

**FIELD HEARING:  
DEFENSE CONVERSION**

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**HEARING**

BEFORE THE

**JOINT ECONOMIC COMMITTEE  
CONGRESS OF THE UNITED STATES**

**ONE HUNDRED THIRD CONGRESS**

**SECOND SESSION**

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**JANUARY 12, 1994**

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## **FIELD HEARING: DEFENSE CONVERSION**



**WEDNESDAY, JANUARY 12, 1994**

CONGRESS OF THE UNITED STATES,  
JOINT ECONOMIC COMMITTEE,  
*Washington, DC.*

The Committee met, pursuant to notice, at 11:10 a.m., in the Los Angeles Board of Public Works Hearing Room, Los Angeles City Hall; Los Angeles, California, Honorable Barbara Boxer (Member of the Committee) presiding.

Present: Senator Boxer, and Representatives Cox and Waters.

Also present: Dave Thompson, professional staff member.

### **OPENING STATEMENT OF SENATOR BOXER, MEMBER**

SENATOR BOXER. This meeting of the Joint Economic Committee will come to order.

I am very pleased that Congressman Cox is joining me here. The Joint Economic Committee is a bicameral committee. It's quite unusual. It has members of the House and the U.S. Senate, Democrats and Republicans, of course. I'm very pleased that Congresswoman Maxine Waters will be joining us today, for as long as she can.

The job of the Joint Economic Committee is to examine the broad range of economic issues facing this nation, including technological competitiveness, the cost of health care, fiscal and monetary policies, and job creation.

The Joint Economic Committee regularly conducts hearings on various aspects of the economy.

Last year, the Committee held hearings on the loss of manufacturing jobs; the cost of health care, its impact on our economy; the state of our federal research lab's technology policy; economic growth; and even dealt with foreign policy economic issues such as economic reforms in China, the former Soviet Union monetary policy, and the need to create high-wage jobs in this global economy.

The Joint Economic Committee is also tasked with reviewing the annual *Economic Report of the President*, reporting on the Committee's findings and recommendations. Each month when you get the new unemployment figures, the Joint Economic Committee conducts a hearing to review those figures released by the Department of Labor. At

this hearing when we discuss the unemployment figures, Committee members have the opportunity to question the Labor Department officials about the reasons for the job gains and job losses.

The Committee is, as I said, bicameral, made up of ten members of the Senate and ten members of the House. It really is a think tank, economic think tank, of the Congress. We have an opportunity to go out into the states and find out what's really happening, and of course that's the purpose of what we're about to do today dealing with conversion.

I want to welcome the witnesses that are here and thank them for taking their time, and again to my colleagues for joining us.

California has been dealt a very difficult hand in this economy. The combined one-two punch of base closures and military cutbacks have hurt us. And although many of us in the Congress had called for a conversion strategy in the 1980s to deal with the end of the Cold War and we all worked toward ending it and prayed it would end, there really wasn't any strategy dealt. So we have been dealt a tough hand.

But all of us here know that we don't intend to fold up our cards and drop out of the game; we intend to stay in it. And the reason I'm so pleased with the panelists that we'll hear from is that they're staying with it and in it, and therein lies the success story to conversion. We need to win this fight, and we intend to make the goals of job creation and economic growth a reality for Californians.

Today, we are saying once again that we must ease this transition. The time is now for our government and industries and workers and communities to work together to direct our economy toward creation of new civilian technologies. It doesn't mean government direction. It's all of us together choosing the direction—technologies for mass transportation systems, electric vehicles, information infrastructure, environmental cleanup, biotech research, to name a few.

Soon after President Clinton took office, I asked him to release conversion funds that had not been distributed yet by the Bush administration, and he did so immediately. The President did a comprehensive defense transition plan that focused resources on community worker assistance, dual-use, reinvestment, and civilian technology work reform.

Today, immediately following this hearing, for those of you who have been that stronghold and who are still with us, we are going to make a call to the Economic Conversion Clearinghouse. This was an idea that I put into legislation—a 1-800 number—so that workers, communities, unions—anyone who wished to—could phone to find out all the various programs that are offered by the Federal Government, because there are 23 separate agencies.

So we're going to make that call and see how the Clearinghouse is working. We understand we're getting about—what is it—200 calls a week. Eighty percent of them are coming from California. So I'm excited to make that call and hope some of you can stay with me.

Today, we will hear success stories, but we will also hear stories of the struggles. And it's a struggle, no question. And through it all, we can't forget what's at stake. We can't forget that conversion means real jobs for real people in California if it works and if it's done right, and we certainly know what it can mean to Californians.

So let me put the rest of my statement in the record at this time and ask Congressman Cox, who is a member of the Committee, if he would like to make a statement for the record.

**OPENING STATEMENT OF REPRESENTATIVE COX,  
MEMBER**

REPRESENTATIVE COX. Thank you, Senator Boxer. I also would like to say hello to Congresswoman Waters.

It has been my privilege to serve with Senator Boxer when she was in the House of Representatives and I backing and she the chairman of the Subcommittee of 204 in Boston and in California before. Now, once again, we've come together. This is, in a certain sense, a happy indication because we are trying to plan to avoid that kind of conflagration. It is possible for us, I think, to make lemonade out of the lemons that California has been dealt.

Eighty-eight percent of personnel cuts and base closures will occur in California. Although 20 percent of the total U.S. defense dollars are spent in California, we will have to absorb more than 30 percent of the cuts in the latest federal budget.

The reason we're here today is that peace allegedly has broken out, although it's difficult to make this out when one looks to North Korea, to the Middle East, to Sarajevo and the Balkans, and to the other hot spots developing around the world.

Nuclear proliferation remains as difficult a problem now as ever it was, and for that reason, we might ask ourselves whether all of the dislocation caused by defense productions is necessary. We are presently posed to cut defense further by a total of \$120 billion over the next five years. This is on top of the 20 percent cut that was already achieved in real dollars between 1985 and 1990.

As a result, Secretary Les Aspen recently concluded that the defense cuts proposed in the latest budget take at least \$31 billion too much out of defense spending and will likely, in his view, endanger our ability to provide a federal defense for our nation. As we meet here in this room today, defense spending already has fallen to the smallest share of GNP since 1951, but the cuts proposed in the aftermath of the collapse of the Soviet empire would go dramatically deeper.

I am concerned that as a result of that, excessive defense cuts would affect not only our capacity to respond around the world, but also around primary readiness. And I think that as we meet today, we ought to see to it that we don't repeat the mistakes that our nation's leaders made in 1939, in 1948 and 1950, and in the late 1970s.

Nonetheless, we can reduce spending, do so in a healthy way, and do so in a real way. That doesn't mean we have to be ill-considered about it. But as we cut, there is no question that California will feel the brunt. More than 20 percent of California's scientists and engineers are involved now in defense-related work. Our state already has lost 780,000 defense jobs since the beginning of the economic downturn in 1991, including well over 100,000 defense-related jobs.

The economists estimate that unless defense conversion works, at least 20,000 more Californians will lose their jobs each year for the next five years because of defense cuts. And our task is to see to it that these people simply change jobs, that they do not lose their jobs. If we fail, it is not merely incidental that our state government's finances will suffer along with the California workers who lose their jobs.

In 1992, defense cuts reduced our state budget, the state government, by \$450 million dollars. By 1997, if this is not corrected, this annual loss will be three quarters of a billion dollars. The total loss from 1992 to 1997, unless we change course, will top \$3 billion.

The task of defense conversion is to redirect the creative energies of some of the most highly skilled members of the California work force—scientists, engineers, and experts in manufacturing, materials, fabrication and electronics—away from government defense contracts, away from contracts for the Pentagon, and toward the area of consumer goods, industrial products, and technological services that our late 20th century society needs.

The number of new ways to use these valuable labor and capital resources is endless. It's mind boggling. Technology-created markets change rapidly. It is therefore inappropriate for government agencies, driven as they are by the political system, to decide one at a time who should get capital for which, hopefully, promising commercial idea. We can episodically provide assistance in this respect. Unless we have a sound macroeconomic strategy, we will never be up to the task.

Responding to society's changing demands for goods and services is what markets do best. They do it far better than the government. Yet, markets need investors. Entrepreneurs with business ideas also need investors. Even though a single laid-off worker from, say, McDonnell Douglas could provide employment for a dozen or more of his colleagues who were likewise laid off, if he has a solid commercial idea that utilizes the high-tech skills they've learned in defense contracting, they can't do it—he or she can't do it—without capital.

That's why macroeconomic policy is the single most important element in defense conversion. Reducing the cost of capital—to lower taxes on investment, not higher taxes on investment, through reducing the cost of capital by repealing capital gains taxes that treat inflationary gains as if they are real economic gains, through less regulations of small business rather than new employer mandates on start-up entrepreneurs—these are the ways that, in a myriad of business opportunities,

the government macroeconomic policy can help with defense conversion.

So I am delighted to see to it that in our governmental oversight capacity, we make sure that defense conversion agencies and the Federal Government work as a joint economic committee. We are principally concerned with macroeconomic policy, and we have got to make sure that macroeconomic policy favors job creation.

We will be hearing from a very excellent panel of witnesses today about a number of opportunities for defense conversion and for the government to assist in this process. I note in some of the written testimony that's been presented that one of the opportunities we have to assist in defense conversion is to improve the Export Administration Act to expedite export licenses and remove unnecessary export restrictions.

This is something that is vitally necessary in the wake of the collapse of the Soviet empire because all of these restrictions were tailored during the era of the Cold War. For that reason, I have become the chief Republican sponsor, with Congressman Edwards of California, the chief democratic sponsor, of legislation to do just that, to fix the Export Administration Act. And I hope that we hear more about that today.

Having said enough, I'd like to give it back to the Chairman and thank our initial panelists for being here with us today.

SENATOR BOXER. Thank you very much, Congressman Cox.

It's a pleasure to welcome Congresswoman Maxine Waters.

#### **OPENING STATEMENT OF REPRESENTATIVE WATERS**

REPRESENTATIVE WATERS. Thank you very much.

I'd like to thank Senator Boxer and Congressman Cox for inviting me to join you here today for this hearing.

I'm especially appreciative of the work that the Senator has been doing and the leadership that she has taken in the area of economic conversion.

Defense conversion is one of our most pressing issues here in California. Since 1987, our defense industry nationally has lost half a million jobs, a 20 percent decline, and that's only the direct job loss. Our state remains locked in a three-year recession that has cost us 800,000 jobs, fully one third of all jobs lost nationally.

Half of California's technical and professional workers are employed in aerospace and defense. Los Angeles County has been especially affected. Aerospace employment, which accounts for 26 percent of manufacturing employment in the county, continues to plummet. Since 1989, the county alone has lost 50,000 high-tech defense-related jobs, and this is not the whole picture. These figures do not include the multiplied effect of job losses in the defense sector—the impact on the parts supplier in Hawthorne, the construction company in Inglewood, and the restaurant in Gardena.



In the 30th Congressional District, which I represent, Northrop is probably the largest single private employer. This is not a "what if" kind of issue for me and my constituents. It is very, very real. It should be obvious to all by now that military production is no longer a practical way to keep America working. As a long-time peace advocate, I have seen this day coming for many years.

Because a succession of administrations did little to prepare, however, we are now having to play catch-up. American workers, their companies, and communities are paying the price for that lack of preparation.

As a member of House Majority Leaders Task Force on Defense Conversion and the California Congressional Delegations Task Force on Defense Reinvestment and Economic Development, I'm happy this hearing will focus attention on the conversion initiatives by both the public and private sector.

We owe nothing less than our best efforts to insure a transition to civilian production that can preserve companies and preserve high-skill, high-wage jobs. These are the jobs that will assure Americans a place in the 21st century local marketplace. Economic conversion is the link between our past investment and our future performance.

To sum it up, I have introduced HR 1027, the Economic Conversion and Diversification Investment Tax Credit Act. This legislation would give defense-oriented firms a tax credit for increasing their investment in civilian production. Firms with 10 percent or more from a total revenue of defense work would be eligible for an investment tax credit equal to 15 percent of their net nonmilitary increase in investment averaged over three years.

This tax credit can give companies some breathing space and some incentive to retool plants and equipment, retrain workers, and rethink strategies for competing in the civilian marketplace. There's descriptive talk of turning swords into plowshares. Well, I want to see companies that once turned out tanks competing to produce the electric cars of the future. I want to see firms who once researched chemical weapons supplying their know-how to environmental cleanup. Our task is to lend a helping hand to business, workers, and communities. We owe them nothing less than our best efforts.

Let me again say, my very special thanks to Senator Boxer and to Congressman Cox. And let me say to those who have some problems with the word "conversion," I really don't care what you call it. Diversification, conversion, a change of direction, rethinking, creativity—we're all talking about the same thing. How do we make up for the loss of jobs? How do we take some of the expertise and the talent and the plant and equipment and create jobs?

California needs to be in the forefront of the creativity because we have suffered more than anyone else. I am very pleased that I'm a part of a delegation working in concert, Democrats and Republicans, to do everything that we can to free up resources to assist in diversifying, or

in converting—whatever you want to call it. And I think that our continuing to work together in the way that we have will continue to produce some results in this area.

Again, thank you very much.

SENATOR BOXER. Thank you very much. Thank you very much, Congresswoman, for joining us.

In response to both of you, for your excellent statements, I would say, during my campaign in the United States Senate, I said something similar to Congresswoman Waters. She might be—I guess you're not that surprised at that—and that is that if you could build a bomber, you could build a bus. And I said it just to make a point.

Well, the truth is, if you've built a bomber, you can build a bus. At Northrop, they're building a Stealth bus. They're using the Stealth technologies. They're making a light-weight, energy-efficient bus, and it's now just about ready to go into production. As far as I know, there isn't a company in the market that builds a bus from start to finish. I haven't seen one yet. There is a lot of room for us to develop that expertise, and it's happening right here in Los Angeles.

In terms of the comments about economic policy, I couldn't agree more with Congressman Cox, because we do need an economic climate that leans in favor of growth. And we did see this Administration ease exports dramatically; dramatically. And I still do agree that we need some legislation.

I would be very happy to be the Senate sponsor of a legislation that says we need to look once a year at the Export Control Act and not just leave it up to the administration. It has to happen every year so that as technologies change, we can respond so that our companies have growing markets.

Lower capital gains for new small business was included in the tax bill. It is for small business, but it's a 50 percent reduction in their capital gains. So all that fits into the package.

Well, enough said for me. At this point, I am very pleased to introduce the first panel. Rohit Shukla, Director, Aerospace and High Technology Business Task Force, Los Angeles Economic Development Corporation. L.A.E.D.C., who was a recipient of the \$5 million Economic Development Administration grant, has taken a leadership role in promoting business diversification and conversion efforts in the L.A. area. He submitted a proposal to the Technology Investment Project for establishing a regional technology alliance.

After he is finished, we will hear from Mr. Michael Gage, President of CALSTART, and I'll say more about him at that time.

Mr. Shukla, welcome, and we look forward to your testimony.

## PANEL I

**STATEMENT OF ROHIT SHUKLA, DIRECTOR,  
AEROSPACE AND HIGH TECHNOLOGY BUSINESS TASK FORCE,  
LOS ANGELES ECONOMIC DEVELOPMENT CORPORATION (L.A.E.D.C.)**

MR. SHUKLA. Thank you, Senator. Thank you for this opportunity to speak with you briefly about the experience in the area of defense conversion.

First of all, let me just state, for the record, the grant that was made by the Economic Development Administration was \$5 million to the County of Los Angeles, of which 2.3 million was awarded to the Economic Development Corporation for the basic program over three years to assist companies and communities in rebuilding their economic base.

Our experience, to date, with defense conversion forces us to be a little more cautious than we would have thought necessary only a year ago. Part of that experience is because of the Technology Reinvestment Project, or T.R.P., I think by emphasizing the boost in development the way it did, it encourages the same qualities and attributes that have been of importance in the defense area.

By suggesting, however, that it was interested in economic development in the regions most affected by defense, albeit in the long term, it exposed the weakness of this approach. And our experience with T.R.P. is that, in fact, those kinds of decisions ought to be left at a local level and among companies. We feel that government's role in this regard is to provide incentives—as Congresswoman Maxine Waters has done and we ourselves have done—to companies, to in fact make those moves the way they see fit rather than establish technology as a driver.

Companies understand what technologies are going to be important, based on their effectiveness and on their ability to market. What they need, frankly, are incentives in the form of either tax credits or other kinds of incentives to make those happen faster and with a greater degree of efficiency.

Hughes, for example, is taking the leadership role in establishing its own units based on the availability of strategic bombers, their ability to capture new markets that will, in fact, be available. But Hughes does not need government direction to tell them where to invest those dollars and what kinds of technologies that are going to be important for the future of economic development in California. They can work very well with the local agencies in establishing what those negotiated areas might look like.

Obviously, efforts by the Department of Defense to establish dual-use technologies are important in that, at least to some extent, it establishes commercial practices as being important rather than defense-unique practices pursued by the Department of Defense over the past 50 years.

Basically, if government is going to do anything apart from the incentive picture, it is to, obviously, establish a predominant role in deployment initiatives, which T.R.P. attempted to do, but in my opinion failed to do, at least in their local effort. By emphasizing the proposal of developments, it made the government decide what is and what is not important in the marketplace simply on precedent. Decisions about the commercial future or the continued investments of technology and products needs to be made by companies.

CALSTART is an example of a consortium that is quite capable of and interested in making strategic investments, based on the availability of talent locally. But regulations that tie down government funding to CALSTART and to other agencies are, frankly, ties that tie them down.

This gigantic, diversified, robust economy does not need more ties and more restrictions either in government funding for specific projects or no funding for specific projects. It needs maximum latitude by local agencies, by local participants, consortia and other kinds of groups, and it needs a very healthy dose of government encouragement, as opposed to restrictions that suggest you can and cannot do such-and-such with the money.

We are not going to go into any detail, but there are several things that we agree the Federal Government can do and has a major role in playing. The capital problem, obviously, you've heard about, is a major problem for expanding, growing companies, especially small companies.

But let me just make an observation here that, despite the continuing news flood of unemployment and so on and so forth, at least part of the problem with the unemployment that defense companies are being confronted with is that for years they have had to mirror their largest customer, so in fact at least part of the employment that they were contending with was mirroring a contracting obligation they had to fulfill by the Federal Government.

Even if the Federal Government becomes a more efficient, cleverer procurer of goods, you can't expect a leaner, more productive defense economy. Otherwise, they're forced to take on additional layers of people to contend with all that compliance, all that paperwork, all that other specification, which is a marked difference.

I mean, one of the greatest disservices we have done in an attempt to talk about defense conversion is to paint the defense contractors as greedy, unscrupulous contractors when they come up with prices like \$600 for a toilet seat. When the truth of the matter is, in the kind of numbers the government procures, it may, in fact, cost that much to build. That has never been made public, unfortunately, by a recalcitrant government that wants to let the contractor take it on the chin for these kinds of things. So there is a bit of deception that has to be corrected with these people before we can even attempt to talk about defense conversion. And certainly, this is going to be talked about in defense conversion.

There are small companies in Thousand Oaks, in Newbury Park, in Glendora, in Glendale, that have moved to be essentially strong subcontractors in the defense base to strong subcontractors in the commercial base.

So the three things that I would suggest is attempts to incentivize capital formation; reduce restrictions in banks that have tied them down in reference to making loans to companies; encourage the regional development of banks, possibly nonprofit banks. Kathleen Brown, for example, announced a new program yesterday along those lines.

Let economic development professions locally do their job; the same point I was making earlier about the restrictions of government funding that constantly hedge us and prevent us from doing what we need to do.

And third, we need regional organization. This is not a county situation; this is a regional matter. It is a matter for Southern California, which involves five counties, and San Diego. Insure that defense conversion is integrated into economic development activities, not as separate, thus emphasizing an artificial separation between defense and commercial companies.

And the last point, I would think—and this goes to the heart of something Senator Boxer is trying to do with the Hotline, which is an extraordinary information tool. The problem is that there is a huge inventory of databases, communication links, communication networks. Data banks have existed for years. I mean, KAREL [phonetic] is one example of a data bank that should have been integrated into a number of other information resource banks a long time ago. It has not been done.

So I would suggest that Congress at least incentivize and encourage the creation of an inventory of such data banks so that we don't do a duplication of effort.

Other than that, my testimony speaks to the program that we have put into place locally. I know we'll have results from that. Thank you.

SENATOR BOXER. Thank you very much.

It is my pleasure to introduce Mr. Michael Gage, president of CALSTART, who is not a stranger to any of us. He was in public life. He is, in a way, still pursuing public service in a very important way. CALSTART is a consortium of defense and auto industry firms, labor unions, local governments, and academia joined together to spur an advanced transportation industry in California, an industry that has a tremendous potential.

CALSTART was disappointed in terms of funding in the last round, I know, as we all were. It didn't get what a lot of us thought it should have gotten. But let me just say, as one Senator, in my view, as we look out into the next century, the electric car is going to be one of the basics of California's economy. We are poised to produce it, and if we are serious about clean air and we stick with that and don't back off and run away from it—which we shouldn't do—I think you're right there ahead of the

curve. What Congresswoman Waters says is right: In the 1980s, people were behind the curve; you have to be ahead of the curve.

So it is with a great deal of pleasure that I introduce Michael Gage.

**STATEMENT OF MICHAEL GAGE, PRESIDENT,  
CALSTART**

MR. GAGE. Thank you, Senator Boxer, Congress members. I'm delighted to meet with your esteemed committee this morning.

CALSTART has been recognized by the California Congressional Delegation as a model defense conversion organization, and we're proud of that. But I also must add that defense conversion is not our only goal. In fact, the major point I'd like to make this morning is that defense conversion will not happen in a vacuum. There must be some reason for defense conversion other than downsizing. There must be something to convert into.

We focus on creating an industry. The advanced transportation industry is one example. And it is that fit between the new industry and the skills of the defense and aerospace industry that have made us a success today.

Here is how we know there is a need. This smoggy picture in the middle of this chart probably says it better than any statistic could, and two thirds of that problem comes out of the tailpipe of vehicles.

Plus, while the air has been improving, the problem is about to get worse. It's a global problem. Worldwide, the number of vehicles is growing geometrically, almost doubling within the next 20 years. And in the United States, we probably are increasing at the tune of 50 billion miles, new miles, driven each year. But as you can see on the chart, worldwide, it's escalating dramatically.

That leads us to a series of congestion, making most of our miles, traveling at an inefficient 20 miles stop and go—from 1975, 57 percent of us travel that way; to 2010, about 75 percent of us travel that way—the least efficient and most polluting miles traveled. The result of all of this is that most experts believe that by the year 2000 or 2001, our air pollution will increase above the 1989 level that we have recently achieved.

That's what's caused CALSTART to come into existence; opportunities to create new jobs and clean the air. It's what Americans do best: Invent and develop high-value technologies. That's our mission, and we do it by tapping the knowledge and experience of California's world-class aerospace industries and redirecting their skills and talents.

For your purposes this morning, I wanted to show you the showcase electric vehicle. It literally was designed to showcase 20 different aerospace and defense technologies, almost all aerospace and defense technologies—everything from its advanced electric motor and electronic controller to its lightweight aluminum space frame and its energy-saving, variable-temperature seats.

I'd like to talk briefly about a number of those technologies this morning. We're using and developing a minimum of 16 defense and aerospace technologies in this new industry. Hughes, who I see over here later in the form of Mike Armstrong, has developed a magnetic-induction vehicle charger based on interwater power transfer technology, and their power control of the vehicle comes from their F-14 radar expertise.

Aerojet is making from their MX missile propulsion systems light-weight natural gas fuel cell storage modules. Allied Signal and others are developing ventricular fuel cells from the power source of the space program. Another company is working on advanced chemical batteries for fine reels based on gyroscope satellite control and guidance technology.

Allied Signal has also converted a turbo alternator that provided electric power to tanks to power hydroelectric vehicles, and FMC in Northern California is converting high-powered A.C. electric drive motors from tanks for use in electric buses and trucks. Kaiser Aluminum adapted technologies from their aluminum space frames for low-weight vehicle chassis. And a little firm called APS, which is a minority business that made tank trailers for the military, now makes an electric bus. In fact, they're opening a new plant and will employ 20 more people in Santa Barbara in the next two months.

Americon [phonetic] has taken technology that tooled the heat-sensor sidewinding missile and turned it into an efficient way to cool and heat vehicle seats. In fact, if that vehicles seat is over here, you can take a break at lunchtime and we would be delighted to have you sit in it and experience the heating and cooling that cooled the infrared sensor on the sidewinder.

SENATOR BOXER. We would love to do that. We're very used to hot seats.

MR. GAGE. We can give you a cool seat.

SENATOR BOXER. Cool seats, we're not used to. So that may be good, yes.

MR. GAGE. We brought you examples just so you can see that defense conversion isn't just an idea; it is actually happening.

More importantly, we're helping to create literally hundreds and probably thousands of jobs. In fact, the California Council on Science and Technology projects that hundreds of thousands of jobs can be created in California, more than 70,000 in electric vehicles alone by the year 2010, and more than 400,000 in the full arena of the advanced transportation industry.

These technologies have new applications because they bring new thinking where it's needed and because there's a new industry growing. We also want to see defense conversions succeed to create jobs and redirect technologies. But we think we must focus our efforts not company by company nor even technology by technology; we must focus instead on efforts to create whole new industries.

Advanced transportation is but one example. Its growth gives many companies, statewide and nationwide, a real chance to reapply their tactics, to compete, and to generate new opportunities for themselves and for American workers.

We will be delighted to respond to any questions you might have.

SENATOR BOXER. Thank you very much. I want to thank both panelists.

Mr. Gage, I have been looking at the reaction of Detroit to California air standards and find them again to be so out of touch with reality, because what they want to do is to say that we don't have to have the standard in which by the year 2000—or is it by 1998—we have to have 2 percent of the vehicles be zero-emission vehicles. They're saying, "Oh, don't do that. We'll create a better car, but get rid of the standard."

It seems to me that the standard is crucial for health and it is also crucial to this industry. And I am putting together a letter that I'm hoping will be a thoughtful piece on this whole issue. And I wanted you to tell me, in your view, if we were to back away from the standard—and as we know, President Clinton said he would not do it. If California wanted to stick with the standard, he would stick with the standard. But I feel it is very important that our state leaders know how important the standard is to the future of CALSTART and to the future of this very promising new industry.

MR. GAGE. Senator, I couldn't agree with you more. Frankly, hundreds of businesses in this state believe that that mandate is important. It's something that's been on the books for years. It's encouraged their dramatic investment in the industry, and it's helped drive an enormous amount of innovation in new technologies.

We believe that the administration in the state is currently very supportive of maintaining that 2 percent standard. Jackie Schaffer [phonetic], the newly appointed air chair, has said publicly at the auto show, in response to the auto industry's refrain, that she was very supportive of the 2 percent mandate; believed that it has a lot of merit; wants to make sure that it is technically feasible. And that's, of course, where we have some differences with the Big Three.

I would say this: The Big Three are indeed protecting their short-term interests, because in fact they don't make electric motors; they make internal combustion motors. It's Westinghouse and Hughes and others that make electric motors. So we understand that their short-term vision says that that's a quantum change, and they're having some difficulty adjusting to it.

We also know that technology today is not what it would be four years, ten years from now. But we look back at the turn of the century, when the auto industry started, and we look at that and the 85 percent cost decline in the first 15 years of the auto industry, and we think that they know that that's exactly what happened then. Those are the U.S. Department of Commerce figures.

But today it's even more dramatic. In the U.S. computer industry, the learning curve drops the cost 80 percent in the first six years of exis-



tence. That's what we believe the automakers are facing, and that's why we believe these vehicles will get extraordinarily inexpensive very, very quickly, because that's the competition today. It's a whole different market than it used to be.

SENATOR BOXER. Congressman Cox.

REPRESENTATIVE COX. Thank you.

I'd like to address some questions also to Mr. Gage.

I wonder if you could enlighten us as to one particular phrase that you used. It struck me that the burden of your testimony was that we ought to place our emphasis on new deployment services rather than proposal development, and I wonder if you could talk at some greater length about what you mean by deployment services, although I think you've given us a good start on understanding.

MR. SHUKLA. Thank you, Congressman Cox.

What I mean is that there have been lacking in California, and certainly around the country, structures of the kind that Ben Franklin Technology accomplished recently in Pennsylvania. I understand that Pennsylvania had to respond to a devastating loss of their steel industry some 12 years ago and responded very clearly with state and federal initiatives, established strong political organizations that were comprised of a whole range of industrial leadership and so on. As a result of their efforts over 12 years, we now have an extremely robust, diversified economy in Pennsylvania. Now, that has happened as a result of a number of issues, and I would be hard pressed to mention all of them here.

Let me just say that there is considerable activity occurring currently in the Los Angeles area in several industrial sectors where defense and commercial companies participate. And the commercial area is only one of them. Advanced transportation is another. Medical and health care systems are a third.

There are activities that local economic development organizations could be assisted by and low-term, low-interest loans that could be made for small companies without restrictions on how that money is spent, except by negotiation with local agencies, as opposed to a government dictator as devised 50 or 30 or 20 years ago.

So there is a range of activities. My testimony goes into some detail on some of it, but we have a whole data bank of experience that I can share with the Committee at some length.

REPRESENTATIVE COX. Now, if, at the national level Congress were interested in redirecting the government's efforts this way and we wanted to focus upon things that you've described as deployment services, how we would do it?

Of the examples you've given in your testimony thus far—correct me if I'm wrong, but I think these are examples of what you mean by deployment services: You'd include assistance with regulatory concerns, patent filings, and so on. How does that translate into a government policy into national—

MR. SHUKLA. Those programs that I was talking about were devised and implemented at a local level, not by the Federal Government. The Federal Government did provide some immediate grants. Title IX is a clear example of a flexible program. It doesn't have too many restrictions, but it doesn't have too much money either. The idea is to allow a local group that is comprised of a number of different organizations to come up with a whole range of activities that they would like to pursue locally.

All I'm saying is that investments ought to be regionally directed, and what kind of investments and what kind of services is pretty much a function of the local economic development field, as opposed to either congressional or federal direction.

REPRESENTATIVE COX. Okay. I appreciate that.

I wonder, Mr. Gage, if you can talk about CALSTART, which I've been personally interested in promoting, and I hope that I have been of some small assistance. Because you're a nonprofit consortium of some public and mostly private entities, you're a strange animal in the marketplace; and indeed, you're not entirely a marketplace animal.

Is it possible that there might be a CALSTART spinoff that would be strictly a commercial exploitation of what the consortium has made happen, to begin with?

MR. GAGE. We see companies that are part of CALSTART as providing—CALSTART itself has no interest in commercial exploitation, but we would encourage the companies that we are assisting to commercialize the product very quickly.

REPRESENTATIVE COX. I take it that in the long list of technologies that are being applied from defense to the automotive industry, there are included some patent-protected technologies——

MR. GAGE. That's correct.

REPRESENTATIVE COX. ——so a lot of these things are proprietary.

Is it a possibility that some amalgam of the same people who are now participating in CALSTART would themselves form a commercial enterprise that would raise investor risk capital?

MR. GAGE. Congressman, actually, I believe that happens right now. We have several teams within CALSTART. You could take the team that is making a running chassis or platform for a car. It is Americon, Hughes, Kaiser Aluminum, and Lawrence National Lab and International Automotive Design, as a team, developing a product, and they will probably spin it off and team up and manufacture that product as a team.

REPRESENTATIVE COX. Now, to ask you a question that I want you to understand that I know at least part of the answer, to my own satisfaction—perhaps not all of it—but I want to ask you the question for purposes of exposition so that we could have a more eloquent description of what I think is the answer.

What has been the principal obstacle to an electric car in the commercial marketplace, thus far? The freeways are open to, at least in

theory, any kind of vehicles that would otherwise qualify. We might need some legislative changes in Sacramento, but probably not many.

What's been the principal obstacle to putting electric cars on the freeways and having them driving alongside gas-powered vehicles?

MR. GAGE. The lack of power density in the battery, in the currently available battery, which tends to be less.

REPRESENTATIVE COX. And thus, it is a technological problem?

MR. GAGE. That's correct. In fact, Congressman, a very limited example: General Motors has, despite the fact that they opposed the mandate, has a vehicle that they have designed. It has a range of somewhere between 90 and 120 miles on lead-acid batteries today, has performance characteristics that outperform most internal-combustion engine cars. And they know, as we all do, that the average commute in L.A. is only 30 miles; it used to be 32 miles. In Boston it's maybe 26 miles. So the average national is very short.

That car would fit a number of indices, but we still have the old mass-marketing notion in the auto industry, which is, "If I can't give it massive fuel, I'm afraid it." And so they're fearful, as business people. I understand. But they have done an enormous amount of work and have a very good product.

It is our belief that we will see batteries dramatically improve. In fact, the traditional lead-acid batteries are right now being improved by a process called bipolar lead-acid batteries, which will improve their performance by 40 to 50 percent. We are seeing new technologies like lithium polymer, lead air, zinc air, and a number of others—aluminum air, coming on line, which looks very, very promising, as well as mechanical batteries that look very promising, within the next four to six years.

So we're very excited about all of these technologies that have really been driven by a mandate in California, worldwide. And that mandate said, "We want 2 percent of our cars to be zero-emission vehicles." It didn't say how. They didn't say how to design it or what to do. They just said, "Let them be zero-emission vehicles by 1998. And it gets driven back in the USABC, the battery consortium.

Unfortunately, the USABC is dominated by the Big Three—the same way, unfortunately, the President's clean-car effort is dominated by the Big Three. And that's never going to get you the sort of bottom-up investment, entrepreneurialism, and innovation that Rohit was talking about earlier. It is too top-down and too centralized, with too few entities, rather than a broader array. And we have encouraged the President to broaden his notion.

REPRESENTATIVE COX. Well, I appreciate it. I would love to pursue both of these points further, but our time is restricted. I want to thank you personally, Mr. Shukla and Mr. Gage, for your outstanding testimony.

MR. GAGE. Thank you.

SENATOR BOXER. Thank you, first panel, very much.

I'll tell you this is just the beginning of what I hope will be an ongoing process—and it is already is—with CALSTART. Any way that our office can be of help to the Economic Development Corporation, please let us know. My staff is here. My field worker, Dave Thompson, is here from my office. So please feel free to get to know us better.

It's my pleasure to bring up the next panel. We do have a time issues here, and I know that many of you have to get back and enter your day.

Michael Armstrong, Chairman and CEO of the Hughes Corporation. We're going to take his testimony first and ask him questions first, because he has a time schedule that's tight.

Don Nakamoto, Research Director of the International Association of Machinists, District 5727, please come on up and sit up here. Catherine Kitcho, Director of New Ventures and ESL Inc. And Dr. Claude Hayes, President of Hayes & Associates.

I am really very excited about this panel, and what I would like to do, for the benefit of those who are here from the press and for the benefit of Congressman Cox, is to just give you a couple of sentences about each of our people.

Michael Armstrong, who I know is speaking for Hughes—Hughes has several areas of diversification, including Direct TV, an interactive satellite TV service; development of fuel cells for electric vehicles; and school bus radar warning systems.

Don Nakamoto is significantly involved with CALSTART and the H.R. Textron [phonetic] project, and is very knowledgeable on labor's role in Southern California's defense conversion efforts.

Catherine is director of New Ventures and ESL in Sunnyvale. It's a subsidiary of TRW, and they've built surveillance and reconnaissance systems for the military. They've recently initiated efforts to expand into the commercial sector with the goal of growing its commercial business to 25 percent of its total corporate sales by the year 2000.

I think it's very important to note that we are always going to have a military budget. And even at the minimum, we know there are different threats of war in the world. And I can't envision a time when we wouldn't have a military budget of 150, 180, 200 billion dollars. Even if everyone turns their swords into plowshares, we will always have that level.

So I think when you say 25 percent of your corporate sales, I think that's important, because we will continue to have military sales. And I don't want the world to fear that we're never going to have military. It's just going to be much lower than it was in the heyday of the Cold War—and rightly so. Right now, we spend more than every single potential enemy in the world combined; we spend more on the military. And we will keep it that way.

And last, I am very pleased to meet you, Dr. Hayes. I read about you in the San Diego paper. Dr. Hayes is President of Hayes & Associates. Dr. Hayes has developed a hot plate from technology, initially devel-

oped for heat shields for the Star Wars missile defense program. The plate, as I understand it, is now being used, or it's being developed?

DR. HAYES. Presently ... excuse me. I have a cold and a cough.

SENATOR BOXER. That's okay.

DR. HAYES. At the present time, it is actually licensed nonexclusively to Pizza Hut, and they have opened up an entire new market as a result of the plate in the sense that they now create a card system that allows them to cook pizzas and place them on this tray——

SENATOR BOXER. Don't tell us everything yet. I don't want to spoil the surprise. But the fact of the matter is, you have been working with Pizza Hut, and they have developed this with you?

DR. HAYES. Yes.

SENATOR BOXER. Fantastic. We are absolutely delighted to have you here and have all of you here. So we go from the very big Hughes Corporation to a gentleman who worked with the Star Wars program. These are real innovators.

If it's possible to have this person not vacuum the floor until we finish this, it would be great. Get my staff or someone ... thank you. That's better.

Mr. Armstrong, I know your schedule will take you away from us shortly, so why don't you speak first. And then I will ask Congressman Cox if he has any questions, and then I will ask some myself.

Welcome. It's very nice to see you here. We see each other in Washington; now we see each other in California.

## PANEL 2

### STATEMENT OF C. MICHAEL ARMSTRONG, CHAIRMAN AND CEO, HUGHES CORPORATION

MR. ARMSTRONG. Thank you, Senator Boxer, Congressman Cox. We appreciate your invitation to be included in this economic forum.

My brief comments would start, maybe, by splitting off into what's happening, from our perspective, and what's needed. And, of course, by pointing out what's needed, you might expect that I'll be specific in asking for your support for what's needed.

What's happening to us in the defense and aerospace is, of course, the industry is restructuring. We're going to go down to real dollars, no matter what that level is at the end of the budget cycle, about 52 to 55 percent in the United States in real-dollar terms.

So the market is going in half. And we're restructuring, we're consolidating; and unfortunately, there is nothing the mayor, the state, or the nation can do about that. Industry must get its resource capacity levels to the real market levels. And if you do a from-the-bottom-up review, they predict about half of the industry will be left when that's done.

Second, I am very encouraged by the improving California business climate, and I think what the Governor and Willie and the legislature

have done to improve the climate here in the last six to eight months encouraged a lot of us to put our new investments in California.

Third, we have been getting unprecedented support from our congressional representation in the Senate and in the Congress: Senate Boxer, who helped us, under the training legislation, with labor. Thank you very much for that. Senator Feinstein has been very helpful. In particular, our District Congresswoman Harvard [phonetic] has been very helpful. And I'm told, since I'm only two years old in California, that this is not historic, necessarily, and so it is much appreciated.

Finally, we are diversifying. We're investing in change. I've brought a toy with me to represent that change. This is living proof that technology and the resources and the labor force that is deployed in the defense industry, with capital and with the strength of doing what it knows how to do best, can independently go into new markets with new technology.

This is a satellite dish that will go on the window sill, representing a new business venture for Hughes called "Direct TV." It will receive 150 channels of television broadcast, digital programming, both video and sound, and will be in the market nationally in October 1994. The satellite is currently in geosynchronous orbit.

The interesting point is where did it come from? Decades ago, Hughes, for the government, for defense purposes, put the first geosynchronous satellite in orbit; and from there, put in two commercial communicating satellites; and from there, put in a whole new fleet of satellites, and going into the network and network management operation business and the leasing of transponders; and from there, went into the private business data network business; and from there, invested with advances in technology, in being broadcast on the television to the home.

There are other examples deserving remark, such as taking repackaged radar and reusing the radar for attachment to school buses so that the driver can see a sweep of the side and the front as the kids get off and on the buses. The driver will load them when the bus is cleared, close the door, and prevent some 9,000 accidents that hurt our children each year around the school bus. This radar technology will assure the driver that it is safe to proceed and that the child is safe as well.

Then, of course, finally, the world is exploding in communications, and our commercial communication satellite business is exploding with it. We now have a commercial backlog of over \$3 billion, and we will be launching a new communications satellite once every six weeks.

Well, that's what's happening in our world, and I'd like to break down what's needed to make more happen for the economic benefit of both business and jobs. If I may, I'd like to state it in four principles that I think are truths, and four suggestions to make those truths a reality.

First, it takes investment to grow business and to provide jobs. Thus the question is, how do we stimulate industry? And I would submit that it's not through subsidy or is it through buying more defense stuff than

we need, nor is it the government's selecting what the markets require, but rather the government should create an environment to stimulate investment. And there is a bill that Congresswoman Harvard has sponsored, HR 2064, that does a darn good job of defining what's needed.

It has three main parts. It's an investment tax credit for investment, an investment tax credit for research and development. It also has a tax credit for the retraining of workers and provides for accelerated depreciation for excess capacity. I urge your consideration toward this or similar legislation.

Second, I've heard the President say often that if we're going to improve the wealth in this country and jobs in this country, we're going to have to improve trade with other countries. We can only go so far in selling each other more things. We're going to have to sell the rest of the world what we can do best, and by doing so improve our businesses and jobs.

I urge your consideration on that score of the Export Administration Act that will expedite export licenses and remove unnecessary export restrictions.

Third, we need to define a foreign policy that doesn't use American businesses and jobs to communicate to the rest of the world. And by that I mean, very specifically, the State Department's interpretation of the MTCR sanctions to include the export of communications satellites is both absurd, punishing business, and laying off workers in California in order to communicate with the Chinese.

In California, we have already lost \$100 million of business. Several hundreds of jobs have gone to Europe. We have at risk the pending backlog, which I described, that would launch on the China rockets, and there is \$1 to \$2 billion of follow-up business that Hughes had secured in a memorandum of understanding. Helmut Cole [phonetic] took a trip to China and returned and made a press conference in November, that the memorandum of understanding, which had been given to Hughes for this business opportunity of joint production of satellites for the China market, representing 5,000 to 6,000 jobs, was now in their hands.

We will be working with Congresspeople and Senators to introduce an amendment that will properly define what the transfer of technology means, rather than permit the State Department to interpret it as an export, a communicating satellite, which is putting all of this business and these jobs at risk.

Finally, the defense industry badly needs procurement reform. It's really necessary for us to not only provide the goods and services to our own nation in a cost-effective way, it is fundamental for us to compete internationally.

The Department of Defense has underway a study—and will soon be submitting it to the floor for consideration—which would simplify the method of buying commercial products and contract financing. It would establish simplified acquisition with thresholds of \$100,000 or

less, and would importantly repeal recoupment of nonrecurring costs of major defense equipment and foreign military sales.

I would appreciate your consideration.

[The prepared statement of Mr. Armstrong starts on p. 41 of Submissions for the Record:]

SENATOR BOXER. Thank you very much. Because I know you need to leave quickly, I will ask you a couple of questions. What are we going to see that selling for, that satellite?

MR. ARMSTRONG. The dish?

SENATOR BOXER. Yes.

MR. ARMSTRONG. The dish with the set-top [phonetic] box will be selling for less than \$700 purchase price at Circuit City or Sears. In many places, you'll be able to finance that, and then of course you sign up for whatever program you wish.

The interesting thing about this technology is that you get the ultimate in choice. Let's say that you're an opera fan and one of our channels is the opera channel, that's all you sign up for; that's all you pay for. If you're a video buff and you want nothing but pay-per-view movies, that's what you sign up for. So you can buy a la carte programming, or you can buy the whole schmear.

SENATOR BOXER. So in other words, your company will supply the viewing channels as well?

MR. ARMSTRONG. Yes.

SENATOR BOXER. That's a whole new frontier.

MR. ARMSTRONG. It's a whole new approach.

SENATOR BOXER. It's very exciting, isn't it?

MR. ARMSTRONG. When you walk in and pick one up at a Sears store and you wish to have Direct TV, you not only can buy the equipment to accomplish that, you can buy in one transaction the programming, and they will install both for you.

SENATOR BOXER. How does the billing system work? How do you work that?

MR. ARMSTRONG. Well, the set-top box—which you now know as your cable box—is programmable, and it's attached to a telephone line. You get your pay-per-view with your little clicker. For example, you watch a fight, or you watch a couple of movies, a special sporting event, an opera event, other kinds of events, and we record all of your selections in the memory of the set-top box. And then we poll it at night when everybody is asleep. We read that out and accumulate that as your billing information and send it to you at the end of the month. What you pay for is what you signed up for.

SENATOR BOXER. It is really nice. And this is going to be available in October of this year?

MR. ARMSTRONG. Yes. We have put up one satellite successfully already. It's a two-satellite system. A second satellite will be up in the spring. We will do market tests this summer and roll out the national



distribution of the products at Circuit City and Sears, available on shelves October 1st.

SENATOR BOXER. What do you figure that the market possibilities are?

MR. ARMSTRONG. Our modest intention is to be the largest cable company in the world. And we believe that by offering quality and choice, we can accomplish that. We believe—

SENATOR BOXER. So it's a huge potential market.

MR. ARMSTRONG. Yes, a huge potential market. There are 97 million households. Fifty-seven million of them pass by cable. We believe that 10 million of those households by the year 2000 will find this the preferential way for video and television.

SENATOR BOXER. And what do you call that part of your company that does this?

MR. ARMSTRONG. Direct TV.

SENATOR BOXER. Direct TV. And that's a separate subsidiary of Hughes?

MR. ARMSTRONG. Yes.

SENATOR BOXER. This technology came from the military too?

MR. ARMSTRONG. This technology came from our defense and aerospace experiences. Obviously, the satellite came from there. But also, we're dealing with compaction; we're dealing with encryption; we're dealing with transmission. And so those areas that we were good at in electronics, mainstream to us, we'll be providing this. Those things that we're not so good at—such as we're not known as a mass distributor or retailer—we have joined partners. The set-top box, for example, will be designed, produced, and distributed by RCA.

SENATOR BOXER. I see. So you are already part of the information superhighway?

MR. ARMSTRONG. Yes, we are.

SENATOR BOXER. Vice President Gore—actually, it was not Lily Tomlin who introduced Al Gore, despite what the *L.A. Times* wrote. It was me. And I guess I look like Lily Tomlin, or the character, Ms. Ernestine, or something. But in any event, the superhighway is here. It's happening. It is remarkable.

I have one last question regarding the China issue. I received a call from Robert Altman [phonetic], who told me that they were now able to go and sell that satellite to China. Is that untrue? I mean, he was very excited about lifting that ban.

MR. ARMSTRONG. Were excited, and that's progress, and that's helpful. But that's not a solution, if I may explain why.

SENATOR BOXER. Yes. I want you to, because I had assumed that that had resolved the problem.

MR. ARMSTRONG. It does not resolve the problem; it's just a terrific step towards resolving the problem.

The State Department concluded that they needed to take the first step to entertain negotiations on the MCTR because of the political

situation in China, and they offered to lift the objections they had to the Commerce Department satellites.

We have two satellites that are to be launched in 1994. One is in the Commerce Department, and that's called Abstar [phonetic] satellite, for December lunch; and another is an Australian communications satellite, which is the summer of 1994. The offer to the Chinese to lift on the Commerce satellites does not cover the Australian satellite, because it has an encryption device which is on a mission task. And second, there is a kick motor, amity motor [phonetic], that's also on the missions list.

Now, if I may explain. What does a missions list have to do with a satellite? The State Department asserts that that is a technology transfer. We assert that it's an imbedded technology: It's under U.S. Government control 100 percent, it is never touched by the Chinese, and it is embedded and thus loses its characterization.

So, while the first step has permitted consideration of Commerce satellites—they talk of three satellites: Two are market variants, and one is a Hughes satellite that still has some problems relative to the kick motor and does not include the Australian satellite.

Thus, we are very hopeful that not only will the Chinese and the State Department conclude successfully the discussions on MTCR, but that Congress will define this so that we don't repeat history and have hundreds of thousands, or potentially thousands, of jobs lost on another occurrence.

SENATOR BOXER. Well, thank you very much.

I'm going to turn this now to Congressman Cox, who is very interested in this export control issue.

REPRESENTATIVE COX. I'm also very interested in Direct TV. I mentioned to Senator Boxer at side bar that I'm all ready to buy one as soon as I can get one. I think it's a wonderful development, and I've been looking forward to it for some time.

I think, since we're in total agreement about the need for reform of the Export Administration Act—as I've already mentioned, I'm a public sponsor of the House bill—I don't think it's necessary to tarry on that, unless you want to.

MR. ARMSTRONG. We appreciate your support on that amendment. It will be constructed shortly and circulated to supporters, particularly California supporters.

REPRESENTATIVE COX. One of the things that you mentioned in your written testimony at great length was the duty to rationalize our federal review of mergers and acquisitions in the defense area. It stands to reason, if we have an industry that is being downsized by, as you say, one half, we're going to have to have consolidation. We have a unique situation where the predominant, if not exclusive, purchaser is the Federal Government. We should be able to do things slightly differently.

You proposed that we establish within DOD an assessment office for mergers. That's probably a useful managerial step that the Federal Gov-

ernment could take. Is there legislation to do this? Are you looking for executive action to do this?

MR. ARMSTRONG. Yes, executive action, or a policy could do it. It does not take legislation to accomplish it.

REPRESENTATIVE COX. Yet, I would imagine that the antitrust laws themselves would provide, in some cases, some insuperable obstacles, even to administration officials who would like to be helpful, if we have the market defined by case law in such manner that we can't overcome definitions. We probably can address the specialties in this area. Is this an area that's indeed a legislative R&D?

MR. ARMSTRONG. Yes. Long term, you're absolutely right. We were taking a practical approach, thinking that if Mr. Aspen and Mr. Perry [phonetic] might establish such an office, the President would endorse such a step, given the influence of the Justice Department, because that's where all the influence is today.

The logic of the Justice Department in applying commercial logic of law to the consolidation of the defense industry where there is only one customer—and in many cases you might have a monopoly situation, just due to a down-select, anyway—it just didn't seem that we would necessarily serve the best industrial infrastructure needs of the company and abide by and be managed by the Justice Department's processing laws. That's where we were coming from.

REPRESENTATIVE COX. Finally, I'd like to deal with the obvious problem. If we consider it nearly inexorable that the industry is going to shrink by half and that we're going to have to have consolidations and mergers, how do we concern ourselves effectively with the problem that we might not have enough of an industry left over the long haul, when and if we need it?

Specifically, if we don't need Hughes this year, this week, for development of any particular new weapons system, but we do need you next year or the year after, what if there is no "there" there? And what can we do as a matter of policy to make sure that at least the industrial base doesn't evaporate?

MR. ARMSTRONG. That is a very real concern all over the country, and it is particularly something that the leadership of this country should pay attention to. I appreciate that you would point it out.

Right now, it seems that we have a concern over the, quote, "hollow army" because of the completion of the forestructure. And I would submit that we should have equal concern, as you point out, as to the hollow industry to support us.

There are a lot of things happening, and we're not going to be able to extend our forces and thus extend our influence of values like we used to. We're going to have to call on both our forestructure and our industrial structure to redeploy in the case of it being, as you say, next year or the following year.

Today, there is a very critical issue in front of both industry and the DOD services, and that's the depot issue. Depots run by the services—

really a public-sector operation—have been increasing their industrial work from the 40 percent before the Gulf conflict to 50 percent around the Gulf conflict to 70 percent today, from a mandate by Congress that it should not be less than 60 percent.

REPRESENTATIVE COX. I wonder if I might interject, because I'm very interested also in that portion of your written testimony. For purposes of exposition, could you perhaps illustrate this with an example in California?

MR. ARMSTRONG. Hughes would propose to a service—say, the Navy or the Air Force—to upgrade or to maintain the radar equipment on fighter aircraft. Before, that might be competing, but today we might find a service depot that would like to get into that business, and so they submit a bid in order to do that work. Now—

REPRESENTATIVE COX. I want to push you a little bit on your example so that we could learn, in one instance, where that might be happening at a service depot in California.

MR. ARMSTRONG. I don't have in my memory—I'm sorry—a good example of a service depot in California. The service depot is in Philadelphia that I'm referring to. So—

REPRESENTATIVE COX. Well, let's use—

MR. ARMSTRONG. I just don't have them with me.

REPRESENTATIVE COX. That's all right. Let's use the Philadelphia example. I just wanted to go a little bit more vertical into that case. Where is it in Philadelphia?

MR. ARMSTRONG. A naval depot outside of Philadelphia decided that they could get into this business and made an unsolicited bid. I'm sorry. I can't tell you who the customer was by name—which I will get for you—because I didn't know that I was going to go down this track.

The principles are what I'd like to point out, however, Congressman, in that we can't compete with the public sector for private work. And so the depot issue is really a conflict between the public sector competing for private work and the private sector having their work lost. And the issue is, who is going to resolve those differences?

As you know, congressional districts that have depots are very depot oriented. There is a depot constituency represented in the Congress. What we need to do is rise above it and appoint a panel—I would submit, a presidential commission—to figure out what's right for the country in the balance between industrial structure, depot structure, and forestructure.

REPRESENTATIVE COX. I appreciate it. In view of your own time constraints and our own here on the panel, my time has expired. I'd like to thank you very much, considering your responsibilities, for being with us here today.

MR. ARMSTRONG. Thank you, sir. Thank you, Senator.

SENATOR BOXER. Thank you, Congressman Cox.

And thank you very much, Mr. Armstrong. We will look forward to working with you in the future.

MR. ARMSTRONG. Thank you.

SENATOR BOXER. We know that you have to go, and go and sell those satellite dishes.

MR. ARMSTRONG. That's what we're going to do.

SENATOR BOXER. All right.

Mr. Nakamoto, welcome, from the International Association of Machinists. We know that you are dealing with very direct, if you will, fallout from the middle down, and we'd like to hear your comments.

**STATEMENT OF DON NAKAMOTO, DIRECTOR, INTERNATIONAL  
ASSOCIATION OF MACHINISTS**

MR. NAKAMOTO. I'd like to just make a brief comment about the statements on the depot issue that Congressman Cox brought up. That's one of the hottest issues with machinists also.

Referring to sites in California, there is a site in Palmdale, California, that does maintenance on the 117 Stealth fighter. There is also a maintenance depot up in the Sacramento area that's tied to McClellan Air Force Base, and the Air Force's involvement with this project displaced a lot of our private industry workers who were represented by the Machinists Union. We have taken, in one instance, two people to court to try and resolve this. We are very concerned about it. So that's something that we would be interested in discussing, so we will pursue it later on.

I'd like to read a statement I have, and I would be happy to answer any questions after that. Before I begin some commentary about the issue of defense conversion and the Machinists Union's involvement in this issue of federal programs and defense conversion and our viewpoint, I'd like to provide some background on why these issues—

SENATOR BOXER. Mr. Nakamoto, do you think you can do this in about seven minutes?

MR. NAKAMOTO. Yes.

SENATOR BOXER. Thank you.

MR. NAKAMOTO. I come out of Local 6727 in Burbank, California, and in the last seven years, we have lost 82 percent of our membership. They have been involved in the aerospace and defense industry. And I think that's pretty typical of the situation in Southern California. The Machinists Union on a statewide level and on a national level have suffered similar losses, although not as dramatic. We've probably lost half a million members nationally, most of those coming out of the defense and aerospace industry.

Therefore, we've taken a fairly unconventional approach to the issue of defense conversion by necessity. We've tried to launch various programs, most of them centered in Southern California, in trying to do

just about anything we can to get opportunities to place our displaced employees back into some type of quality jobs.

I'd like to talk briefly about four of those programs. One is a program working in a collaborative effort with H.R. Textron [phonetic] Corporation, and the focus of that program is to bring together a lot of these small defense suppliers in Southern California to try and develop some of the companies' internal defense technologies into commercial products. And I think this is a unique focus and a unique approach, because the small suppliers and medium suppliers in the defense industry have largely been ignored.

I'm glad the Federal Government and other agencies—and most of the focus, when you talk about defense cuts, has been on the prime defense contractors, the losses they have suffered, but nothing's really been done to address the losses of the small and medium-sized defense suppliers. Those are, in fact, the companies that have, we believe, some great possibilities for working with defense conversion because of their flexibility, their ability to adapt in markets quite quickly, but they don't have the type of resources that a larger company does.

That's one of the focuses of the Machinists Union, to try and assist some of the small and medium-sized companies. So H.R. Textron has taken up a collaborative effort with the unions to try and put our focus in that area.

Another project is one that Mike Gage and CALSTART are working together with us and with various car companies on, in trying to develop electric vehicle technology and hopefully spur some job creation from there.

One other project that might be of interest to you is one that we have been working on through a grant from the Department of the Labor. It's a half-million dollar grant received in 1993 specifically to do with defense conversion activity, and training hopefully will be the main focus of that grant. We're using that money to target small companies to intervene their activities and hopefully to do a complete transformation of companies that were involved in defense and transform them into 100 percent commercial activity.

We have been involved fairly heavily in the Arco process that was discussed earlier, and I do have some comments about that. The union, on a national and local level, feels that the emphasis on this program was not strongly enough in the area of job creation. We believe there is too much emphasis on technology and development and not any accountability as far as, at the end of a two-year or five-year program, how many actual quality jobs would result as a result of the government's investment in these various proposals.

We feel that at some point, there has to be some accountability built into this process, so at the end of the line the government isn't left with a lot of exotic, exciting technologies that really don't result in any meaningful job creation. Our hope, from a union perspective, is that

defense conversion is about job creation, and so there has to be some element of accountability in this process.

That, basically, is what I had to say.

SENATOR BOXER. Thank you very much.

Catherine Kitcho, please proceed.

**STATEMENT OF CATHERINE KITCHO, DIRECTOR, NEW VENTURES,  
ESL, INC.**

Ms. KITCHO. Thank you, Senator Boxer and Congressman Cox, for the opportunity to talk to you today about what we have been doing with ESL in the area of our defense conversion efforts.

As you know, I'm the director of New Ventures and ESL Incorporated, and what that means is that I'm responsible for implementing our strategy and working toward defense conversion. I think ESL has a somewhat unique and successful approach to defense conversion, and I want to share that with you today.

ESL is a subsidiary of TRW, and we have been engaged in developing defense electronic systems for the government for about 30 years. ESL has not downsized due to defense cutbacks. In fact, in the last couple of years, we have added about 200 people to our payroll. We now employ about 23 new people in California. So we're a medium-sized defense contractor.

The fall of the Berlin Wall in 1991 signaled the end of the Cold War and an imminent change for our industry. Our CEO, Arthur Lenny, became very concerned at that time. It was very symbolic for him. In 1992, he established a program to reinvent ESL's future. We started what we call our 20/20 program, and that's a series of workshops whereby we have brought in futurists and strategic consultants to help us identify our skills that we could then apply to new markets.

Nineteen ninety-three was a year of action for us. We put together an internal process to develop new business ideas. We opened an internal incubator center to turn good ideas into good businesses. We set a strategic goal for the year 2000 to have 25 percent of our sales coming out of this business. By the end of the year, we had evaluated 18 new ideas and launched 6 internal ventures.

Some examples of those: The first was TRW Phoneprint [phonetic], a product that blocks fraudulent cellular telephone calls, which is a big problem, especially in metropolitan areas. And it is based on our radio frequency imprinting.

Traffinfo [phonetic] is an advanced traveler information system that we're developing for the Bay Area Metropolitan Transportation Commission.

The Digital Imagery Video Analysis Tool is a video analysis software package that is a dual-use product. It is designed and used for battle damage assessment on the military side and can also be used in the field of law enforcement.

So these are just some of the products that we've introduced to the market so far. And as a result of our efforts last year, we are now in three new industries in addition to defense. Those are telecommunications, information processing, and transportation. And we're forecasting that in 1994, 10 percent of our sales will be in nonmilitary business.

So we're well on our way toward our goal for the year 2000, and we're really having a lot of fun in the process in terms of trying to think up new things that we can do. We have learned some painful lessons along the way, and I'll list some of those for you.

Start when you're healthy. We started at a time when we weren't downsizing. Start small and build from the successes. You need that leadership and support from the top received from management.

Recognize competencies and then do something about it.

Retrain people in basic business skills. Use high-tech commercial business laws for new ventures.

And focus on market pull, not technology push. Our first products failed because we tried to take developed technology and then push it into new markets, and that just doesn't work. So now we look for problems that we can solve using our skills, and we let the market create the demand instead. Government can really help in this process.

I've discussed the positive things that we have accomplished, but that doesn't mean it's easy. It's very difficult to create and operate commercial businesses within a defense infrastructure. The primary reason for this is that the rules and regulations evolved through government acquisition are very different from those of commercial practices with the same functions, such as security, accounting procedures, and so on.

This makes it impossible for the same employees to work under both sets of rules. So we support any legislation to help reform and streamline the government acquisition process to make it more compatible with commercial practice.

Also, conversion tax credits can help, because they would free up immediate funds. These could be an expansion of the federal R&D tax credits specifically targeted for commercialization. Presently, the R&D tax credit is allowed only for the incremental increase in R&D spending over a three-year period. Now that the defense business is shrinking, defense contractors are spending less on R&D than normal, and therefore they can't take advantage of this credit the way it's calculated.

If the formula could be changed, this could create millions of dollars for commercial development. So I'm requesting that you look into what can be done in this area to help contractors help finance—whether internal, defense, or commercial activities.

And lastly, government-sponsored retraining programs in commercial business skills will be very helpful. Most of the current programs focus only on displaced workers. What I'm suggesting is that programs train people that are still in the work force so that they can apply those skills in different ways.



Finally, I wanted to thank you and commend you for holding this hearing today. I think it is important to hear about what's going on and what we're experiencing at present in the industry. And I also wanted to invite you to Silicon Valley to see firsthand some of the efforts that are going on with some of the companies in that area.

ESL President, Arthur Lenny, is the chairperson of the Defense Space Consortium, which is one facility now, a joint venture facility with many entities. So we'd like to have you come and set up a meeting with him, and we'd be happy to arrange that meeting.

I want to thank you again for the opportunity to present our success story today.

SENATOR BOXER. Thank you very much. I would very much like to take advantage of that tour offer. So we will be in touch with you.

I'm going to call on Dr. Hayes. I want to announce the plans for the rest of the hearing. After we hear from Dr. Hayes, we are going to call up this one-stop shop that's working and operating in Washington in order to try and put together into one place all the information on defense conversion that we have going, since I've never tried it before. I am very happy about it; I hope it works. And then Congressman Cox and I will ask a few questions of the operator.

The way to do this thing is, if you have a computer, you can link right into their database. But if you don't, they will either FAX you things or tell you things. So we're going to do it in a very low-tech way. We're going to tell them we have no FAX and we have no computer, and what information could they give us on certain areas.

We will do that after we hear from Dr. Claude Hayes, who again, I am very happy that you could join us, Dr. Hayes.

DR. HAYES. I appreciate it.

SENATOR BOXER. I thought your story was a wonderful story. Why don't you share it with us.

DR. HAYES. I'd like to share more than a story, if that's all right.

SENATOR BOXER. Sure.

#### **STATEMENT OF CLAUDE HAYES, PRESIDENT, HAYES & ASSOCIATES**

DR. HAYES. I'd like to thank you, Senator Boxer and Congressman Cox, for having me here.

I would like to start out by saying that we should all be cognizant of the fact that the steam engine and the electric battery were first invented in Greece about 3,000 years ago, and nothing was done with it until approximately 1970, a quarter of a century ago. With that in mind, you can understand some of the apprehensions that people such as myself have when we attempt to develop a piece of technology.

In the very beginning of my company, it was easy for me to go directly to the government. The government was the simplest source for potential application of technology. What I had was the technology that provided an excellent means for stabilizing and controlling temperature

over a very large range, and it was a very valuable technology. I am not going to go into all of that now. It would take too much time.

I will say that approximately in 1991, after having worked for the laser shield program extensively, funded by SDI, I realized that the intimacy with the Russians was going to hurt me very seriously. I started making plans on how I could resolve this matter. The first part of the plan was to look for other industries and other applications.

Part of that plan included going to Europe, which I did go to. I went to Sweden, Germany and France looking for applications. I found some very good applications from them. I also recognized that there were a lot of complexities relative to my patents and doing business over there also.

I also looked at American industry and came to the conclusion that there were certain characteristics endemic to the type of industry I would need to pursue. And as you know, we were in the middle of a downturn in the economy, and I certainly did not wish to go into an industry that was suffering and lacking capital.

I chose the food industry merely because people must eat. The technology I had was very suitable for controlling temperature in fast food. To make something like that successful, you have to take advantage of competitiveness within the industry, and that was one of my approaches.

I would say that there are several elements I observed that were necessary to make this piece of technology happen with respect to Pizza Hut, and I'd like to also mention that there are many other applications of technology wherein many of the issues that came up in this area weren't apropos to my situation.

The food industry is just one application, but it was a manageable application for me. My company is very small. It basically consists of myself, and there are approximately seven people who receive regular checks from me who are really 1099 types. There are a couple of other people who are not technically oriented, such as accountants and bookkeepers, who get money also. But that's basically the company. So we consider that we probably employ about ten people, or contribute to the incomes of ten different people, most of whom have Ph.D.'s or degrees of that type.

To essentially do what I did, I would like to go over some of the things I thought were very evident to me but significant or important in achieving this. The first thing I thought was, you had to have a technology that worked. I was not in a situation where I could go to a group of people in the military who were all Ph.D.'s in engineering and they would sit around and listen to me, and they could look at equations and graphs and understand.

To go into industry was entirely different than going to the military. I started by saying to myself, "I need a technology that works conspicuously." So I had that, and I knew it. And I chose the proper materials to prepare for a demonstration. I then selected an industry that was com-

petitive, which I have already brought up. I identified or targeted the companies I wanted.

I originally targeted five companies. Out of those five, maybe two of them were very receptive. The one that I chose to work with most consistently was Pizza Hut Corporation, primarily because I met the right provisions there.

First of all, I was speaking to someone who understood what I was talking about, who was a vice president of the company, and they had money. So I looked for money, a cognizant chairman in the industry, or in the company, and a need.

Fortunately for me, not only did I find such a person in Pizza Hut, we were able to demonstrate the technology successfully enough to impress this vice president and then walked out, as I did many times in the military, with a contract, basically. And then the next thing that followed was a year and some months of development. And fortunately, we were able to get them to pay portions of that back.

One of the things that is very important to a small company such as mine is that we are not capable of fighting great patent battles. You can win the patent case when you're dead, and your estate can receive the money, but it does you no good. And your blood pressure has destroyed you, probably, by that time.

One of the things I found that was most compelling was to set up a test in the course of dealing with companies for essentially beginning my association. They would say to me, for example, "We have a patent for you on this information." Very often the patent is not economically viable to deal with, in terms of something coming up and you're in patent litigation.

I always attempted in these situations to reduce and to test the companies as to their initiative, relative to the technology and their reliability and honesty, by having them sign a nondisclosure agreement. Basically, these agreements would say that they will not take advantage, and so forth, and they have no interest in the technologies that I present to them.

Interestingly enough, I was always able to get such an agreement signed with the military, which, in theory, should have been even more difficult. With industry, some companies sign, and those companies that sign usually tend to be better to deal with and easier to deal with merely because they're willing to tie themselves down and admit who they are. There are many horror stories relative to such technology.

I would like to say also that I have made an observation. I did my project without the benefit of funding. My technology presently has application into several other areas, one of which I consider very significant relative to the environment. It is possible for me to create a backing as an underliner on siding for homes that acts chemically and can, without any electrical or energy inputs, control the temperature of a house.

That is, in a daylight situation, say, of a hot desert climate, during the day, it would absorb the energy, stabilizing the temperature of the interior, and at night would release the energy as the temperature dropped.

Unfortunately, for a small company such as mine—I knew this back in 1992—it is not viable for me to go ahead and do this at all. This is where I think it becomes significant to find funding. DOE is a bit more complicated than I'd like to deal with sometimes in acquiring funding, and I haven't pursued that until now, maybe.

When it comes to developing technology or converting military technology, I think there is a principle that should be observed. I do not really believe that it is absolutely compelling for the government to pour large sums of money into large corporations. I do not believe that is of benefit. I believe 80 percent of our new technology does come from small companies.

Large companies have the type of resources to take advantage of a market opportunity. It is the small company that does not. Certainly, if you know that you can sell 10 million units of a certain type and the market is there, you would have to say you were grossly remiss if you failed to do it and you had the resources to do it. I believe most of the large companies do have that capability.

Canada has a very interesting R&D program. It varies from province to province. In Quebec Province, for example, you receive 80 cents back on a dollar spent for R&D. This is unlike the way we do it, where, based on incremental increases in your R&D cost, you receive a tax credit of 20 percent a year. Basically, in Canada, it comes down to filling out forms and mailing in your receipts, and the government returns the money.

I don't expect that the United States would become that radically different. When I say "radically different," I mean I don't expect to see that type of procedure adopted. But I do think that development credits are important and critical to all the industry, large and small companies.

But I think, when it comes to programs to stimulate technology investment, in terms of government grants or research that's tied into defense contracts for the government, it really turns more on small companies that do not have capital resources to do the things that large companies do, or could do.

As I indicated with the home development, we also have had calls from Canada for developing a pad that goes under the soil, so they can keep the tundra soil warm longer during the cold climate, so the bacteria that consumes toxic substances in the soil that they are replenishing can continue working during the winter.

It's unbelievable, some of the things that you could do if you had the resources. And as I said, there's a lot of good ideas; nothing has happened.

SENATOR BOXER. Dr. Hayes, thank you. And thank you to all this panel. I would encourage you, if you could stay for just a few more minutes, we may have some questions.

Overall, I think it was an excellent presentation—if you're labor, an entrepreneur, or someone with a larger company. I think, Dr. Hayes, that you've given all of us some good ideas here. I agree with you on your analysis about small business. The bottom line is that they are job creators. Unfortunately, larger companies are job destroyers, which is the way it has been. Without the small business, we'd have no jobs.

The reason I'm hurrying along here is because I want to do this phone call. I have to do this by 1:00. It's supposed to work like magic—information superhighway.

TRACY. Good afternoon.

SENATOR BOXER. Hi. This is Senator Boxer. I want you to know that your voice is being broadcast to some wonderful people who are working on the issue of economic conversion, and I wanted to get some information about the hotline and how it's working?

TRACY. Okay.

SENATOR BOXER. Are you the one I should talk to?

TRACY. Yes.

SENATOR BOXER. And what's your name?

TRACY. Tracy.

SENATOR BOXER. Tracy. Okay. You know, I was the one that came up with this notion, and happily it didn't have to go through the House and Senate because the Administration sought to put this in place. So I'm very interested in finding out what kinds of calls you've been receiving, how many, and what information is a typical caller asking.

TRACY. Okay. Well, mainly we [inaudible] job retraining [inaudible].

SENATOR BOXER. Is that right? Like how many, about 8 percent?

TRACY. About 16, 17 percent.

SENATOR BOXER. And then most——

TRACY. About a thousand calls a week.

SENATOR BOXER. A thousand calls per week. And it's mostly people who want help relocating?

TRACY. Relocating, retraining, [inaudible].

SENATOR BOXER. And what options can you tell me about? Like, if I were a displaced worker, what would you do?

TRACY. I would recommend programs [inaudible].

SENATOR BOXER. Can you talk a little louder on that last point? We've lost you.

TRACY. Okay. (Inaudible.)

SENATOR BOXER. Yes.

TRACY. (Inaudible) and dislocated worker program by retraining, readjustment, and [inaudible].

SENATOR BOXER. Do you ask the people where they live, and do you actually give them the addresses of offices and so on?

TRACY. Yes. What we do is, we get their name, get the area where they're calling from, and [inaudible]. And once you determine their [inaudible], say, in the San Diego area. And then we tell them the programs that are available in their area. SENATOR BOXER. Now, if I was hooked into a computer, what would you do after I called? Would you have me push another number, and then I would be able to hook into the database?

TRACY. [Inaudible.]

SENATOR BOXER. And I could——

TRACY. You would be able to access our program that has the [inaudible].

SENATOR BOXER. I see that my staff has handed me what I would be able to hook into here. Also, if I had a FAX machine, you could FAX me some information?

TRACY. Yes, I could FAX [inaudible] information. We can mail it to you, or we can FAX it to you.

SENATOR BOXER. Excellent.

TRACY. [Inaudible] large amount of documents for [inaudible].

SENATOR BOXER. I'm going to ask Congressman Cox if he has any questions.

REPRESENTATIVE COX. Thank you very much for joining us today. I am intrigued that at the beginning of this last month, the Clearinghouse database was also available at public libraries across the country on CD ROM.

We're in downtown Los Angeles at City Hall right now, and I wonder if you could tell us whether the Los Angeles public library is one such federal constituted library.

TRACY. The Los Angeles Public Library; California State University, Los Angeles; Loyola Law School. [Inaudible.]

REPRESENTATIVE COX. Well, I appreciate that.

TRACY. You're welcome.

REPRESENTATIVE COX. Just one other question. I have a new technology that might be useful for controlling the temperature of residences, and I'm looking for a means to obtain investment capital to promote this idea. How would I go about that?

TRACY. Okay. (Inaudible) innovative research program to develop technology, [inaudible] military and commercial research. If you want to learn more about this program, you can dial a 1-800 number, 1-800 [inaudible], or you can dial 703-693-8942, and they could forward information on how to introduce your technology.

REPRESENTATIVE COX. I appreciate it. I'm going to turn you back to Senator Boxer.

TRACY. Okay.

SENATOR BOXER. Thank you so much. I've just been told that I have to move along, because we have another group that has to meet in the room I'm working in right now. So I want to thank you, and I'm going to come by and visit you at your office.

TRACY. Okay. Thank you for calling.

SENATOR BOXER. Okay. All right. Thanks a lot. You were very helpful. Thank you.

TRACY. Thank you.

SENATOR BOXER. All right. We know we have a number; that was the point. And I think we need to take advantage of this service because it's out there. It takes a little work, but at least we have it in one place so that we can get the answers in one place.

Unfortunately, we have been told that this room is being used momentarily by another hearing. So what I need to do is thank the panel. I'd ask you, if you'd like, to wait around to talk with us one on one.

I won't have time for our last, very important closing panelist, Dr. Allen Scott from UCLA, who was going to give us an overview on the economy here. I want to thank this panel very, very much. If you want to hang around, we'll see you later. Okay?

Dr. Scott, if you could join us, we're going to try to move this through. Are you here?

[Dr. Scott raises his hand from the audience.]

SENATOR BOXER. You are. Come on up. There is a very interesting article written by Daniel Scott and David Bergman [phonetic] called "Getting the Southland Back on Track," and a lot of it has to do with electric cars.

Dr. Scott, why don't we do this. I promised them that we would be out of here at 1:15 sharp. So you can either take the full ten minutes; or do five or six, and then Congressman Cox and I will have a chance to question.

DR. SCOTT. I will just take a few minutes and give you a very quick summary of what it was that I wanted to talk about.

SENATOR BOXER. I would just ask that people would step outside if they are talking, because we need to concentrate on this testimony. Thank you.

### PANEL 3

#### STATEMENT OF ALLEN J. SCOTT, DIRECTOR, LEWIS CENTER FOR REGIONAL POLICY STUDIES, UCLA

DR. SCOTT. I'm going to talk a little bit about research that we've done at my center at UCLA, which is the Lewis Regional Policy Studies. We have been spending a lot of time studying the economy of Southern California and for the state of the California, and we don't need to tell you that we've found that there's an enormous economic crisis going on, particularly in Southern California.

That crisis is due to defense cutbacks, of course, but it's also—and this is a little less widely known—a reflection of the fact that the economy in Southern California is moving into—especially manufacturing economy—a low-wage, low-scale form of production. So we have really a twofold problem: One is to create new jobs, and the other is to ensure that these new jobs are high-scale and not minimum-wage jobs.

Now, to make a long story short, I have submitted for the record a long research report that we did. We have completed enough research to know that the best bet for future economic development in Southern California is the advanced ground transportation industry. There are many other industries that need to be cultivated: biotechnology, medical instruments, software, and so on.

Advanced ground transportation equipment seems to us to be very much the best bet here and now for the future of Southern California. And again, I'm thinking of products like electric cars and other alternative-fuel vehicles; IVHS systems—that means intelligent vehicle highway systems—and the command control devices that go with them—high-technology trains of all kinds, including magnetic levitation devices; telecommunications; and all of the technologies and sub-systems that go with those things.

We're very optimistic about this for four reasons. Very quickly, the Metropolitan Transportation Authority is going to be spending upwards of a \$180 billion over the next 30 years on new transportation procurements, and this represents a lever to kickstart this industry. There is already an existing industrial base of technologies and skills that can be very easily redeployed from defense into the advanced ground transportation industries.

You have very rapidly expanding markets locally, nationally, but also worldwide. This represents an enormous export potential for the region, of course. And there is a possibility for new technologies coming on line and the skills and aptitudes in Southern California for making what is obviously called an early start and instigate a group of advantages, including competitive advantages, that put our region ahead of other regions in these kinds of markets.

However, to do this, there are a number of policy tasks that need to be envisaged. This is not going to happen just by itself—in particular, Japan and European countries are moving very aggressively relative to these sorts of equipment—and we need to engage in a number of policy measures in order to cultivate this kind of production in Southern California.

The kinds of policy measures I have in mind are measures that would create high-skill, collaborative forms of manufacturing. And I could give you six quick items that I think could be very useful if attended to by policymakers locally, in the state, and federally.

First, there is research into advanced ground transportation equipment and more advanced technological research to ensure that it can be safely used in a commercial setting; work at training, of course. And



here I should point out that UCLA recently received a million dollars from Harver [phonetic] to establish a program of training engineers in the manufacture of transportation equipment.

We need entry capital, agencies and organizations of various kinds. We need to encourage consortiums, like CALSTART, that have done an outstanding job in developing collaborative forms of manufacturing and research and development.

I'm personally persuaded that we also need to establish in Los Angeles a manufacturing research zone for advanced transportation equipment, and I think we also need to establish in the region a Southern California transportation equipment industry council as a way of coordinating overall the efforts of labor, employees, management, local government, and community groups and so on.

That's a very quick summary of a very complex set of propositions, and I'd be happy to answer any questions you may have.

SENATOR BOXER. Because of our timeframe, we have some time to make some closing comments and address your testimony. So Congressman Cox, please proceed.

REPRESENTATIVE COX. Well, I think it probably would be inappropriate to take what little time is left to make my own closing statement, though I'm not too sure. So what I'd like to do is to take what time I have to just ask you to flesh out a little bit your ideas for a transportation equipment research and manufacturing zone.

How would this be accomplished, whose job would it be to set it up, and what incentives would there be to locate that kind of activity in such a region?

DR. SCOTT. The idea really is based on the notion that success in the region—and hopefully further development—comes increasingly from building synergized clusters of industries. Industries that work together, collaborate together, are able to learn together dynamically over time, exchanging information and so on.

I think that a manufacturing research zone will help to anchor and promote the industry in the region, and I would see it as, hopefully, in activities like, for example, the consortium at CALSTART; and the City of Los Angeles has a consortium of advanced transportation; research and development consortium. I would see that as being part of the zone. Technology research centers, labor-training centers, prototype manufacturers, high-quality and high-technology manufacturers. In other words, the most basic and synergetic sets of actors in this emerging industry would presumably have a place in this manufacturing zone.

As I say, I think that that would help to anchor the industry, to create a center of gravity for it to increase.

REPRESENTATIVE COX. Well, I'd like to thank you, Dr. Scott, for my part, for being here today and bringing this to our attention. I will certainly follow up on it.

I'd also like to thank Senator Boxer for arranging all of this and for providing our witnesses. It seems to me that one of your points—and there is a thread throughout this—is that we need to find ways, including through enactment of new policy, to encourage investment capital and, in particular, venture capital. And so I will do what I can to encourage that from Washington, D.C.

Thank you, Dr. Scott.

SENATOR BOXER. Thank you very much, Congressman Cox. As always, I think we do make a good team. We see things, attack what's needed to bring them about, and I think that's what's it's all about. I always enjoy working with you.

I want to thank Dr. Scott for giving us basically a five- or six-point program of what we need to do. I think we're doing some of them; we're not doing all of them.

I think the notion that we have to do all this within the framework of a larger economic policy is absolutely true. I agree with Congressman Cox. It does no good to do this in a vacuum. It needs to be in an overall economic climate that encourages diversification.

I'm going to follow your articles. I want to see more of your work, and it will help me as a Senator.

I want to say to the committee that's about to sit here, thank you for your patience. We did run a little bit over. We are going to leave now and turn over the chamber to you.

I know Steve MacDonald is here from the Mayor's office, and I want to thank the Mayor's office and the City Council for being so generous with this space; and to all the panelists for really helping us as we deal with the economic situation today. The economic situation today is difficult, but I think many of you on the panels gave us the light that we need.

So many, many, thanks. And the Committee stands adjourned.

[Whereupon, at 1:15 p.m., the Committee adjourned, subject to the call of the Chair.]

## **SUBMISSIONS FOR THE RECORD**

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### **PREPARED STATEMENT OF C. MICHAEL ARMSTRONG**

#### **Additional Challenges Facing the Defense Industry**

Certainly, there's a great deal we don't know about the world we'll face tomorrow, or about the dangers that may dominate headlines a month or a year from now. But there are a few things we do know, "facts of global life t that ought to inform our actions:

- We know that, in our post-Cold War world, the United States can no longer afford extensive forward deployment.
- We know that, even after the Cold War, threats remain. Now or in the near future, some 30 nations will possess the ability to deliver tactical or ballistic missiles with warheads of increasing destruction.
- We know that, the threat we face is no longer fixed, but unforeseen. Gone are the days when standing armies across the East-West divide made it possible to predict an enemy's route of attack and prevent it. In future conflicts, geography will likely choose us. After all, think what every potential adversary of the United States has learned from Desert Storm: Never give the United States 6 months to prepare for war.

#### *Four Facets of Change*

These facts pose a fundamental challenge to the purpose, the placement, and the programming of our defense strategy. Now, implementing a new defense strategy would be challenge enough. But it is just one of four facets I see to the larger transition taking place around us—a transition changing the face of not only our national security, but our defense industrial base, our foreign policy, and the essence and size of our government as well.

To sustain our defense industrial base we must have more flexibility to consolidate so that we may still provide competitive output. To be driven by down selects on the one hand while anti-trust drives us apart with the other, makes no sense.

To re-define our foreign policy, we must promote the cause of peace amidst new nationalism and old conflicts that are emerging from the ashes of communism. Our foreign policy must not only protect and extend our values, it must also recognize the value of an economically strong America.

To re-invent governments we've got to invent a government that consumes less of our GNP, reduces the layers of bureaucracy, and dictates policies that bolster our economy, rather than burden it. America was never intended to be a nation of the governments by the government, for the government.

Let me first speak to reinventing government. As you know, the defense industry has been reinventing itself We are driven by budget reality, competitive necessity and company survival. For example at Hughes we have:

- Downsized by 30,000 people since 1986,
- Written off 7 million square feet of apace and abandoned over 100 facilities,
- Taken out 2 layers of management and reduced corporate vice presidents by 25 percent,
- Invested \$450 million to consolidate General Dynamics Missile business with ours, and reduced five major locations to one,

- Reinvigorated our quality program and required all management to go back through an education on customer focus, communications and continuous measurable improvement,
- Imposed a 30% cost reduction across our entire business and taken a \$1.3 billion restructuring charge to earnings.

### *Reinventing Government*

But government must change also. And, it like industry, should be driven by budget reality, competitive necessity and our country's survival.

To reinvent government means redefining what government should do and should not do.

Reinventing government means being driven to do less, as well as doing away with many things that government has been doing

A small example I came across the other day. It costs \$54 for DoD to process travel vouchers for its personnel. Private travel agencies do the job for about \$4 per voucher. That shouldn't surprise us. It's called comparative advantage. If you want to move half-a-million troops and their materiel to Saudi Arabia, you don't call a travel agency. In the same way, if you want to dispatch a defense audit team from Washington to Seattle, quickly and at the lowest cost, there's no advantage in the Pentagon playing travel agent in the public sector and the private sector, we need to play to our strengths.

But other than the election process, we haven't patented a process or a set of market forces that drives us to redefine and downsize government. In fact there are plenty of forces around to do just the opposite.

Thus, reinventing government means leadership. leadership from the Administration, the Congress and Industry. Leadership that rises above its traditional role of an adversarial balance of power within a growing economy.

Reinventing government means redefining our relationships and our responsibilities.

Instead of the defense industry and the defense establishment operating at arm's length, we are going to have to join up in teamwork to drive out cost and drive up quality.

Instead of all the rules, regulation and oversight currently imposed on procurement and productions we are going to have to step up to self-assessment, trust and the discipline of the market.

Instead of protecting surpluses throughout the system to perpetuate power, be it politics or service thrones, we are going to have to decide what it takes to deploy and support a competitive force structure and get on with it!

But this is far from easy or natural—not when pressure to protect your piece of the pie sets government against industry, and the services against one another.

### *Defense Industry's "Belly Up Review"*

All of us know the grim statistics. 1994 will mark the ninth straight year the defense budget has declined in real terms. The forecast is for more of the same. Before it's done, we will see a shrinkage of 50 percent between 1986-1997.

The services are shrinking, too. From a late 80's peak of 2.1 million men and women, down to a force of 1.4 million. Fewer air wings, fewer carrier groups, fewer divisions—our services will all be learning how to perform new missions with less.

As I've mentioned, what's true for the defense budget and the services, is true for my industry. In the aerospace sector alone we've shed 800,000 jobs since the mid-1980s. And we're not done. Some analysts predict a net loss of as many as 15,000 to 20,000 jobs each month—every month—for years to come.

You're all familiar with the recently completed Bottom Up Review. In the defense industry we have been involved in what I might call the Belly Up Review—because that's the consequence of failure.

And to avoid failure as we reinvent government—to assure we deliver the most competitive force structure, we must not only set objectives, we must implement with the passion we hold for winning on the battlefield, instead of the continual time-outs we call on the playing field of politics. Our sense of urgency must be survival, the moral equivalent of avoiding "industrial belly-up,"—or we will waste valuable resources and be far less prepared to respond with the results and the pride we delivered in the gulf conflict.

### *China Sanctions*

As I previously stated, our foreign policy must not only protect and extend our values, it must also recognize the value of an economically strong America.

But too often foreign policy uses a strange understanding of economics to communicate its messages.

Take, for example, the recent China sanctions.

We all support the Missile Control Technology Regime, because further proliferation of missile technology surely endangers world peace. And imposing sanctions on China until we reach a satisfactory agreement is understandable.

But to stretch the definition of the sanctions to include commercial communications satellites is not understandable. Due to the sanctions, Hughes cannot deliver or China launch the satellites we have on order for Australia, Hong Kong and China.

A satellite is a packaged, enclosed system that never leaves U.S. government control. It is accompanied by armed U.S. Air Force personnel. It is under lock and key until launch and monitored by TV cameras 7 days and nights a week.

A satellite is not a missile part or component, as the sanctions restrict, it is a secured U.S. asset that does not pose a missile threat.

While people at the Defense Department, the Commerce Department and the CIA agree with that interpretation, the State Department interprets the law to say the sanctions apply to satellites.

Why? Because, I'm told, the State Department thinks the Chinese want Hughes satellites and, while it may cost Hughes some jobs and business, it gives the State Department leverage with the Chinese.

The Chinese Space Agency recently informed us that they now have a MOU with DASA of Germany to transfer from Hughes the contract for two communications satellites valued at \$80 to \$100 million. This will cost us several hundred more jobs in California.

In addition, the Europeans are presently pursuing three more Hughes satellites we have under construction, for China launch, as well as the follow-on potential of seven additional satellites, that are worth a billion dollars of business and 4000 to 5000 jobs.

It escapes me what effect our laying off 4000 to 5000 more people in California and shifting this export business to Europe has on the Chinese.

I know it doesn't affect missile technology transfer, but I do know it affects American jobs, American families, American business and the American satellite technology base.

The foreign policy of this country must not only defend our interests, it must be defensible to our people,

It is unacceptable to me, to my shareholders and to those who will be laid off—who will be unemployed—the our economic sacrifice is necessary to communicate to the Chinese.

I have asked the President of the United States to review the situation, hopefully before it is too late.

### *Redefining Anti-Trust Policy*

China sanctions are just one issue where government must change with changing circumstances. It's also time we reassessed our anti-trust policy as well.

Right now, defense firms are struggling to downsize and stay alive. For some firms, survival means mergers—if they can walk across the anti-trust minefield. My view is that downsizing is tough enough—without old interpretations of anti-trust policy being applied.

I believe anti-trust application must acknowledge that defense suppliers operate businesses in a unique environment. In contrast to the commercial sector, there is no conventional group of consumers who may purchase defense products. DoD is the "market."

One of the key questions anti-trust agencies ask is whether a proposed merger will substantially limit competition—or in the extreme case—create a monopoly. That is, will the customer be forced to pay higher prices? Now, if in the defense sector the customer is DoD, then DoD should have a formal role—a prominent place at the table—in the merger approval process. No one knows better than DoD what the impact of a proposed merger will be on defense procurement and the defense industrial base. How can we make that happen?

I believe DoD should establish an assessment office for mergers—one office that presents the department position to the Federal Trade Commission and Department of Justice.

DoD should meet regularly with industry members, with Justice and the FTC to formalize the procedures for evaluating mergers of defense suppliers.

And finally, DoD should work with Justice and the FUC to modify merger guidelines to reflect the special circumstances of the defense sector.

### *Heading Off a "Hollow Industry"*

And that brings me to the final policy issue I want to address—the depot issue.

Downsizing is making depot work more important for one simple reason. With less work building new systems, maintenance, modernization and upgrade work become imperative to critical mass. Depot work is already big business: \$13 billion in annual maintenance work—and \$9 billion more each year in up grades. Without new direction or policy change, there is a reasonable chance depot work, over time, will end up being effectively nationalized.

Now, I know some people say all we need is honest competition between service depots and defense firms. But I believe the idea that we can somehow level the playing field is a dangerous illusion.

Competition between the public sector and the private sector is inherently unequal. Depots don't account for total costs—they don't account for their taxes—for their losses—for their R&D—for their overhead for their investments—for their returns. Depots do not account for their existence with the same rules and rigor of their private competitors. If the market system doesn't do the job, it is accountable to customers and shareholders. If depots have cost or schedule overruns, what should we do, increase taxes?

And if that's not enough, Congress has set aside 60 percent of the work for service depots. The economics or military logic of such a set aside appear to be overwhelmed by the politics—and predate the industrial base concern.

We used to worry about finding ourselves dependent on a "hollow army. What is at risk today is a "hollow industry." And we need to realize that indecision is our enemy on this issue. Each day we do nothing—we creep closer to a nationalized depot system. If this country ends up with nationalized depots, it should be by thoughtful intent, not indecision and politics.

I'm not arguing to industrialize the depots any more than I'd argue we should nationalize the depots. We need a solution that balances our need for force structure with our need for industrial structure.

But to achieve an objective assessment and direction is unlikely due to the battle between congressional interests, policy interests, and industry interests. It's time to declare a cease-fire in the rhetorical wars on the depot issue—and shift to a dialogue that produces less heat and more light. We need an objective forum to accomplish this. That's why I'd like to call for a Presidential Commission to resolve the depot dispute: a commission with people respected by all sides—people above self-interest and politics—who will thoughtfully hear us all out—think this through in terms of the national interest and recommend to the country what's right for the country.

### *The Change Imperative*

Not long ago, I heard Lester Thurow, the MIT economist, comment that the Chinese have a proverb—some call it a curse—"May you live in interesting times." To most of us, that saying has a comfortable ring to it. If so, we're kidding ourselves.

To live in interesting times means we live in times of change. Now, what we really mean when we say we like times of change is—change for someone else. Change for the Russians or the Chinese, for the Poles or Haitians—change for someone we can observe from a safe distance. But when it's our turn—change turns from interesting to threatening.

Well, it is our turn.

From our victories in World War II to our triumph in the Cold War and the sands of Desert Storm we've had a terrific run. But now we find ourselves on a different global playing field. And just as we've changed the world—now we, too, must change.

- Change the way we reinvent government.
- Change the way we implement foreign policy.
- Change the way we administer anti-trust.
- Change the way we manage depots.

But in this world of change, we also need to know what we can count on.

In a significant way, that is why whatever the change, whatever the challenge we can say with confidence, we live in interesting times.

