borrow sub-

stantially more and thus boost import capacity for a short time, but we expect Moscow to continue its present conservative financial policies and thus avoid a possible repetition of its earlier heavy borrowing.

Performance of the economy in first half 1979 will depend largely on the harvest of 1978. Generally favorable spring and summer weather into August was expected to yield a record grain crop, but overall crop prospects for 1978 will remain uncertain until September-October, when harvesting nears completion in Siberia. An above-average crop will impact favorably on the food and clothing industries in 1979, while limiting grain import needs and thereby easing hard currency shortages. A poor crop, on the other hand, would depress economic growth in 1979 and seriously exacerbate the leadership's economic difficulties.

ALLOCATION OF RESOURCES IN THE SOVIET UNION AND CHINA—1978

FRIDAY, JULY 14, 1978

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON PRIORITIES AND
ECONOMY IN GOVERNMENT OF THE
JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The subcommittee met, pursuant to notice, in executive session, at 10:05 a.m., in room 3302, Dirksen Senate Office Building, Hon. William Proxmire (chairman of the subcommittee) presiding.

Present: Senators Proxmire and Javits.

Also present: Richard F. Kaufman, assistant director-general counsel.

OPENING STATEMENT OF SENATOR PROXMIRE, CHAIRMAN

Senator PROXMIRE. This morning we resume our annual hearings on the allocation of resources in the Soviet Union and China. Today's testimony will be confined to the Soviet Union, and next week witnesses from the intelligence community will be back to discuss China. The testimony is being given in closed session in order to facilitate full discussion. We will strive to sanitize the record as quickly as possible so that it can be released to the public. In that regard, I am hopeful that DIA will help to expedite the process and enable us to release the full excerpts of the testimony at an early time prior to final fall publication.

I should observe that I am very pleased with the quality of the presentations received so far. Your testimony, General Aaron, is a major improvement over previous statements given by your agency in that it discusses the Soviet defense program along with the Soviet economy, and issues such as technology transfer.

My own criticism, which I will go into later when you finish your statement, is that it could be a little more balanced from a congressional perspective, but I will explain what I mean by that after you finish your testimony.

Anyway, it is a very fine testimony, it is extremly well organized. You may introduce your associates and proceed in your own way, and then we will have some questions.

STATEMENT OF LT. GEN. HAROLD R. AARON, U.S. ARMY, DEPUTY DIRECTOR, DEFENSE INTELLIGENCE AGENCY, ACCOMPANIED BY HAROLD J. DOUGHERTY, SOVIET THEATER FORCES ANALYST, GROUND FORCES BRANCH; CHARLES LEOBOLD, CHIEF, MILITARY MATERIAL PRODUCTION BRANCH; NORBERT D. MICHAUD, SENIOR ECONOMIST, MILITARY ECONOMICS BRANCH; GERALD J. ROTH, SUPERVISORY PHYSICAL SCIENTIST, TECHNOLOGICAL CAPABILITIES BRANCH; JAMES R. MILLER, CHIEF, BALLISTIC MISSILE SYSTEMS BRANCH; CAPT. HOWARD R. PORTNOY, CHIEF, NAVAL SYSTEMS BRANCH, U.S. NAVY; CARL H. TROSS, CHIEF, AERODYNAMIC SYSTEMS BRANCH; AND COL. DONALD K. LOCKE, U.S. ARMY, CHIEF, GROUND SYSTEMS BRANCH

General AARON. Good morning, Mr. Chairman. I am Lieutenant General Aaron. I will be sitting in today, as you know, for General Tighe, who sends his regrets. A change in the schedule for this hearing resulted in a conflict with a 6-month-old commitment that he could not change.

Assisting me at the table are on my left, Mr. Harold J. Dougherty, Soviet Theater Forces analyst; Charles Leobold, chief of our materiel production analysis branch; and on my right, Mr. Norbert D. Michaud, one of our senior economists, and Mr. Gerald J. Roth, Soviet research and development analyst. In the back we have our Soviet weapons systems experts from our Directorate of Science and Technology, Col. Donald K. Locke; James R. Miller; Capt. Howard R. Portnoy, and Mr. Carl H. Tross. Major Reed is my special assistant.

The slides we will be using today have been converted to charts and are included in my prepared statement.

I appreciate this opportunity to discuss the Soviet view of military power and the Soviet military acquisition process. In contrast to past testimony when we emphasized weapons development and capabilities, today I will describe Soviet military policy and then examine the nature and extent of the present Soviet effort.

While the American people are now aware of the large numbers of sophisticated weapons entering the Soviet arsenal, there is much less appreciation of the quality and extent of the resources devoted to defense. I will, therefore, provide basic information on resources. Much of this comes from Soviet sources.

I will first discuss several possible explanations for the Soviet commitment to defense and outline the Soviet decisionmaking process related to weapons development and acquisition. I will then discuss our estimates of Soviet defense spending and the R. & D. resources they use. The production facilities which the Soviets have constructed to attain their current weapons production levels will be treated in some detail. I will then review the forthcoming constraints on military manpower and end with a short concluding statement.

SOVIET COMMITMENT TO MILITARY STRENGTH

Soviet resource allocation patterns as determined by the political leadership have consistently supported a strong defense establish-

ment, and I would like to quote, Senator, from [security deletion] which is on Soviet capabilities for strategic nuclear conflict for the late 1980's. The leadership has a strong commitment to powerful military forces stemming from historical experience in which such forces have succeeded in defending the Soviet Union, expanding its influence, and turning it into an acknowledged global power. This warfighting capability, as you know, is supported by the political leadership, and I will get into this a little bit more with Ustinov.

Senator PROXMIRE. As you go along, General, would you provide the source citation for your quotations?

General AARON. Yes, sir.

Senator PROXMIRE. As you go along so we will be able to have that for the record?

General AARON. Yes, sir, I will.

Senator PROXMIRE. Because I understand you have a number of quotations.

General AARON. Yes, sir, I do.

Military R. & D. and production enjoy priority over nonmilitary programs at all levels of the planning process. We see no indication that the persistent problems which trouble Soviet economic development have resulted in a willingness by the political leadership to change the policy of a strong national defense. This statement by L. I. Brezhnev, which is widely cited by Soviet military theorists, provides an indication of the Soviet view, and I quote,

> . . . Developing the technical equipment of our armed forces . . . is very expensive . . . but we are compelled to spend a part of our budget on the country's defense needs, and this is understood and supported by the nation . . .

MARXIST-LENINIST DOCTRINE

There are several explanations for the political leadership's commitment to military strength. Marxist-Leninist doctrine once asserted the inevitability of war with the West. Although this facet of Soviet ideology has been substantially modified over the years, current Soviet doctrine insists that war with the West is still a distinct possibility, in spite of the Party's commitment to peaceful coexistence. A corollary of this view is that the Soviet armed forces must be prepared for this possibility.

WORLD WAR II EXPERIENCE

A second factor is the experience of World War II. The memories of this conflict and the loss of 20 million Soviet citizens have been deliberately kept alive through a media campaign designed to heighten patriotism. I might mention here, Senator, that I just returned a short time ago from Eastern Europe and Moscow, which gave me an opportunity, in addition to past experiences, to talk to several Soviet generals. This is one point that they consistently made to me. It is an expected point, but I feel that some are sincere. The tremendous casualties in World War II still have a tremendous impact on those people. When they talk about the need for peace, they cite the tremendous number of losses of their people that were suffered. The higher leaders of the Soviet hierarchy, I think, believe this, and I think it is something that we have to understand perhaps a little bit more about. It is not just propaganda.

So, an important facet of Soviet doctrinal justification for continuing investment in a large military establishment is the need to maintain a high level of military preparation to deter World War III, or failing that, minimize Soviet losses and insure Soviet victory.

International Power

Third, the Soviets see military power as an important component of international power. Soviet emergence as an international superpower in the six decades since the October Revolution is heavily based on enhanced military capabilities. Soviet military strength has provided the political leadership with a large measure of foreign policy flexibility. Soviet emergence as a world power is an important source of national pride and one source of legitimacy for the political leadership.

These explanations for the leadership's commitent to military programs provide some insight into the values that the Soviet leadership brings to the military-political decisionmaking process.

Decisionmaking Structure

Now, I would like now to describe this Soviet peacetime military-political decisionmaking structure. Broad policy decisions on resource allocations are made in the Communist Party Politburo, the highest level of the Party structure.

The Defense Council, a military-political body chaired by Brezhnev, advises the Politburo. It apparently brings together the elements of the national leadership most concerned with defense matters, and draws up the basic recomendations upon which the Politburo makes its final decisions.

Heavily involved in the work of this Defense Council and at the apex of the military establishment is the Minister of Defense. He is supported by the MOD Collegium and the Soviet general staff. The current Minister of Defense is Dmitri Ustinov, who is the former Secretary of the Party Central Comittee for Defense Matters, and a member of the Politburo and probably the Defense Council, as well.

Ustinov has emerged over his 2-year tenure in the top military post as an articulate spokesman for military interests. He appears to have impressed his military subordinates with his energetic, hard-driving, and decisive approach, and, I might say, he has probably been more ubiquitous than Marshal Grechko in terms of visits to Eastern Europe and in the Soviet Union.

Senator Proxmire. How old a man is he?

General Aaron. He is 70 years old.

In addition, he has apparently maintained an active interest in the weapons procurement process which he managed for over 30 years. His Politburo membership, coupled with his long-term professional association with the top political leaders, including Brezhnev, provide him with an important avenue for input in the top Soviet decisionmaking forum.

Ustinov's likely successor to the top party position for the defense industrial management slot is Yakov P. Ryabov. who is expected to continue the tempo of military production and R. & D. Ryabov's previ-

ous record as a regional party leader reveals a strong commitment to production efficiency and planning reform. His appointment to succeed Ustinov may indicate a leadership desire to provide more efficient use of investment funds in military design, development, and production, thus easing the military burden.

Competition Between Military and Civilian Sectors

Now, this concern for more effective resource allocation within the military establishment is a recurring theme in Soviet military doctrine. And this is expressed in a statement by former Minister of Defense Marshal Grechko.

Soviet military officials are also aware of the competition between military and civilian sectors for the finite resources of the Soviet state. [Security deletion.]

Concern over the military impact on economic development stems from the close linkage they see between the economy and military power.

The Soviets define military power as an aggregate expression of military, economic, scientific, and moral or ideological potentials. In their discussion of these various potentials which comprise military power, Soviet military theorists stress the importance of the centralized planning process which allows them to steer economic and scientific policy in directions which will enhance military power.

I turn now to a detailed discussion of two of the potentials of military power, the economic and the scientific.

Perhaps the best overall indicator of the Soviet quest for power——

Senator Proxmire. General, I think it might be helpful, in view of the fact you have a 55-page prepared statement here, if you condense any part of it you think you can.

General Aaron. Yes, sir.

Senator Proxmire. Because I have a number of questions. Then, after I finish questioning you, if you feel that we have omitted or neglected any part of it, then we can go back and make sure that that is emphasized.

General Aaron. All right, sir, I will try to cut it down.

As you know, we work closely with CIA to publish agreed upon estimates of Soviet military costs in rubles and in dollars for comparisons with U.S. defense expenditures. And I think, Senator, at this point I will be repeating much of the testimony that Admiral Turner gave you, and I don't want to belabor you with it. I don't see any conflict between their estimates and ours, and if there is any conflict as I go through this, I will point that out.

But generally, you see the span of the costs here and the trend since 1967. I think the important thing is the agreement on the 11 to 13 percent of the GNP devoted to defense throughout the period.

Total Defense Expenditures—1977

Admiral Turner has also made this point in his statement, and I don't think there is any reason for me to go into this again. It gives you the same thing.

SOVIET GROWTH—NATIONAL BUDGET TRENDS

This is a chart Admiral Turner didn't show which gives some idea of the defense budget in terms of the national budget and other defense-related accounts. Growth of 9.9 percent for defense-related accounts is compared to 7.3 percent for the national budget. Regarding the difficulty in getting Soviet defense budget information, I think we have been very fortunate in getting [security deletion]. I think Admiral Turner pointed this out. [Security deletion.] It gave us a better grip on our problem of estimation..

HUNGARIAN DEFENSE BUDGET

Now, in terms of their announced defense budgets, we show a percentage here of GNP. Of course, they talk about a negative defense growth during 1970 to 1977. In this connection I would highlight for you the Hungarian budget, which is lower than some of the others. This has been of considerable interest to Marshal Ustinov, who has made several visits to the Hungarians for two reasons. One is to encourage a dedication of more of their GNP to defense in line with the rest of the Warsaw Pact. The other is the reluctance of the Hungarians to do so. When I was in Hungary, the thing that struck me in comparison with all of Eastern Europe was the lack of food and clothing queues, especially in Budapest, which you would find in Prague and Warsaw.

I think that the Hungarians have, on the surface, a much better life. Jobs are plentiful and maybe these are some of their reasons for the reluctance to spend a great deal on defense and to heighten combat readiness. It is a source of concern for the Soviet leadership.

Gen. V. Kulikov, here again, cites their concern with the problem of science and technology. We show the source at the bottom right of the chart.

The next chart is a quote from Maj. Gen. M. Cherednichenko.

I might mention something about Mr. N. Baryshnikov who was involved in long-term planning [security deletion]. He has been in the United States with the United States-Soviet Union Joint Working Group on Scientific and Technical Cooperation in the field of computer applications, and attended a conference that was held here in 1974.

Here again we see the economic trends in Soviet growth. We show the primary defense accounts rising, along with the national budget, the national income, and of course, the GNP.

The Soviets are now developing their economic plan for the 1981–85 period. We expect that they are planning a growth rate for national income of 4 to 5 percent, but that they will probably achieve somewhat less growth.

GNP, which includes services as well as output of goods, will probably grow at the same rate as national income, but with inflation considered, this means a real increase of only 3 to 3½ percent. The national budget, in the meantime, should continue to rise, perhaps faster than national income, as it has in the past. Increased centralization of expenditures in the budget has been, and will continue to be, a reflection of public consumption, primarily defense, at the expense of private consumption.

I think this was also brought out by Admiral Turner. If there is going to be any crimping, it is not going to be the defense economy but in the civilian economy.

Energy

Of course, one of the problems is the question of energy and economy, and I know Admiral Turner testified on this. I would like to read this portion of my statement.

As you know, Soviet oil production and reserves are controversial issues. Earlier testimony from the Director of Central Intelligence paints a bleak picture of declining oil production into the 1980's, and this is at variance, of course, with our more positive estimate that the Soviets will reach increasing output goals during the same period. I believe that these professional disagreements between the CIA and the DIA are healthy. They have made both the national decisionmaking body and the public privy to divergent views on a subject of immense concern to the Nation, and at the same time forced us to take a harder look at the issue and work constructively towards a resolution.

I do want to emphasize, however, our agreement that at some point in time the Soviets will inevitably face a problem of decreasing oil output, and we expect production to continue to increase at 4 to 4.5 percent up to 1980, with a slowdown in growth rate to about 1 to 1½ percent after 1980.

The Soviet output goal, in their Tenth Five Year Plan, is 12.4 to 12.8 million barrels per day by 1980. We think that this goal is attainable.

I might also mention, Senator, that we have supporting DIA a group of military reserve detachments composed of reserve officers and rather expert analysts. Many of these people come from the oil industry, such as oil construction and other areas, so we feel that we have a good corps of backup oil people. Their expert help supports some of the disagreement that we have with CIA.

Now, the potential value of oil output, or its growing opportunity cost, will continue to rise in external markets. This represents a potential boon to the economy if petroleum exports, which now account for nearly half of Soviet hard currency earnings, are continued into the 1980's. We expect Soviet domestic consumption to continue being constrained in order to maximize oil exports.

Military energy consumption could be somewhat restricted, not so much by the actual lack of oil as by its growing value in both external markets and in the civilian domestic economy. At this time, the Soviet military share is small, amounting to less than 5 percent of total refined petroleum. Any savings due to military conservation would be very minor compared to the total national consumption.

Growth in Defense Outlays

Growth in defense outlays will continue at roughly 4 to 5 percent, despite economic restraints. The growth in R. & D. and procurement outlays for new weapons systems will continue into the 1980's.

Senator Proxmire. On what do you base that 4 to 5 percent growth, and that is in real terms?

General Aaron. Yes, sir.

Senator PROXMIRE. How do you base that? How do you know it? I mean, why do you think it will be that?

Mr. MICHAUD. We have been working with CIA, projecting weapons systems into the future and costing weapons systems, and we see the same kind of trend that we have had in the past in weapons procurement continuing into the 1980's.

Senator PROXMIRE. You see all the growth in the weapons systems rather than personnel?

Mr. MICHAUD. Primarily, right. Personnel, military personnel will probably level off in the 1980's, considering constraints in the Soviet labor force.

Senator PROXMIRE. You see the growth—have you broken it down into specific terms to know whether the growth would be in ships or tanks or planes or missiles, whether it would be strategic or tactical, or is it across the board?

Mr. MICHAUD. I can't give you the answer off hand. We have projected by weapons system into the future, but I cannot tell you at this point which type of systems are involved.

Senator PROXMIRE. Are they fairly uniform? That is, do you get about the same level of growth, or is there one or two or three that are likely to be much greater?

Mr. MICHAUD. I just don't recollect at this point. I would think it to be aircraft and missiles rather than ground force equipment.

IMPLICATIONS OF SALT

Senator PROXMIRE. Can you make any assumptions on SALT agreements with respect to growth? Would that affect the growth, the degree, in strategic limitations?

Mr. MICHAUD. As CIA has testified, we would have to agree that SALT would have very little effect on growth in defense expenditures because the strategic section comprised only 10 percent of the total outlays, and any reduction there would be a very small amount, and therefore a small change in growth of defense spending in the future.

General AARON. I think we can extrapolate what they are applying from strategic forces to ground forces. We are probably going to see a continuation of that percentage.

Senator PROXMIRE. Can you make any assumptions at all to how they respond to increased goals by, say, NATO, by increased defense efforts by this country? You have some quotations there that indicate that they feel they have to match our defense expenditures.

One, do you accept that, and if you do, what assumptions do you make about our growth and its relationship to this 4- to 5-percent growth?

Mr. MICHAUD. I think what we are going to show as we go along here is the pattern they have developed in their defense industries and the continuing development of new facilities, which appear to mean more systems in the future, more sophisticated systems, which mean higher costs, and as far as reactions to U.S. expenditures, this would be speculative. Of course, it would depend on what the U.S. outlays would be, but they do not appear to be at this time responsive to what we are doing. In terms of responding to a decrease in our expenditures, I don't think they would decrease their expenditures.

Senator PROXMIRE. Well, is it just a determination somehow on their part that they think they should expand 4 to 5 percent in real terms, regardless of what the threat is, regardless of what we do, regardless of what imagined or real threat they may have from the Chinese or from other elements?

Mr. MICHAUD. There isn't anything in the Soviet literature that suggests a change in their attitude toward continuing development. There is nothing that says, well, if the United States reduces their expenditures, we are going to do the same, or we want to do it only if the United States would. There is none of this in their statements at all.

Senator PROXMIRE. It seems rather strange that they don't relate it to need at all. Certainly so much of our debate is based on what we confront what the Soviet Union is doing. Whether or not that is persuasive, it is an argument that is used on the floor of the Senate and in the committees constantly.

General AARON. Well, Senator, I think there are several things working. One is the historical paranoia I think that plays a part in this. I think the business of NATO and the 3-percent growth which they have been attempting to achieve certainly must have an impact. I think the decision of the United States at one time to perhaps go ahead with the B–1 bomber had an impact. As we bring out in the testimony, Brezhnev's reaction to that was "If you don't build it, we won't build it." Had we built it, I am sure we would have gotten a reaction. There is no doubt that the continued modernization of their ICBM forces—greater MIRVing, and greater accuracy—puts them in a better deterrence posture. And I think there is no doubt that during the last 7 years the question of China and its future has had an impact, as we have seen the build-up of divisions in the Chinese area. We have seen new weapons systems moving in.

Then, at the same time, I think they have the problem of modernization of the force. Many of these—more technology, more sophistication, increased cost of manufacturing, all of these competitions—must force the problem of how far can they stretch defense growth without causing a serious impact on their citizenry.

Senator PROXMIRE. Well, that is exactly right, but it is a matter of how they look at this.

I suppose you can make two assumptions. You can make one assumption that they are going to try to keep pace with us, whatever they have to do and whatever sacrifices they have to make. Or you can make the assumption that they are going to keep growing, and if we don't grow, they are going to try to achieve a position of dominance which they can, if nothing else, intimidate us into knuckling under to whatever pressure they put on us, wherever they put it. I suppose it is very, very hard to tell, and maybe those viewpoints change in the Soviet Union, but I just wondered if you had any, what our assumptions were based on. They seem to feel that they are going to have a 4- to 5-percent increase in military expenditures in real terms regardless.

General AARON. Sir, I think that the way things are going, they are going to insure at least parity. The estimate that we have arrived at in the community is that if they can, they are going to try to get that margin of superiority. I think that is going to continue.

I think they are also moving in a position of strength in [security deletion].

CUBAN MISSILE CRISIS

I think the Cuban missile crisis, for instance, had a tremendous impact. They didn't have the military power or the ability to project that power. I think that this is deep in their psyche, to the point that it is conditioning much of what they are doing now. I think that we are going to see this growth continue. They are going to have the competing demands, the urge to stay with us, and I don't see any negative change or leveling out.

Senator PROXMIRE. You think that Cuban missile crisis of 16 years ago, or 17 years ago, whenever it was, is still an element, and it is likely to continue for years to come?

General AARON. Yes, sir, I do. What we have seen, for example, is this: Take the projection of Soviet power in the 1962 timeframe; go ahead and take another view of about 1969, and the ability to deploy ships and aircraft; look then at it here in 1977–78. You had Luanda, the Middle East, and Ethiopia. The increased capability of their airlift would allow them to put a division in Syria in [security deletion] days, or Ethiopia, with or without overflight rights, depending on the situation. They have enhanced their ability to project their fleet or the scope of the TU–95 aerial reconnaissance throughout the world, whether it is in the Indian Ocean, South Atlantic, the Gulf of Mexico, or off of Alaska. These are some of the tremendous things they have accomplished since that particular period of time, and I think this trend will continue.

Senator PROXMIRE. All right, sir, go ahead.

General AARON. The next chart quotes I. G. Pavlovskiy.

I think we are getting into the area now that I think is of interest to you, and this is the production area.

MACHINE BUILDING

They have dedicated a great deal of effort and investment here. It is probably one of the biggest areas of their annual capital investment in industry. We expect this to continue.

SCIENCE OUTLAYS

There has been tremendous impetus in this area. A number of years ago, we were interested in the United States in developing our own science and technology base by training people. We have sort of forgotten that. They haven't.

Now, this is the thing, Senator Proxmire, that is the most fascinating to me as a military man—how they do their business. This is just the design and development of a weapons system. First is the business of off-the-shelf hardware. They don't push the technology, and sometimes we have been criticized for trying to push it to its limits. The Cheyenne helicopter is a good example. Proven technologies. I don't know how many scientists I have talked to in the past 5 years who have examined Soviet equipment [security deletion] and every one of them tells me that the Soviets have used an ingenious physical principle to do something that we had discarded.

I remember one that they showed me in connection with a radar that had a friction wheel with a string, you turn the little crank and the

string would turn in the friction wheel, and it would turn another gadget. I often thought if we gave that problem to industry, we would end up with a $200 servomechanism to turn that same wheel, and they have been able to do that with much of it.

They use new subsystems only as exceptions and emphasize simple operation and repair. If they have a problem with the soldier being able to repair it, their specialists replace it. They reduce the risk and development time, but at the same time innovation is possible, as are technical surprises. I would like to read something here that [security deletion] talks about advanced technology.

Senator PROXMIRE. All right.

General AARON. During the next 10 years the Soviets will have a growing potential for significant and perhaps novel developments in weapons and supporting systems. Our knowledge about Soviet R. & D. projects [security deletion] but it is still heavily dependent upon fragmentary information from sources which can be and often are denied us by Soviet security measures.

We are uncertain about when we would detect and identify an advanced novel weapons program, about whether we could give sufficient warning for the United States to adopt countermeasures.

Now, you have heard much and seen much in the press about charged particle beam and laser technology. These are two that we are watching. I will show you some other examples.

BMP

The BMP is one. This is probably the best infantry personnel carrier in the world, built about 1967. It can carry a Soviet squad. Sure, they are rather constrained but the average Soviet soldier is only about 5 feet, 6 inches tall. The BMP has a 73-millimeter gun, which can knock out a tank at about 800 meters. It has a Sagger missile on top that can reach out 3,000 meters. [Security deletion.] It can travel across water. It is a good system.

I don't have to remind you about the problems that we have gone through with our own infantry fighting vehicle.

Now, here again we're talking about costs for the future, with 4 to 5 percent growth. In a particular Soviet division, you will find a regiment of these BMP's. The other two regiments have wheeled vehicles.

In terms of the Army and its requirements, what they would probably like to have is the whole division equipped with these because then you have got the match—self-propelled personnel carriers which can fire on the move, tanks, and self-propelled artillery; in other words, a combined arms team that can move in a quick armored thrust across Europe.

And here is where they didn't take one trend after another.

Senator PROXMIRE. You say they are better than anything we have?

General AARON. Yes, sir.

Senator PROXMIRE. Then why don't we build them?

General AARON. I asked that question at one time.

Senator PROXMIRE. You say they are 11 years old now.

General AARON. Yes, sir.

Senator PROXMIRE. With 11 years to copy it, if they have the superior weapons systems——

General AARON. I asked that question of some of my colleagues when I was on the Army Staff. They of course were in the middle of the MICV development. Part of the problem was that they needed a vehicle with a higher silhouette. Many of our soldiers are taller. Many of the ideas of this vehicle have been adopted, for example, the firing ports, and the means to exhaust fumes from the rounds as they are expended.

It also has other innovations: A filter for CBR protection, and of course their overpressure system. To put that into our MICV, for example, would cost a great deal more money, whereas they can build it a lot cheaper and put it in their vehicles. It is a very decided vulnerability of our vehicle.

And I think you put your finger on the problem of the intelligence officer who goes to the developer to say they have got this, why not reverse engineer it? We have people going in other directions. We have done reverse engineering in the past with the Soviet ribbon bridge. We have taken their ribbon bridge, actually duplicated it, and improved the strength. We made a much better bridge than they did. And we have done that successfully, so the system will work.

Senator PROXMIRE. But if the Army wanted something like that, I don't think Congress would deny them if they could convince them that it was better than anything we had.

General AARON. Well, there has been considerable debate about this vehicle in the Armed Services Committees and others.

TANKS

This is another example, the T–72 tank. Here again we have seen the development in tanks, T–54, T–55, and T–62. Then came the prototype, the T–64, which was the midpoint. Then they came out with the T–72 with a better gun; a 125 millimeter. A more powerful engine gives them better cross-country mobility. We think they have a laser range finder for better fire control and a better snorkeling system underwater. There are two snorkles on the T–64, one for the engine in the back and then one for the crew. In the past, they only used one. This tank can go down on a river bed about 15 feet deep and up a bank. It is a good tank and it is in series production right now. I will get into this later.

But here was a case where in certain components they took the jump, instead of staying with the old components from the T–54, T–55, and T–62.

FIGHTER AIRCRAFT

Now we get into the aerodynamics systems and some idea of the growth of facilities. One of the big things that will require more money for them is the modernization of their fighter aircraft, especially their ground attack aircraft and continued growth of the fighter fleet.

MISSILES

Next are the Missile and space systems. Here again you have seen continued growth in this area. I think the American public has been told by many people about the tremendous development of their ICBM systems and the various modifications to the SS–18 and SS–19 to

continue testing, MIRVing, accuracy, and a greater number of MIRV's. I don't think this is going to stop. And of course, what we are seeing also is an improving defense. The SA–X–10, which is now being tested, [security deletion.] So, in terms of both ground and air defense, there is continued emphasis.

R. & D. Manpower

And of course, here is where we get to Soviet R. & D. manpower. They are putting a large investment into it. I would say that it is one of the areas of priority allocations.

This is what we were talking about, Soviet scientific and engineering manpower. In terms of graduates, we show over 260,000 graduates in 1977. If you take scientists as well as engineers, you have a total of 300,000 graduates in 1977.

This is where all of the key personnel, the cream of the crop, are working—the military R. & D. program.

Now, we talk about this in terms of systems. Looking at aerodynamic system developments [security deletion] new systems since World War II. They are averaging about [security deletion] systems per year, and we expect this to continue.

Missile and space system development [security deletion] new systems per year. We expect [security deletion] new ballistic missiles in the next decade.

Naval ship developments [security deletion].

[Security deletion.]

Ground Systems

Being an infantryman and Army officer, I have watched ground systems more closely than others perhaps, probably the same way that Admiral Turner has watched the Navy. I have been impressed with the new systems that are coming into their inventory on a constant basis, whether antitank weapons, self-propelled artillery, improved mortars, or improved air defense. I have seen it in the last 5 years and I have just been absolutely amazed at what they are doing. And I am not talking only about quantity, but about quality.

Technology Transfer

Now, if I may go ahead and talk a little bit about technology transfer, which is a problem. [Security deletion.]

As you all know, it is a concern to the Government. There are certain ways to protect that and certain ways not.

First we have the question of providing them plants in toto, where they walk in, it is all ready for production, ready to turn it out—turnkey plants—training in the United States, and I will touch on that, and visits of their commercial travelers to the United States to commercial establishments and facilities.

To give you an idea, in 1972, the United States received 641 Soviet commercial visitors. The number was 1,148 for 1976.

This is a statement from [security deletion].

Over the past 4 years there have been $14 billion in total Soviet imports of Western machinery and equipment, including $600 million in approved Coordinating Committee, or COCOM, exception requests of embargoed goods and technology. In addition, there has been an

estimated [security deletion] million of detected diversions of embargoed equipment and technology.

Sales of Western equipment and technology have been facilitated by reductions in the length of both the COCOM embargo list and the U.S. unilateral embargo list, called the Commodity Control List. In 1970 the U.S. Commodity Control List included 2,692 items. It had fallen to 1,073 and then to 720. The latest reduction has been in part due to the restructuring of the list. The COCOM list is now under review, by the participating nations, primarily the NATO countries and Japan, with further reductions anticipated.

Now, if I may turn to the Soviet presence in the United States.

This gives you some idea of special student/young faculty exchange groups and individuals, and the commercial individuals and groups. I asked the question why there was a slight decline in temporary visitors. I haven't gotten a good answer yet and we are still researching that.

Here we talk about student exchange, which is very interesting. As you know, some of our people are invited to study history and the social sciences in the Soviet Union, but nothing in the physical sciences. We usually send Ph.D. candidates. These are the type of Soviets that we get studying in our schools—older and more qualified. I saw a report within the last 10 days of [security deletion].

[Security deletion.]

The official bilateral technical agreements that exist between the United States and the Soviet Union are another area of concern. These agreements cover approximately 300 separate projects, some of which are of concern to the Department of Defense because of the high technology involved. These agreements facilitate the exchange of some 700 to 1,000 persons per year from each side in specific topical areas, and encourage the Soviets to establish direct contacts and cooperation with private companies in the United States. Approximately 70 to 80 such agreements with U.S. companies are known to exist.

Our concerns about transfers by means of these bilateral agreements, and I am talking about the Department of Defense, are such technologies as computers, petroleum processing, superconductivity, microelectronics, and petrology, which is the study of earth resource material, and of course, microbiology, just to name a few.

I think you are well aware, Senator, that the President's science and technology adviser is due to go to the Soviet Union.

Defense Production

Now, if I can get into Soviet production facilities, this shows the growth since 1965. I might say of all [security deletion]. I have seen in the last five years, I can't emphasize the impact that you get personally [security deletion]. I think just in Moscow in the short week that I was

there, I was struck with the tremendous amount of construction of housing for their people, not the best in the world perhaps, but building cranes just dotted the skyline of Moscow. At the same time, you can see the construction and repair of airfields in other places.

We talk about army materiel plants. I'll show you something on tanks in a minute. Artillery plants, and that is primarily the self-propelled artillery, are growing. Armored personnel carrier plant construction is also climbing.

[Security deletion.]

Going now to the aircraft industry, engine plants and airframe plants.

This gives you an idea [security deletion] of their aircraft production facilities.

[Security deletion.]

The Soviet production facilities for missile/space systems.

[Security deletion.]

You will see the same thing in the Soviet shipyards, commercial and military, the [security deletion] new floating drydocks. For example, there is a Soviet floating drydock that was taken down to Berbera in the Red Sea about a year and a half ago. It is now located near Aden after they were ejected from Somalia.

Modernization of the shipyard continues.

[Security deletion.]

This gives you some idea of the building positions, both commercial and naval.

So we are seeing increased output, sophistication, production efficiency, and better accommodation of new systems.

Senator PROXMIRE. General, thank you. Without objection, your prepared statement will be placed in the hearing record at this point.

[The prepared statement of General Aaron follows:]

PREPARED STATEMENT OF LT. GEN. HAROLD R. AARON

INTRODUCTORY STATEMENT

Good morning, Mr. Chairman, I am Lieutenant General Harold R. Aaron. I will be sitting in today for Lieutenant General Tighe, who sends his regrets. The change in the schedule for this hearing resulted in a conflict with a lengthy travel plan that General Tighe could not change.

Assisting me at the table are, on my left, Mr. Harold Dougherty, Soviet theater forces analyst, and Mr. Charles Leobold, Chief of our Materiel Production analysis staff. On my right are Mr. Norbert Michaud, one of our senior economists, and Mr. Gerald Roth, Soviet research and development analyst. In the back are Soviet weapon systems experts from our Directorate for Scientific and Technical Intelligence: Colonel Donald Locke, Mr. James Miller, Captain Howard Portnoy, and Mr. Carl Tross. Major Reed is my special assistant.

I appreciate this opportunity to discuss the Soviet view of military power and the Soviet military acquisition process. In contrast to testimony when we emphasized weapons development and capabilities, I will describe Soviet military policy and then examine the nature and extent of the present Soviet effort.

[The chart presented at this point follows:]

While most people are now aware of the large numbers of sophisticated weapons entering the Soviet Arsenal, there is much less appreciation of the quality and extent of the resources devoted to defense. We will therefore provide basic information on resources, much of which comes from Soviet sources.

I will first discuss several possible explanations for the Soviet commitment to defense, and outline the Soviet decisionmaking process related to weapons development and acquisition. I will then discuss our estimates of Soviet defense spending and the R. & D. resources they use. The production facilities which the Soviets have constructed to attain their current weapons production levels will be treated in some detail. I will then review the forthcoming constraints on military manpower, and end with a short concluding statement.

[The chart presented at this point follows:]

TOPICS

- COMMITMENT TO DEFENSE
- DECISION-MAKING PROCESS
- DEFENSE SPENDING
- R&D RESOURCES
- PRODUCTION FACILITIES
- PRODUCTION LEVELS
- MILITARY MANPOWER
- CONCLUSIONS

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Soviet resource allocation patterns as determined by the political leadership have consistently supported a strong defense establishment. Military R. & D. and production enjoy priority over non-military programs at all levels of the planning process. We see no indication that the persistent problems which trouble Soviet economic development have resulted in a willingness by the political leadership to change the policy of a strong national defense.

[The chart presented at this point follows:]

RESOURCE ALLOCATION PATTERNS

- POLITICAL LEADERSHIP SUPPORTS STRONG DEFENSE ESTABLISHMENT
- NO INDICATION OF WILLINGNESS TO CHANGE POLICY

DIA6859E

This statement by Brezhnev, which is widely cited by Soviet military theorists, provides an indication of the Soviet view.

[The chart presented at this point follows:]

L. I. BREZHNEV

"...DEVELOPING THE TECHNICAL EQUIPMENT OF OUR ARMED FORCES..... IS VERY EXPENSIVE..... BUT WE ARE COMPELLED TO SPEND A PART OF OUR BUDGET ON THE COUNTRY'S DEFENSE NEEDS, AND THIS IS UNDERSTOOD AND SUPPORTED BY THE NATION....."

DVINA

DIA6859E

There are several explanations for the political leadership's commitment to military strength. Marxist-Leninist doctrine once asserted the inevitability of war with the West. Although this facet of Soviet ideology has been substantially modified over the years, current Soviet doctrine insists that war with the West is still a distinct possibility, in spite of the Party's commitment to peaceful coexistence. A corollary of this view is that the Soviet armed forces must be prepared for this possibility.

[The chart presented at this point follows:]

POLITICAL LEADERSHIP COMMITMENT TO MILITARY STRENGTH

- MARXIST/LENINIST DOCTRINE
- EXPERIENCES OF WORLD WAR II
- INTERNATIONAL POWER

DIA6859E

A second factor is the experience of World War II. The memories of this conflict, and the loss of twenty million Soviet citizens, have been deliberately kept alive through a media campaign designed to heighten patriotism. An important facet of Soviet doctrinal justification for continuing investment in a large military establishment is the need to maintain a high level of military preparation to deter World War III, or, failing that, minimize Soviet losses and ensure Soviet victory.

Third, the Soviets see military power as an important component of international power. Soviet emergence as an international superpower in the six decades since the October Revolution is heavily based on enhanced military capabilities. Soviet military strength has provided the political leadership with a large measure of foreign policy flexibility. The Soviet emergence as a world power is an important source of national pride and one source of legitimacy for the political leadership.

These explanations for the leadership's commitment to military programs provide some insight into the values that the Soviet leadership brings to the military-political decisionmaking process.

I would now like to describe this peacetime military-political decisionmaking structure. Broad policy decisions on resource allocations are made in the Communist Party Politburo, the highest level of the Party structure.

[The chart presented at this point follows:]

The Defense Council, a military-political body chaired by Brezhnev, advises the Politburo. It apparently brings together the elements of the national leadership most concerned with defense matters, and draws up the basic recommendations upon which the Politburo makes its final decisions.

[Security deletion] at the apex of the military establishment is the Minister of Defense. He is supported by the MOD Collegium and the Soviet General Staff. The current Minister of Defense is Dmitri Ustinov, who is the former Secretary of the Party Central Committee for Defense Matters and is now a member of [security deletion] the Politburo [security deletion].

[The chart presented at this point follows:]

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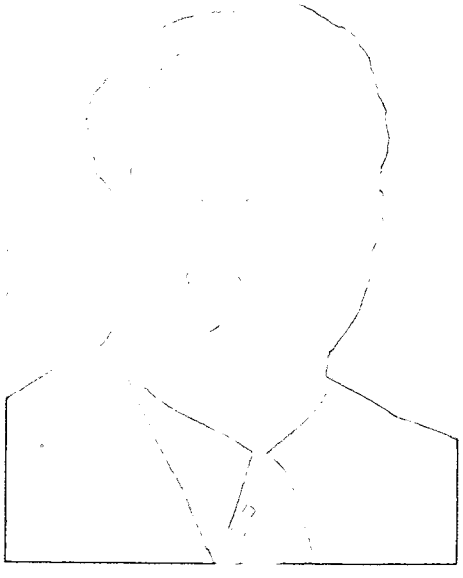
Ustinov has emerged over his two year tenure in the top military post as an articulate spokesman for military interests. [Security deletion.] In addition, he has apparently maintained an active interest in the weapons procurement process which he managed for over thirty years. His Politburo membership, coupled with his long term professional association with top political leaders, including Brezhnev, provide him with an important avenue for input in the top Soviet decision-making forum.

Ustinov's apparent successor to the top party position for the defense industrial management slot is Ryabov, who is expected to continue the tempo of military production and R. & D. Ryabov's previous record as a regional party leader reveals a strong commitment to production efficency and planning reform. His appointment to succeed Ustinov may indicate a leadership desire to provide more efficient use of investment funds in military design, development, and production, thus easing the military burden.

[The chart presented at this point follows:]



YAKOV P. RYABOV

CPSU CENTRAL COMMITTEE SECRETARY

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This concern for more effective resource allocation within the military establishment is a recurring theme in Soviet military doctrine.

This is expressed in a statement by former Minister of Defense, Marshall Grechko:

[The chart presented at this point follows:]

ACCORDING TO

MARSHALL GRECHKO,

DECISIONS REGARDING DEFENSE PROGRAMS SHOULD BE ". . . JUSTIFIED, EFFECTIVE AND ECONOMICAL" BECAUSE "MISCALCULATION COULD LEAD TO UNJUSTIFIED EXPENDITURES OF FUNDS AND OF THE COUNTRY'S ECONOMIC AND MANPOWER RESOURCES."

FBIS, 1974

DIA-859E

Soviet military officials are also aware of the competition between military and civilian goods for the finite resources of the Soviet state. This statement [security deletion] reflects this awareness:

[The chart presented at this point is a security deletion.]

This concern over the military impact on economic development stems from the close linkage they see between the economy and military power.

The Soviets define military power as an aggregate expression of military, economic, scientific, and moral potentials.

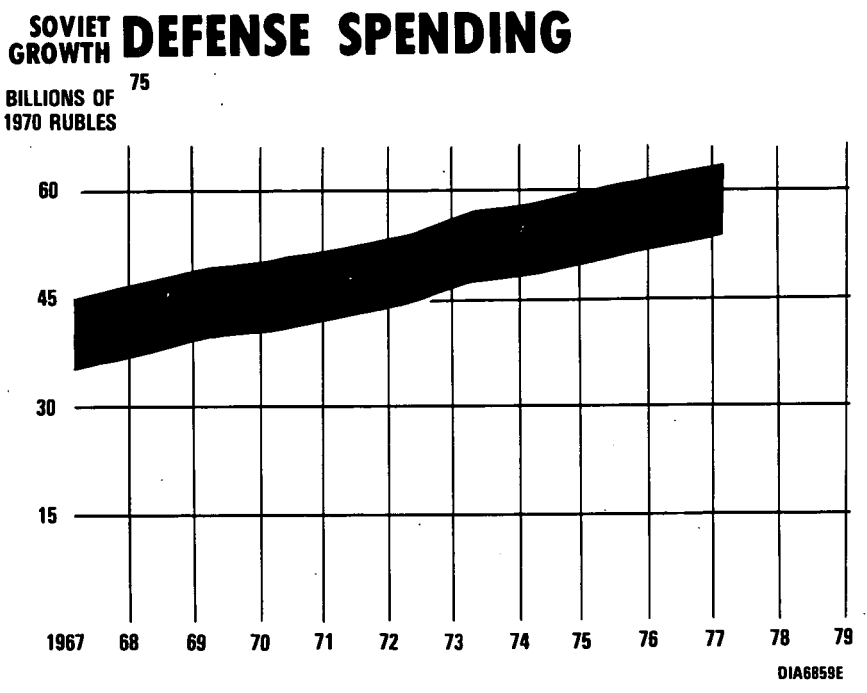
[The chart presented at this point follows:]

In their discussion of these various "potentials" which comprise military power, Soviet military theorists stress the importance of the centralized planning process which allows them to steer economic and scientific policy in directions which will enhance military power. I turn now to a detailed discussion of two of the "potentials" of military power, the economic and the scientific.

DEFENSE SPENDING

Perhaps the best overall indicator of the Soviet quest for power is the amount spent for defense. As you know, we work closely with CIA to publish agreed-upon estimates of Soviet military costs in rubles and in dollars for comparisons with U.S. defense expenditures. According to our estimates, which are generally published on an unclassified basis, Soviet defense outlays in rubles ranged from about 35 to 45 billion rubles in 1967, rising to between 53 and 63 billion rubles in 1977.

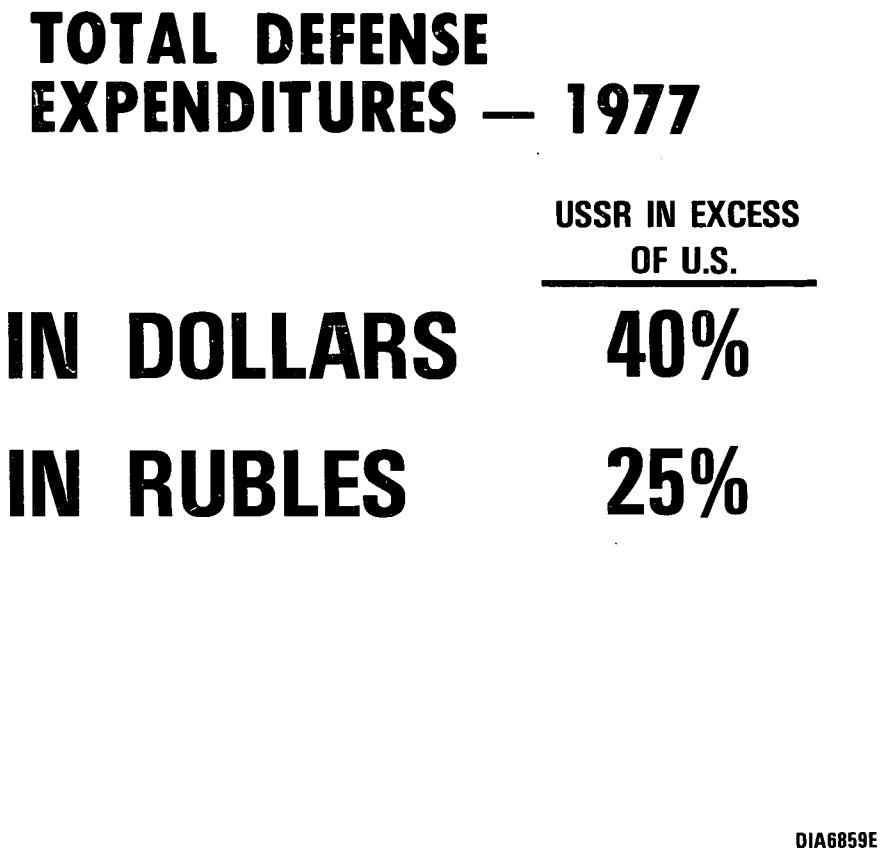
[The chart presented at this point follows:]



This represents an average annual growth of 4 to 5 percent and a defense share of 11 to 13 percent of GNP throughout the period.

As Admiral Turner has already indicated to you, the cost of Soviet military activities in 1977 was 140 percent of the U.S. level when denominated in U.S. dollars and 125 percent of the U.S. level if measured in rubles.

[The chart presented at this point follows:]



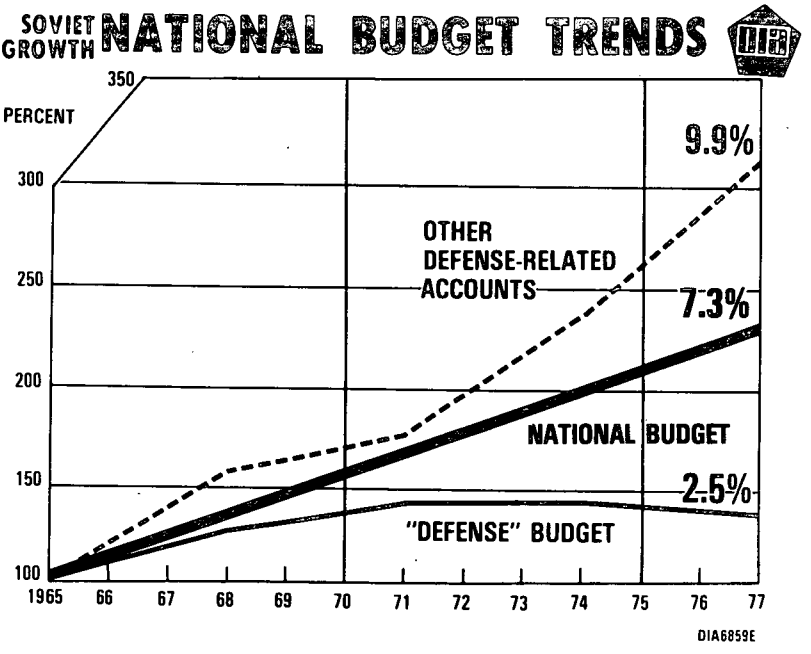
The Soviet defense effort has been larger than that of the United States since at least the early 1970's.

This subcommittee has expressed concern in the past regarding the bias in the dollar comparison. As the ruble comparison indicates, the cost difference is significant regardless of the currency employed. There are two explanations for this: The Soviet Union is in fact maintaining a larger defense establishment than the United States. Many of the new weapon systems that they procure approach their technological frontier and are therefore relatively costly. Research on this ruble comparison is continuing and more details on the analysis should be published during the next few months.

How do the Soviets view their outlays for defense?

[Security deletion.]

[The chart presented at this point follows:]



This was confirmed later by some hard information. In contrast, public statements by Soviet officials deny the western estimates and cite their declining defense budget and its diminishing share of the National budget.

We know, however, that the defense sector is mostly, if not entirely, funded through the National Budget with the published Defense budget as only one of the accounts funding defense. The science account funds some of the military R. & D., and the National Economy account includes some, if not all, of the procurement outlays.

It is the growth of these defense related accounts which, in part, gives rise to the growth in the National Budget. The National Budget since 1965 has grown at over 7 percent per year, and the other defense-related accounts, representing nearly 40 percent of the National Budget, have grown at about 10 percent per year. Although we are unable to ascertain the exact level of defense spending solely by analyzing budget data, we are certain that the growth in these accounts implies continuous growth in actual defense outlays.

In contrast to the declining announced Soviet Defense budget, the announced East European defense budgets, which represent most of their major defense outlays, continue to increase. Although some of these increases are due to inflation, the recent growth in the announced East European defense budgets exceeds the growth of their gross national products. This in turn increases the defense shares of total output.

[The chart presented at this point follows:]

ANNOUNCED DEFENSE BUDGETS

	PERCENT OF GNP IN 1977	AVERAGE % GROWTH 1970-77
SOVIET UNION	3.5	NEGATIVE
EAST GERMANY	6.0	7.3
POLAND	3.0	6.2
HUNGARY	2.6	5.8
CZECHOSLOVAKIA	3.8	4.7

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To put these East European defense outlays in perspective, their defense establishments are estimated to cost about [security deletion] dollars or only about 30 percent of the cost of NATO Europe defense. East European procurement is estimated to cost about 20 percent of total NATO Europe procurement. We will soon publish a study of East European defense costs to address some of the problems involved in making these international comparisons.

The Soviet Union has been urging the East Europeans to increase their defense spending. In pleading their case for higher defense outlays, the Soviets understandably do not refer to their own artificially low and declining announced defense account, which they state is only about 4 percent of their GNP, but to spending, in their words, "Whatever is necessary for Defense."

Other references to defense outlays by Soviet leaders indicate concern regarding high levels of spending, the burden on the economy, and the continued growth of the economy as a whole.

[The chart presented at this point follows:]

GENERAL V. KULIKOV,
FIRST DEPUTY DEFENSE MINISTER

"THE DEFENSIVE CAPABILITY OF OUR COUNTRY IS CONSTANTLY INCREASING WITH THE GROWING ECONOMY AND DEVELOPMENT OF SCIENCE AND TECHNOLOGY."

COMMUNIST, May 1976

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For instance, General Kulikov, Deputy Minister of Defense, refers to defense capabilities growing with the economy. Another General referred to the increased expenditure of resources for defense.

[The chart presented at this point follows:]

MAJOR GENERAL M. CHEREDNICHENKO:

"THE NEED TO ENSURE THE COUNTRY'S SECURITY . . . HAS PLACED GREAT DEMANDS UPON THE ECONOMY AND REQUIRES INCREASED EXPENDITURES OF MATERIAL, MONETARY AND HUMAN RESOURCES."

COMMUNIST OF THE ARMED FORCES, September 1971

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And still another Soviet official speaks of the high burden.
[The chart presented at this point follows:]

N. BARYSHNIKOV,
USSR GOSPLAN SPECIALIST

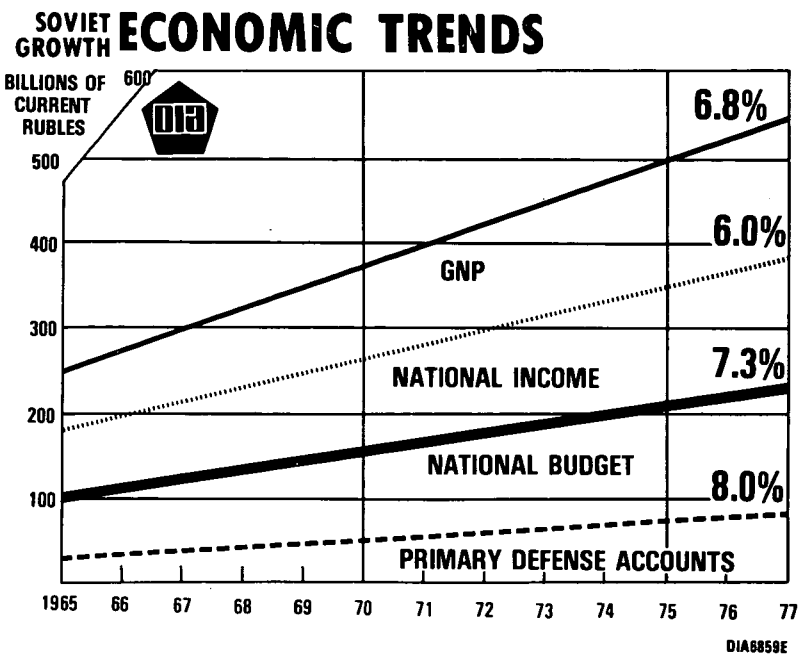
"OUR NATIONAL INCOME IS ONLY 65 PERCENT THAT OF THE UNITED STATES. YET IT IS OBVIOUS THAT WE CANNOT SPEND LESS THAN THE U.S. DOES ON NATIONAL DEFENSE . . . THIS MEANS THAT THE DEFENSE BURDEN OF OUR COUNTRY IS MUCH GREATER THAN THAT OF THE UNITED STATES."

PUBLIC SPEECH, September 1970

DIA6859E

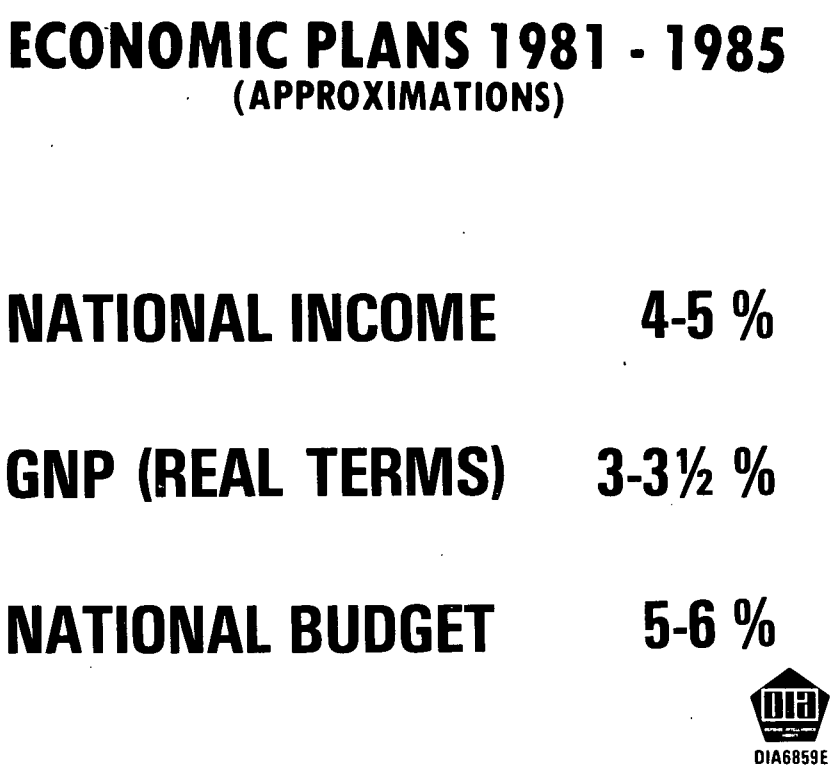
Last year, this subcommittee inquired as to the relationship of the Soviet national budget to gross national product. The total national budget is increasing at 7.3 percent, or slightly faster than the gross national product and national income at 6.8 percent and 6.0 percent respectively. In 1977, the National Budget comprised about 43 percent of GNP or 60 percent of national income. In turn, the primary defense accounts are growing at about 8.0 percent or slightly faster than the total national budget and the national income. We believe the Soviets are following a fairly deliberate program of expansion in defense, thereby avoiding excessive demands on the economy.

[The chart presented at this point follows:]



The Soviets recognize that military spending limits the growth of their economy. Such limits make it difficult to allocate technical and economic resources to defense in subsequent periods. Soviet leaders have expanded the defense sector at rates that the general economy and the key industrial sectors could allow without in turn being adversely affected.

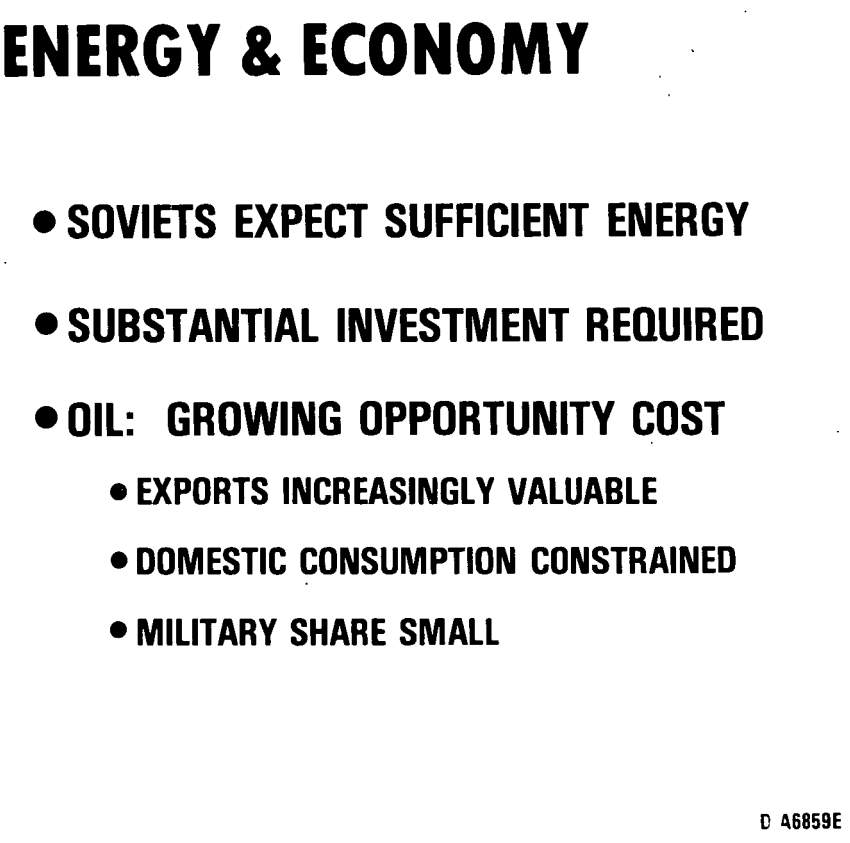
The Soviets are now developing their economic plan for the 1981–85 period. [The chart presented at this point follows:]



We expect that they are planning a growth rate for national income of 4 to 5 percent, but that they probably will achieve somewhat less growth. GNP, which includes services as well as output of goods, will probably grow at the same rate as national income, but with inflation considered, this means a real increase of only 3 to 3½ percent. The national budget, in the meantime, should continue to rise, perhaps faster than national income, as it has in the past. Increased centralization of expenditures in the budget has been, and will continue to be, a reflection of public consumption, primarily defense, at the expense of private consumption.

The growth of Soviet GNP in the 1980's will depend largely on how rapidly they can develop their energy resources. Energy growth, particularly oil output, will determine whether the economy will grow at 3 percent or more in the 1980's. The Soviets fully expect to have sufficient energy to sustain that growth, although substantial investment will be required to develop an adequate infrastructure in the remote areas where their petroleum reserves are located.

[The chart presented at this point follows:]



As you know, Soviet oil production and reserves are controversial issues. Earlier testimony from the Director of Central Intelligence paints a bleak picture of declining oil production into the 1980s. This is at variance, of course, with our more positive estimate that the Soviets will reach increasing output goals during the same period. I believe that these professional disagreements between CIA and DIA are healthy. They've made both the National decisionmaking body and the public privy to divergent views on a subject of immense concern to the Nation, and at the same time, forced us to take a harder look at the issue and work corporately toward resolution. I do want to emphasize, however, our agreement that at some point in time the Soviets will inevitably face a problem of decreasing oil output.

The potential value of oil output, or its growing opportunity cost, will continue to rise in external markets. This represents a potential boon to the economy if petroleum exports, which now account for nearly half of Soviet hard currency earnings, are continued into the 1980s. We expect Soviet domestic consumption to continue being constrained in order to maximize oil exports.

Military energy consumption could be somewhat restricted, not so much by the actual lack of oil, but by its growing value in both external markets and in the civilian domestic economy. At this time the Soviet military share is small, amounting to less than 5 percent of total refined petroleum. Any savings due to military conservation would be very minor compared to total national consumption.

The economic plan will probably call for a 4 to 5 percent growth rate for defense outlays, as well as for national income. Despite the potential for severe economic constraints in the 1980's, we believe the current growth in defense outlays will be sustained at least until the mid-1980's. The impetus for this growth will be R. & D. and procurement outlays for new weapons systems.

[The chart presented at this point follows:]

DEFENSE OUTLAYS EXPECTED TO GROW AT 4-5% IN THE 1980'S

- **DESPITE POTENTIAL FOR SEVERE ECONOMIC CONSTRAINTS**
- **IMPETUS FOR GROWTH WILL BE R&D AND PROCUREMENT OUTLAYS FOR NEW WEAPON SYSTEMS**

DIA6859E

Perhaps typifying the Soviet attitude toward the future development of defense was the remark made earlier this year by Deputy Defense Minister Pavlovskiy:

[The chart presented at this point follows:]

GEN. I. G. PAVLOVSKIY,
DEPUTY DEFENSE MINISTER

"... THE PLANNING ORGANS AT ALL LEVELS SHOULD ENVISAGE AND DO EVERYTHING POSSIBLE TO INSURE THAT LEADING INDUSTRIAL SECTORS CONSTANTLY INSURE THE RAPID MODERNIZATION OF EQUIPMENT AND THE CREATION OF FUNDAMENTALLY NEW WEAPONS.

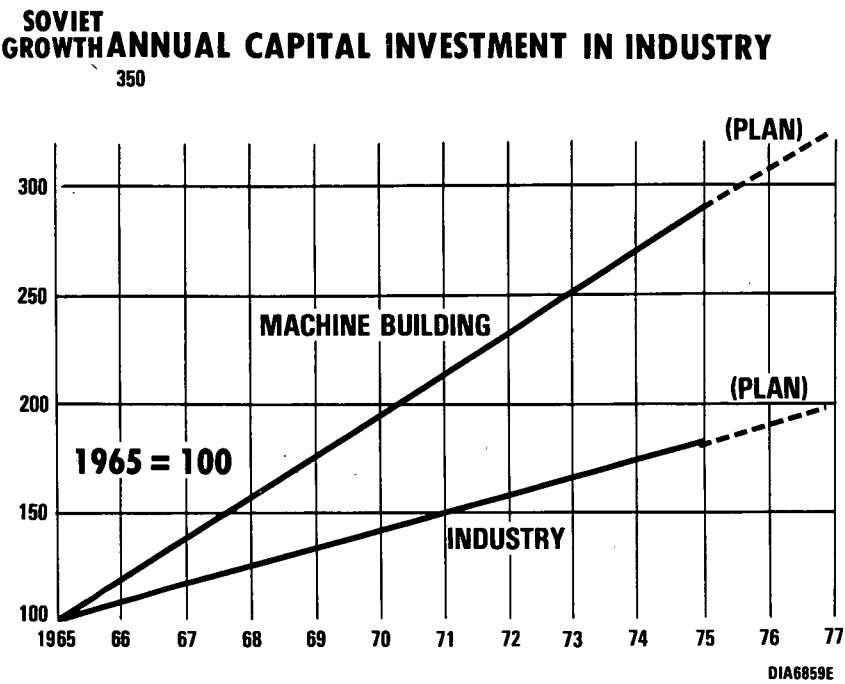
PLANNED ECONOMY, 4 January 1978

DIA6859E

In their pursuit of new systems, the Soviets are investing large amounts for the construction and expansion of military industries. While the value of these investments cannot be directly measured, additions to capacity in the sector producing most of the military hardware indicates the stress being place on such activities.

The Soviet machine building sector, which delivers one-third of its output to military use, is expanding much faster than the remainder of the economy. Between 1965 and 1975, annual investment in the machine-building industry increased by about 200 percent. Consequently, the machine-building share of total industrial investment rose from 15 to 25 percent, indicating the priority the Soviets place on this sector. These trends are being continued in the tenth five-year plan. Although much of this additional capacity is available for either civilian or military production, there has been considerable expansion of facilities devoted exclusively to defense output.

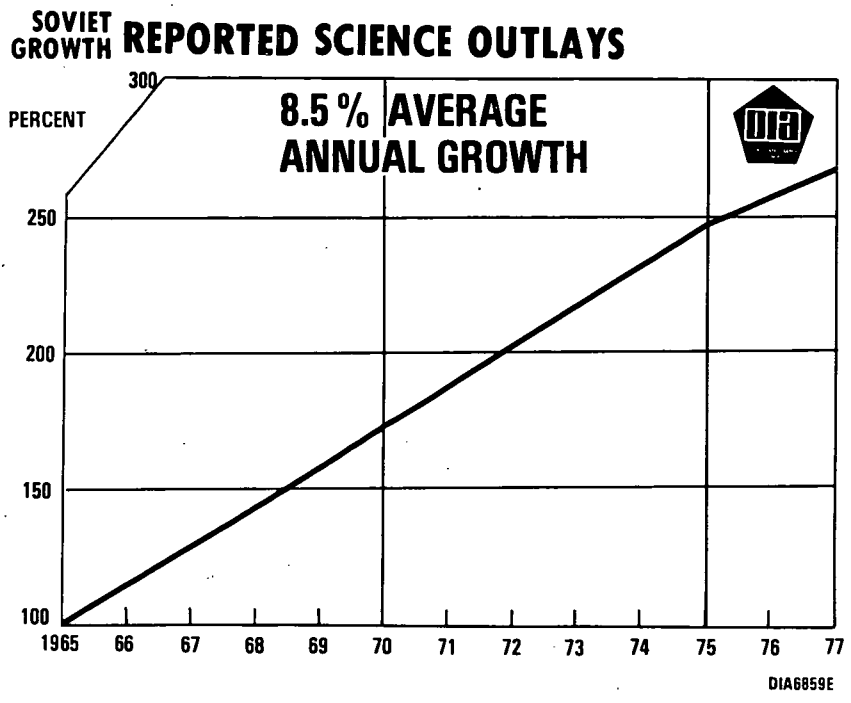
[The chart presented at this point follows:]



SOVIET R. & D.

The Soviets have been spending a considerable amount on science. We believe the rapid growth in this sector of 8.5 percent was prompted by military R. & D. and space outlays, which may represent the majority of these science expenditures.

[The chart presented at this point follows:]



MILITARY R. & D.

To carry out their research and development, the Soviets have established an extensive R. & D. base that is continuing to expand. In the process of acquiring a large number of weapon systems, they have followed certain cardinal rules of design and development, regardless of the type of weapon system being considered.

[The chart presented at this point follows:]

CARDINAL RULES OF DESIGN & DEVELOPMENT

- OFF-THE-SHELF HARDWARE
- PROVEN TECHNOLOGIES
- NEW SUBSYSTEMS ONLY AS EXCEPTIONS
- SIMPLE OPERATION AND REPAIR
- REDUCE RISK AND DEVELOPMENT TIME
- INNOVATIONS AND TECHNICAL SURPRISES

DIA6859E

Off-the-shelf hardware is used extensively, so that a single component may be used in a number of different weapons designed over a span of 10 years or more. [Security deletion.]

Consistent with the design handbook requirements, only proven technologies are utilized in weapons design and development.

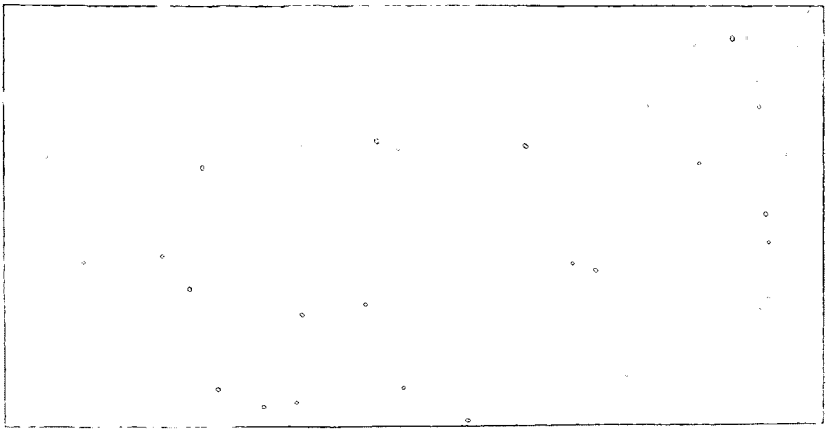
New subsystems are developed only as exceptions when existing subsystems cannot meet the required performance characteristics.

Basic to all weapons development is the apparent philosophy of keeping the system as simple and easy to operate and repair as possible. This increases reliability, decreases training requirements, and makes production cheaper and easier. The fact that versatility and performance may be lessened appears to be an acceptable cost to the Soviets.

Soviet practices tend to reduce both risk and development time. Progress occurs in small measured steps rather than leaps and bounds, though innovations and technological surprises are a growing possibility. Good examples here are the BMP armored vehicle and the T–72 tank.

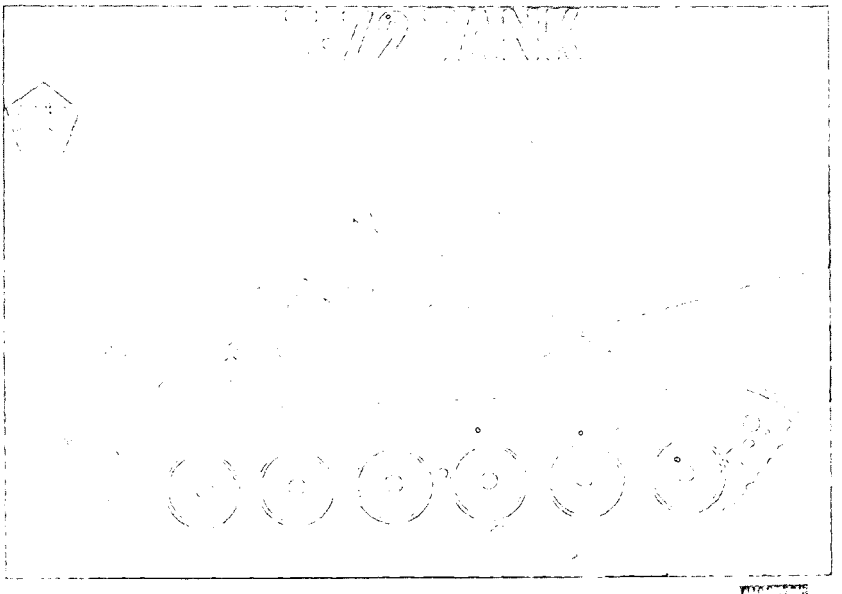
[The chart presented at this point follows:]

BMP



Although fielded in 1967, the BMP's advanced capabilities in mobility, firepower, survivability, and CBR protection have allowed it to remain the world's finest integrated fighting unit. Equally impressive are the technological advances of the T–72 tank, particularly in firepower, mobility, and fire control. However, introduction of its automatic loader countered a future manpower problem by reducing the crew from four to three men.

[The chart presented at this point follows:]



AERODYNAMICS SYSTEMS—INVESTMENTS

The Soviet aerodynamic systems have long held a high priority in R. & D. resource investments. Sustained expansion of research, design, and test facilities, extensive prototyping, and program continuity characterize this segment of the Soviet defense R. & D. sector. [Security deletion.] The extensive R. & D. base has grown by nearly [security deletion] percent since 1965 and continues to expand today. These growth trends, uniform in all phases, are unmatched by any other country in the world. A mature technological base has been established, providing the capability for achieving increasingly complex system developments. The continued expansion reflects plans for future weapons development.

[The chart presented at this point is a security deletion.]

MISSILE/SPACE SYSTEMS—INVESTMENTS

The impressive increase of R. & D. facilities during the 1960s and 1970s is vivid evidence of the importance the Soviets have atached to their ballistic missile and space systems.

[Security deletion.]

[The chart presented at this point is a security deletion.]

These facilities have also grown over [security deletion] percent since 1965, and growth of these facilities in all phases continues today. This expansion reflects their sustained high priority and, in particular, Soviet plans for future development. Their capability for carrying out development of complex systems and achieving significant technological advances continues to grow. The real payoff from this large investment may not be fully realized in terms of new weapons procurement until the 1980's.

R. & D. MANPOWER

Perhaps the most important aspect of the Soviet technological base is its pool of research and development manpower. Through the years the Soviets have made a large and sustained investment in this sector of the R. & D. base, and have established an extensive educational system to support their R. & D. manpower requirements. As with other national resources, the defense sector has historically been accorded a high priority in the allocation of this important asset. The top scientists and engineers, as well as administrators, are directed into the country's defense R. & D. programs. Prestige, material benefits, high level support, and the best of equipment are part of the advantages of defense R. & D. employment.

[The chart presented at this point follows:]

SOVIET R&D MANPOWER

- LARGE INVESTMENT
- PRIORITY ALLOCATIONS TO DEFENSE SECTOR

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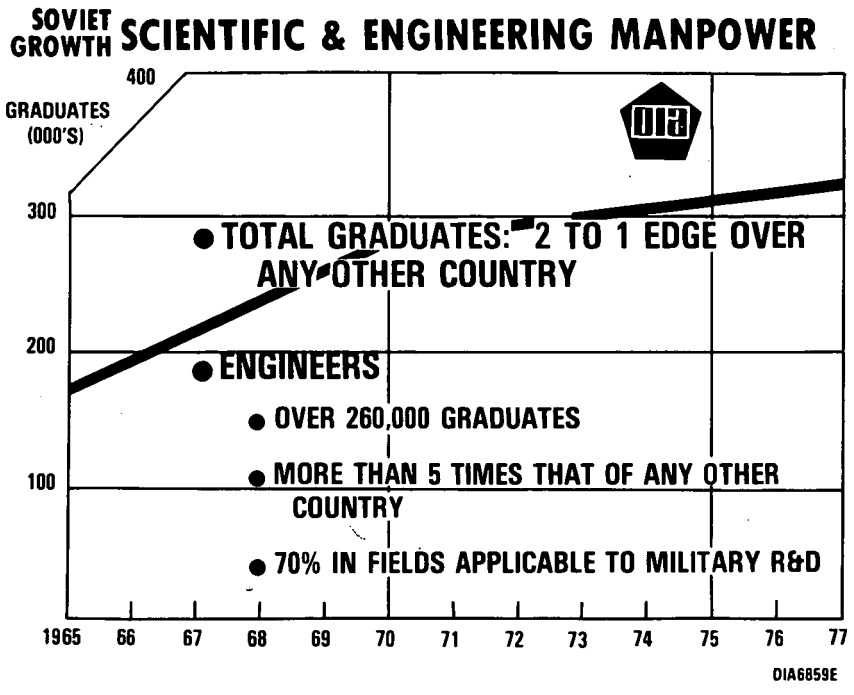
MANPOWER GROWTH—SCIENTIFIC AND ENGINEERING GRADUATES

The Soviet Union continues to grant top priority to the training of scientific and engineering manpower. In 1977, the U.S.S.R. graduated more engineers than the United States has in the past five years.

[The chart presented at this point follows:]



On balance, the Soviets, with over 300,000 science and engineering graduates in 1977, hold a two-to-one edge over any other country, and will clearly continue to do so into the 1980's. Of this total, over 260,000 are engineering graduates, which is more than 5 times that of any other country.

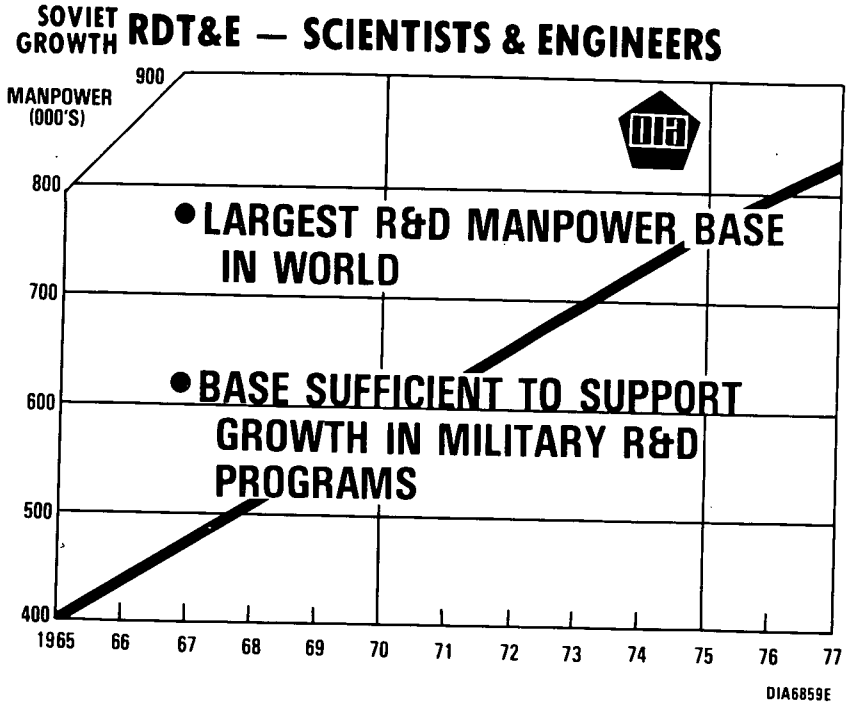
This quantitative edge is tempered somewhat by the way the Soviets define their needs for, and frequently utilize their engineers. They, more so than the United States, tend to use engineers in positions that could be filled by technician-level personnel. In terms of the quality of Soviet engineers, this undoubtedly varies considerably depending largely on the school, just as it does in the United States. In general, the engineers graduated from the top Soviet schools are probably as well trained as those engineers educated in the best U.S. schools.

Seventy percent of these engineers are graduated in fields applicable to military R. & D. This is not to imply that they all will go into this sector—but it does indicate that a large pool of trained personnel are available for defense-related R. & D.

MANPOWER GROWTH—R. & D. SCIENTISTS AND ENGINEERS

As a result of this effort, the U.S.S.R. has developed the largest R. & D. manpower base in the world. It is estimated that in 1977 over 800,000 scientists and engineers were engaged full time in R. & D. As a comparative note, the U.S.S.R. passed the U.S. in sheer numbers in the 1968–69 time frame and presently holds a better than 200,000 man lead in R. & D. manpower. This base is sufficient to support growth in military R. & D. programs for many years.

[The chart presented at this point follows:]



R. & D. RESULTS AND FUTURE TRENDS

Aerodynamic systems—Achievements

Aerodynamic system developments illustrate the magnitude, continuity, priority, and, to a degree, the effectiveness of the aviation industry's R. & D. effort. More than [security deletion] new aircraft systems since World War II—including roughly [security deletion] aviation systems per year over the last ten years—have evolved through the growth and application of R. & D. resources.

Based on historical development trends and the continuity of R. & D. resource growth, there could easily be as many as [security deletion] new aviation systems during the next decade, including fighters, bombers, and transports, for a wide variety of military missions. Soviet systems are expected to exhibit the basic incremental off-the-shelf approach established over the past several decades. Their growing S. & T. capability, however, is increasing their potential for significant advances and breakthroughs in critical technologies—such as propulsion, fuels and materials—that could enable them to develop new systems.

[The chart presented at this point is a security deletion.]

Missile and space systems—Achievements

The Soviet missile and space system development has also been characterized by significant advances. A cumulative total of more than [security deletion] new systems has been identified since the 1950's.

Over the last decade, an average of [security deletion] new systems per year have appeared. While there has been renewed emphasis on spacecraft, the development of ballistic missiles may still enjoy the highest priority in the Soviet military R. & D. system.

In the next decade. [security deletion] new ballistic missiles are expected to appear, and space development activities will continue at a high level.

[The chart presented at this point is a security deletion.]

Navy systems—Achievements

Soviet R. & D. has produced a series of naval ship developments at a rate unmatched anywhere in the world. In the post-World War II period, they have developed approximately [security deletion] new classes of ships. In the last decade, they have averaged [security deletion] new ship classes each year.

In the next decade, at least [security deletion] new ship developments are expected. These will include:

Major surface combatant classes;
Submarine classes; and
Aircraft carrier.

[The chart presented at this point is a security deletion.]

Ground-force systems—Achievements

The extensive Soviet effort in ground force systems development has resulted in a significant qualitative increase in the effectiveness of army materiel. Since World War II, a total of nearly [security deletion] new systems have been developed. Of these, approximately [security deletion] were major ground force weapon systems, including artillery, tanks, armored personnel carriers, and ADA systems. Over the last decade, ground force weapon developments have averaged approximately [security deletion] major systems per year. In addition, some [security deletion] small ground force weapon systems have appeared, including small arms and antitank guided missiles.

Based on investments and recent trends, at least [security deletion] new major systems can be expected in the next decade.

[The charts presented at this point are security deletions.]

TECHNOLOGY TRANSFER

Soviet technological requirements.—There is a continuing Soviet dependence on Western Technology. This began after World War I and still exists today, as the doors of virtually all U.S. companies are open to the Soviets and their Pact allies.

[The chart presented at this point follows:]

TECHNOLOGY TRANSFER MECHANISMS

The Soviets have developed a technology transfer program to identify and exploit western government, commercial, and private sources to the point where they employ virtually every conceivable means to define, learn, and extract information and technology.

In addition to the direct flow from the United States to the Soviets, there is also the free use of the services of their Eastern European allies as a conduit for the acquisition of western technology. They have mounted an intensive effort by:

Acquiring turn-key plants,

Training at U.S. industrial plants, including computer applications to manufacturing, and

Visits of U.S. plants and manufacturing facilities.

[The chart presented at this point follows:]

American production know-how remains decidedly ahead of the Soviets.

SOVIET STATEMENT ON TECHNOLOGY TRANSFER

A statement from [security deletion] provides an appropriate summary of this effort.

[The chart presented at this point is a security deletion.]

SALES OF WESTERN TECHNOLOGY

Over the past 4 years there have been $14 billion in total Soviet imports of western machinery and equipment, including $600 million in approved Coordinating Committee, or COCOM, exception requests of embargoed goods and and technology. In addition, there has been an estimated [security deletion] dollars of detected diversions of embargoed equipment and technology.

[The chart presented at this point follows:]

SALES OF WESTERN TECHNOLOGY
1974-1977

TOTAL SOVIET IMPORTS OF WESTERN TECHNOLOGY — **$14 BILLION**

TOTAL APPROVED COCOM EXCEPTION SALES — **$600 MILLION**

ADDITIONAL DETECTED DIVERSIONS OF EMBARGOED TECHNOLOGY — [Security deletion] **MILLION**

DIA6859E

Sales of Western equipment and technology have been facilitated by reductions in the length of both the COCOM embargo list and the U.S. unilateral embargo list, called the Commodity Control List. In 1970 the U.S. Commodity Control List included 2,692 items. By 1972 it had fallen to 1,073, and in 1978 it numbered 720. The latest numerical reduction, however, is in part due to a restructuring of the list. The COCOM list is now under review by the participating nations with further reductions anticipated.

[The chart presented at this point follows :]

U.S. COMMODITY CONTROL LIST REDUCTIONS

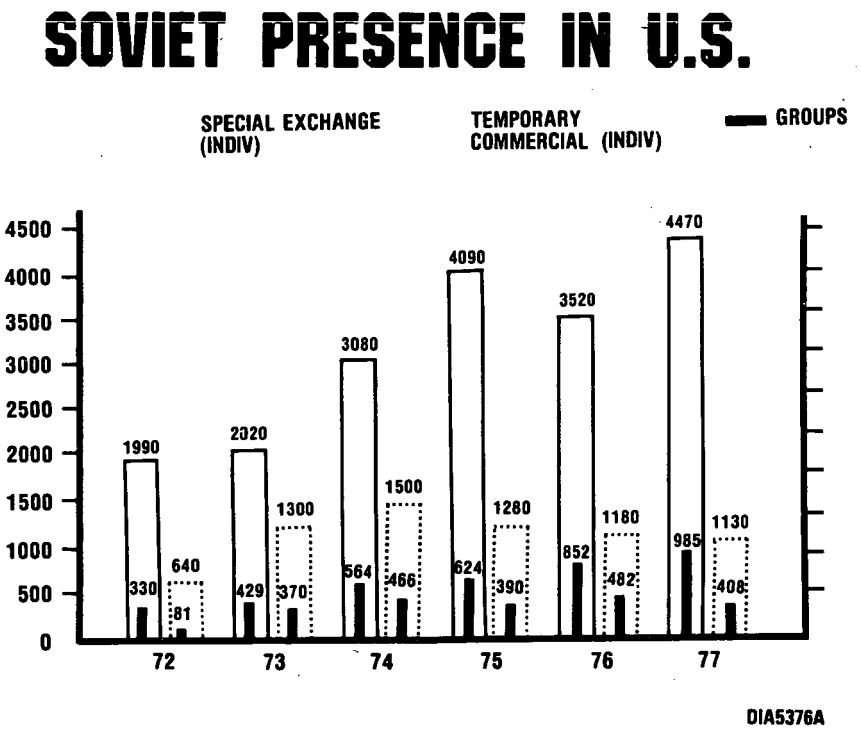
YEAR	SIZE OF CONTROL LIST
1970	2,692 ITEMS
1972	1,073 ITEMS
1978	720 ITEMS

DIA6859E

SOVIET PRESENCE IN UNITED STATES

Since 1972, there has been an increasing Soviet presence in the United States. As a result of numerous bilateral agreements, the number of Soviet special exchanges has grown as shown here. Included in his flow of visitors are students, faculty, scientists, athletes, artists, and tourists. The number of Soviet commercial visitors has also shown impressive growth as indicated here.

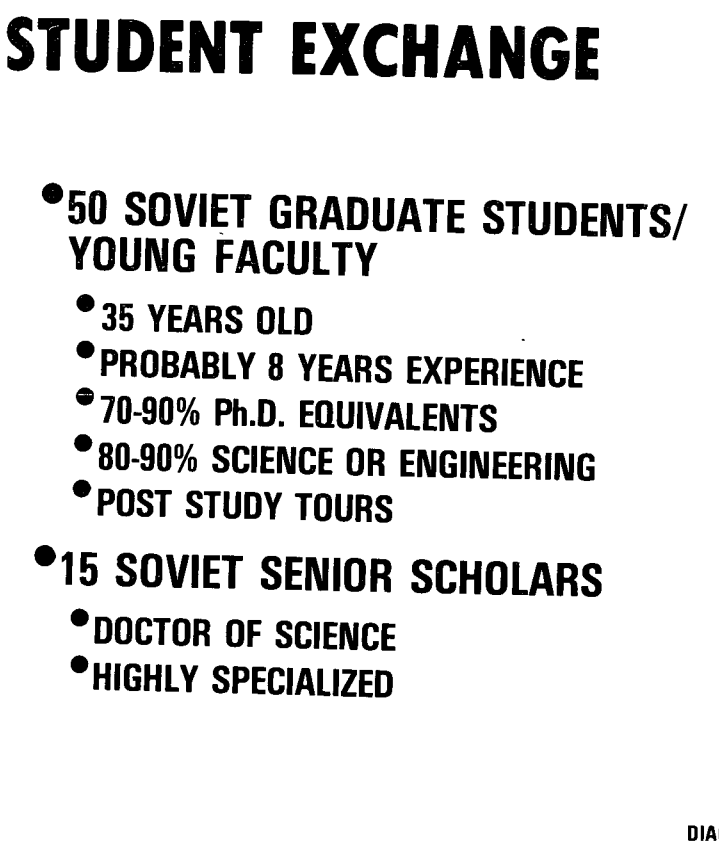
[The chart presented at this point follows:]



STUDENT EXCHANGE

Each year the U.S.S.R. and the United States exchange graduate students, young faculty, and senior scholars. As shown here by their typical characteristics, the Soviets are much more experienced in technological areas useful in military and industrial development. In contrast, U.S. students and faculty members are typically young masters or Ph. D. candidates studying history, social sciences, or the fine arts. Very few pursue the physical sciences or engineering.

[The chart presented at this point follows:]



The 10 bilateral technical agreements that exist between the United States and the Soviet Union are another area of concern. These agreements cover approximately 300 separate projects, some of which are of concern to the Department of Defense because of the high technology involved. These agreements facilitate the exchange of some 700 to 1,000 persons per year from each side in specific topical areas and encourage the Soviets to establish direct contacts and cooperation with private companies in the United States. Approximately 70 to 80 such agreements are known to exist.

[The chart presented at this point follows:]

BILATERAL TECHNICAL AGREEMENTS

- SCIENCE & TECHNOLOGY
- ENVIRONMENT
- SPACE
- HEALTH, HEART & MEDICINE
- AGRICULTURE
- OCEANOGRAPHY
- TRANSPORTATION
- ATOMIC ENERGY
- ENERGY
- HOUSING

COVERS 300 SEPARATE PROJECTS INVOLVING U.S.-USSR TECHNICAL EXCHANGES

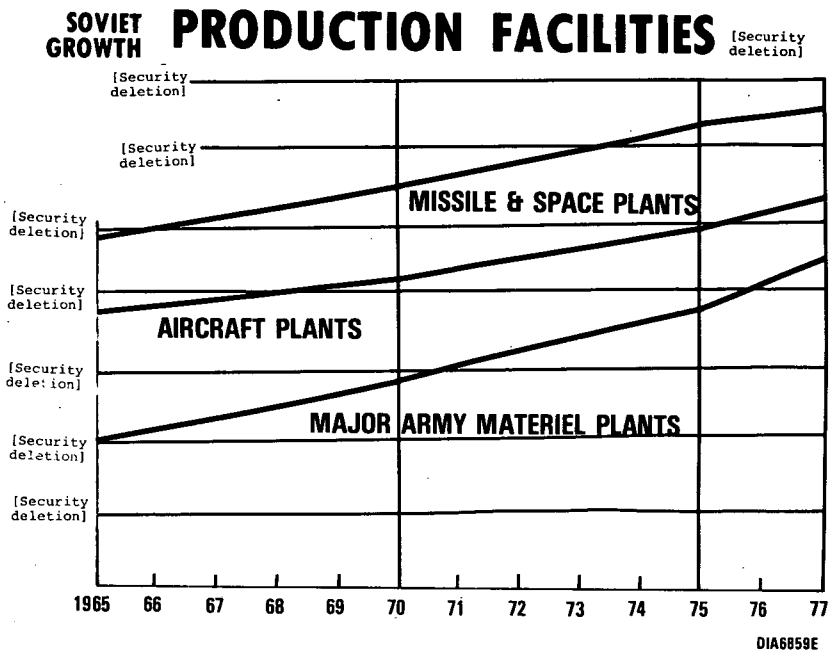
DIA6859E

PRODUCTION BASE

For the reasons cited in my introductory remarks, the Soviet defense industry, which encompasses ground, Aerospace and Naval production facilities, has traditionally received first priority. Since the end of World War II, the Soviets have been committed to strengthening the military production base across the board for all sizes and categories of weapons.

This chart illustrates the steady growth of the aerospace, which includes aircraft and missiles, and Army materiel production facilities. The Army materiel plants have had the greatest rate of growth, while the already large aerospace industry has continued to show steady growth. The input data for these growth lines include only final assembly plants or facilities that can be classified as prime contractors. [Security deletion.]

[The chart presented at this point follows:]



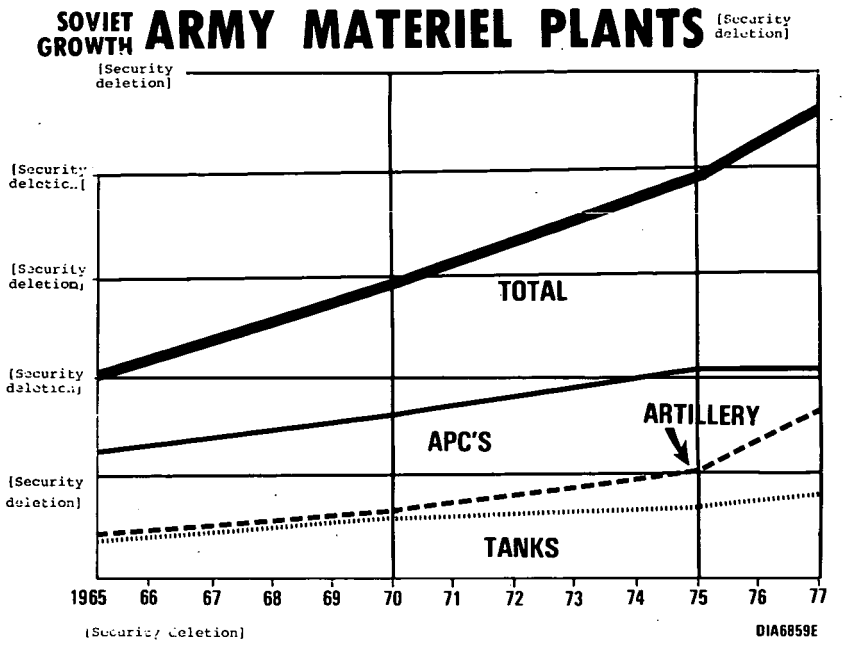
This expansion cannot be equated solely to increased numbers produced. It can also indicate increased sophistication of weapons, more efficient production, or a unique requirement due to size or change in manufacturing techniques. [Security deletion.]

The shipbuilding industry has not been included, because shipyards are not quantifiable in the same terms as other sectors of the defense industry. I will show later that there has also been a significant modernization and expansion of Soviet shipyards since 1965.

EXPANSION OF PRODUCTION FACILITIES

For purposes of this briefing we are limiting our discussion of Army materiel production plants to those producing tanks, armored personnel carriers, and artillery. This is the smallest sector of the defense industry [security deletion].

[The chart presented at this point follows:]

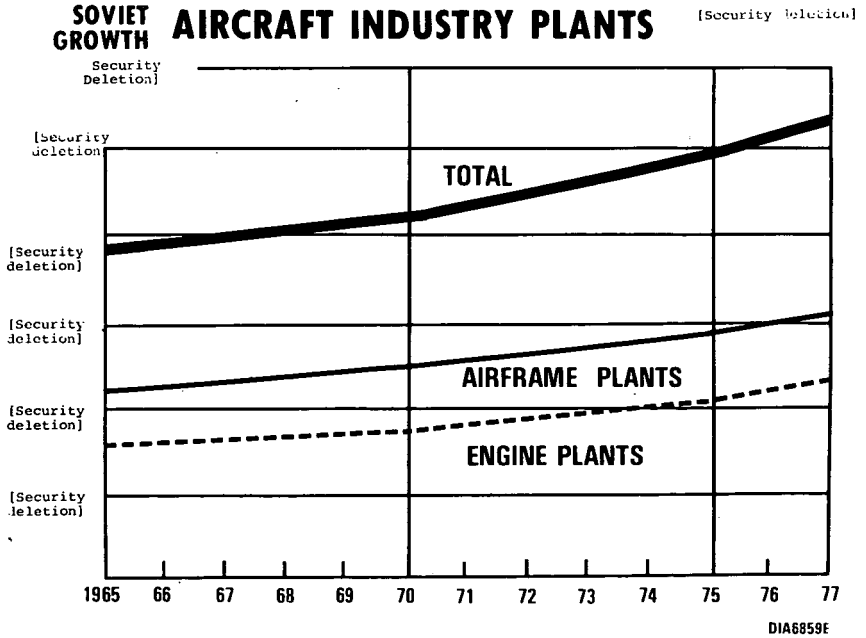


[Security deletion.]

[The charts presented at this point are security deletions.]

The aircraft industry has also shown steady growth since World War II, largely by expansion of existing facilities rather than the construction of new plants.

[The chart presented at this point follows :]



[Security deletion.]

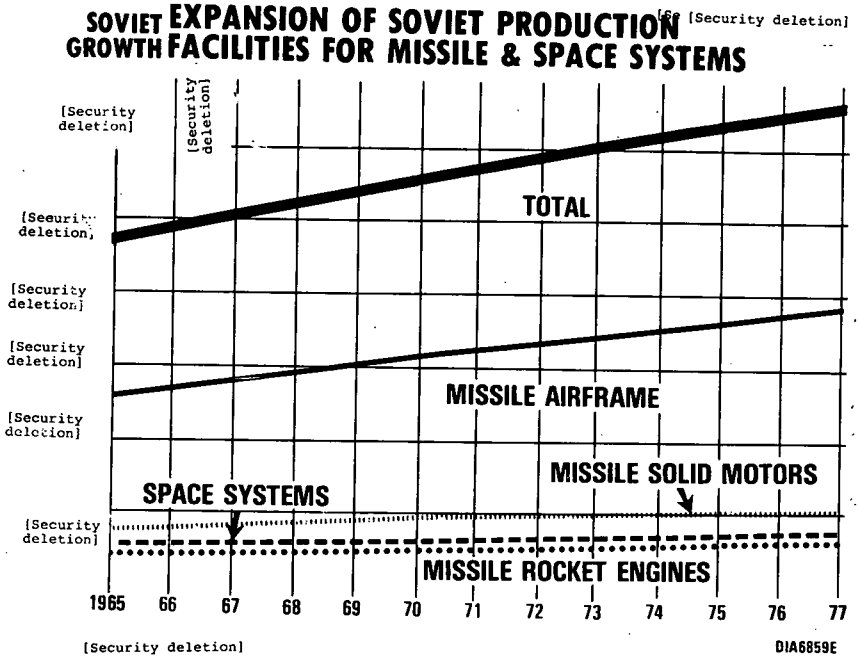
The continuous growth of the Aerospace Industry and its increase in capacity since World War II is expected to continue at close to present levels for at least the next [security deletion] years.

[The charts presented at this point are security deletions.]

[Security deletion.]

The Soviet missile and space production facilities [security deletion] and Soviet capacity to build missiles has been growing steadily since 1965. [Security deletion.]

[The chart presented at this point follows:]



[Security deletion.]

[The chart presented at this point is a security deletion.]

[Security deletion.] This comparison is misleading for the shipbuilding industry.

In the last ten years, the Soviets have added [security deletion] floating drydocks to the repair capability of their new and existing shipyards. These drydocks, a premium shipyard resource, have lift capacities ranging from 2,500 and 30,000 tons and in number represent a [security deletion] percent increase in the last decade.

[The chart presented at this point follows:]

[Security deletion]

EXPANSION OF SOVIET NAVAL SHIPYARDS

[Security deletion]

- NEW FLOATING DRYDOCKS FOR SHIP REPAIR

[Security deletion]

- NEW SHIPYARDS

[Security deletion]

- SHIPYARDS DOUBLED IN SIZE

[Security deletion]

- SHIPYARDS MODERNIZED

[Security deletion]

DIA6859E

During the same period, five new shipyards have been built, the facilities of [security deletion] existing yards have been increased by nearly 100 percent, and [security deletion] yards have been modernized and expanded by between 20 and 90 percent.

In shipyards, the activity often includes new construction and overhaul of surface ships, submarines, and merchant ships.

As an example of the diversity of operations and continued expansion [security deletion].

[Security deletion] most of the new yards, are fitted with the most efficient level building ways, equipped with heavy lift cranes and transporters, and employ a straight line material flow. They are versatile in that they are equipped with drydocks, and their launch facilities are able to retrieve ships for performing hull repairs. Still, the Soviets continue to build and upgrade shipyards.

[The chart presented at this point is a security deletion.]

[Security deletion.]

[The chart presented at this point is a security deletion.]

Having reviewed the various major sectors of the Defense Industry, it is evident that considerable expansion has occurred and is still in progress. This expansion can be equated to one of the results shown here or to a combination of these factors.

[The chart presented at this point follows:]

SUMMARY

- STEADY EXPANSION SINCE 1965
- EXPANSION EQUATES TO:
  - INCREASED OUTPUT
  - INCREASED SOPHISTICATION
  - INCREASED PRODUCTION EFFICIENCY
  - BETTER ACCOMMODATION OF NEW SYSTEMS

DIA6859E

WEAPONS PRODUCTION AND PROCUREMENT

Turning now to weapons production and procurement, the Soviet industrial base allows self-sufficiency in meeting the requirements of Soviet armed forces, those of their Communist allies, and many third world clients. Soviet industry also permits a balanced approach to improving strategic, tactical, and defensive capabilities, and has allowed them to become a major arms supplier. This capability to export weaponry has provided the Soviets with an effective means of acquiring hard currency and simultaneously penetrating many areas of the world, both economically and politically.

[The chart presented at this point follows:]

WEAPONS PRODUCTION

- SELF SUFFICIENT
- BALANCED APPROACH
- ALLOWS SOVIETS TO BE A MAJOR ARMS SUPPLIER
- NO "FEAST OR FAMINE" SYNDROME
- PRESENT PATTERN: HIGH LEVEL OF PRODUCTION WITH MODERATE INCREASES

DIA6859E

Soviet defense industries are much less subject to significant cutbacks in output than are U.S. companies, which is one advantage that the Soviet planned economy has over the U.S. economy. This virtually eliminates the "feast or famine" syndrome in the U.S.S.R. When there is a cut-back in military programs, workers are more likely to be kept at the plant working on a civil project until a new military product is phased in.

As would be expected, the present pattern of production is one of high and moderately increasing production rates in many weapons systems. I will use data on both the value of military procurement and actual hardware production to illustrate the increases in military strength which the Soviets are obtaining from their commitment of resources to the military sector.

The Soviets take great pains to ensure the correctness of their weapons acquisition decisions. The weapons development cycle requires that all Soviet weapons systems must pass through a series of stages [security deletion.]

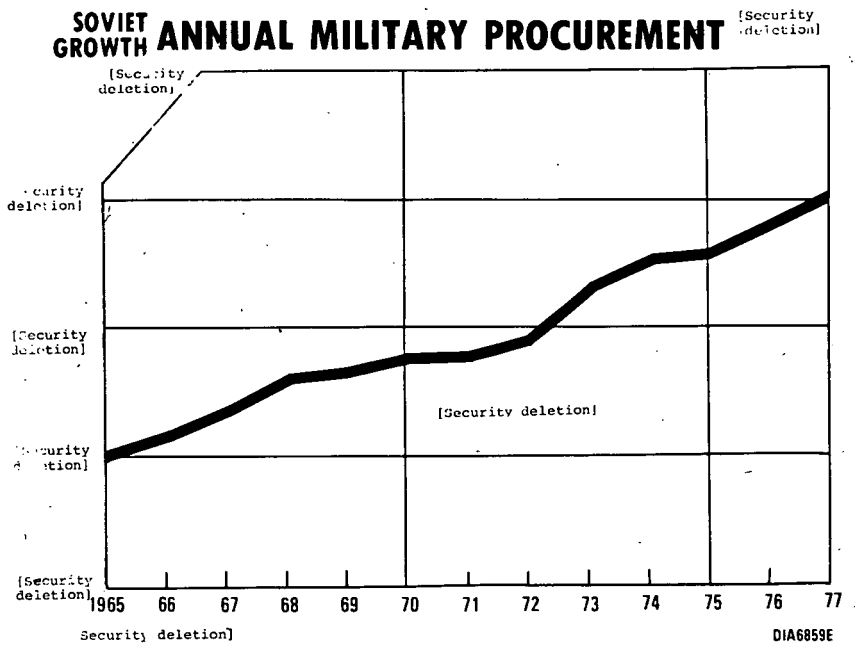
[The chart presented at this point is a security deletion.]

[Security deletion.]

The actual weapons design and development takes place in design bureaus with assistance provided by scientific research institutes [security deletion]. These stages are used to organize the activities of the often large numbers of organizations involved in weapons research and development. Each stage requires volumes of design and technological documentation. Before the completion of a stage, all applicable documentation and hardware is reviewed by a maze of governmental, research, design, production, military, and ministerial organizations. The rigorous review process and heavy documentation ensure that a consensus on the systems develops and strengthens as each program progresses. [Security deletion.]

After the decision has been made to enter series production, the systems are produced and added to military inventories. Such additions can best be illustrated by the trend in the total dollar value of all military procurement over time.

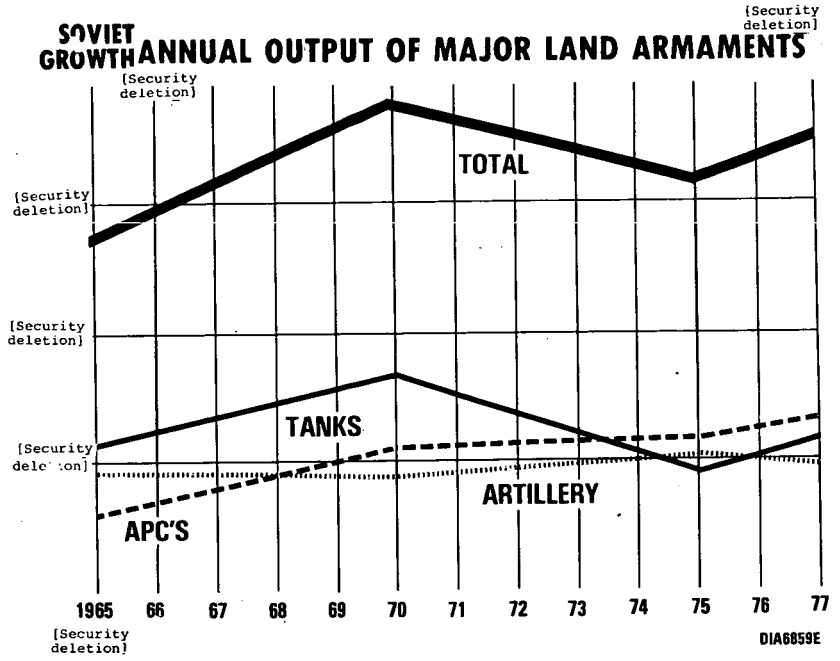
[The chart presented at this point follows:]



Between 1965 and 1977, the value of all Soviet investment in military hardware rose by about 50 percent. This average increase conceals some substantial variations in trends among different weapons systems.

I will now address the production of army, navy, and aerospace weapons. Significantly more land armaments were produced in 1977 than in 1965. This reflects a renewed development of general purpose forces, following a period when Khrushchev emphasized strategic forces. As shown here, there are variations in production levels of selected major land armaments over time. Variations in output levels are indicative of changeovers to more modern models rather than long term decisions to manufacture more or fewer weapons.

[The chart presented at this point follows:]



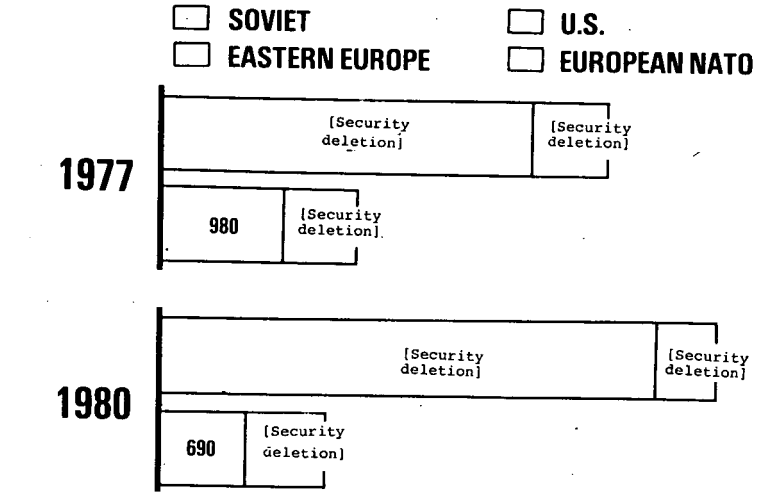
In the tank category, the 1970 output of [security deletion] tanks represents a period when T–62 production was at its peak. The low output of 1975 represents the phasing out of the T–62 and the production build up of the T–72. By 1980, T–72 production could reach [security deletion] per year.

To highlight the significance of the production capability, this graphic compares current and projected NATO and Warsaw Pact tank production.

[The chart presented at this point follows:]

ESTIMATED NATO-WARSAW PACT TANK PRODUCTION

[Security deletion]



[Security deletion]

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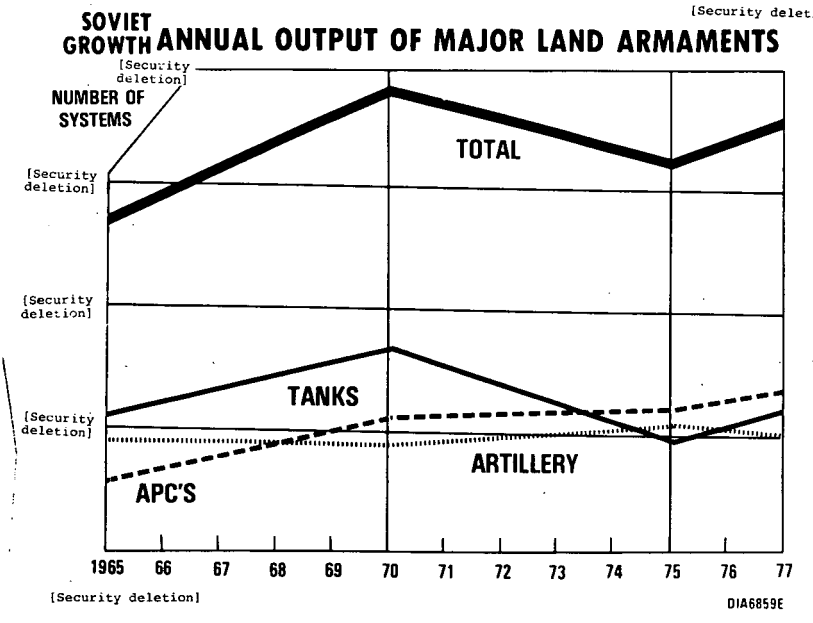
[Security deletion] output has remained fairly constant. This is due to the increased production of larger, more complex self-propelled gun-howitzer systems. Output of APC's increased steadily in the late 1960's and early 1970's with the introduction of the infantry combat vehicle, and has since shown a continued moderate upward trend.

[The chart presented at this point follows:]

[Security deletion]



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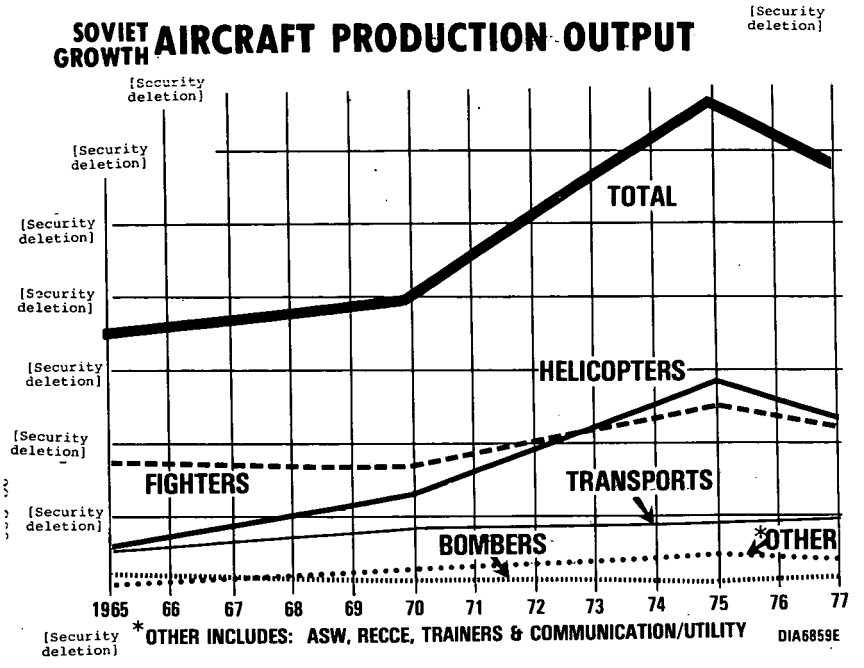
Turning to aircraft production, high military and civil output levels have been achieved during the 1970's. Between 1965 and 1975, output rose by nearly [security deletion] percent [security deletion].

[The chart presented at this point follows:]



The Soviets have continued to upgrade their Frontal Aviation tactical air force. As a result, fighter and helicopter programs have comprised the bulk of output during this decade Fighter production has remained around 1,000 units per year during the 1970's which is reflected in both additions to military inventories and fighter exports. A large increase has occurred in the helicopter category.

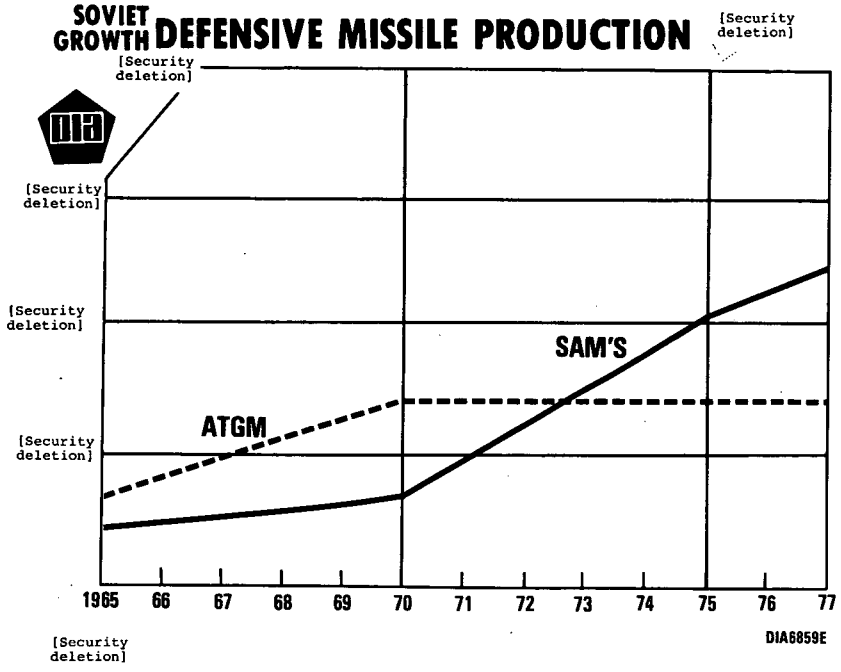
Bomber output has decreased with the elimination of [security deletion] programs. Currently, the Backfire is the only Soviet bomber in production and is being produced at a rate of about [security deletion] per year. Transport and miscellaneous production have remained fairly constant.

[Security deletion.]

[Security deletion] Soviet aircraft production [security deletion] in the next several years, but the total will remain impressive in terms of both quantity and sophistication of products.

Soviet defensive missile production has increased greatly since 1965, primarily as the result of increases in SAM output and, to a lesser degree, antitank guided missile output. These two categories comprise over [security deletion] percent of total missile production [security deletion].

[The chart presented at this point follows:]



Examining total production of approximately [security deletion] missiles per year may give a distorted impression. This chart, showing recent production trends for some of the larger systems provides another perspective.

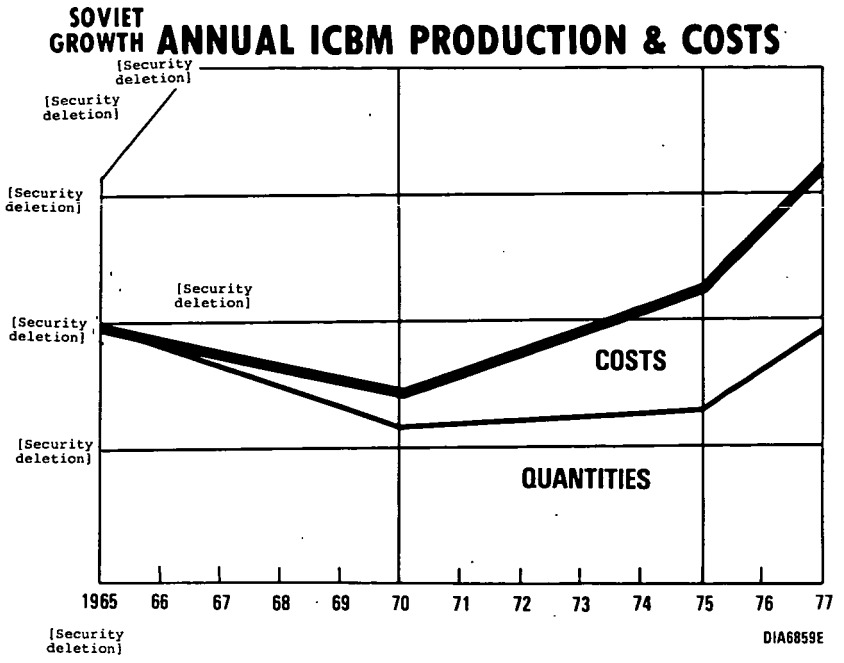
[The chart presented at this point is a security deletion.]

The current generation of ICBM's and SLBM's, the SS–17, 18, and 19, and the SS–N–18, is now being series produced in support of deployment. Although the deployment status of a fourth new ICBM—the mobile SS–16—and a second SLBM—the SS–NX–17—is unclear, the Soviets have the capability to rapidly implement large scale series production.

[Security deletion.]

The trend toward increasingly sophisticated and expensive missiles is shown here by contrasting the trends in cost and production quantities of Soviet ICBM's. This demonstrates the increasingly expensive components which are being used in Soviet missiles, adding significantly to the quality of those hardware items actually procured.

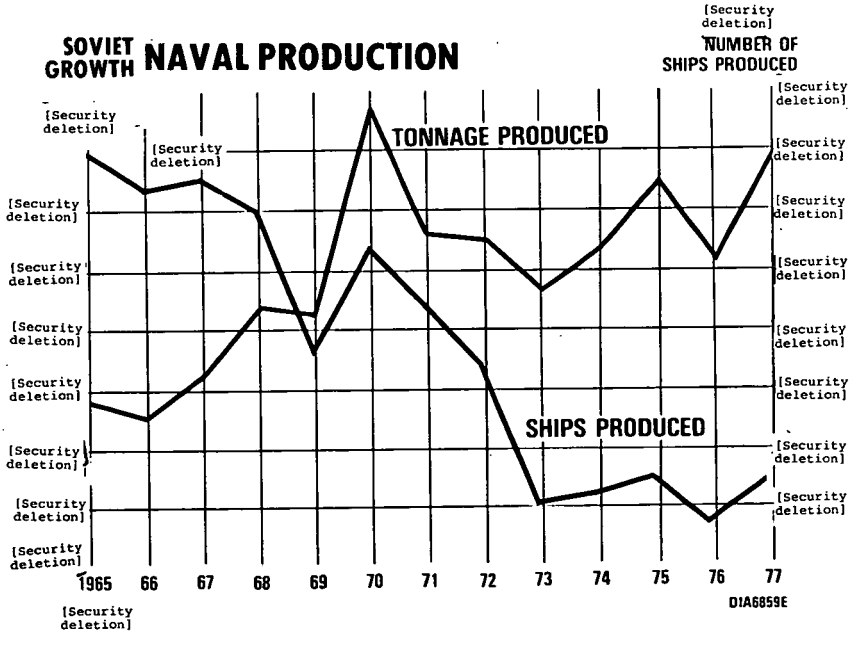
[The chart presented at this point follows:]



Turning to naval weapons, shipbuilding activities in 1977 reinforce the assessment that Moscow is committed to the continuing development of a Navy capable of projecting a worldwide maritime presence and improving its sea-based nuclear deterrent force.

The general trend of Soviet naval construction during the past decade is best expressed as a very stable ship production effort. [Security deletion.]

[The chart presented at this point follows:]



Soviet shipyards are not now, nor are they expected to be a constraint of naval production in future years. We expect to see the current constant production effort continued.

We expect to see the shift continue to larger, more sophisticated, higher quality units. [Security deletion.]

[The chart presented at this point is a security deletion.]

[Security deletion.] The development of new classes of combatants and support ships, reinforced by the growth of the Soviet merchant fleet—especially such types as roll-on roll-off ships and specialized container or barge carriers that are rapidly convertible to naval support uses—indicate an increasing emphasis on the modernization and expansion of an open ocean navy.

Indications of this ongoing modernization [security deletion] by construction of a [security deletion].

[The chart presented at this point is a security deletion.]

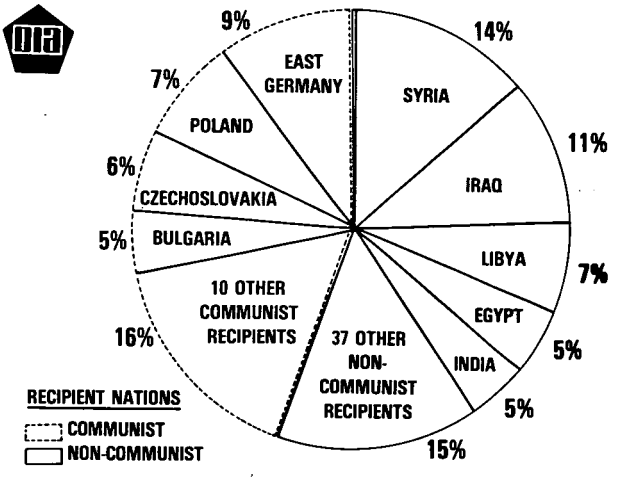
Additionally, construction continues on the third unit [security deletion] of the *Kiev* class carriers [security deletion] at Nikolayev [security deletion].

[The chart presented at this point is a security deletion.]

What is the effect of military assistance on defense expenditures and the defense industry?

[The chart presented at this point follows:]

ESTIMATED SOVIET MILITARY ASSISTANCE DELIVERIES WORLDWIDE, 1973—1977



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Soviet military equipment valued at over $20 billion has been exported to free world and Communist recipient nations over the past 5 years. Shown here are the principal recipients, communist and noncommunist, of Soviet weapons. The export value represents known or estimated equipment deliveries costed in trade prices. Soviet deliveries are comprised primarily of new equipment, although some export items represent equipment retired from Soviet inventories or stockpiles, such as Mig-17 and Mig-19 aircraft, and T–54 and T–62 tanks. The net effect of military equipment exports on Soviet defense expenditures is minimal. In many cases, equipment transferred is less sophisticated than that currently produced for Soviet inventory. Repayment for exported materiel, either in trade goods or hard currency, has become a more common requirement as grant aid and discount provisions have gradually disappeared from Soviet military assistance agreements.

The Soviets measure the success of their materiel export program in political rather than economic terms. Foreign policy considerations often far outweigh the relatively meager expense incurred. Foreign military assistance has been employed for more than two decades as a major Soviet instrument for expanding its influence in the Third World.

The Soviets plan their annual production of Aerospace and Army materiel to accommodate a significant number of exports.

[The chart presented at this point is a security deletion.]

[Security deletion.] In the aircraft category, some 20 to 30 percent of annual fighter aircraft production has been exported. In the missile category, unknown but significant quantities of surface-to-air, air-to-air, and antitank guided missiles are exported. In the army category, from 15 to 20 percent of the medium tanks produced have been exported. Therefore, it can be concluded that export requirements have some effect on production planning.

To summarize, we foresee little or no "cooling" of the pace of development of new weapons and weapon systems and expect continued industrial growth of both development and production facilities. Therefore, no significant change in the production pattern is expected. We do not foresee any great or sustained increases in numbers produced, at least for the rest of this decade and possibly into the next. The greatest emphasis will be on increasing the quality of the product, rather than on quantity, efficiency, or cost reduction. The U.S.S.R. will remain a leader in arms sales throughout the world.

[The chart presented at this point is a security deletion.]

MANPOWER

Let's look at Soviet manpower trends and their military-economic prospects. After developing and procuring the military hardware which is viewed as necessary to achieve their goals, the Soviets must still provide the manpower for their military establishment.

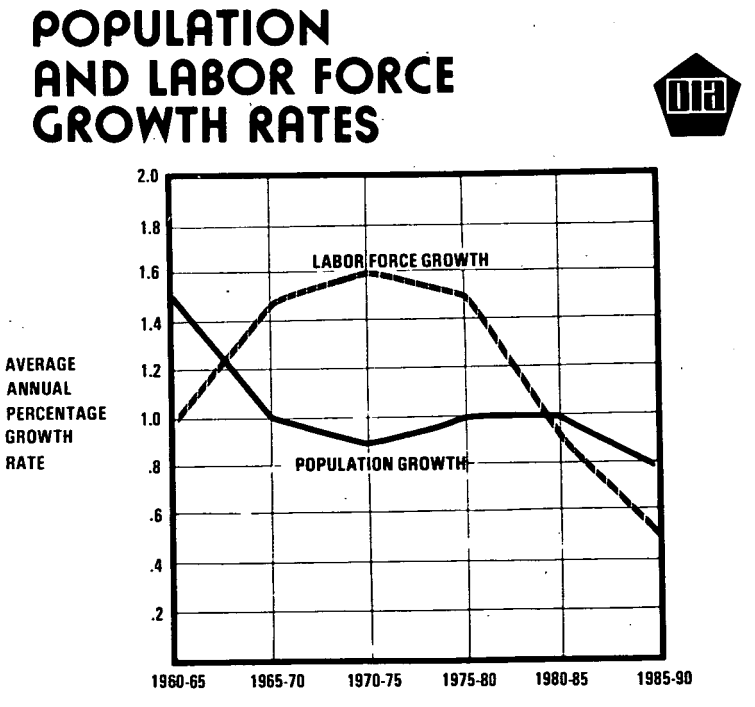
We estimate military manpower in the Soviet armed forces at over 4 million men in 1977, up some 12 percent since 1968. This can be compared with about 2 million military personnel in the United States.

[The chart presented at this point is a security deletion.]

DEMOGRAPHIC TRENDS

The population of the Soviet Union will experience declining growth rates through 1990. More importantly, the labor force will rise even more slowly through 1990. These trends are due to declining birth rates since 1960 and a sharp rise in the number of retirees in the 1980's.

[The chart presented at this point follows:]



The Soviet Union has the highest labor force participation rate in the industrialized world, a level much higher than that of the United States, as indicated here.

[The chart presented at this point follows:]

LABOR FORCE PARTICIPATION RATES-1975

(Percent)

	OF TOTAL POPULATION	OF MALES 20-59	OF FEMALES 20-54
USSR	55	93	89
U.S.	43	91	50

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Future increases in the labor force will come from the group of young people initially attaining working age. However, both the civilian and military sectors need the services of young men, as competition between the two sectors is expected to intensify in the future. The Soviet leadership will be faced with minor problems regarding the distribution of manpower between the military and civilian economy.

I will examine the military implications first.

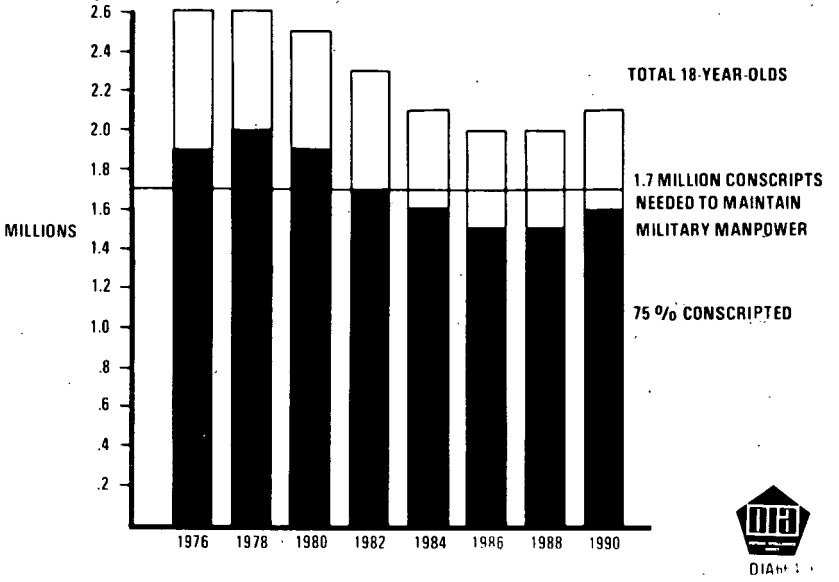
MILITARY IMPLICATIONS

As an illustration of the problem the Soviets will face, we will assume that to maintain the current force size of over 4 million men, the Soviets must draft 1.7 million men per year to serve a 2-year term of service. Difficulties will arise in the 1980's when the number of 18-year-old males drops by over 20 percent from the current level.

If the Soviets do not alter their current policy of inducting about 75 percent of the 18-year-old males, it will be impossible in the mid-1980's to conscript the necessary military manpower. This would reduce the armed forces by 300,000–400,000 men in the 1986–88 period.

[The chart presented at this point follows:]

SOVIET 18-YEAR-OLD MALES AND CONSCRIPTS UNDER PRESENT REGULATIONS



MANPOWER OPTIONS

There are, however, numerous options open to the Soviets to ameliorate this problem. Virtually any combination of the options shown here, some of which are already being exercised, would allow the Soviets to adjust to this decline in population growth. Because the Soviets rely on mobilization of reserves to supply much of their war-fighting capability, they could choose to make no changes in conscription and allow the active force levels to drop. Regardless of the options chosen, we expect frontline divisions to be maintained at or near full strength.

[The chart presented at this point follows:]

MANPOWER OPTIONS

- TIGHTENING DEFERMENT REQUIREMENTS
- DRAFTING TWO AGE GROUPS
- LENGTHENING TERMS OF SERVICE
- ENCOURAGING RE-ENLISTMENTS
- EMPLOYING MORE WOMEN
- RELINQUISHING NON-MILITARY FUNCTIONS
- IMPORTING LABOR
- REDUCING LABOR INTENSITY
- MAKE NO CHANGES

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ECONOMIC IMPACT

A reduction in Soviet population and labor force will contribute to a slower growth in the economy from the current 4 percent annual rate to between 3 and 3½ percent during the 1980's. The inflexibility of the Soviet economic system and the overall decline in the growth of economic inputs, such as land, labor, and capital, leave the Soviet leadership few viable means of combating the economic slowdown.

[The chart presented at this point is a security deletion.]

Reducing the size of military conscription, if chosen as an option, would cause little change in defense outlays. Conscript pay and allowances which amount to less than 10 percent of the average wage in the Soviet Union, make up [security deletion] percent of Soviet defense expenditures. Variations in the number of conscripts, therefore, have relatively little effect on the level or trend of Soviet defense outlays. Even a drop in military manpower of 1 million men would constitute only a one-time increase of seven-tenths of 1 percent of the labor force, and raise the annual rate of economic growth by less than two-tenths of 1 percent. The reduction of conscripts, which could occur by 1986–88 if no changes were made to the military draft system, would have an even smaller impact on the economy.

Greater use of technical personnel to replace the conscripts would increase defense outlays only slightly. Highly productive specialists are far more expensive to pay as reenlistees than they are as conscripts. However, if the entire 300,000–400,000-man shortfall in conscripts is compensated for by the use of military professionals, Soviet defense outlays would rise by only [security deletion] percent above the expected levels in the mid-1980's.

Whether or not the manpower shortfall is made up by the exercise of these options, the quality of the recruits is likely to be adversely affected by the changes in the regional distribution of the population. Fluency in Russian is low in the central asian republics and in the Transcaucasus, which provided an

estimated 23 percent of the total cohorts in 1975, and are expected to provide about 35 percent by the end of the century.

In summary, the Soviets do not have a particularly serious manpower problem. They should be able to adjust their policies to compensate for the changing demographic situation without reducing military capabilities.

Let me make some final observations. It is clear that the Soviets see military strength as an important component of international power. The current Soviet political leadership is closely identified with both the maintenance of a strong national defense and the overall enhancement of the Soviet international position.

[The chart presented at this point is a security deletion.]

They show every sign of continuing the pattern of resource allocations supporting their military posture. The capital resource investments made to date and their research and industrial infrastructure should result in a continuation of hardware improvement and new development trends into the 1980's. Soviet resource investments clearly reflect their intent, decisions, and commitment to future weapons development and a continuing buildup of military capabilities.

This priority for military programs has caused a sacrifice in the growth of economic power. Even though the economic costs of the Soviet defense sector are severe—a fact that the Soviets have recognized for many years—the evidence indicates they intend to continue devoting a large share of their economy to defense. This will remain the case as long as problems with economic growth, energy, and manpower are not aggravated to the point where they are a threat to fundamental Soviet policies. Meanwhile there will be a greater effort to improve the efficiency of military resource allocation and defense industrial management.

In conclusion, I believe the impetus and momentum of Soviet military programs of the past 10 years will continue. I foresee little change in their attitude, their buildup of military resources, or in their quest for greater military strength.

Senator PROXMIRE. Now, General, let me ask some questions, and then, as I say, when we—later on you can tell me if you think we ought to go back and cover some ground we haven't covered.

As I said before, I think this is a very, very good presentation, a very helpful one, but I have a problem here in that it presents what seems to be a kind of an undifferentiated picture of an across-the-board Soviet buildup. The message seems to be that the Russians are building up steadily and in a big way in the air, on the sea, on the land, with conventional and strategic systems, expanding their power and threatening this country all over the world.

I wish you could be more specific. Are we threatened in one area more than others? Is there any direction to the allocation of Soviet military resources, or are they just expanding everywhere?

THREAT TO NATO

Can you give us some notion, for instance, most of the defense budget increases proposed by the administration this year that we are concerned with are with regard to NATO. Congress has responded so far by approving those requests.

Do you agree that the major threat posed by Soviet military allocations is in Europe, or is that just one of many equal threats?

General AARON. I would say yes, sir. That is the area of probably the greatest threat, Central Europe. We are seeing the continued modernization and improvement of forces in the central region.

Senator PROXMIRE. All right, now, let's take that, then.

What is the degree of increase in the NATO area, Warsaw Pact area by the Soviet Union and their allies? Can you give us some notion of how much that has expanded in the last couple of years?

General AARON. Well, first, I think Admiral Turner provided you the figures of the growth in the NATO Guidelines Area over about the past 5 years. There has been an increase in people, and let me give you some idea of people.

Senator PROXMIRE. Well, their figures indicated a very modest, limited increase in personnel.

General AARON. Yes, sir, but it has also added significant combat power, despite this small increase in the Central European area. We have seen increased artillery, ground artillery, as a result of this. We have seen increased air defense systems, and I am talking at a division level now, combat power of the division. We have seen an increased chemical warfare capability in the division. We have seen an increased transport capability within the division.

Then you go back to the Army area. We have seen increased communications, increased electronic warfare, and increased pipeline construction units. Then within the Group of Soviet Forces Germany, we have seen increased fighter aircraft capability for all-weather engagement, increased electronic warfare capability of considerable scope, and increased air defense and surface-to-surface missile systems.

Senator PROXMIRE. Well, can you give us some specific numbers so that we can get our teeth in it. The fact that they have increased in these respects may or may not be significant, may be impressive or may be unimpressive. Obviously there is an enormous technological improvement in military everywhere, in this country, in Russia and elsewhere. Every 5 years, as I understand it, there is a technological revolution, military revolution. Maybe it is more often than that.

At any rate, the fact that they have increased their military power may, as I say, may be very significant or it may not be. We would like to know the degree, how much and so on.

General AARON. Let me give you a good example, sir. A significant number of tank battalions have increased in strength from 31 tanks to 40 tanks.

The number of artillery pieces has increased from 4 to 6 tubes per battery and the number of batteries has increased.

READINESS

Senator PROXMIRE. How many are on blocks, how many are ready to go?

One of the things we noticed was that the Russians are far, or seemed far, both with respect to their ships and with respect to their aircraft, they seem to have far fewer in operation.

General AARON. Yes, sir, but I think the idea that they are on blocks is misleading. They are not in a sort of a "cocoon." They are ready. They are in what we think of as administrative storage but not physically up on blocks. They will use a few tanks for training crews. The rest of those tanks are put in storage, but they are checked and maintained. They run them up periodically. If an alert is sounded, all of those tanks have to move. [Security deletion.]

Senator PROXMIRE. Is that as good as, better than or not as good as ours.

General AARON. They are as good as ours in terms of alert capability and moving out of garrison.

Senator PROXMIRE. Why can't we do the same thing?

General AARON. We can, sir. We can move out of our garrison in [security deletion] in Europe. In fact, we are required to. But we don't believe in their training process. It is a matter of training philosophy. We feel that every crew should train on the tank which they are going to use and shoot. What they do is take five tanks and use that as their training base, and that prevents the wear and tear on the other vehicles. It has a certain advantage.

TANKS AND ANTITANK CAPABILITIES

Senator PROXMIRE. All right, now, General, you have given me one example of an increase in the number of tanks per unit.

General AARON. Yes, sir.

Senator PROXMIRE. Taking it from 30 to 40, or something?

General AARON. Thirty-one to forty in selected units.

Senator PROXMIRE. What does that mean, that they have considerably more tanks than they had, what, 5 years ago?

General AARON. We believe that there has been about a 10-percent increase in the total tank inventory over the past 5 years.

Senator PROXMIRE. Overall, on the West European front?

General AARON. Yes, sir. In addition to increasing the tanks within the battalion, they formed independent tank battalions in which they have added additional tanks. This has taken place within the last 4 or 5——

Senator PROXMIRE. How does that relate with respect to our antitank capabilities, which I understand have also increased very greatly?

General AARON. Well, I think that is one of the reasons for all the emphasis we have had in improving the NATO antitank defense, especially with the Dragon and the Tow missile systems. Where they have a 3 to 1 ratio in tanks, we are not going to match them tank for tank. The best way to hit them is through the Tow and the Dragon missile systems, as they come in.

Now, the problem that remains is, if you have a Soviet tank battalion in an assembly area coming at Tow gunners, at the rate of speed that they move on the battlefield they only have—with tank gunners—about [security deletion] minutes to get those tanks before they are on their position. That means one hell of a lot of firing in a short period of time if that happens.

But the key to it is to have both tanks and the antitank systems in depth throughout the defensive position.

Senator PROXMIRE. For the record, will you give us data supporting as much as you can the buildup of the Soviet Union in Europe, not only with respect to ground forces and tanks, but also with respect to air and missiles and so forth.

General AARON. Yes, sir.

[The following information was subsequently supplied for the record:]

SOVIET BUILDUP OPPOSITE NATO

The last decade of developments affecting Soviet forces opposing NATO has not constituted a buildup in the usual sense, i.e., a buildup of personnel and equipment levels for an anticipated operational contingency. With some exceptions, Soviet posture opposite NATO has remained relatively stable numerically.

Manpower opposite NATO probably has increased by some [security deletion] primarily as a result of Soviet occupation of Czechoslovakia. Other personnel increases have resulted from expansion of some tank battalions, by the addition of about [security deletion] independent tank battalions, and by augmenting missile launchers from [security deletion] in FROG units from [scecurity deletion] in SCUD brigades. Perhaps the most dramatic augmentation is the increase in Soviet helicopters from about [security deletion] in 1965 to the current total of over [security deletion] the majority oriented to the NATO area. The overall numerical increase opposite NATO, however, probably is overshadowed by qualitative enhancements.

For about 10 years, the Soviets have been in the process of correcting what they apparently viewed as serious deficiencies in their capabilities for theater warfare, deficiencies largely attributable to the policies of the Khrushchev regime. The tactical air forces were progressively enhanced by the introduction of new and improved aircraft, some featuring longer ranges and greater payloads for attack missions; others designed to extend the range and capabilities of air defense interceptors. The evolution of Soviet ground forces during the same period has been characterized by significant overall quantitative expansion—although remaining relatively stable numerically opposite NATO—and by the acquisition of a diverse array of new and improved weapons and equipment. New ground materiel have included tanks, fighting vehicles, self-propelled artillery, air defense weapons, river crossing equipment and a variety of other materiel. The qualitative improvements are clearly evident among ground and air components dedicated to potential operations against NATO, particularly those based in Eastern Europe.

Weapon Production Estimates

Senator Proxmire. Now, a second problem I have with your presentation is that it seems to give us a "bean count" of Soviet production rates, increases in production facilities, numbers of new systems under development, and so on. For the most part there is no comparison. You seem to ignore the United States and the NATO side, except for a few isolated cases such as tank production and numbers of engineers.

What is the rationale for such a one-sided presentation, giving us only the Russian and not what our response has been or what our developments are?

General Aaron. I have a slide, Senator, I would like to show you that answers your point.

Senator Proxmire. All right.

General Aaron. May I have that tank production chart?

Senator Proxmire. Well, that's on tank production again, and I think you are very good on tank production, but that is not the only element here. We would like to get it on something else.

General Aaron. All right, sir.

Mr. Leobold, can you give the Senator another production example?

Mr. Leobold. Yes, sir. We could have added any number of additional examples to this, but in the interests of an already long briefing getting longer, we opted to take that one, but certainly for the record——

Senator Proxmire. All right, for the record I wish you would do that. That would be very helpful.

[The following information was subsequently supplied for the record:]

1977 WEAPON PRODUCTION ESTIMATES

Item	U.S.S.R.	NSWP	United States [1]	NATO
Ground:				
Tanks	[Security deletion.]		[2] 980	[Security deletion.]
APC's			1,665	
Artillery			262	
Air defense			15	
Field			247	
Ships:				
SSBN			0	
SSN/SSGN			3	
SS			0	
Carriers			1	
Cruisers			1	
Destroyers			5	
Frigates			1	
Aircraft:				
Bombers			0	
Fighters			500	
Helicopters (military)			275	
Transports (military)			20	
Guided missiles:				
ICBM's	[Security deletion.]			
IRBM's				
MRBM's				
SRBM's				
Naval ballistic				
Cruise				
SAM's				
ATGM's				
ASM's				

[1] Estimates provided by both official and unofficial Government sources.
[2] Includes M-113A1 only.

Senator PROXMIRE. Aren't comparisons of United States and Soviet defense allocations inherent in the intelligence function? Shouldn't you be placing Soviet actions in their relevant contexts so we can assess their moves and adopt the policies that react rationally?

You do this in some areas such as dollar cost spending estimates. Why not make comparisons up and down the line?

General AARON. I think that is a good point, especially the NATO versus the Warsaw Pact.

SOVIET BUILDUP ON CHINESE BORDER

Senator PROXMIRE. One example of the need for balance concerns the Chinese threat to the Soviet Union. One would never know from reading your statement that a major share of Soviet military resources are tied down on the Chinese border and that much of the buildup has been in that area.

How many Soviet troops are deployed on the Chinese border, and by how much did they increase from 1965 to 1978?

General AARON. There are 42 divisions and I think in that time frame we have seen an increase of about 9 divisions.

Senator PROXMIRE. How much in terms of personnel? What does that mean in terms of the number of troops?

General AARON. That is at least 70,000 troops [security deletion].

Senator PROXMIRE. Well, let me ask you what proportion of the Soviet military forces, nuclear and nonnuclear, are committed at the Chinese border, and what is the estimated dollar cost of those forces?

General AARON. I can supply that, sir——

Senator PROXMIRE. Would you say that the proportion would be something like 20 percent?

General AARON. A better estimate would be around 10 to 12 percent of total Soviet military manpower.

Senator PROXMIRE. What does that represent in terms of personnel?

General AARON. I would like to address that point, Senator.

Senator PROXMIRE. All right, go ahead.

General AARON. [Security deletion.]

[The following information was subsequently supplied for the record:]

SOVIET MANPOWER OPPOSITE CHINA

	1965	Percent of total force
Ground	[Security deletion]	12
Air		20
Offensive missiles		7
Defensive missiles		12
Total		

	Total	Percent of total force
Ground	[Security deletion]	25
Air		25
Offensive missiles		9
Defensive missiles		16
Total		

Note: Total increase of [security deletion] or 126 percent.

Some 20 to 25 percent of the total Soviet Ground Forces establishment of about 2 million troops, including nuclear components, is deployed against China. Of the total armed forces of over four million personnel, approximately 10 to 12 percent are committed to China border regions.

The estimated dollar cost of forces on the Chinese border is relatively small [security deletion], or over 10 percent of Investment and Operating costs for 1977. This includes bombers, ground, and tactical air forces in the Far East air defense units [security deletion].

General AARON. One thing that comes out very interestingly is that in 1969 there was a jump in the momentum of their construction, which was a very good time. We were tied down in Vietnam, and of course, we had withdraw from the European base and put people into Vietnam. It was a good time for them to start doing it, but I think there are other factors, the friction between the Chinese and the Russians, and the growing nuclear capability of the Chinese, which disturb them very much. We have seen now a continuous upgrading in quality and quantity in the China border region, and particularly in Transbaykal and Mongolia.

[Security deletion.]

I think what this really demonstrates is this tremendous concern about the Chinese that is increasing on the part of the Soviets as the Chinese nuclear capability expands.

[Security deletion.]

And at the same time, what we are getting from the Chinese at the public level and the private level is their concern that we are not doing more in NATO. This is for the obvious reason of drawing off more forces from the Soviet Union and possibly the Chinese border. So, I think we have a very interesting situation.

Senator PROXMIRE. Well, to what degree do you attribute the Soviet buildup in the last 10 years to the Sino-Soviet tensions? In other words,

what percentage of the 4- to 5-percent increase represents an increase to meet the Chinese threat?

General AARON. I would like to provide those figures for you.

Senator PROXMIRE. A significant portion of that?

General AARON. Yes, sir, I would think so.

[The following information was subsequently supplied for the record:]

If estimated Soviet spending on forces arrayed against the People's Republic of China are removed from the defense totals, the average annual growth rate would be 3–4 percent, or a drop of roughly 1 percent per year.

TROOP DEPLOYMENTS AGAINST CHINA

Senator PROXMIRE. The CIA's figures show Soviet military manpower increased in the 1969–78 period from 3.7 million to 4.2 million.

How many of the additional 500,000 were deployed on the Chinese border and where were the others deployed?

Mr. DOUGHTERY. I think something in the neighborhood of 400,000 ground troops are on the Chinese border.

Senator PROXMIRE. So 80 percent of the increase are deployed on the Chinese border.

Mr. DOUGHERTY. In actual deployment, yes.

Senator PROXMIRE. Where were the additional 100,000 deployed?

Mr. DOUGHERTY. I think we assessed that the deployment against NATO increased by about 100,000. The other increases were due to organizational expansions, expansions of the SRF, but the major deployment increase was opposite the Chinese.

TROOP DEPLOYMENTS AGAINST NATO

Senator PROXMIRE. Now, in the past 5 years—I gave a longer period, but now in the past 5 years, Soviet military manpower remained rather stationary, from 4.1 million to 4.2 million.

Do you agree that the figures show Soviet troop levels have been stable in that period?

General AARON. Yes, relatively so, yes, sir.

TROOP DEPLOYMENTS AGAINST NATO

Senator PROXMIRE. Now, the CIA figures also show that the number of Soviet troops in East Europe haven't changed much. They were 520,000 troops in East Europe in 1969, 550,000 in 1973, and 590,000 today. That's an increase and a steady increase, but nevertheless, relatively stable, certainly compared to the Chinese front.

Do you agree with that?

General AARON. In terms of military personnel, yes. But, in terms of potential, there have been some changes that "military personnel" doesn't cover. Let me give you an example. Some Soviet military personnel coming out of their active duty training in Eastern Europe supposedly to return to the Soviet Union now return to Eastern Europe as technicians or truck drivers. They are backstopping the military forces there. That is one example and there may be as many as 50,000 of them subject to recall on mobilization.

The other thing, which is both good and bad, is the business of bringing Soviet dependents into the forward area. While this puts them in the same hostage position as are our own dependents, many of these people are manning jobs which release more military personnel for the units. The drawdown for troop details can only decrease. That is a change within the last 5 years that has not been mentioned with the accentuation that it should.

Senator PROXMIRE. How many in that category?

General AARON. I would estimate that there could be as many as 150,000.

Senator PROXMIRE. Now, the way I look at it, from what I have seen, there doesn't seem to be a Soviet buildup in Europe so far as manpower is concerned. You stressed the weapons, which are different. I don't intend to dismiss the Soviet presence there, but there has been no major or massive buildup with regard to troop levels.

Do you agree with that?

General AARON. Yes, sir.

EAST EUROPEAN DEFENSE SPENDING

Senator PROXMIRE. You say that the announced East European defense budgets are increasing at a faster rate than the growth of their gross national products. In other words, the defense budgets are increasing more rapidly than the economy, taking a higher percentage of the resources.

Tell us to which countries you are referring and how much each of them spent in 1977. You did that in your chart; you gave us the specific changes, but can you tell us how much each of them spent? You gave us the percentage of GNP. We didn't have the GNP there.

If you can do that for the record.

General AARON. All right, sir.

Can you answer that?

Mr. MICHAUD. I think we can provide that for the record.[1]

Senator PROXMIRE. As I say, we don't have that variable, the GNP. The assumption is that there has been a substantial increase in defense spending over the past 5 years.

Is that correct?

General AARON. Yes, sir.

Senator PROXMIRE. And is it correct to assume that the gross national product in each of these countries in the past 5 years in real terms has been increasing somewhat?

Mr. MICHAUD. Yes.

Senator PROXMIRE. Now, the military programs of these countries plus the Soviet Union constiute the entire Warsaw Pact, or is there another element?

Mr. MICHAUD. That's it.

Senator PROXMIRE. That's it.

Are there other countries involved than the ones you showed?

General AARON. Yes; we didn't show Rumania, Bulgaria. We can supply that.

Senator PROXMIRE. All right.

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[1] See the table entitled "Eastern European GNP and Defense Outlays" on p. 243.

[The following information was subsequently supplied for the record:]

EASTERN EUROPEAN GNP AND DEFENSE OUTLAYS

	GNP				Defense			
	In billions of dollars		In billions of native currencies		In billions of native currencies		Defense as percent of GNP	
	1970	1977	1970	1977	1970	1977	1970	1977
Czechoslovakia (crowns)	33	58	380	540	15	21	3.9	3.8
Bulgaria (leva)	11	20	14	19	.32	.5	2.4	2.6
Hungary (forints)	15	27	330	510	9	13	2.7	2.6
East Germany (marks)	37	68	130	190	7	11	5.0	5.9
Poland (zlotys)	43	95	860	1,900	35	58	4.1	3.0
Rumania (leu)	24	55	330	650	7	11	2.1	1.8

Senator PROXMIRE. Are your dollar estimates of East European defense spending based on the same dollar cost, building block methodology used to estimate Soviet spending, or are you simply using official figures published by the East European governments?

Mr. MICHAUD. We have used the building block approach.

Senator PROXMIRE. You are not taking the figures as they announce them?

Mr. MICHAUD. No, we have adopted the building block approach.

Senator PROXMIRE. Have you prepared any studies of East European defense spending, and if so, would you provide copies for the subcommittee?

Mr. MICHAUD. Yes, we have prepared such studies. We are engaged in preparing——

Senator PROXMIRE. How soon will those be ready?

Mr. MICHAUD. I would say in a month.

Senator PROXMIRE. When they are available, will you present them to the committee? We would appreciate that.

General AARON. Yes, sir.[1]

NATO EUROPEAN DEFENSE OUTLAYS

Senator PROXMIRE. Now, you estimate East European defense outlays at $20 billion, or only 30 percent of the cost of NATO Europe defense. You also say that the East European procurement costs are an estimated 20 percent of NATO Europe procurement. That means NATO European outlays are $66.67 billion. How did you derive your figures for NATO European outlays?

Mr. MICHAUD. We took the NATO expenditures, the figures each country submits to NATO, and then we made the adjustments applying U.S. pay rates to the NATO forces. The announced figure is $55 billion. Our total figure is $67 billion when we use U.S. pay rates.

Senator PROXMIRE. Now, are your estimates of NATO spending based on your own analysis or are you simply using figures supplied by our NATO allies?

Mr. MICHAUD. We are using our own analysis of their pay by using U.S. pay rates. The rest of it is their own announced figures converted at the official rates.

[1] The study has been provided to the subcommittee in classified form.

Senator PROXMIRE. Do you believe that those figures are reliable?

Mr. MICHAUD. We feel they are reliable, yes, sir.

Senator PROXMIRE. When Admiral Turner was here he testified that the CIA has not made direct cost estimates of the dollar costs of non-U.S. NATO defense spending.

Is that true for DIA and the Intelligence Community as a whole?

Mr. MICHAUD. Of the Warsaw Pact?

Senator PROXMIRE. Well, non-U.S. NATO defense, in other words, the British, West Germans, and so on.

Mr. MICHAUD. We have accepted the NATO figures except for pay and allowances, and we are in the process of analyzing the rest of NATO for purposes of making better comparisons with the Soviet Bloc.

Senator PROXMIRE. What is the rationale for analyzing pay and allowances?

Mr. MICHAUD. In order to make them more comparable with the Soviet and East European estimates in dollars, we apply U.S. pay rates to those countries as well, in order to make comparisons with the United States.

Senator PROXMIRE. Do you do that for hardware, too?

Mr. MICHAUD. Not as yet.

Senator PROXMIRE. Why not?

Mr. MICHAUD. It is very difficult and we are not in a position to evaluate West European equipment in terms of U.S. costs at this point. We have emphasized the Warsaw Pact rather than NATO. We hope to make better estimates of NATO as well.

Senator PROXMIRE. Is it true that our NATO allies don't publish defense budgets that are as detailed as ours and in general they don't have public hearings or even closed hearings on defense which are later published as ours are?

Mr. MICHAUD. I don't know about the hearings, but they publish in quite some detail. We have it by category of weapons in the NATO countries.

Senator PROXMIRE. I just wondered, do you think we actually know more about the Soviet defense program as a result of our satellite and electronic surveillance than we know about NATO European defense programs?

Mr. MICHAUD. I don't think I'm in a position to comment.

General AARON. Well, sir, this is one problem Admiral Turner alluded to [security deletion].

Senator PROXMIRE. That's right.

General AARON. But we have given this additional emphasis in the past 4 years in terms of building up our data base on NATO, using NATO documents as much as we can, relying on our defense attachés and visits to get more information to get a better handle on this problem.

Senator PROXMIRE. Well, maybe I ought to put it this way. Have you found any, had any experience where you have found that the announced figures have been in error?

In other words you have had other, or you suspect they may be in error, that they might tend to exaggerate what they are doing? There is always pressure that we put on them to spend more——

Mr. MICHAUD. Yes, sir.

Senator PROXMIRE. And if anything, they would tend to perhaps exaggerate a little bit what they do spend in reporting to us, or letting it be known, unlike the Soviet Union, which would understate, and grossly understates what they spend, and I wonder for that reason whether we have any system of checking without spying or without seeming to——

General AARON. Well, in many cases our defense cooperation office, MAAG or MILGROUP, provides a certain amount of data. Professional military exchanges are quite open. We are able to visit their installations and see for ourselves. So I think we have quite a few checks in the system.

Senator PROXMIRE. OK.

Do you agree that there are nevertheless large gaps in our direct knowledge of NATO European defense spending, that we are essentially, especially unsure of the effect of inflation on their spending due to the absence of the European defense inflator?

General AARON. I don't think so.

Mr. MICHAUD. Well, we don't know very much about inflation in Europe. I don't know the rate.

Senator PROXMIRE. It seems to me in view of the enormous inflation that all the free countries have suffered, especially in the last 6 or 8 years, that that is a serious weakness.

Mr. MICHAUD. It certainly is.

Senator PROXMIRE. How is it possible to confidently compare a Warsaw Pact and NATO defense spending with so many weaknesses in our estimate?

Mr. MICHAUD. I would say to that that we have been asked so many times to make these estimates, that we are making an effort to make them, and to provide as best an estimate as we can.

TANK INVENTORIES

Senator PROXMIRE. I understand that NATO has—NATO I am talking about now, has [security deletion] tanks in storage in Europe.

How many are there in storage and when comparing numbers of Warsaw Pact and NATO tanks, are those in storage counted?

General AARON. Yes, sir——

Senator PROXMIRE. I remember a few years ago, there was a revelation of the fact that somebody somewhere had lost count of 5,000 tanks we had, didn't know we had them, didn't count them at all. All of a sudden they were discovered. I think GAO discovered that they were in storage somewhere.

General AARON. I probably was responsible for that. I was the senior Army Intelligence Officer in U.S. Army, Europe, when it happened. It was a matter of going through every Soviet [security deletion]. What we found was more tanks in that inventory than we had initially suspected from other sources.

Senator PROXMIRE. We are talking about NATO tanks.

General AARON. Well, I am talking about the Soviets. I think that in terms of NATO and putting vehicles in storage for mobilization, we will have to provide those figures.

[The following information was subsequently supplied for the record:]

WARSAW PACT-NATO MEDIUM TANK INVENTORIES

Tha total inventory of Warsaw Pact medium or main battle tanks oriented to the NATO area represents almost a three-to-one superiority over NATO. Currently, the Warsaw Pact inventory facing NATO includes about 40,000 active medium tanks and an additional [security deletion] in storage. The total national inventories for NATO, including the United States, comprises 15,800 active medium tanks and some [security deletion] in storage. These aggregates, of course, do not address availability times or utilitarian factors.

Senator PROXMIRE. General, when Warsaw Pact and NATO weapons are compared numerically, are the reserve stocks and prepositioned weapons and equipment included?

General AARON. Yes, sir.

Senator PROXMIRE. They are?

General AARON. Yes, sir.

SEALED VEHICLES

Senator PROXMIRE. Now, the BMP and other Soviet vehicles are sealed so as to allow them to be used for chemical warfare.

Is it correct that the Army has made a deliberate choice to provide individual protection for our troops rather than protection in sealed vehicles on the assumption that the seals are likely to be broken in combat?

General AARON. Cost is another consideration, sir. The Chief of Staff has testified on that. He was asked that question. The first consideration is individual protection in terms of alarms, overpressure, and filters. It was cost that deterred it. I still think it is a consideration, though, in future design.

Senator PROXMIRE. So we made a deliberate choice not to build it in the personnel carrier for that reason.

General AARON. Yes, sir.

TACTICAL AIRCRAFT TECHNOLOGY

Senator PROXMIRE. Admiral Turner testified that NATO retains technological superiority in tactical combat aircraft despite Soviet efforts to close the gap. Some experts argue that NATO aircraft superiority has been increased with the F–14 and the F–15.

Do you agree or disagree?

General AARON. Yes, sir, I agree.

TECHNOLOGICAL SUPERIORITY

Senator PROXMIRE. Let me ask you a more general and broad question, and I am not sure what Admiral Turner's answer would be now. I didn't ask him this time. I intend to do so. But I remember 1 year ago Admiral Turner—I think it was Admiral Turner—indicated, as I recall—I don't want to be unfair to him, but as I recall—that he couldn't think of any significant military technological area where the Soviet Union was ahead of us. Remember, I have argued that with some of my colleagues in the Senate and they are appalled that that is possible.

Now, from what you tell us this morning, General Aaron, I take it that you feel, at least as of today, that they may be ahead of us in some important technological respects?

Can you tell us what those are?

General AARON. Yes, sir, [security deletion].

Senator PROXMIRE. [Security deletion.]

General AARON. [Security deletion.]

Senator PROXMIRE. [Security deletion.]

General AARON. [Security deletion.]

Senator PROXMIRE. [Security deletion.]

General AARON. [Security deletion.]

Senator PROXMIRE. [Security deletion.]

General AARON. [Security deletion.]

Senator PROXMIRE. Is this the high energy beam that General Keegan talked about last year?

General AARON. No, sir.

Mr. ROTH. [Security deletion.]

Senator PROXMIRE. All right, now, I am glad to get that. I didn't have it before. But you take a look at the whole sweep of major technological areas, first conventional, ships, tanks, planes, other conventional weapons. Then you look at the strategic weapons [security deletion]. It is very important, but it is certainly not the only important, it is one of the series of important elements.

Am I mistaken in indicating that in these other areas they are not ahead of us, and in most areas we are ahead of them?

General AARON. Yes, sir.

Captain PORTNOY. I think antiship missiles is one area, Senator——

Senator PROXMIRE. What is that, sir?

Captain PORTNOY. Antiship missiles. The Soviet Navy has a whole group of systems that can be launched by submarines, small combatants, or major warships. This is something that we just don't have, although we are making attempts to catch them in certain areas.

Senator PROXMIRE. Antiship missiles.

Captain PORTNOY. Antiship missile systems.

Senator PROXMIRE. Well, that is another area. If there is any way you can document that for the record, we will be glad to have that.

[The following information was subsequently supplied for the record:]

The Soviet Union has invested heavily in the development of submarine, surface ship, bomber aircraft and land-launched antiship cruise missile systems. At least [security deletion] different cruise missile systems have been developed over the last 20 years, and [security deletion]. The Soviet Union has more than [security deletion] bomber aircraft, submarines, and surface ships that can launch cruise missiles. Under present weapons loading conditions, these platforms are capable of launching approximately [security deletion] missiles.

The majority are antiship missiles; [security deletion].

The Soviets have also developed [security deletion] variations of air- and sea-launched cruise missiles.

[Security deletion.]

The United States has developed the Harpoon antiship cruise misile. The missile has a range of 110 km and carries a conventional warhead. The missile is planned for installation in most cruisers, destroyers, frigates, nuclear attack submarines and some shore and carrier based aircraft. Introduction into submarines has begun and introduction into fleet aircraft will take place in mid-1978.

The United States is developing an air launched cruise missile that can be launched from B–52 and FB–111 aircraft. The missile will have a range of 2500 km, carry a nuclear warhead and have an IOC of 1981.

The United States is also developing the Tomahawk cruise missile. Available in both land attack and antiship versions, Tomahawk can be launched from sub-

marine, surface ship, land and air platforms. The antiship Tomahawk will be capable of delivering a conventional warhead against enemy ships and the land attack version will be capable of delivering a nuclear warhead against land targets.

High Energy Particle Beam Weapon

Senator Proxmire. Are you now revising last year's position with respect to the high energy particle beam weapon. Is it your present view that the Soviets are on the verge of producing and testing such a weapon?

Missile Technology

General Aaron. No, sir, but they are working on applicable technology, and DIA does not agree with General Keegan's assessment. [Security deletion.] But it is an area that we must continue to watch.

Laser development, yes [security deletion].

Senator Proxmire. Let me ask you about this. Some experts cite the U.S. cruise missile as an example of our continuing technological lead in both strategic and conventional arms.

Do you agree with the proposition and can you compare United States and Soviet cruise missile technology? Are we ahead there?

General Aaron. We're much better, and it's a tremendous worry to them. That is the reason it is in the SALT discussions.

Senator Proxmire. Can you tell us the—for the record, would you give us some discussion of cruise missile technology?

General Aaron. Yes, sir.

[The following information was subsequently supplied for the record:]

[Security deletion.]
Cruise missile technologies can be summarized into five groups:
(1) Propulsion.
(2) Guidance.
(3) Aerodynamics.
(4) Materials and Structures.
(5) Warheads.
These are discussed in detail as follows:
Propulsion: [Security deletion.]
Guidance: [Security deletion.]
Aerodynamics: [Security deletion.]
Materials and structures: [Security deletion.]
Warheads: [Security deletion.]

Tactical Nuclear Weapons

Senator Proxmire. Now, can you tell us the number of NATO and Warsaw Pact tactical nuclear weapons in Europe, including those deployed with naval forces?

General Aaron. [Security deletion.]

Senator Proxmire. Is it true that all or most of the Soviet tactical nuclear warheads are actually stored in the Soviet Union, although the delivery vehicles are kept in East Europe?

What are the facts on that?

General Aaron. The evidence is not clear enough for me to verify that.

Mr. DOUGHERTY. [Security deletion.]
Senator PROXMIRE. [Security deletion.]
Mr. DOUGHERTY. [Security deletion.]
Senator PROXMIRE. [Security deletion.]
Mr. DOUGHERTY. [Security deletion.]
Senator PROXMIRE. Can you tell us for the record?
Mr. DOUGHERTY. Yes, sir.
[Security deletion.]

READINESS

Senator PROXMIRE. Now, last year General Wilson testified about Soviet readiness and alertness levels. Testimony showed that the Soviets deploy a far smaller percentage of their strategic submarines and surface vessels than we do. Their ships are at anchor much more than ours. Their pilots fly fewer hours per month, and much of the ground equipment, including tanks assigned to combat units in Europe are kept in storage.

Now, some experts believe the Pact uses only 30 percent of its equipment in field training, keeping the rest in warehouses or up on concrete blocks.

Do you agree with these observations, and can you give a rationale for this practice?

General AARON. Yes, sir, I think that the initial part of the statement is true. There is a tendency to have more in anchorage or do less flying, although Belenko demonstrated he was a pretty good pilot. I think Admiral Turner brought that up. But when they come to the exercise of a Soviet division for example, in East Germany, they pull all of that equipment out and they exercise it. Now, a great majority may go back into storage, but all of that equipment is exercised in their major training areas.

Senator PROXMIRE. Nevertheless, they do have a lesser readiness capability, apparently, is that correct?

General AARON. Yes, sir, in comparison they are slower in reaching readiness than we are, but it is difficult to generalize about this.

Senator PROXMIRE. Yes.

General AARON. And their missile sites, for example, are in much less of an alert posture than we are.

Senator PROXMIRE. Why is that? Is that in any degree because to conserve energy, or primarily to conserve wear and tear and so forth on their part?

General AARON. I think it is probably wear and tear, the problem of maintenance and, of course, their own philosophy. They expect a period of tension to precede raising their alert condition.

Senator PROXMIRE. Is it true that Soviet forces in East Germany use one-third of their assigned equipment, that some combat units are not allowed to train with tanks?

General AARON. No, sir, but I would prefer to elaborate on that for the record.

[The following information was subsequently supplied for the record.]

SOVIET TRAINING

Soviet forces in East Germany and elsewhere train sufficiently with assigned equipment to insure proficiency. It is true that the Soviets use equipment selec-

tively; that some portion of assigned equipment is always maintained in administrative storage. Such storage, however, does not involve the maintenance of vehicles on blocks but requires immediate availability for unit use. During the course of a training year, vehicles are used on a rotating basis. Periodically, entire complements move to the field.

Warning Time

Senator Proxmire. I understand that while most of the Soviet forces are kept at lower preparedness levels than ours, part of their ICBM forces and of their air and ground forces are able to respond quickly to an attack from the West. This seems to imply that the West would have considerable warning time of a Soviet attack as they would have to bring equipment out of storage in order to mobilize their forces.

What is the likely warning period implied from the Soviets' low level of preparedness?

General Aaron. I can give you an example of an exercise, Senator. This is called a category 3 division, which is really at about 25 to 35 percent strength. This particular division [security deletion] mobilized in [security deletion] hours with most of its people and equipment, moved 1,000 miles and engaged in an exercise. They did this with very little preparation. So, sometimes when we think it is low in strength and a low category division, it does have a capability to mobilize.

Senator Proxmire. Well, in terms of an attack, what are the assumptions we can make with respect to warning time?

General Aaron. Sir, we expect that we will get warning of their mobilizing for an attack in probably [security deletion] and then the problem becomes one of disseminating that information getting everybody to react, to move to their emergency defense positions, and we feel that the Soviets——

Senator Proxmire. [Security deletion.]

General Aaron. Yes, sir. For example, [security deletion].

Senator Proxmire. Despite their low readiness levels.

General Aaron. Yes, sir.

Senator Proxmire. I wonder about that. Is that pretty much a unanimous view, or is there some difference of opinion?

Mr. Dougherty. DIA agrees with the intelligence community position that we will know of Soviet preparations to go to war [security deletion]. That is simply general preparation. We may not know when or where the weight of the attack is.

Senator Proxmire. Well, does that assume that they would be able to put together a maximum effort [security deletion].

Mr. Dougherty. No, sir, that just assumes that we will know [security deletion] after they start their preparations for war.

Senator Proxmire. Well, I'm talking about the time between when they start their preparation and when they attack.

Mr. Dougherty. The community also believes that within [security deletion] they could build sufficient force to mount an attack.

Senator Proxmire. Now, have our advances in satellite and electronic detection improved NATO's capabilities for picking up signs of an impending Soviet attack? If so, how has this increased the warning time the West is likely to have?

General Aaron. [Security deletion.]

There are a lot of indicators that we look at, Senator Proxmire, that are going to give us——

Senator PROXMIRE. Well, give us a worst case assumption, [security deletion] so forth.

General AARON. [Security deletion] or an exercise going on which is used for deception purposes. The Czech invasion was a good example of not the best warning in the world, since an exercise in East Germany was used to disguise assembly of forces.

We have [security deletion] and, [security deletion]. I feel pretty confident. There has been a great debate——

Senator PROXMIRE. Even under adverse circumstances.

General AARON. Yes, sir.

Senator PROXMIRE. Are there any recent studies in the intelligence community of the warning time issue?

General AARON. Yes, sir.

Senator PROXMIRE. Would you supply us with those studies?

General AARON. Yes, sir.[1]

NEW SOVIET BOMBER

Senator PROXMIRE. Now, recent press accounts of the DIA testimony describes a new Soviet bomber which is supposed to be like the U.S. B–1.

Are these accounts correct, and what can you tell us about the new Soviet bomber?

General AARON. Yes, sir.

Mr. TROSS. I have a response on this. Do you want me to read it?

General AARON. Do you want me to read it or supply it?

Senator PROXMIRE. I would like to hear it. This is very important. As you know, I was very much involved in the B–1 and I would like to hear about this.

Mr. TROSS. There is limited evidence that the Soviets are involved in designing a new advanced variable geometry wing bomber aircraft; however, we do not believe it has progressed past this phase.

[Security deletion.]

Senator PROXMIRE. All right, sir, I think it was a little difficult for our recorder to hear that. Would you make that document available to him so he could have it, that would be helpful.

Now, as you read that, you had [security deletion] you implied at the very beginning of your statement that there wasn't any hard evidence that it was in production, is that correct? In fact, the evidence is that it is not in production.

Mr. TROSS. [Security deletion.]

Senator PROXMIRE. Is there any evidence that it is in development.

Mr. TROSS. [Security deletion.]

We do not believe it is beyond the design phase.

SOVIET CRUISE MISSILE AND U.S. CARRIER VULNERABILITY

Senator PROXMIRE. Now, earlier we discussed the Soviet cruise missile. How much of a threat is this weapon to U.S. aircraft carriers and other surface vessels, and also how much of a threat to our surface navy, especially the carrier, is the Backfire bomber?

[1] The studies have been provided to the subcommittee in classified form.

General AARON. Well, I think Admiral Holloway testified on this previously, Senator. We don't think the carrier is as vulnerable as people believe, primarily because of its extensive defensive and damage limiting capabilities. Mr. Tross would you like to address that?

Mr. TROSS. Yes, sir, I have also a statement on that same subject.

DIA has not conducted any net technical assessment on the vulnerabilities of aircraft carriers to cruise missiles. However, the Chief of Naval Operations has made the following statement concerning aircraft carrier vulnerability to Soviet missiles. I again will provide you with this paper.

Senator PROXMIRE. All right.

Mr. TROSS. Soviet air, surface, and submarine-launched——

Senator PROXMIRE. Incidentally, do you agree with this? Does the DIA agree with this assessment by Admiral Holloway? I take it that is from him.

Mr. TROSS. I think so, yes.

Senator PROXMIRE. Do you agree with this?

General AARON. Yes, sir.

Senator PROXMIRE. You agree with it? All right.

General AARON. It is an area that we must watch. It may not be true a year or two from now.

Mr. TROSS. Do you want me to read it?

Senator PROXMIRE. Go ahead.

Mr. TROSS. Soviet air, surface, and submarine-launched guided or cruise missiles are the primary military threat to U.S. aircraft carriers. Basically, all surface warships are vulnerable to these weapons. However, the aircraft carrier is the least vulnerable because of its extensive defensive and damage-control features. Of course, the aircraft carrier is essentially a mobile air base, and is less vulnerable than a fixed base would be: also, it is not subject to certain threats such as political denial and guerrilla attack.

Senator PROXMIRE. Let me just interrupt and ask about that at that point. You say it is the least vulnerable because of its defenses, and I would wholeheartedly agree that it has got marvelous defenses against almost any kind of a conventional weapon, but the big element here if they are using nuclear weapons, it has always seemed to me, is can you find it and can you hit it and I can't think of a bigger target than an aircraft carrier, as long as three football fields, slow, relatively, 50 miles an hour, flies at one sea level, one altitude, sea level, so it would seem to be about as easy a target to hit as anybody can possibly imagine, and what you are telling us is that it is less vulnerable, although it is vulnerable, it is a little less vulnerable because of his defenses, but isn't it true that the enormous power of the Soviet missiles, the nuclear missiles are such that no matter what defenses you put in, you hit it, goodbye aircraft carrier.

Isn't that true, or is that untrue?

Mr. TROSS. I think you are quite right. The word nonnuclear does not appear in the statement from the CNO, although I have personally interpreted this as being part of the statement, but I cannot speak for the CNO.

General AARON. Well, I think there are several things here: how good his radar is and how well he can discriminate that carrier from

other vessels. He is firing those missiles from far over the horizon. We also have to give credit to the countermeasure systems on that aircraft carrier, which are aimed specifically at those cruise missiles in terms of jamming them, causing them to fall short and explode prematurely.

So they are not firing them in the old 1776 days. I think——

Senator PROXMIRE. I understand that. However, one hit or one very near miss, goodby carrier, just get one of them through.

General AARON. Yes, sir.

[The following information was subsequently supplied for the record:]

Soviet air, surface, and submarine-launched guided or cruise missiles are the primary military threat to U.S. aircraft carriers. Basically, all surface warships are vulnerable to these weapons. However, the aircraft carrier is the least vulnerable because of its extensive defensive and damage-control features. Of course, the aircraft carrier is essentially a mobile airbase, and is less vulnerable than a fixed base would be; also, it is not subject to certain threats such as political denial and guerilla attack.

The modern U.S. aircraft carrier is thus considered highly survivable in comparison with other general purpose forces and, at the same time, is recognized as one of the most powerful and versatile weapon systems ever developed.

Senator PROXMIRE. Now, can Soviet—I think you may have touched on this, but can Soviet [security deletion].

General AARON. [Security delection.]

Senator PROXMIRE. With that reliability and accuracy?

General AARON. I will provide that for the record,[1] sir, if I can.

SOVIET AIR DEFENSE TO U.S. CRUISE MISSILES

Senator PROXMIRE. When and at what cost will a Soviet air defense system be built that could successfully intercept the current generation of U.S. cruise missiles and the next generation of U.S. cruise missiles with supersonic speed and ECM?

In other words, is an effective defense to the cruise missile feasible in your view, or is it pretty far off?

General AARON. Sir, it is going to cost them a great deal of money to try to beat our cruise missile systems. I think Secretary Brown has made a public statement to that effect. It is going to be late in the 1980's before they are ever going to be able to come to grips with it.

Senator PROXMIRE. It is going to be late 1980's and what?

General AARON. To be able to come to grips with it because of the low-altitude penetration. [Security deletion.]

Senator PROXMIRE. Can you give us an estimated cost of that defense for the record?

General AARON. Sir, we will try.

Senator PROXMIRE. All right, fine.

General AARON. I would say it would be considerable.

[The following information was subsequently supplied for the record:]

We do not know how the Soviets are going to cope with the U.S. cruise missile threat. At the present time it is believed that the SA–X–10 has some capabilities against cruise missiles. In that event the Soviets are likely to deploy large num-

[1] The response of General Aaron was a security deletion.

bers. However, advances in U.S. cruise missile technology is likely to downgrade whatever capabilities that the SA–X–10 might have. As an option the Soviets could attempt to defend against cruise missiles by attacking missile launch platforms. It is expected, however [security deletion].

It is difficult to assess the cost of developing an effective cruise missile defense. [Security deletion.] There is a wide range of uncertainties around the number to be built or the type of system that the Soviets might view and develop as the ultimate anti-cruise missile defense. Insofar as a truly effective anti-cruise missile system cannot be visualized at present, its costs are indeterminable.

Until it has been determined what system or systems, and how many of each, would be required for a Soviet defensive capability against the U.S. cruise missile, it is not possible to estimate the cost to develop and deploy this capability.

Technological Capabilities

Senator Proxmire. Now, when will the Soviets have a sophisticated look-down/shoot-down fighter and a flying radar of the same technology as the AWACS, and can you estimate what it will cost for the Soviets to acquire these capabilities?

General Aaron. Mr. Tross, can you estimate this,

Mr. Tross. Yes, I believe there is some ongoing testing. I am not sure that I have at my disposal the IOC date for such an aircraft. I would like to provide this for the record.

Senator Proxmire. All right.

[The following information was subsequently supplied for the record:]

[Security deletion.]

The costs for the Soviets to develop a look-down/shoot-down radar capability could be as much as one billion dollars. These costs would include research and development, tests, evaluation and prototypes. This would not include any development costs associated with a new aircraft which could fully utilize such a radar.

Senator Proxmire. What is the current Soviet capability to locate, track, and destroy U.S. ballistic missile submarines?

General Aaron. I would say a low capability, sir.

Senator Proxmire. Low capability.

General Aaron. But they are working on it, sir, very seriously.

Senator Proxmire. What do you estimate——

I'm sorry. Go ahead.

Captain Portnoy. I would say negligible right now.

Senator Proxmire. Negligible. And you say the prospects seem negligible for at least the near future?

Captain Portnoy. [Security deletion.]

They are working very hard on ASW, and this is an area we must keep watching.

Senator Proxmire. Now, what is your assessment of the current capabilities of Soviet reconnaissance satellites in terms of constant coverage, resolution, and reliability?

General Aaron. [Security deletion.]

Senator Proxmire. [Security deletion.]

General Aaron. [Security deletion.]

Mr. Miller. [Security deletion.]

[Whereupon, Senator Javits entered the hearing room.]

Senator Proxmire. What does the recent incursion of the domestic airliner that was shot down over the Soviet Union tell us about their air defense capabilities and their intercept possibilities?

General AARON. [Security deletion.]

Senator PROXMIRE. But I am just wondering about that. They were embarrassed that it invaded their territory. They deliberately shot it down then, is that right?

General AARON. Yes, sir.

Senator PROXMIRE. Does that indicate a capability on their part, or a failure of capability?

General AARON. [Security deletion.]

INTERDICTION DURING WAR IN EUROPE

Senator PROXMIRE. In your judgment, in your opinion, could the Soviets, do they have the capability to successfully interdict the supply of U.S. equipment and personnel to Europe during a conventional war?

General AARON. The Soviets have the capability to impede our sealift. There have been a number of studies on that, to which I am not completely privy. Much of that problem is being alleviated by POMCUS stocks in Europe, air movement of troops to get to the POMCUS stocks, and the protection that we can provide to sea convoys. Much of our material is transported by air, C–5A's, C–141's.

Senator PROXMIRE. Senator Javits, would you care to comment?

Senator JAVITS. Well, of course, may I?

Senator PROXMIRE. Sure, by all means.

Senator JAVITS. Well, I am sorry I was so late, General, and I apologize, because I think this is a critical subject, and I have had many other problems today.

I hope that you would be able, sir, perhaps after inquiring, to give a very considered reply. Let me tell you why.

The whole strategy of Europe is now going to be built upon the acceptability or unacceptability of losses which will be taken in such an activity. For example, we are redeploying a division out of Korea, which will be deployed into the United States, trained in North Atlantic warfare, perhaps some cadre sent over for training, you know, experienced the passage, but this is going to be an important dependence of Europe, so we must assume that the NATO ministers, in dealing with this matter, knew what they were doing, and I don't think, General, with respect, that you noted the use of the word "successful." I think that is a very critical question, and if you feel that it has been answered adequately to the Armed Services Committees, then we will of course consult the testimony there. But I do think, sir, we ought to have a very considered reply.

General AARON. Yes, sir.

Senator JAVITS. So what would you suggest? Would you suggest you would like to make that now or——

General AARON. I would rather provide that for the record——

Senator JAVITS. Or have a chance to check?

General AARON. Because I know the JCS and others have done studies.

Senator JAVITS. Thank you, General.

Then if you would do that and supply it for the record, and I am sure the chairman would not have any objection.

Senator PROXMIRE. No, no, that is fine. I am glad that Senator Javits requested that.

[The following information was subsequently supplied for the record:]

SOVIET CAPABILITIES AND CONSIDERATION FOR INTERDICTION OF THE SEA LINES OF COMMUNICATION BETWEEN THE U.S. AND EUROPE

The Soviets have clearly indicated that they regard the interdiction of sea lines of communication as an important mission. With respect to the Atlantic, the Soviets maintain a formidable interdiction capability represented by more than 160 torpedo and cruise missile attack submarines and some 240 naval strike bombers. As the Backfire bomber comes into service and is deployed with Soviet Naval Aviation, its extended range and increased offensive capabilities are of added concern.

U.S. reinforcement for a war in Europe would initially depend on airlift for responsiveness, but ultimately on sealift for capacity. As much as 95 percent of the tonnage required to sustain forces after the initial phase of a European defense must move over Atlantic sea lanes. The Soviets are obviously cognizant of this dependence, and have emphasized the interdiction requirement by including it in naval mission statements and exercise activity.

The extent and timing of a Soviet sea lines of communication interdiction campaign would depend on the nature and scope of the initial stages of a conflict. Should they make a maximum interdiction effort and deploy a large number of their submarines prior to hostilities, significant attrition of early U.S. reinforcement and supply elements could be expected. Although past studies have concluded with varying estimates of anticipated attrition levels, it has been postulated that as much as [security deletion] attrition of unescorted ships might be expected during the first 30 days of hostilities.

It is not certain, however, when or with what exact force the Soviets would mount an interdiction campaign. Attack submarines and aircraft capable of interdiction would also be required to perform other major naval tasks. The conduct of anticarrier and antisubmarine missions and protection of Soviet strategic attack submarines would compete for allocation of forces in addition to interdiction requirements. These force allocations would ultimately be situation driven and, therefore, difficult to predict with any degree of certainty. If a NATO/Warsaw Pact conflict were nuclear and of short duration, Soviet interdiction operations would be of little consequence. A protracted conventional conflict, however, would project a different scenario.

It is believed that during initial stages of a prolonged conflict the interdiction mission would be subordinated to anticarrier, antisubmarine and protection missions. Regardless of the length and level of a conflict, however, a balanced allocation of Soviet offensive seapower in the Atlantic to merchant shipping and other missions would result in expected loss levels that might disrupt, but not prevent, NATO reinforcement.

It is further believed that present U.S. naval capabilities, in conjunction with those of our allies, should ensure delivery of essential tonnage across the Atlantic during the first months of a war, and gain unimpeded control of the seas thereafter.

AIRCRAFT CARRIERS DURING CONVENTIONAL WAR

Senator PROXMIRE. Now, Senator Javits, we were having a discussion earlier on a number of things. One of the items we were discussing was the vulnerability of our aircraft carrier, and it was indicated by the experts here that while they are less vulnerable than almost any other kind of a ship, they could be hit, and if hit or a near miss, there they go.

Now, in following that up, do you believe that U.S. aircraft carriers could operate for any significant period of time in the Mediterranean during a conventional war with the Soviet Union?

General AARON. Yes, sir.

Senator PROXMIRE. You think they could in a conventional war?

General AARON. I think they could do a very good job.

Senator PROXMIRE. A conventional war in which they used tactical nuclear weapons?

General AARON. At the outset I don't think they would use them. They'd use conventional bombs and ammunition for doing that.

Senator PROXMIRE. And then your definition of a conventional war would be one in which no nuclear weapons of any kind, including tactical nuclear weapons are used.

General AARON. Yes, sir.

Senator PROXMIRE. Once you use nuclear weapons, however, they are unlikely to survive.

General AARON. Some, I am sure would take losses, but I think we would do a great deal of damage.

Senator PROXMIRE. How could they survive if they used nuclear weapons? They are easy targets, slow, huge, easy to locate. A near miss knocks them out.

General AARON. Yes, sir, maybe.

TECHNOLOGICAL SURPRISE

Senator PROXMIRE. All right, in your statement you demonstrate how conservative and cautious the Soviets are in their approach to military R. & D. Would you say that progress occurs in small, measured steps rather than leaps and bounds? But in the very next sentence you say that innovations and technological surprises are a growing possibility. Isn't that inconsistent?

General AARON. No, sir, I don't think so at all. I have given you a couple of examples of that, such as the BMP, also the T–72. I think that if they can get a technology jump on us through some innovation——

Senator PROXMIRE. Was that a technological surprise, a personnel carrier and a tank?

General AARON. The personnel carrier I would say was a surprise to see. We probably expected more of the wheeled type personnel carriers when the BMP showed up.

Senator PROXMIRE. But now we are on the technology aspect. What was surprising technologically about that?

General AARON. Well, I would say if they do make that breakthrough in [security deletion] or they move much faster than we expect in terms——

Senator PROXMIRE. Well, first, let's stay on the BMP and the tank, the personnel carrier and the tank. What were the technological surprises there?

General AARON. I think it was in design, it was in speed, and the fact, primarily, that they put a weapon on it, the 73 millimeter gun, which gave it not only a personnel carrying capability but an antitank capability at close ranges, as well as mounting the Sagger on it to give an antitank capability at longer ranges. There isn't a personnel carrier in the world that is both a fighting vehicle as well as a carrier.

Senator PROXMIRE. But aren't those just state-of-the-art characteristics that are put together in a certain way? There is not a matter of an advanced technology there, is there?

General AARON. No, sir, it is a question of design.

Senator PROXMIRE. Now, can you cite examples of Soviet technological surprises in the last 10 or 15 years, and also provide a more comprehensive list for the record?

You did talk about high energy laser beams and that is the only area I can find that so far. There may have been one other with respect to their antiship weapons, but you have to hunt very hard and fast to find any technological area where we are not ahead of them militarily.

General AARON. Yes, sir, high energy physics is an area in which they are at parity with us.

Mr. TROSS. [Security deletion.]

Senator PROXMIRE. [Security deletion.]

Mr. TROSS. [Security deletion.]

Senator PROXMIRE. Well, let me go back. The question was to cite examples of Soviet technological surprises in the past 10 to 15 years, surprises. I am not talking about the fact that they made some technological advances, usually following those made in other countries, but technological surprises, where they made a surprising kind of a breakthrough.

Can you give us any?

General AARON. No, sir.

Senator PROXMIRE. Well, take a look for the record and see what you can do.

General AARON. There is one point here, Senator Proxmire. You are making the assumption that we know enough about their R. & D. capabilities through our intelligence system that we are not going to be surprised.

Senator PROXMIRE. I am not making that assumption at all. I want to know what the history is, and then we can make our judgment based on that history, but you may be right. They may be changing and improving enormously now.

General AARON. Yes, sir, [security deletion]. That just improves the potential for this technological surprise.

[The following information was subsequently supplied for the record:]

In the past 15 years, the Soviet Union has made steady progress in the development of new and modified weapon systems. Some of these systems reflect the Soviet ability to be innovative when and where they perceive the need. They have also made steady progress in advancing the basic technologies that support their weapons developments.

In some areas, such as their work on [security deletion]. Soviet progress has been somewhat faster than was anticipated. In some cases, there were surprises, but due more to how the Soviets developed a system, or the type of design [security deletion] rather than of a technological nature.

If a technical surprise is considered in terms of a major technological advance that was totally unexpected, or occurred much sooner than anticipated, and which has had significant impact on military capabilities, then the assessment would have to be that there have been no real technological surprises apparent in the Soviet weapon systems developed and identified during the past 15 years.

TECHNOLOGY TRANSFER

Senator PROXMIRE. Well, now, with regard to the issue of technology transfer, you cite the growing numbers of Soviet citizens in the United States as a result of exchange agreements and other arrangements. How many U.S., West European and Japanese citizens are present

in the Soviet Union as a result of trade, exchange agreements and the like? Can you give us that and give us the comparison?

General AARON. Sir, I believe that may be a matter under cognizance of the Department of State, and perhaps better answered there.

Senator PROXMIRE. Well, then, can you tell us off the top of your head or can any of your people tell us off the top of their head what the comparison is? Do they have more or less?

General AARON. I would suspect they have more——

Senator PROXMIRE. You suspect they have more.

General AARON. Yes, sir.

Senator PROXMIRE. With respect to U.S., West Europeans, and Japanese people?

General AARON. Yes, sir.

Senator PROXMIRE. Now, can you provide us a breakdown by country of origin of Soviet imports of Western technology, approved Cocom exception sales, and additional detected diversions of embargoed technology?

General AARON. Yes, sir, we have that. We can provide that for the record.

Senator PROXMIRE. Can you give us some idea of that now?

General AARON. Well, in terms of Cocom exceptions, let's just take for the United States, 1977, $55.1 million; Italy, $33.7 million; United Kingdom, $17 million; FRG is probably the largest, $63.9 million.

[The following information was subsequently supplied for the record:]

The following information on imports for 1975 and 1976 is provided from open source Soviet data and reflects their grouping of Western products and associated technology data packages under machinery and equipment. Amounts are in millions of U.S. dollars.

SOVIET IMPORTS (MACHINERY AND EQUIPMENT)

Country	1975	1976
United States	$629	$823
Japan	612	662
West Germany	1,421	1,473
France	589	677
Italy	432	427
United Kingdom	208	230
Other	702	782

Note: 1977 figures not available.

[Security deletion.]

Senator PROXMIRE. Let me ask Mr. Kaufman, he has a question he would like to ask.

Go ahead.

Mr. KAUFMAN. General, I wonder if there is any explanation for the large amounts of exports of advanced technology from West Germany to the Soviet Union in light of the fact that West Germany is right there on the border with East Germany, is likely to take the brunt of any attack, seems to fear the most Soviet aggression and has the most to lose when the Soviet military establishment advances technologically.

General AARON. That's a good point. We are not directly involved in the Cocom and all of its deliberations, and you know it is not a

tightly knit body. It has no force of law. The United States, I think has tried to take the lead in terms of restricting this material. [security deletion]. However, we do not have evidence that West Germany is exporting advanced technology of military significance to the Soviet Union. There is, of course, always the possibility of illicit trade. [Security deletion.]

Senator PROXMIRE. That is particularly pertinent in point of your statement that [security deletion] had indicated how appalled he was at the fact that we are exporting technology to them that they could find very useful militarily, and it would seem from what I have heard—I may be wrong—but the principal export has been not from this country, although maybe I am wrong about that, but from European countries, particularly West Germany.

General AARON. Well, a great deal of it is gained by espionage. [Security deletion.]

Senator PROXMIRE. Senator Javits, I just have three or four more questions.

Senator JAVITS. Please, go ahead, I am learning every minute.

Senator PROXMIRE. I doubt that, you know so much more about this than I do.

COCOM AND EXPORT CONTROLS

Isn't it true that West European nations disagree with the United States over the usefulness of the Cocom embargo list, and isn't it virtually impossible to police sales of western technology to the Soviet Union because of the attitudes of these countries and the problem of leakage?

General AARON. Yes, sir, as I admitted earlier, it is a difficult problem. We try to police it, try to set the example, but it is a problem.

Senator PROXMIRE. Well, then, is it realistic for us to restrain our businessmen from selling in the Soviet Union under those circumstances? Does it accomplish anything, when they can turn right around and get it from our allies?

General AARON. Well, I think——

Senator PROXMIRE. You have this big list. You had 2,600 some embargoed items, down to 500. You seemed to indicate that that was a—the implication. I don't mean to attribute anything but an implication that that was a foolish policy on our part, that we are giving away technology, but my question is, wouldn't it be sensible for us to recognize the facts of life, either to take steps that would inhibit this action by our allies, or permit our businessmen to sell to the Soviet Union?

General AARON. If you'll remember, about 6 months ago there was a series of articles on this very subject, and as a result of that, I have detected a tightening of that procedure, especially in technology flow from the United States.

Now, I am not up to speed on that completely but——

Senator PROXMIRE. Well, if we are tightening it, is it doing any good, or are you talking about tightening it with respect to our allies, too?

General AARON. I am talking about with respect to ourselves.

The question of policing our allies is one of negotiation.

Senator PROXMIRE. Is it correct that the Cocom embargo and U.S. Commodity Control Lists were reduced because the technologies had already been sold to the Soviets?

General AARON. No, generally decontrol is based on the Soviets, the East Europeans, and the PRC developing their own capabilities or because the item is no longer of military significance.

PROJECTIONS OF SOVIET ECONOMIC GROWTH

Senator PROXMIRE. Now, your projections of future Soviet economic growth are more optimistic than they were last year. That is, you are estimating higher growth rates today than you did a year ago.

What are the factors that contributed to your modified projections? Why do you think they are doing better?

Mr. MICHAUD. Well, last year we were going along with the CIA feeling that the oil situation would be pretty drastic. They said the growth rate would be as low as 2 to 2½ percent, so we went along with them. But as long as we don't accept that decline of growth in oil in the 1980's, then we don't think the GNP will decline as much as CIA had estimated.

Senator PROXMIRE. You say that you had estimated 2½ percent. Now you are up to 3½ percent.

Mr. MICHAUD. As I recall, CIA last year, in their worst case, had prognosticated a possibility of a 2 percent growth rate in the 1980's as a result of the oil, and I think they raised that this year to 2½ to 3 percent. We would have to agree with them on the 2½ to 3 percent, as the worst case.

Senator PROXMIRE. Well, you go up to 3½ to 4 percent.

Mr. MICHAUD. Three to three and one-half percent, which is what CIA is saying this year, and we agree with them.

Senator PROXMIRE. And the difference, then, I take it is because of the difference in the energy availability?

Mr. MICHAUD. We feel that if there is going to be an oil crisis, as CIA predicts, that they won't achieve 3 to 3½ percent.

Senator PROXMIRE. But you don't agree with the CIA on the figure.

Mr. MICHAUD. We agree with the CIA on the GNP growth rate. We don't agree with them that there is going to be a drop in the oil output.

Senator PROXMIRE. You don't agree with them on the energy crisis.

Mr. MICHAUD. On the energy crisis, and the time they say it is going to occur.

LARGE ICBM'S

Senator PROXMIRE. Do you have an opinion as to why the Soviets are insisting on having the right to deploy very large ICBM's at the SALT negotiations? Is there something about their defense policy that demands that type of weapon?

Mr. MILLER. The Soviets have always had a desire for large-sized weapons. It started with the SS–9, and now they have gone to the SS–18. They have a major requirement in their mind to keep that weapon.

Senator PROXMIRE. That's right, but why? What is behind it? What are they concerned about?

Mr. MILLER. There are two reasons. The SS–18 is the carrier for their very-large-yield warhead, the [security deletion] megaton warhead, which they feel they needed a few of——

Senator PROXMIRE. Is this because their accuracy is less and they have to have a bigger warhead to be able to take out a Minuteman and so forth?

Mr. MILLER. No, sir. This weapon is too large and there are not enough of them to go against Minuteman. [Security deletion.] That is the type of application that they would have for that weapon. They want it for large area targets. The reason they are trying to retain this is, we feel, for use as a MIRV system with 10 RV's [security deletion].

So this is one of the major reasons they want to retain that system.

TARGETS IN SOVIET UNION

Senator PROXMIRE. All right, now, how many, prime, secondary, and tertiary military and civilian targets are there in the Soviet Union in the event of nuclear war?

General AARON. I will have to provide that for the record, sir.

I could give some of that but not completely.

[The following information was subsequently supplied for the record:]

The question probably cannot be answered exactly as it was phrased. Nuclear targeting is not couched in terms of primary, secondary or tertiary targets. [Security deletion.]

SOVIET MILITARY AID TO LESSER DEVELOPED COUNTRIES

Senator PROXMIRE. And finally, how much military equipment, of what type, is the U.S.S.R. supplying the new Government of Afghanistan, Ethiopia, and so on?

General AARON. Well, that isn't only to the new government. They also supplied the old Government. It has been going on for some period of time. It ranges from BMP's to tanks, to fighter aircraft; the whole spectrum of military technology and weapons.

Senator PROXMIRE. Well, I want to make sure that I understand this. You say that they are supplying a whole spectrum of military weapons from personnel carriers, tanks, and so forth to both Afghanistan and Ethiopia.

General AARON. Yes, sir.

Senator PROXMIRE. And how much?

General AARON. Over the past 5 years Afghanistan has received more major items of military equipment. But when you look in the short term at Ethiopia, the Soviet tonnage that poured in there during the Somalia incident was absolutely fantastic. They received on the order of [security deletion] tons of equipment in a short period.

Senator PROXMIRE. Well, give us the data for the record.

[The following information was subsequently supplied for the record:]

The following data shows the relationship between Soviet deliveries of military equipment to Afghanistan and Ethiopia annually over the past five and one-half years and cumulatively for the duration of the respective programs. Although cumulative deliveries to Afghanistan exceed deliveries to Ethiopia in virtually every category of equipment, Soviet deliveries to Ethiopia during the past year and one-half greatly exceed exports to Afghanistan during the same period.

[Security deletion.]

Senator PROXMIRE. Are the Soviets supporting guerrillas in and around Rhodesia?

General AARON. [Security deletion.]

Senator PROXMIRE. Senator Javits.

Senator JAVITS. I wanted to ask you this question.

Your department, only would deal with the negative, in other words, what are they doing, what are we being disadvantaged, et cetera. It doesn't deal with the positive, what have we got and how do we counter all these things.

Is that right?

General AARON. Yes, sir, you are getting into the net assessment area.

Senator JAVITS. That's correct.

And you feed into that, the Defense Intelligence Agency gives the information to whom? What is the channel?

General AARON. Well, we will give it to everybody, Senator Javits. We will give it to Mr. Marshall, the Director of Net Assessment for the Secretary of Defense. He also gets the "Blue" data on friendly forces. We give it to Mr. Murray, the Assistant Secretary of Defense for Program Analysis and Evaluation. We will provide it to the military services, their operations people, their plans people, and their budget people. So we supply the whole Defense Department with this "Red" data. I don't mean to say that it is all DIA data. If at all possible, we try to provide the intelligence community data to those planners and policymakers.

Senator JAVITS. Now, then, do they come back to you, based upon what they are doing to meet these challenges, so that you may followup in your intelligence on what to look for, the counterthrust, as it were?

General AARON. Yes, sir.

Senator JAVITS. The intimacy is all there.

General AARON. Yes, sir.

Senator JAVITS. Now, what committee here accounts for that, the Armed Services Committee and the Intelligence Committee? Does that get into it?

General AARON. Yes, sir, I would say so.

Senator JAVITS. That is the channel and the way it works.

General AARON. Yes, sir.

SOVIET PERCEPTIONS OF U.S.

Senator JAVITS. And I notice that, you know, there are many things you kind of throw up your hands at and say, well, I mean, that is just something we have to encounter, deal with. It is just rough.

For example, the export of technology, which by the way came up very heatedly on the floor this morning in connection with these cases, Scharansky, et cetera, and I gather from what you say that in view of the Soviet concentration on the military side, which they are in a position to do of course much more than we, that they are doing quite well.

Now, from your observation and the intelligence, strictly intelligence point of view, what is their opinion of how we are doing? Do you have anything on that? In other words, what is their assessment of how well we are meeting the challenges, what is their—are they confounded by any new technical developments we have made in the last, what Senator Proxmire said, 10 or 15 years?

In other words, from your vantage point of intelligence, how do they appraise us?

General AARON. Well, there have been a couple of [security deletion] studies that looked at Soviet perceptions of us, and I would suggest that you and Senator Proxmire might want to see them. For example, they addressed Soviet reaction to how well we did in Vietnam in deployment of military forces.

The one thing I think that impresses them tremendously is our technology, our technological capability and the ability to field new systems on the battlefield, despite that many times it seems to us rather slow. I think this is one area that is very, very impressive to the Soviet civilian leadership, as well as the military.

Senator JAVITS. So you think they do have a healthy respect for the capability of our system to produce technology and the goods at the performing end.

General AARON. I think one of the most intriguing items in the Soviet Union right now is the little pocket calculator.

Senator JAVITS. The little pocket calculator?

General AARON. Yes, sir.

Senator JAVITS. That we use in the military.

General AARON. No, that we go out and buy in the drugstore. It's the Mickey Mouse watch of 1978.

Senator JAVITS. Well, General, I am glad you testified to that because to me that is very key, their appraisal of us.

And are you satisfied that the means that you have used to monitor that situation are OK and do what needs to be done in terms of giving us that factor to crank into our plan?

General AARON. Yes, sir, I think it is just amazing how well we are able to follow their system. As I pointed out to Senator Proxmire earlier, we don't have [security deletion]. But we are not satisfied with that. I doubt if we ever would be.

Senator JAVITS. Do you think—this is just a question of quality so you can just answer it to your best judgment. Do you think that they rate us higher than we rate them or vice versa?

General AARON. Yes, sir, I think they do.

Senator JAVITS. They do?

General AARON. Yes, sir.

Senator JAVITS. Well, so long as that continues, I think we at least have a 5-percent edge.

General AARON. Yes, sir.

Senator JAVITS. Thank you, Mr. Chairman.

Senator PROXMIRE. Thank you, Senator Javits.

DEFENSE AGAINST CRUISE MISSILE

I should point out to you that two of the points that impressed me—I am sure you are familiar with this, but they were confirmed by these top experts—was that as I understand it, and correct me if I am wrong, but they have no defense and no likely defense in the near future against two of our weapons: One, the cruise missile, and, two, our submarines—the nuclear capability of our submarines. They know that, and of course, they are so defense minded——

General AARON. Yes, sir.

Senator JAVITS. How long is that likely to last?

General AARON. Well, we think that Soviet submarine detection, although they are working very hard on it, is going to be insufficient for [security deletion] years. As for cruise missiles, I think it is going to be a long time before they get an air defense. It is going to cost them billions of dollars to do it.

The SA–X–10 is now in tests. It is a low altitude air defense system. I don't think that is going to do it alone.

Senator JAVITS. General, I can't tell you how impressed I am with your appraisal, even for the short time I have been at this hearing today, and knowing a great deal about this subject myself.

What do you think about the possibility of sanitizing any kind of a version of this? You know, our people have now depreciated us to the point where, not the Russians, but they think we are 4 feet tall, and the equanimity, the judgment, the coolness of this, the fact that American scientists and American technologists have not all gone on strike against our defense, and that we are in there, there is an appreciable factor, especially what they think of us, there is an appreciable factor, I think it would be very valuable.

And I just wondered whether you and our chairman might not together, because this is strictly collaborative, because we are certainly not wild Indians, certainly not on this committee, to think over whether something could be done toward a judicious publication of what you can say, perhaps even this very testimony——

Senator PROXMIRE. Senator Javits, perhaps I misinformed you. You are dead right. The question is time, and they are going to give us a sanitized version, and I am delighted you bring that up at the end, at this point, because I think it is something we ought to agree on.

Would it be possible for you to give us that sanitized version by August 20?

General AARON. Yes, sir.

Senator PROXMIRE. That gives you about a month, and we would like to have it very much.

Senator Javits couldn't be more right. I think it is very important for us to get the facts, the information to our colleagues, too. They are not going to read this unless it is published, and then they will, as well as, of course, the general public.

Senator JAVITS. Well, now, in sanitizing—may I?

Senator PROXMIRE. Yes.

Senator JAVITS. May I ask you this information? Now, we have asked you for a lot of additional information. That gives you an opportunity to fill out a record, so that it is not this, you know, the crazy business here and then suddenly it stops. Let's make it readable and narrative and quality and what you haven't told us that we have asked you for enough information, you know, give it to us so it can be filled in so that a sanitized version really tells the story rather than just, you know, technically standing by, we asked you this and you answered that, and you excised so and so and then the thing is hardly readable.

Senator PROXMIRE. I think that on the basis of past experience, the version that you give us will be extremely interesting, and very, very helpful to the public as well as the Congress in understanding what we are up against and what our policy should be to meet our problems.

Senator JAVITS. In an interesting way, General, I hope it is reassuring, because we are spending our life's blood on defense and people, you know, worry about the fact that we are pouring out all of these billions, and are we really up there, and I think from what you say, it sounds reassuring to me, and that the facts are more reassuring than the theories about the facts, or the special pleading that somebody, you know, in the complex may be using because they want to sell airplanes or missiles or what, and I hope very much you can do that.

General AARON. Sir, I would like to say one thing here. I have not in any way tried to imply that these people are 10 feet tall. They are far from it, because they do have a lot of weaknesses. I haven't brought any out this morning, but I would like to touch on a couple of points.

I have been in Europe as an assistant division commander and corps chief of staff, and as G–2 in Europe. I have watched these people and what we can do. If we got in a confrontation with them—and I am talking about a conventional confrontation—I think we could take damned good care of ourselves. I would like to make that point.

SOVIET MILITARY IN EAST EUROPE

Now, the second thing, I would like to tell you a funny thing that happened in [security deletion]. It shows you the weakness of the Soviets, and the difficulty of the Soviet officers, especially in the East European areas. There he is not seeing the cyrillic alphabet on road signs, which say this is the way to get to Waldorf, Md. It is in [security deletion] the Anglo-Saxon letters.

Our attaché was out in a green jeep which we provided him for better cross-country mobility and he came on this Soviet formation in the field. Our people were dressed in green clothing that looked in some respects like their military clothing. Suddenly, a Soviet lieutenant came up. Our attaché thought he was going to throw him out of the maneuver area. The Soviet officer was waving a map and said, "I'm trying to get to this [security deletion] town. Can you help me?"

And our attaché, who speaks both [security deletion] and Russian, said, "Well, let me see your map." [Security deletion.]

Our attaché was showing him how to get to this road and that road. Next comes up a Soviet colonel who had made the same mistake and also was lost.

So a lot of people don't understand that they lock those maps up, they can't read the road signs, and sometimes they may be going across that border and may end up on another route going back to Moscow. And there are serious deficiencies in their army like the lack of flexibility among their subordinates. Even the Soviet leadership has complained about their people who have to be told everything. They can't think for themselves.

Ustinov complains about the lack of party indoctrination. So we have a lot of spiritual pluses, in addition to technological capability and people doing their jobs.

So, I want to leave you with that impression. I didn't come over here to use scare tactics.

Senator PROXMIRE. Well, I think that is a delightful story. I think it is very interesting.

Now, General, I take it that you can give us for the record the rest of your presentation.

Was there anything that you would like to emphasize because I did cut you off before you finished your formal presentation?

General AARON. No, sir, we would have covered the manpower problem, as did Admiral Turner. We think that they can make adjustments within their manpower by conscription. I think that is the only big point I would make. But you already heard that. I don't see any reason to repeat it.

Senator PROXMIRE. All right, thank you for an excellent presentation. We are in your debt. You made a fine record, and we appreciate it very much.

General AARON. Thank you.

[Whereupon, at 12:25 p.m., the subcommittee adjourned, subject to the call of the Chair.]

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