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SUPER 301: EFFECTIVENESS IN OPENING FOREIGN MARKETS

HEARING

BEFORE THE

SUBCOMMITTEE ON INTERNATIONAL TRADE

OF THE

COMMITTEE ON FINANCE
UNITED STATES SENATE

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SECOND SESSION

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SUPER 301: EFFECTIVENESS IN OPENING FOREIGN MARKETS

FRIDAY, APRIL 27, 1990

U.S. SENATE,
SUBCOMMITTEE ON INTERNATIONAL TRADE,
COMMITTEE ON FINANCE,
Washington, DC.

The hearing was convened, pursuant to notice, at 10:04 a.m., in Room SD-215, Dirksen Senate Office Building, Hon. Max Baucus (chairman of the subcommittee) presiding.

Also present: Senator Heinz.

[The press release announcing the hearing follows:]

[Press Release No. H-29, Apr. 19, 1990]

FINANCE SUBCOMMITTEE ON TRADE TO HOLD HEARING ON SUPER 301; EFFECTIVENESS IN OPENING FOREIGN MARKETS TO BE EXAMINED

WASHINGTON, D.C.—Senator Max Baucus (D., Montana), Chairman, announced Thursday the Subcommittee on International Trade will hold a hearing on the views of the private sector regarding the effectiveness of Super 301 and future action that should be taken under Super 301.

The hearing is scheduled for *Friday, April 27, 1990 at 10 a.m.* in room SD-215 of the Dirksen Senate Office Building.

Super 301, a key provision in the Omnibus Trade and Competitiveness Act of 1988, created a program to eliminate the major trade barriers of foreign countries. It requires the Administration to identify countries and trade barriers that, if removed, would have the greatest potential to increase U.S. exports. Once identified, the Administration negotiates with those countries, seeking to eliminate the unfair trade practices over a three-year period.

Senator Baucus said, "Super 301 is the heart of the 1988 Trade Bill. Congress intended it to be the primary tool for prying open closed foreign markets."

"With the second round of Super 301 decisions due by April 30th, it is timely to evaluate how well Super 301 has performed thus far," Baucus said.

OPENING STATEMENT OF THE HON. MAX BAUCUS, A U.S. SENATOR FROM MONTANA, CHAIRMAN OF THE SUBCOMMITTEE

Senator BAUCUS. The hearing will come to order.

For many years U.S. exports have been shut out of foreign markets, particularly in the country of Japan. For many years, administration after administration has paid lip service to not only these trade barriers but to many others. Sometimes administrations even negotiated trade agreements to eliminate foreign barriers, but unfortunately these agreements were often half-heartedly negotiated and inadequately implemented.

Acting in response to the deep frustrations of the U. S. business community and the American public, the Congress enacted in 1988 legislation to break this pattern. In the 1988 Trade Act, Congress

created a strong provision known as Super 301 to break down foreign trade barriers in a systematic manner. In my view this provision was faithfully implemented by the Bush administration in 1989 and it resulted in a major trade breakthrough.

Some nations, namely Taiwan and Korea, negotiated significant trade agreements with the United States to avoid becoming a target of Super 301. And in six other cases negotiations were initiated to eliminate foreign trade barriers. This week the Bush administration made its decisions on implementing the Super 301 provision of the 1988 Trade Act for the second, and under the law, for the final time.

In my view, these are the most critical trade policy decisions the administration will make this year. It is widely believed, given the recent comments of administration sources, that Japan will not be listed as a priority country under Super 301. This is unfortunate.

In 1989 the administration launched three Super 301 cases against Japan. The three cases dealt with forest products, supercomputers, and satellites. At the same time the so-called Structural Impediments Initiative or SII was launched to address larger systematic barriers in Japan. Over the last several weeks we have successfully concluded trade agreements to resolve all Super 301 cases against Japan. We have also made significant progress in the SII talks.

As one administration official noted, "This has been the most successful four weeks in the history of trade negotiations with Japan." This record of success, coupled with past achievements, demonstrates that Super 301 is an overwhelming success. I fear that now abandoning Super 301 may send the message, albeit unintentional, that the United States is no longer concerned about Japanese trade barriers. This is certainly not the message the United States should be sending.

The three sectional agreements recently concluded are major steps forward, and I am confident that the forest products trade agreement will boost U.S. forest product exports and create U.S. jobs. But much remains to be done. A final agreement on SII, the largest of the ongoing trade talks with Japan, will not be reached until July of this year.

Further, a number of other sectoral problems remain unresolved. Assuming the agreements that have been reached are enforced, we have made progress, real progress, but there is still a considerable way to go.

That said, I must also note that I am sympathetic to Ambassador Hills' plea that she be given a bit of latitude in dealing with Japan. Certainly Ambassador Hills and her staff have done enough to deserve some trust from the Congress. I am also sympathetic to the argument that Japan deserves credit for the progress that has been made. The Japanese market is opening and the Government of Japan does deserve praise, though more remains to be done.

With all this in mind, I am willing to give the administration some leeway. I do not agree with the decision that has been made with regard to Japan, but at this time I will not support legislation to reverse the administration's decision. However, I will continue to press for progress in opening the Japanese market. Needless to

say, I will also demand from Japan strict compliance with the trade agreements that have been reached.

In particular, I will pay very careful attention to the SII talks. After the final agreement in July, I will carefully review the progress that has been made in SII. If the SII agreement fails to meaningfully address the structural barriers in Japan, I will at that point press for passage of legislation to extend and expand Super 301. This legislation would direct the administration to initiate cases aimed at eliminating the Japanese structural barriers that are now the topic of SII.

Given the timing and the subject matter, this legislation would be an appropriate component of future legislation to implement the provisions of the new GATT agreement. According to the administration, this GATT implementing legislation will be submitted to the Congress by early next year.

Further, it is time for the United States to take a hard look at the mechanism for evaluating compliance with trade agreements. We must make sure that the United States fully realizes the potential trade benefits of the trade agreements that have been recently reached with Japan. Unfortunately, no formal procedure is now in place to evaluate compliance with trade agreements.

Several weeks ago I introduced, with several cosponsors, legislation aimed at remedying this oversight. In the coming weeks I intend to initiate hearings on this legislation, and after those hearings I will press for the passage of the Trade Agreements Compliance Act.

The United States must demonstrate that it expects its trading partners to live up to their agreements with the United States. Trade relations between the United States and Japan have been somewhat tense in recent years. I hope that the agreements that have been recently concluded with Japan will prove to be a turning point in U.S.-Japanese relationships. But I must confess to some skepticism.

I hope that the Bush administration and its counterpart in Japan will continue to work diligently toward progress in opening the Japanese markets. If not, the United States and Japan will rapidly be drawn back into trade confrontation. This is the time for Japan to demonstrate leadership; a time to shoulder the burden of being an economic super power. We cannot wait forever for Japan to recognize its responsibilities. Both the Government of Japan and the Bush administration should rest assured that the Congress will act if they fail to.

Today, I have asked a number of representatives of the U.S. business community to testify on Section 301 provisions of the 1988 Act and I look forward to their testimony.

[The prepared statement of Senator Baucus appears in the appendix.]

Senator BAUCUS. Our first witnesses are a panel of two. First Mr. Morris who is the director of the international trade section of the National Association of Manufacturers; and Mr. John Howard, Executive Director of the Subcommittee on Market Access for the U.S. Chamber of Commerce.

Gentlemen, would you please come forward. Whomever wants to proceed first can go ahead. Why don't you go ahead, Mr. Morris?

STATEMENT OF R.K. MORRIS, DIRECTOR, INTERNATIONAL TRADE, NATIONAL ASSOCIATION OF MANUFACTURERS, WASHINGTON, DC

Mr. MORRIS. Thank you, Mr. Chairman.

First, on behalf of NAM, I want to thank you very much for these hearings and for giving us a chance to appear. I would also like to recognize the obvious truth in what you have just said about the likely decision of the administration. On the other hand, until the announcement is actually made, NAM would prefer to proceed on the presumption that maybe our petition will be heard. So let me go on that basis.

The Super 301 process which was established by, as you mentioned, the Omnibus Trade and Competitiveness Act of 1988 and the decisions that flow from it by the administration are among the most important that the administration makes because they state American priorities.

It is the strong belief of the NAM that Japan should again be designated as a priority foreign country, that the SII process should be continued, at least for another year, and that the new Super 301 practices should be cited for action. These recommendations follow from a single premise—this is, that it would be a mistake for the administration to indicate in any way that the problems in the U.S.-Japan economic relationship are less serious or less important today than they were last year.

NAM submitted a statement to Ambassador Hills to this effect on April 5—last Wednesday. Our president, Jerry Jasinowski, wrote to President Bush expressing the same concerns.

The manufacturing component of the U.S.-Japan economic relationship is NAM's starting point in this discussion. Japanese firms are more than just the rivals of American firms. They are their suppliers, their customers, their partners and in some instances, their bankers. Unfortunately, the aggregate of these relationships is a serious unsustainable balance in the bilateral relationship.

While, for example, the overall merchandise trade deficit, as you know, last year was $49 billion, the deficit in manufactured goods was $66 billion or about 60 percent of the total merchandise deficit. The magnitude of these numbers indicates both the great value of U.S. economic ties to Japan and the seriousness of the difficulties for besetting them.

There is some evidence that the 1990 deficit will be a little bit less, but it will not be enough less for us to believe that the problems we are confronting are going to take care of themselves. They will not. The disturbing reality is that although the U.S. and Japanese economies are already interdependent and likely to grow more so, a satisfactory modus vivendi between the two countries does not exist.

In a sense, the highly successful negotiations of this past year, especially those conducted under the frame work of the SII—the Structural Impediments Initiative—only underscored this fact. This is because they serve to illuminate aspects of Japanese life, such as the kiretsu system, that tend to inhibit the normal commerce between the two countries.

Even so, the interim report of SII bespeaks an impressive commitment on both sides. Promising starts have been made in many areas, but it is essential that these beginnings be built upon forcefully and diligently. Otherwise, they could become little more than yesterday's expressions of good intentions.

In my prepared statement, Mr. Chairman, I list several reasons why the real outcome of the SII initiative may depend upon the redesignation of Japan as a priority foreign country. The point here is that Japan's willingness and ability to follow through in a way that meets American needs may well depend upon the signals we send respecting our priorities. The Super 301 designation today is the single most important index of that priority.

In keeping with our view that nothing the U.S. does this year should suggest a lessening of American concern with respect to Japan, NAM believes it would make sense for the U.S. Trade Representative to cite new practices. We have not suggested what these should be. We have said that they should first relate to the larger problem in the relationship; second, be credible cases; and third, where possible, use the tools of government to correct unreasonable, unjustifiable or discriminatory situations abroad that private firms cannot attack for fear of retaliation.

Mr. Chairman, it would be disingenuous to deny that citing trading partners as priority foreign countries under Super 301 cannot be seen as a kind of blacklisting, stigmatizing them as bad traders. Presumably, it was to avoid just such stigmas that Korea and Taiwan were as forthcoming as they were in last year's negotiations. Surely, though, we are beyond that point with Japan.

The question to be decided now is not whether Japan behaved well in the last year. Japan's leaders have acted conscientiously and boldly to deal with a series of potential divisive issues. The question today is whether we in this country will again state our trade priorities clearly. Silence is readily understood as consent and the United States should not consent to the status quo with Japan.

Let us speak up. Let us name Japan as a priority country under Super 301. Let us continue the SII talks and let us work hard to make our partnership with Japan an asset to both countries.

Thank you, Mr. Chairman.

Senator BAUCUS. Thank you very much, Mr. Morris.

[The prepared statement of Mr. Morris appears in the appendix.]

Senator BAUCUS. Mr. Howard, will you proceed?

STATEMENT OF JOHN E. HOWARD, EXECUTIVE DIRECTOR, SUBCOMMITTEE ON MARKET ACCESS, U.S. CHAMBER OF COMMERCE, WASHINGTON, DC

Mr. HOWARD. Thank you, Mr. Chairman.

The U.S. Chamber appreciates the opportunity to makes its views known at this hearing this morning. The Chamber strongly supports aggressive use of the Super 301 procedure to obtain trade liberalization agreements with the designated countries and has twice filed submissions with the USTR toward achievement of these goals. Achievement of these goals will benefit not only U.S. exporters but also exporters from third nations and consumers and

restricted markets who pay higher prices as a result of trade restrictions.

On March 24, 1989 the Chamber recommended that USTR identify various practices in Brazil, India and Japan as priorities under the Super 301. And on February 16, 1990, in a follow-up submission, the Chamber concluded that no change had occurred that would justify not identifying those nations and those policies and practices as priorities in 1990 under the Super 301.

I would like, with the Committee's consent, to submit those two submissions for the record.

Senator BAUCUS. They shall be included in the record.

[The information appears in the appendix.]

Mr. HOWARD. Since our February submission, Brazil's President Coller, has since implemented or promised to implement sweeping trade and economic liberalization measures. Furthermore, Super 301 agreements have been reached with Japan concerning satellites, super computers and wood products; and an interim SII agreement to address some of Japan's impediments to imports was announced on April 5, 1990.

While recognizing the importance of this progress, the Chamber still prefers the identification of these nation's trade barriers and distortions under Super 301. It believes that much of the progress can be attributed directly to leverage afforded under Super 301 and that a failure to identify once again these priorities may result in a loss of momentum towards additional progress.

Nonetheless, while the Chamber has expressed its reservations in the past over the SII's lack of time tables and procedures, it is currently the principal operative approach for resolving Japan-U.S. disputes and should be given a chance to succeed. Any loss of momentum that may arise from decisions made this April can be revisited later in the year, after the final SII announcement is issued and an appropriate grace period for its execution is passed.

Preservation of the American position in the world market place requires that the United States also address its own competitiveness challenge, in particular lower capital costs and a strengthened educational performance are critical to our successfully meeting this challenge.

However, while the United States must clearly act to correct its own structural impediments and it elevates the importance of trade in its policy circles, this in no way justifies weakening its resolve to open foreign markets, whether through multilateral, bilateral or even unilateral means. U.S. businesses continue to face a wide range of trade barriers and distortions in other countries that do not burden those country's businesses operating in those countries or in the United States.

The United States must continue to give the necessary support to its negotiators and even prod them into tougher positions when they appear to falter. The U.S. must make it even clearer that it takes its legitimate trade rights very seriously and is prepared to take unilateral action if necessary and appropriate to defend those rights.

History tells us all too often that when Japan makes relatively small concessions the United States reacts as if the battle has been won, even though Japanese trade policies remain significantly

more protectionist than those of other advanced industrial democracies. Neither Congress nor the business community should be under any illusion that the real progress that has been achieved is the result of unilateral Japanese conversion of free-market principles. Such progress is the result of the sustained application of leverage through negotiation and as Ambassador Hills herself has said on a number of occasions, a credible threat of retaliation.

There is nothing protectionist about asserting America's legitimate trade rights. On the contrary, it is clearly in the best interests of not only the United States economy but also of the world economy and world trading system.

That concludes my testimony and I will be glad to try and answer any questions you may have.

[The prepared statement of Mr. Howard appears in the appendix.]

Senator BAUCUS. Thank you, gentlemen, very much.

I take it you both disagree with the probable announcement today that Japan will not be named; that's correct?

Mr. MORRIS. It isn't that I—if I were a betting man might not bet that with that announcement. On the other hand, we operate on the theory that it isn't over until it's over, and so as long as the announcement has not been made, we will continue to press for naming Japan.

Mr. HOWARD. Yes, we would obviously prefer that, as I said earlier, these practices be named in Japan as well as in the other two countries I mentioned. We can accept, in the event that is not what happens, the continuation of the SII approach. But as I also said earlier, we can also revisit that at a later date if in that even there is a loss of momentum. So, yes, we obviously prefer that these practices be named.

Senator BAUCUS. But backing up, it is your strong belief—and if I am putting words in your mouth, tell me—that the basic components of the 1988 Trade Act, particularly the 301, albeit, Super 301 provisions are working? I want to first determine whether or not you agree with that basic statement.

Mr. HOWARD. I would argue that yes, the 1988 Act, the Super 301 provisions have had a positive impact on the ability of the United States to exercise leverage in negotiations, not only with the countries that were listed, but as you, yourself, alluded to, in other countries that were not listed.

Senator BAUCUS. Mr. Morris?

Mr. MORRIS. We do not want to denigrate or be disparaging about the relationship of the Super 301 provisions as they may apply to other countries. But NAM's principal concern, and we believe the principal concern of many in the Congress, was Japan in enacting the Super 301.

Senator BAUCUS. All right. Now——

Mr. MORRIS. Can I make one more comment?

Senator BAUCUS. Sure.

Mr. MORRIS. That is, so far it has been a great start. We have what the Ambassador called for—a blueprint. We do not have a building. I am not confident that if we let up now we are going to get the building we want.

Senator BAUCUS. Okay. So it is your position that if Japan is not named, it is less likely that we will continue the progress that we have been making under SII and other sectoral negotiations with Japan; is that correct?

Mr. MORRIS. Yes, Senator; it is.

Senator BAUCUS. Now what countries and what practices would the National Associations of Manufacturers name if the NAM were our trade negotiator? What is your recommendation? What countries and what practices under the present trade law should be named?

Mr. MORRIS. The only country that we are concerned with seeing named is Japan. We believe that something very special is happening with Japan, but it is important to reiterate United States priorities.

As to practices NAM would not, because of the nature of its membership, pick the actual practices. On the other hand, we note that the very success of past practices begs the question why not repeat what seems to be successful.

Senator BAUCUS. Mr. Howard?

Mr. HOWARD. Well in our submission we did identify both countries and practices; and in each of the three countries the practices we identified were significant, pervasive, transectoral, systemic, if you will. In Japan some of those practices are being addressed under the SII announcement—the distribution system, the anticompetitive business practices and the like.

We also identified others in our submission, including the use of administrative guidance, the practice of export targeting, which is in part a combination of other practices, an overly restrictive customs regime and some others.

In Brazil and India of course they have their own sets of practices as well.

Senator BAUCUS. How significant are the agreements with Japan that have been reached thus far—supercomputers, satellite technology, forest products, and SII? I mean, do you regard those as significant, as major or as inconsequential?

I am just trying to determine the degree to which you think that those agreements are or are not substantial progress in lowering Japanese trade barriers.

Mr. HOWARD. If I could point out on that, we are, of course, pleased at the achievement of any agreement that increases the opportunities for United States companies to compete fairly on a level playing field in other countries. Again, we are very pleased at that.

But it is important to note that given the legislative history of the Act, as you well know, such agreements do not in and of themselves constitute the resolution of the problem that the Super 301 statute was enacted to address. The law was intended to go after systemic barriers, not only the kinds of problems that to date appear to have been resolved, but also the broader transectoral, systemic, generic types of problems that in some cases are being addressed under the SII and other cases are not.

Senator BAUCUS. What is your response to the argument that if we name Japan now in the wake of the substantial progress that we have made with Japan, that the United States would be over-

reaching. That it would cause the Japanese to be more intransigent, or that it might topple, a weak government?

You know, one could make the argument that you can only press so far and then pretty soon one's efforts become counterproductive.

Mr. MORRIS. Could I respond both to that, Mr. Chairman, and add a comment on the last question?

With respect to that one, it seems to us that it ought to be possible between all the talent that is in the two governments to convey the idea to the Japanese that the naming of Japan as a priority country is a statement of what is important to the United States to get done and is not an accusation about Japan. That seems to me a fairly straight forward concept and one that we ought to be able to communicate.

With respect to the question as to whether the negotiations so far have been successful, let's break it into the two parts as you did, Mr. Chairman. On supercomputers, satellites, forest products, our initial impression is that these are good agreements but we would defer to the experts in those sectors. With respect to the SII interim report, it is very clear that that report, while a very great success on one hand, almost demands the kind of intensity that we had this year be continued next year. In other words, if we do not rename Japan under Super 301 naming, the process may not be successful.

For several reasons: The first is that the report combines many different things. In some areas like land reform, the distribution system, and contain other than proposed changes are things that Japan wishes to do for its own interest. They could well implement them in a way that does not adequately take account of our interests if the United States does not continue a strong negotiating presence.

In other areas such as the kiretsu system, for example, which is discussed or in the areas of beefing up the Fair Trade Commission in Japan, it is not clear that the Japanese heart is really into this and, it is important I think, that the American presence be clear there throughout. There is a danger that if we do not name Japan now the pressure will go off.

Finally, we are concerned for the coming year. We believe that if Japan is not named and if we do not clearly have a separate and successful Japan strategy that the politics in the coming year, in which a great deal must be done in trade, will be even more complicated than they already are set up to be.

Senator BAUCUS. Mr. Howard?

Mr. HOWARD. I do not perceive any real danger of a loss of momentum as a result of naming Japan or the other countries. I think on the other hand, as I said earlier, the use of the statute has added to that momentum.

I would also add to what my colleague said that in the SII, taken together, it is quite an ambitious agenda. Some of it will in fact take a long time to achieve. But if you take the components of the SII separately, I think you will note that there is a great variance in terms of the amount of time that might be required. It is our view that a distinction can be drawn on the hand between the more or less behavioral or what some would argue cultural traits, such as high savings rates on the one hand; and on the other hand,

some of the more policy or institutional aspects of the SII which can be more directly addressed through changes in law or its enforcement.

It is in the latter case that we think that in the SII there should at least be some sort of time table analogous or procedural setup analogous to the structure of the Super 301 law itself. But again, we want to give SII a chance to work and we look forward to seeing that this is accomplished in the July statement. And at that point we can revisit any deficiencies that there may be.

Senator BAUCUS. What about the potential extension and the timing of the 301 decisions? That is, under current law, as you know, this is the last shot. The administration probably will not name countries by the end of this month. Under the current law, because this is the second year and the law only provides for 2 years, that is the end of it.

Do you recommend that the Super 301 procedure be extended in the future? Should we review these decisions on an annual basis or should there be some other timing? What is your basic views on the propriety of extending Super 301?

Mr. HOWARD. If I could respond with an anecdote that I think you have heard I think in this Committee before, our vice-president, Bill Archey, has used it in testimony before this Committee, in which he recounts an incident where he met with a European trade official who basically was chastising the United States for all the lawyers and accountants and reporters and others who get into these great public debates and forums and engage in all this second guessing as to what United States trade policies should be. The European official's point there was, look, in Europe we don't get into all this, we just simply do it.

The point is that if the will is there a lot of this action, a lot of this negotiation, can be initiated without a new Super 301 law. The point again is, it is the will that the U. S. Government has to do what has to be done to achieve the results we want.

So my response is that at this time in addition to letting things shake out with the SII, it is not clear at all that reenactment of a Super 301 or extension, if you will, would necessarily serve that great a purpose. Again, there are issues more fundamental to that.

Mr. MORRIS. The current Super 301 decision is both a special opportunity and a decision that one cannot avoid. In other words, consequences and thinking will flow from it no matter what you do. We think that the future is likely to be somewhat brighter if Japan is named. If, however, this opportunity is missed and Japan is not named, then the wisdom of a new statute, which it seems to us is unlikely to look exactly like the currently one, would depend upon subsequent events.

If, for example, we are mistaken, as I hope we would prove to be and the negotiations with Japan prove just as successful in 1990 as they did in 1989, then, of course, no further action would be necessary legislatively, although we are going to have years of work on this problem in the bilateral administration sense.

So I think what I am saying, Mr. Chairman, is that that decision is really one for next year no matter what happens in the next day or so.

Senator BAUCUS. As I hear you, you are saying that if SII is unsuccessful, then it would be appropriate for the Congress to either by statute—to initiate or direct the administration to initiate 301 cases on the trade related issues under SII; is that correct?

Mr. MORRIS. If I could, Mr. Chairman, I would like to phrase it somewhat differently.

Senator BAUCUS. Sure.

Mr. MORRIS. And that is that we begin from the premise that there are serious problems in the bilateral relationship, but there isn't modus vivendi; and we need to work toward that. We think that the SII process is a promising one. If it becomes disappointing, then clearly everyone involved—In fact, if it is going to be successful, it will be successful because the Congress and the administration cooperated in terms of the United States side of the discussion. And if it is unsuccessful they are going to need to cooperate again to find a new avenue to pursue.

The relationship is too important to allow it to fail, but it is floundering now. What we have here is a good beginning in SII. It would be a mistake, though, to let up the pressure now and create the impression that, well, we had a success so we can just concentrate, for example, on the Uruguay round. We had a success which is only a success if it is properly brought to fruition.

Senator BAUCUS. What is your current estimate of the portion of the United States trade deficit with Japan that is caused by Japanese trade barriers?

Mr. MORRIS. I think, Mr. Chairman, that American debate about Japan has suffered from people answering that question too readily. Because, you hear numbers like 85 percent is macro or a 15 or 10, whatever opposite number, if all the trade barriers went away. It is virtually impossible, even in small identifiable markets, to know exactly what changes will flow from allowing goods to enter that hither to could not enter.

I do not think we will ever know exactly how big the problem is unless it really goes away and we can see the difference. I, myself, think the potential is much larger than the 10 percent, but I admit that is not a sophisticated estimate; it is a personal impression. But I do not think it is measurable anymore than when you have a prohibitive tariff. With a prohibitive tariff it is much harder to measure what the results would be, than if you have a tariff over which goods can flow.

So to the extent that we are dealing with real barriers that we cannot penetrate, it is hard to measure what the effect would be of their absence.

Senator BAUCUS. I very much agree with that. I think that with all the subtleties included the portion of the trade deficit that is caused by trade barriers is higher than a conventional analysis would indicate. There are some definite barriers, but there are a lot of subtle barriers too. I tend to think that once significant barriers are reduced, it will tend to have a greater positive consequence than some might think.

It is for that reason that the trade barriers must be eliminated. We are making progress. But I agree with you, we have a lot more progress yet to make. It would make much more sense if the

present mechanism that has been working were examined. That would include continuing to name Japan.

I strongly believe though that the administration is not going to name Japan. It means that we are going to have to follow up and monitor much more closely the progress or the lack of progress.

Frankly, I think that the administration now will be under considerable pressure to produce. Japan will also be under considerable pressure to produce because they are going to want to show to the Congress those of us who are a bit skeptical that they can do it. They may make considerable progress and I very much hope they do. But if they do not, then it is clear that many in the Congress will take appropriate action, introduce appropriate legislation, albeit sadly, because the progress was not achieved.

Thank you very much for your testimony, gentlemen.

Mr. MORRIS. Thank you, Mr. Chairman.

Senator BAUCUS. The next panel will consist of three people. First, Mr. Donnelly who is president of the Contact Lumber Company and he is with the Industry Sector Advisory Committee on Lumber and Wood Products in Portland OR; Ms. Suzanne Tichenor, director of international trade affairs with Cray Research; and Mr. David Hill, senior vice president of engineered materials of Allied-Signal.

Would you three please come forward?

Welcome back, Mr. Donnelly; it is good to see you.

Mr. DONNELLY. Thank you, Senator.

Senator BAUCUS. Why don't you proceed?

Mr. DONNELLY. Thank you.

STATEMENT OF ROBERT L. DONNELLY, PRESIDENT, CONTACT LUMBER CO., AND CHAIRMAN, INDUSTRY SECTOR ADVISORY COMMITTEE ON LUMBER AND WOOD PRODUCTS, PORTLAND, OR

Mr. DONNELLY. Mr. Chairman, I want to thank you for the opportunity to appear before you today. My name is Bob Donnelly. I am president of Contact Lumber Co. in Portland, Oregon. I am also chairman of the Industry Sector Advisory Committee on Lumber and Wood Products.

The current job of the committee is to provide the United States Government with the technical support and input it needs to negotiate effectively in the multilateral negotiations known as the Uruguay round.

I am extremely pleased to address this subcommittee today on wood products trade with Japan. This hearing could not have come at a more appropriate time for the United States industry. As you have undoubtedly heard, United States and Japanese Government negotiators reached a tentative agreement in Tokyo on Wednesday in the Super 301 wood products market access talks. This hearing provides the industry with its first public opportunity to assess the outcome of the talks and to consider where we must go from here.

The Super 301 talks with Japan have been long and difficult. This should come as no surprise to this subcommittee, to the industry, or to the United States Government. Market access for United States wood products in Japan has been a goal pursued relentlessly

by the industry and the government for decades. Every member of this Subcommittee knows through experience the difficulty of prying open Japanese wood products markets.

In light of these past difficulties, I am very happy to say that the agreement achieved by Ambassador Hills, Ambassador Williams, and Don Phillips is a good one. Although we did not get everything we wanted, the agreement represents substantial progress on a number of key issues.

Japan has agreed to remove a number of major barriers in the areas of codes, standards, certification rules and tariff misclassification. We believe that this agreement could help to boost United States sales value of wood products in Japan by $750 million annually.

Clearly the industry is pleased with this agreement. I want to extend my personal appreciation to the entire United States negotiating team, which included members from the Departments of Agriculture, Commerce, State and the Treasury as well as from the Trade Representative, for the intelligence, perseverance and dedication they have shown throughout the long and often trying negotiating process. Without the long hours and hard work they put into this effort the results may have been far different.

Obviously, this agreement will not resolve all of our differences with Japan on wood products issues. In the crucial area of building codes, for example, Japan agreed to remove unreasonable restrictions that prevented the construction of safe, three-story structures of wood-frame design. This represents major progress in expanding the market and giving the Japanese consumer access to quality, cost competitive construction. Japan has not, however, agreed to allow the full range of construction we have sought.

Similarly, the agreement reflects certain gains with respect to the problems of high tariffs and tariff escalation. Japan has agreed that it will engage in meaningful negotiations on wood products tariffs in the Uruguay Round. This is helpful, especially when contrasted to the Tokyo Round where no reduction in wood products tariffs was obtained. But this also falls short of our objectives. The United States Government must continue to press hard for the total elimination of wood products tariffs in the Round, a goal to which the United States has publicly committed.

Tariff misclassification represents another example of the limited gains achieved by this agreement. As I understand it, Japan has agreed to classify correctly certain products which have been misclassified. Other important products, however, will continue to be placed incorrectly into high tariff categories in contravention of international norms.

The industry greatly appreciates the long hours, hard work, and dedication which the United States negotiators put into this effort. They set out to get the best possible package that could be obtained at this time under this process and I believe they succeeded. We thank them for their hard work.

It is my view, and I believe the view of the United States negotiating team, that the Super 301 talks should be seen as part of an ongoing process for the achievement of a truly open market for wood products in Japan. This process began in earnest with the market-oriented sector specific talks known as the MOSS in the

mid-1980s and continued forward with the Super 301 talks. The process will not end until United States exports to Japan are allowed to attain their full potential.

Where do we go from here? I have already mentioned the Uruguay Round. Japanese tariffs on value-added wood products are several times higher than average developed world industrial tariffs and must come down faster than tariffs as a whole during the round. In my opinion wood products tariffs should come down to zero. In this context it is important to reiterate that the United States has tabled a contingent offer in Geneva to reduce our tariffs on a number of sectors, including wood products, to zero, if our trading partners agree to do the same.

On difficult technical issues such as modification of Japan's restrictive and discriminatory code standards and certification practices, the agreement requires the establishment of a highlevel working group, in which the United States Government will actively participate, to oversee further changes in unreasonable Japanese practices. The provision is a key element of the agreement, for it recognizes the need for additional movement and establishes a mechanism for achieving it.

The United States industry expects to see further progress——

Senator BAUCUS. I am going to have to ask you to summarize your statement, Mr. Donnelly.

Mr. DONNELLY. To conclude, I think we have some really good opportunities here in the future and we want to specifically thank the members of this Committee and members of Congress for their vital support. Multilateral trade negotiations have taken place every decade so the Uruguay Round truly is the Super Bowl of trade negotiations.

Our major focus, I would suggest, in the next month is for our industry, other industries, Congress and the Administration to put our full efforts into supporting and influencing a very successful outcome to the Round.

Thank you.

[The prepared statement of Mr. Donnelly appears in the appendix.]

Senator BAUCUS. Thank you, Mr. Donnelly.

Ms. Tichenor?

STATEMENT OF SUZANNE P. TICHENOR, DIRECTOR, INTERNATIONAL TRADE AFFAIRS, CRAY RESEARCH, INC., WASHINGTON, DC

Ms. TICHENOR. Thank you, Mr. Chairman. On behalf of our chairman, John Rollwagen, we are pleased to have the opportunity to testify today about our marketing activities in Japan. I have prepared written comments for the record which I would like to submit. I have also prepared for you a document which outlines in more detail our competitive position against Japan and the barriers that we have faced for the last ten years.

I am very honored to have the opportunity to release this for the first time to the public at your hearing today; and it will provide you with, I think, more background material.

As you know, Cray is the first manufacturer of a true super computer. We installed our first system in 1976 in the United States and our first international system in the European public sector in 1977; and we entered the Japanese market in 1980. From 1980 to 1982 we were the only supplier of super computers in Japan and we saw a number of opportunities in the public sector, but we were not able to make any sales. In 1983 the Japanese introduced their first super computer.

We do not know if it was official government policy to wait for an indigenous supplier before purchasing, but we do know that once they introduced their super computers the Government embarked on a mini buying binge, satisfying what was obviously a pent-up demand for the technology.

In the high growth purchase years between 1983 and 1987 vague procedures, closed bidding practices, and a subtle though unstated "buy Japanese" policy effectively kept us out of the market and once again we were not able to make any sales.

Also, the Japanese certainly could not say at that time that they had caught up with the United States because Cray Research had and continues to have the most powerful super computers available and a wide array of sophisticated hardware and software features some of which are not even available in Japanese systems and many of which are only there in rudimentary form.

In 1987 the United States Government initiated a Section 305 study and determined that United States manufacturers were in effect being blocked out of the market; and began negotiations that year with the Japanese. In August of 1987 they concluded the first super computer procurement agreement.

This agreement was supposed to provide for more transparency in the procurement process and it was supposed to end the bias against foreign manufacturers. Unfortunately, again, although there were many opportunities, we still did not make any sales. Yes, the procurement process was more transparent, but as our Chairman has often said, now we could see ourselves getting cheated out of the market. There was definitely a bias towards the incumbent vendor. The Japanese were offering massive discounts in the public sector, sometimes up to 80 percent; and the Japanese government was also only offering minuscule budgets to the procuring agencies for super computer purchases.

Purchases declined substantially between 1987 and 1989 and the continued market access problem was highlighted in USTR's National Trade Estimates Report in 1989. Subsequent to that, of course, Japan was listed on the Super 301 list, one of the reasons being the lack of super computer purchases in the public sector. The United States and Japan again entered into negotiations and as you are aware have come to terms on language for a new procurement agreement. It has not yet been signed but will be shortly.

During the 1987 to 1989 time frame when we participated in the public sector procurements we noticed that one of the principal criteria for selection was theoretical peak performance numbers. This was very misleading to the user. These numbers only represent the maximum theoretical performance that a super computer can attain under very unusual highly specialized circumstances. That is why they are called theoretical.

Usually in public procurements the procuring entity will put together a representative sample of the work that they are doing, give it to the vendors and ask them to run this benchmark. And the vendor who can do the work the fastest usually is the one who wins the procurement. But in Japan they were not requiring these benchmarks and the users were not allowed to test drive the super computers.

It would be like going in to buy a new car and buying your car based on theoretical maximum RPM and never going out on Interstate 95 and test driving the car.

So this was one of the principal areas addressed in the new agreement.

Senator BAUCUS. Like Gramm-Rudman? Like the budget process?

Ms. TICHENOR. Yes.

The 1990 procurement did address this and theoretical peak performance numbers are no longer allowed to be used as a criteria. Benchmarks have to be run. Low ball bids which are determined to inhibit competition are also thrown out, as is the vendor offering them.

I would like to raise one flag of caution here. While we are very pleased with the agreement and it has addressed a number of our concerns, it does only change process. The 1987 agreement instituted new procedures but no sales resulted as a result of those procedural changes. The 1990 agreement once again changes procedures. We could not ever consider the 1987 agreement to be a success because no sales resulted. The only way we can consider the 1990 agreement to really be a success is if sales result. They cannot be one-time sales. They must be ongoing, resulting in increased market share in Japan for us which is commensurate with our market share outside of Japan which happens to be about 80 percent of the market.

Senator BAUCUS. Thank you.

Ms. TICHENOR. Thank you very much.

Senator BAUCUS. Thank you.

[The prepared statement of Ms. Tichenor appears in the appendix.]

Senator BAUCUS. Dr. Hill?

STATEMENT OF DAVID C. HILL, PH.D., SENIOR VICE PRESIDENT, ENGINEERED MATERIALS, ALLIED-SIGNAL INC., MORRISTOWN, NJ

Dr. HILL. Thank you, Mr. Chairman. You will find that many of my comments are very complementary to those you have just heard. I hope you will bear with me.

Certainly the story that we are going to tell you is a story that has been repeated many, many times over in our commercial dealings with Japan. Metglas amorphous alloys which are the subject of the 301 Petition which we have filed with United States Trade Representatives are manufactured by a business that I have run for the past 5 years. Today I intend to review with you what we believe is a classic case of Japanese targeting of advanced technology for development by their own industry, the petition that we filed with USTR in this regard and the status of that petition.

I do have a copy of our petition which I would like to have entered on the record.

Senator BAUCUS. Without objection.

[The information appears in the appendix.]

Dr. HILL. We believe that the Japanese Government and industry have worked in concert to deny Allied-Signal and its joint venture company access to the Japanese market. We made this case in our position where we have presented evidence that the Japanese have manipulated their patent system so as to delay the issuance of key Allied-Signal patents in Japan, while at the same time funding and directing a consortium of companies to develop and commercialize competitive technology.

Today Japanese customers refuse to buy our product, waiting instead for a product that will be produced by Japanese manufacturers. The object of these actions is clearly to dominate the world market for this technology. A technology that is substantially more cost effective than conventional metallurgical processing and that produces engineering products with significantly higher value in their end uses.

We expect that our case will be a familiar repetition of the way in which Japan has done business over the past 40 years—government and industry working together to develop the manufacturing know how necessary to enter a targeted field. A world scale plant will be built. The products will be sold in a protected home market at prices 30 to 50 percent higher than the rest of the world and products will be dumped in the international arena where we must compete with them. I am sure you are very familiar with this practice.

When American business raises its voice to speak out what we hear from the Japanese is, it is all a misunderstanding. Besides, everyone knows American companies are lazy, they are too focused on short-term profits, and they do not take time to understand Japanese language and customs.

In our case these excuses do not work. We do understand the Japanese market. We have had a joint venture in Japan for the past ten years. We have worked hard. We have invested $200 million of our own money in developing this technology. We even sent a Japanese-born American citizen, who was a co-inventor of this technology and fluent in Japanese to Japan to oversee our product qualification. Yet after nearly a decade of trying we are far short of where we should be in the Japanese market.

The reasons are very simple. The Japanese dominate their own domestic market and the world market for silicone steel, the conventional material in use. Allowing Metglas alloys to be sold in Japan will threaten this position and it will confirm to the rest of the world the value of our technology.

Metglas alloys belong to a class of advanced materials known as amorphous metals. They are produced by our proprietary direct casting process which is substantially more capital and energy efficient than conventional metallurgical processing. What our process does is to convert molten steel into a solid finished sheet in a single operation, thereby bypassing conventional hot and cold rolling operations.

I have a sample here, if I could have you take a look at it, just so you can get a sense for what amorphous metal really is.

From a manufacturing cost perspective alone, our casting technology is 25 percent more cost effective than conventional technology. But as I have commented, what is more significant is that our process allows the creation of engineered materials with substantially higher value.

Because we freeze steel so quickly in a single operation the atoms that comprise the molten bath cannot get into the regular three-dimensional array that characterizes conventional metals. They are trapped in a disordered—or amorphous—array, and hence the name amorphous metal.

They can be harder, stronger or more ductile than conventional metals. But in this case the alloys that we make are much more efficient than conventional metals in transforming electrical power in the utility distribution system. When substituted for conventional silicon steel transformer cores, Metglas alloys reduce energy losses up to 70 percent. These performance advantages in utility transformers using Metglas alloy cores have been documented at over 100 United States utility companies and the conversion of these energy efficient transformers is occurring at an accelerating rate in the United States.

The utility transformer application is a major opportunity with a world market value of $1 billion and $100 million in Japan. Japan is totally dependent on imported energy. The economics for conservation in Japan are more compelling than in the United States.

We have established ourself as the world leader in this technology. In addition to the utility transformer application, many other value-added applications are possible from our technology. In the face of all of this we decided to go to USTR to take action to open the Japanese market. We filed a petition and have worked closely with USTR over the past several months. As you know, on April 18 we agreed to a request to withhold our petition for 150 days so that the USTR can enter into direct negotiation with the Japanese government to resolve our situation.

We are pleased with this action for three reasons. First, it holds out the promise for expedited resolution of this matter; second, USTR has said our petition meets the statutory requirements for 301 action; and third, if after 150 days we have not achieved satisfactory resolution, USTR will open an investigation with no loss of time.

In conclusion, I would like to say that we are pleased with the support and encouragement that we have received from our Government. We are particularly thankful to the members of Congress who have contacted the Executive Branch in support of our petition and we are grateful to Ambassador Hills who has prevailed on the Japanese to begin immediate talks to resolve this matter.

Thank you very much.

[The prepared statement of Dr. Hill appears in the appendix.]

Senator BAUCUS. Thank you all very much.

As I understand it, all of you are saying that the 1988 Trade Act, the Super 301 provisions which some of you have used directly and some of you have used indirectly are working and that they are good market-opening measures. Is that correct?

Ms. TICHENOR. Generally speaking, yes.

Senator BAUCUS. Okay. Second, I think it is important to point out that all three of your companies and industries build very high quality products. Sometimes commentators say that one reason the United States has a trade deficit is because Americans do not build high quality products. Your industries, and the industries you represent, all build very high quality products.

I could speak with some personal experience. I have been through Japanese plywood plants. I have been through American plywood plants. And just as Toyota and Honda in Japan are quite efficient and highly roboticised, I can tell you that Japanese processed forest products industries are inefficient and as wasteful. Frankly, astoundingly so. In the same vein, I know that American processed forest products are the highest quality in the world. That is undisputed.

I believe that is also true with American supercomputers, and certainly with Cray and other companies that are trying to make supercomputers. I have been through the Cray facilities in Minnesota and am very impressed with them. I just know that American supercomputers are the best in the world and are very high quality. And this amorphous metal development, though I know a little less about that, seems to be, again, a very high quality product. Certainly, Allied-Signal has diligently tried to market its product in Japan.

Dr. HILL. Yes, sir.

Senator BAUCUS. It is just not willy-nilly. Marketing shares in Japan and say here, take our product.

So you all tried very hard and that is very important. It is important for many Americans to know, and for the people in Japan and other countries to know, that America does produce very high quality products. Higher in some areas than perhaps in some others, but we do produce a substantial volume of very high quality products. And yet we are denied access in Japan.

Although recently in the case of supercomputers and in the case of processed forest products, we have now reached agreements at least in two areas where there is some improvement which we all pretty much appreciate.

Ms. TICHENOR. Mr. Chairman?

Senator BAUCUS. Yes.

Ms. TICHENOR. If I might just make one comment here. There still have been no super computer sales to the Japanese public sector. I do not want people to get the impression that there have been. The agreement provides for process changes. We will have to wait to see whether the sales result.

Senator BAUCUS. You have just anticipated my next point.

Ms. TICHENOR. I didn't mean to steal your thunder.

Senator BAUCUS. No, no. Namely, you both—all of you, to one degree or another—seem to be suggesting that we need a very rigorous monitoring, follow-up process in order to determine whether or not we get results. Because we are really looking for results here—additional sales in Japan.

What recommendations do you have to the Congress, to the administration, to enable us to more concretely and affectively monitor, the results that are achieved under these agreements?

Mr. DONNELLY. I think one of the good things about the wood products agreement is that there it establishes a process at a Subcabinet level, to bi-annually review additional opportunities, barriers.

Senator BAUCUS. Bi-annually or semi-annually?

Mr. DONNELLY. Excuse me, semi-annually. I am sorry.

And that we think that that is going to go a long way towards talking about compliance and being sure that the agreement is executed as well as talking about further improvements and seeking further improvements and access to the Japanese market.

Senator BAUCUS. But again, besides the semi-annual review, do you have any other recommendations a li'tle more precise and concrete?

Mr. DONNELLY. Certainly I would think Congress would take the opportunity to suggest a structure for evaluation that would be a meaningful adjunct to the agreements we make. And particularly as you look at the Uruguay Round, there are certainly wide opportunities coming ahead of us, and to be able to judge whether we are afforded the opportunities by our future agreements, I think that would be meaningful.

Senator BAUCUS. Okay.

Ms. Tichenor?

Ms. TICHENOR. Well definitely this agreement cannot be put away for a year into a file and hauled out next spring for an annual review. That certainly will not help our industry. The kind of monitoring that we need is frankly going to be very labor intensive, both for Cray Research—which we are willing to stand up to— and for USTR and the Department of Commerce. I think we need to examine every procurement that is announced; we need to follow the procurements every step of the way; the RFPs have to be examined to ensure that they are not written to support the incumbent vendor.

Let me give you an example of a pattern that we have noticed and why this is important. As I mentioned earlier, when we had product available, they did not buy and they waited for their own suppliers in 1983 and then they went on. Well we now have features in our super computers which are being used by users all over the world which are not yet available on Japanese super computers. These features are becoming standards in RFPs outside of Japan, but they are not being asked for in the Japanese procurements because they are not available from their own vendors.

You can see this pattern continuing and that is why we have to monitor these procurements very carefully.

Also, the super computer procurement agreement does not directly address the budgeting process. It does say that low ball bids have to be thrown out and it tries to indirectly get rid of the massive discounting. But the Japanese government still has to budget so that super computers can be purchased by procuring entities from vendors who will not and cannot give 80 percent discounts. So we have to be very cognizant of how the Ministry of Finance is doling out this money.

Also, it is very difficult to overturn an incumbent vendor at a site that has been using a certain vendor's hardware and software for years. That is true anywhere. We do overcome incumbent ven-

dors but it is a little bit more difficult. We would hope that when the Japanese government sets budgets for super computer purchases that they would not just allocate this money to sites that already have super computers and just want to upgrade within the existing Japanese vendor line.

Senator BAUCUS. We have had agreements before, as you pointed out, Ms. Tichenor, on supercomputers, we had the MOSS talks on forest products. Those were agreements. They did not work.

Ms. TICHENOR. That is right.

Senator BAUCUS. What assurance do we have that these new agreements are going to work? And how can we better insure that they will work?

Dr. HILL. Mr. Chairman, may I just make one more comment relative to the most recent remarks?

Senator BAUCUS. Sure.

Dr. HILL. The structural barriers in the Japanese market are very pervasive and very numerous. Trying to deal with this problem by simply measuring the end result very often does not permit us to thoroughly understand exactly what is happening inside the Japanese structure.

So the kind of oversight that has to be employed here is expensive and it is one that must be done at a number of levels. If we do not go in and begin to analyze at numerous levels in the structural hierarchy in Japan how business is done and monitor it; and simply measure what comes out at the bottom line, I think we are going to be continually frustrated.

Senator BAUCUS. I appreciate that. But without going into too much detail, should various United States agencies be undertaking those analyses?

Dr. HILL. Well clearly the issue of how money is budgeted in Japan, how dollars or yen are made available to buy product, is something that needs to be well understood. You heard the comments in the case of super computers. For our industry, dealing with the electric utility industry in Japan, it is much the same kind of situation. The barrier between and the line between Government and industry or between Government and public utility is not very clear in Japan.

So certainly at the level that financial decisions are being made, we need to have some oversight. USTR is going to be an important agent in helping us to police conformance with these negotiations; and, I think, in the case of Cray and in the case of Allied, we are prepared to step up and put up our own money to supplement whatever investigation and whatever factfinding and data needs to be obtained.

Senator BAUCUS. Well that is probably important because USTR's budget is not that great. The USTR does not have the personnel to undertake the kinds of analyses that you are suggesting.

Dr. HILL. Right.

Ms. TICHENOR. That is right.

Senator BAUCUS. They just do not have it.

So what is the answer? Will Allied-Signal and other companies begin to contribute?

Dr. HILL. I believe that if American industry is convinced that its Government is standing shoulder-to-shoulder with it in internation-

al trade that you will find a tremendous amount of cooperation, both from the standpoint of manpower and of money on the part of American industry to make these processes work.

Senator BAUCUS. I think that is right. I take it you are finding beginnings of some of that cooperation; is that correct or not?

Dr. HILL. We are really right at the beginning and we are certainly hopeful of a positive outcome.

Senator BAUCUS. What about Cray and the forest products industry?

Mr DONNELLY. The various segments of our industry as industry segments are very active in trade promotion in the world's major markets. So, along with the companies present there, it is not difficult to ascertain whether the agreements are being lived up to. So I think from our part as an industry, we are certainly in a position to make a judgment and certainly with the support of agencies and so forth, we would make our wishes or our thoughts very well known.

Senator BAUCUS. Thank you.

I see we are joined by Senator Heinz who has been very active in trade matters. Senator, we welcome you here and look forward to any comments or questions, whatever contribution you will make.

Go ahead.

Senator HEINZ. Thank you.

I would like to ask Dr. Hill a little bit about his experience with amorphous metals in Japan beyond what you have testified. As I understand it, in your complaint you raised the issue of whether intellectual property laws in Japan are offering adequate protection to holders of intellectual property rights and wether the Japanese have been manipulating their patent system specifically to your disadvantage.

What was done by whom? What role, if any, did the Government play? And what is your view beyond the negotiations that have been entered into on your behalf by USTR, what the United States ought to do to strengthen such protection in Japan?

Dr. HILL. Thank you, Senator.

In our case, Allied made two landmark inventions—pioneering inventions—one in 1973 and one in 1977. In the United States we applied for and received issued United States patents within 2 years of our application. In Japan it took us 11 years in the first instance and 12 years in the second instance to obtain our patent.

Patent rights in the United States are granted for 17 years from the time of issuance. Patent rights in Japan run 20 years from the date you file. So that if there is a significant delay in the period of time in which a patent is applied for in Japan and the time in which it is issued, you have effectively lost a significant amount of the time value of your intellectual property right.

Furthermore, in Japan, while there are some mechanisms for attempting to assert your right during that period of prosecution— in our case 11 and 12 years—the Government and private industry have the right to practice your invention for their own research purposes. What we saw happening in Japan, quite frankly, is that during that 10 and 11 year period the Government went out and funded people to develop a competitive technology.

I cannot sit here and tell you that it is a knock off because I have not seen it up close and personal. But I have seen the products that that technology produces and they are identical to ours.

Senator HEINZ. Do you consider what the Government has done to be widespread or were you a special case?

Dr. HILL. No, I think that if you examine the record you will see that in the case of advanced technology, American and foreign applicants in the Japanese patent office typically see prosecution periods three to five years longer than Japanese who file for similar kinds of patent protection.

Senator HEINZ. Would you consider what the Japanese are doing an unfair trade practice or is it just a sharp practice?

Dr. HILL. I certainly regard it as unfair, Senator.

Senator HEINZ. Would you therefore conclude that at least on intellectual property there is a very strong case to be made for listing Japan under Super 301?

Dr. HILL. Yes, I do.

Senator HEINZ. Can you think of any reason that anybody could give not to do that? For example, in the SII there is an intellectual property component, as I understand it. What do you know about that and is it going to cure the problem?

Dr. HILL. Well, of course, as I commented earlier, in Japan the levels of structural impediments that we encounter are so numerous and so pervase that it is very often difficult to point a finger at any one place and say that is where the problem is. I think that our experience is not uncommon and not very different from other American industry.

Therefore, I believe that the current inclusion of remedies for the Japanese patent system in SII is too narrowly focused and that we need to have a much broader understanding of the way in which Government, industry and the quasi-Government organizations in Japan interact with one another so as to obstruct foreign companies who wish to obtain intellectual property rights.

Senator HEINZ. What did the United States Government obtain in the Structural Impediments Initiative on intellectual property?

Dr. HILL. Well, of course, as you know——

Senator HEINZ. To the extent anybody knows.

Dr. HILL. Well no one can predict an outcome before it happens.

As you know, there has been significant criticism of our own patent system by the Japanese who argue that it is a nonconforming system; who argue that it is not the general case, for example, that patents run from date of issuance; it is not the common practice that you can have a junior party—that is, the second to file, obtain a patent coverage. I would have to wonder when we are all done what concrete actions will be accomplished by SII in patent area.

Senator HEINZ. I gather the first patent you filed, which you filed in 1973, issued 11 years later in 1984, that is 6 years ago.

Dr. HILL. That is right.

Senator HEINZ. Why did you only identify in effect an unfair trade practice in this area 6 years later?

Dr. HILL. Well, Senator, as I commented and as is spoken to in our complaint, we have been trying very hard to be successful in

Japan with the development of our product and with its commercialization for the past ten years.

Through 1986, maybe early 1987, Japanese utilities were moving very aggressively to qualify our product and to bring it to the point at which it would be used commercially in Japan. In 1987 everything stopped. I think we heard a similar case in the case of Cray. The reason everything stopped is that the Japanese had reached a point where the decision was inevitable—now they had to start buying our product. There was no domestic source of that product.

In 1987, I think our senses were heightened that in fact we were in the process of being shut out in Japan. And really, it has only been over the past two and a half years that we have been putting together our case. The patent issue is only one element of our case.

Senator HEINZ. What are the other elements?

Dr. HILL. We have a situation where Japanese Government and industry have worked together. The Japanese Government has funded, targeted the development of this technology by Japanese industry. We have a case in which Japanese utilities have refused to buy transformers that contain our high efficiency material.

So we have a pattern of behavior on the part of government and industry in the commercial sector which is a step above, beyond, and far away from the manipulation that we saw in the patent office.

Senator HEINZ. At what point, if it has happened, have the Japanese produced any competing or infringing products or distributed samples to potential customers or set up production facilities; and, indeed, if they have a product is it the same or different from yours?

Dr. HILL. Well, as I commented earlier, Senator, we have not seen their production facility, but we have seen samples of material that have been distributed by Japanese companies that have developed a competitive technology. I can tell you that they are virtually indistinguishable from the product that we make. Those samples are given away in Japan, not sold. Because if they were sold that would create a commercial harm and we might have recourse in the courts.

But they serve a very useful purpose. They inform Japanese industry that someone in Japan is ready, willing and able to step into the void when our patents expire in the mid-1990s to serve their needs; and, therefore, Japanese utilities, Japanese transformer companies should wait until Japanese product can be available from a domestic source.

Senator HEINZ. Would it be accurate to say then that your potential customers, those utilities that would need to purchase transformer products incorporating amorphous metals were in fact told either by the government or by a consortium supported by the government, just lay off?

Dr. HILL. I think that there is certainly a high degree of circumstantial evidence to support that conclusion. We have been told by Japanese transformer companies that they will not buy transformers that contain our product.

Senator HEINZ. You know, one of the arguments we perennially hear is that, well, if the Japanese ceased and desisted in all their unfair trade practices it would only increase American exports to

Japan by just a little teeny bit and that is all the trade deficit between our countries would improve.

Let me try, if the Chairman will permit me, to get at that. As I understand it, there is expected to be a very large worldwide market for amorphous metals. Is that correct?

Dr. HILL. That is correct, Senator.

Senator HEINZ. Could you put a number on that?

Dr. HILL. Today the world market for electrical steel, the product for which we have a sample in the front of the room is $1 billion. That is a pretty large market by anyone's reckoning. And the kinds of technology and applications to which amorphous metal will be put in the next decade and the coming century are several billion dollars in size.

Senator HEINZ. Now let's look at what might happen to your company in two different scenarios. One, you are successful in being allowed to sell, penetrate, break in, and hopefully by being first on the block with as good a product as there is, a major player—perhaps the most formidable competitor in Japan. That is scenario one.

Scenario two is, you are kept out because the negotiations that are underway do not produce anything in terms of either process or results that are meaningful.

What is going to be the difference in two ways? One, to your position in world markets and your ability to sell, your sales volumes; and secondly, how much bigger a player would Japanese manufacturers become under scenario two rather than scenario one?

Dr. HILL. Well, of course, in the case of scenario one, where we are accorded access to the Japanese market, all of the Far East follows Japan—Korea, Taiwan, the Peoples Republic of China—look to Japan as a technological leader. There is no great love lost between those countries and Japan as a trading partner. But from a technology point of view they are watching the Japanese very carefully.

We have been, frankly, frustrated in our efforts in the Pacific Rim because we are told by those other Asian countries, we are watching Japan, we are following Japan. Be successful there, then come here. So success in Japan would open up not only the $100 million market for us in Japan, but also a market of equal or larger size in the rest of the Pacific Rim.

If we are denied, scenario two, access to the Japanese market we are going to have a very difficult time gaining what for us represents at least a third and maybe a half of that billion dollar market on a worldwide basis.

Senator HEINZ. I know the chairman is going to point out correctly our time has expired.

Senator BAUCUS. On the vote.

Senator HEINZ. That is what I mean, my time is expiring on the vote.

Senator BAUCUS. We have about 4½ minutes.

I want to thank you all very much. This has been a very informative panel. It was helpful discussion. There will be many followup sessions too. We thank you very much. We appreciate it.

Dr. HILL. Thank you, Mr. Chairman.

Senator BAUCUS. This hearing is adjourned.

[Whereupon, the hearing was adjourned at 11:20 a.m.]

APPENDIX

ADDITIONAL MATERIAL SUBMITTED

PREPARED STATEMENT OF SENATOR MAX BAUCUS

For many years, United States exports have been shut out of foreign markets—particularly Japan—by trade barriers.

For as many years, Administration after Administration has paid lip-service to these problems.

Sometimes Administrations even negotiated trade agreements to eliminate foreign barriers. Unfortunately, these agreements were often half-heartedly negotiated and inadequately implemented.

Acting in response to the deep frustrations of the United States business community, the Congress acted in 1988 to break this pattern.

In the 1988 Trade Act, the Congress created a strong provision—known as Super 301—to break down foreign trade barriers in a systematic matter.

In my view, this provision was faithfully implemented by the Bush Administration in 1989, and it resulted in a major trade breakthrough.

Some nations—namely Taiwan and Korea—negotiated significant trade agreements with the United States to avoid becoming a target of Super 301.

In six other cases, negotiations were initiated to eliminate foreign trade barriers.

1990 SUPER 301 ROUND

This week, the Bush Administration made its decisions on implementing the Super 301 provision of the 1988 Trade Act for the second and final time.

In my view, these are the most critical trade policy decisions the Administration will make this year.

It is widely believed—given the recent comments of Administration sources—that Japan will not be listed as a priority under Super 301.

This is an unfortunate step.

In 1989, the Administration launched three Super 301 cases against Japan. The three cases dealt with forest products, supercomputers, and satellites. At the same time, the so-called Structural Impediments Initiative or SII was launched to address larger systemic barriers in Japan.

Over the last several weeks, we have successfully concluded trade agreements to resolve all three Super 301 cases against Japan. We have also made significant progress in the SII talks.

As one Administration official noted: "This has been the most successful four weeks in the history of trade negotiations with Japan."

This record of success coupled with past achievements demonstrates that Super 301 is an overwhelming success.

I fear that now abandoning Super 301 may send the message—albeit unintentional—that the United States is no longer concerned about Japanese trade barriers.

This is certainly not the message the United States should be sending.

The three sectoral agreements recently concluded are major steps forward.

I am confident that the forest products trade agreement will boost United States forest product exports and create United States jobs.

But much remains to be done. A final agreement on SII the largest of the ongoing trade talks with Japan—will not be reached until July of this year. Further, a number of other sectoral problems remain unresolved.

Assuming the agreements that have been reached are enforced, we have made progress—real progress. But there is a considerable way to go.

BAUCUS RESPONSE

That said, I must also note that I am sympathetic to Ambassador Hills' plea that she be given a bit of latitude in dealing with Japan.

Certainly, Ambassador Hills and her staff have done enough to deserve some trust from Congress.

I am also sympathetic to the argument that Japan deserves credit for the progress that has been made. As I said, the Japanese market is opening and the government of Japan does deserve praise—though more remains to be done.

With all this in mind, I am willing to give the Administration some leeway. I do not agree with the decision that has been made with regard to Japan. But at this time I will not support legislation to reverse the Administration's decision.

However, I will continue to press for progress in opening the Japanese market.

Needless to say, I will also demand from Japan strict compliance with the trade agreements that have been reached.

FUTURE LEGISLATION

In particular, I will pay very careful attention to the SII talks.

After the final agreement in July, I will carefully review the progress that has been made in SII.

If the SII Agreement fails to meaningfully address the structural barriers in Japan, I will at that point press for passage of legislation to extend and expand Super 301.

This legislation would direct the Administration to initiate cases aimed at eliminating the Japanese structural barriers that are now the topic of SII.

Given the timing and subject matter, this legislation would be an appropriate component of future legislation to implement the provisions of a new GATT Agreement. According to the Administration, this GATT implementing legislation will be submitted to Congress by early next year.

Further, it is time for the United States to take a hard look at the mechanism for evaluating compliance with trade agreements. We must make sure that the United States fully realizes the potential trade benefits of the trade agreements that have recently been reached with Japan.

Unfortunately, no formal procedure is now in place to evaluate compliance with trade agreements.

Several weeks ago, I introduced—with a number of co-sponsors—legislation aimed at remedying this oversight.

In the coming weeks, I intend to initiate hearings on this legislation. After those hearings, I will press for passage of the "Trade Agreements Compliance Act."

The United States must demonstrate that it expects its trading partners to live up to their agreements with the United States

CONCLUSION

Trade relations between the United States and Japan have been extremely tense in recent years.

I hope that the agreements that have recently been concluded with Japan will prove a turning point in United States-Japanese relations.

But I must confess to some skepticism.

I hope that the Bush Administration and its counterpart in Japan will continue to work diligently toward progress in opening the Japanese market.

If not, the United States and Japan will rapidly be drawn back into trade confrontations.

This is the time for Japan to demonstrate leadership; the time to shoulder the burden of being an economic superpower.

But we cannot wait forever for Japan to recognize its responsibilities.

Both the government of Japan and the Bush Administration should rest assured that the Congress will act if they fail to.

PREPARED STATEMENT OF ROBERT DONNELLY

Mr. Chairman, Members of the Subcommittee, I want to thank you for the opportunity to appear before you today. My name is Bob Donnelly, and I am President of Contact Lumber of Portland, Oregon. I am also the Chairman of the Industry Sectoral Advisory Committee on lumber and wood products. The job of the Committee is to provide the United States Government with the technical support and input it

needs to negotiate effectively in the multilateral negotiations known as the Uruguay Round.

I am extremely pleased to address this Subcommittee today on wood products trade with Japan. This hearing could not have come at a more appropriate time for our industry. As you have undoubtedly heard, United States and Japanese Government negotiators reached a tentative agreement in Tokyo on Wednesday in the Super 301 wood products market access talks. This hearing provides the industry with its first public opportunity to assess the outcome of the talks, and to consider where we must go from here.

The Super 301 talks with Japan have been long and difficult. This should come as no surprise to this Subcommittee, to the industry, or to the United States Government. Market access for United States wood products in Japan has been a goal pursued relentlessly by the industry and the Government for decades. Every Member of this Subcommittee knows through experience the difficulty of prying open Japanese markets. Wood products are no exception.

In light of these past difficulties, I am very happy to say that the agreement achieved by Ambassadors Hills and Williams is a good one. Although we did not get everything we wanted, the agreement represents substantial progress on a number of key issues. Japan has agreed to remove a number of major barriers in the areas of codes, standards, certification rules, and tariff misclassification. We believe that this agreement could help to boost United States sales of value-added wood products in Japan by $750 million dollars annually.

Clearly, the industry is pleased with this agreement. I want to extend my personal appreciation to the entire United States negotiating team—which included members from the Departments of Agriculture, Commerce, State and the Treasury, as well as from the Trade Representative—for the intelligence, perseverance and dedication they have shown throughout the long and often trying negotiating process. Without the long hours and hard work they put into this effort, the results may have been far different.

Obviously, this agreement will not resolve all our differences with Japan on wood products issues. In the crucial area of building codes, for example, Japan agreed to remove unreasonable restrictions that prevented the construction of safe three story structures of wood frame design. This represents major progress in expanding the market and giving the Japanese consumer access to quality, cost-competitive construction. Japan has not, however, agreed to allow the full range of construction we had sought.

Similarly, the agreement reflects certain gains with respect to the problem of high tariffs and tariff escalation. Japan has agreed that it will engage in meaningful negotiations on wood products tariffs in the Uruguay Round. This is helpful, especially when contrasted to the Tokyo Round, where no reduction in wood products tariffs was obtained. But this also falls short of our objectives. The United States Government must continue to press hard for the total elimination of wood products tariffs in the Round, a goal to which the United States is publicly committed.

Tariff misclassification represents another example of the limited gains achieved by this agreement. As I understand it, Japan has agreed to classify correctly certain products which it had been misclassifying; other important products, however, will continue to be placed incorrectly into high-tariff categories in contravention of international norms. The United States industry will continue to press for proper classification of these products in every forum available to it.

My discussion today should not be taken as a criticism of the Office of the United States Trade Representative. The industry greatly appreciates the long hours, hard work and dedication which the United States negotiators put into this effort. They set out to get the best possible package that could be obtained at this time, under this process, and I believe they succeeded. We thank them for their hard work.

It is my view (and, I believe, the view of the United States negotiating team) that the Super 301 talks should be seen as part of an ongoing process for the achievement of a truly open market for wood products in Japan. This process began in earnest with the Market-Oriented Sector-Specific talks (known as the MOSS) in the mid-1980s, and continued forward with the Super 301 talks. The process will not end until United States exports to Japan are allowed to attain their full potential.

Where do we go from here? I have already mentioned the Uruguay Round. Japanese tariffs on value-added wood products are several times higher than the average developed-world industrial tariff, and must come down faster than tariffs as a whole during the Round. In my opinion, these tariffs should come down to zero. In this context, it is important to reiterate that the United States has tabled a contingent offer in Geneva to reduce our tariffs on a number of sectors, including wood products, to zero if our trading partners agree to do the same.

On difficult technical issues, such as the modification of Japan's restrictive and discriminatory code, standards and certification practices, the agreement requires the establishment of a high-level working group, in which the United States Government will actively participate, to seek further changes in unreasonable Japanese practices. This provision is a key element of the agreement, for it recognizes the need for additional movement and establishes the mechanism for achieving it.

The United States industry expects to see further progress on these issues over the next year. The United States negotiators and the Government of Japan are fully aware of our views on this point. Any failure to fully implement the agreement would be viewed with the greatest seriousness by the United States industry.

To conclude, the next few years are rich with opportunities and equally full of risks. We recognize how hard it is for any nation to open up its markets to the full force of world competition, especially where the protection takes such varied and complex forms. This agreement, if fully and fairly implemented, is a good first step. If all parties proceed in good faith, Japan and the United States can move forward from here, for the benefit of the Japanese consumer, the United States and Japanese industries, and the United States-Japan relationship in general.

PREPARED STATEMENT OF DAVID C. HILL

Mr. Chairman, Members of the Subcommittee: I am David C. Hill, Senior Vice President of Allied-Signal's Engineered Materials Sector. Metglas amorphous alloys, the products which are the subject of our Section 301 Petition, are manufactured by a business that I run. Today I will review with the Subcommittee what we at Allied-Signal believe is a classic case of Japanese targeting of advanced technology for development by their own industries, the petition that we filed with the USTR in this regard, and the status of that complaint. I would like your permission to submit a copy of our petition for the record.

I would like to begin by describing to you what Metglas alloys are and the benefits obtained from using them. Metglas alloys belong to a class of advanced materials known as amorphous metals. Metglas alloys are produced by Allied-Signal's proprietary direct casting process which is substantially more capital and energy efficient than conventional metallurgical processes. What Allied-Signal's casting process does is to convert molten steel into solid, finished sheet in a single operation thereby by-passing conventional hot- and cold-rolling operations. From a manufacturing perspective alone, our casting technology is 25% more cost effective than conventional technology. But what is even more significant is that our process allows the creation of engineered materials with significantly higher value in their end-uses. We believe that this process will revolutionize the way metallurgy is practiced in the next century.

Our process cools the steel so quickly that the individual atoms that constitute the molten bath cannot arrange themselves into the regular, three-dimensional array that characterizes conventional metals. The atoms are trapped in a disordered—or amorphous—state. This structure gives amorphous metals different engineering properties than conventional metals. They can be harder, stronger or more ductile than conventional metals. In this case the alloys we make are much more efficient than conventional metals in transforming electrical power. When substituted for conventional silicon steel transformer cores, Metglas alloy cores reduce losses by up to 70%. The performance advantages of utility transformers utilizing Metglas alloy cores have been documented at over one hundred United States utility companies and the conversion to these energy efficient transformers is occurring at an accelerating rate in the United States I would like to point out to the Subcommittee that the United States Department of Commerce, in its 1990 Industrial Outlook, included amorphous metals such as Metglas alloys in a group of advanced materials that are considered key to any nation's future global competitiveness.

Allied-Signal has invested more than $200 million in the development and commercialization of Metglas alloys over the past 20 years. We built and operate the world's only full-scale amorphous metal production facility in Conway, South Carolina. We also produce amorphous alloys at our Parsippany and Morristown, New Jersey, locations. In addition to the utility transformer application, Metglas alloys produced by Allied-Signal are used in electrical and electronic device applications, for integrated circuit manufacture, to join high temperature superalloys and, in our latest innovation, for advanced aerospace applications.

Allied-Signal has established itself as the world leader in this technology and has obtained over 200 United States patents and 800 foreign equivalent patents on products, processes, apparatus and applications.

The utility transformer application is a major market for Metglas alloys. The annual world market value for transformer core steel is about $1 billion. Our commercialization programs are proceeding on schedule in the United States, Canada, and India. But our expectations for Japan have come up far short. We do not believe that this is for lack of effort or misunderstanding on our part. Rather we believe it is because of deliberate actions on the part of the Japanese government acting in concert with Japanese industry.

Let me summarize our experience in Japan. Prior to our breakthrough inventions in materials and processes, amorphous metals were a scientific curiosity. In the mid-1970's Allied-Signal scientists made those breakthroughs and were granted United States patents. The significance of those inventions was recognized around the world. In Japan, MITI, the Ministry of International Trade and Industry, through JRDC, the Japan Research and Development Corporation, organized a group of 34 major Japanese corporations to develop and commercialize this technology. The group, known as the Amorphous Metals Trade Group, was partially funded by the government to develop a patent and know-how pool. The only thing that the Japanese failed to account for in developing this strategy was the persistence of Allied-Signal in obtaining Japanese patents. Despite over 10 years of orchestrated resistance to our patent applications, we were granted both of our key patents in Japan. These patents were both an obstacle and an embarrassment for the Japanese. Unfortunately for us, the patents alone do not create a business.

When Allied-Signal went to Japan in the late 1970's and early 1980's to find markets and customers, we were told by the JRDC that it represented the Japanese. We were told that we could agree to license away our property rights at a low price or else we should stay out of Japan. If we did not, no one would buy from us and the Japanese would work to avoid our patents. We refused. All of this history with documentation is discussed in detail in our complaint.

I would like the Subcommittee to know that we did not give up after our early attempts. We have aggressively pursued the Japanese market. We were eventually able to find a joint venture partner outside the JRDC group and we established a joint venture in Japan. From 1985 through 1989 the marketing efforts of our joint venture, known as Nippon Amorphous Metals Company, or NAMCO, were led by a Japanese born, United States citizen who was an inventor of the technology. He assisted in the demonstration and qualification of Metglas alloy in Japanese utility transformers. By the end of 1986 our product was fully qualified in Japan. Yet Japanese utilities have consistently refused to buy transformers despite competent marketing efforts, proven power savings and demonstrated product reliability. Japan is completely dependent on imported energy. The economics for conservation are even more compelling there than in the United States Widespread use of high efficiency transformers could reduce Japanese oil imports by 75 million barrels equivalent per year. Yet we are denied market access. The reasons are simple: the Japanese dominate their domestic and the world market for silicon steel, the conventional materials in use. Allowing our Metglas alloys to be sold in Japan will threaten this position. Moreover, it will confirm to the rest of the world the value of Allied-Signal's technology.

We believe that the Japanese are denying our access to their market until our patents expire in the 1990's. At that time they will construct a worldscale plant, sell at high prices in their protected home market and "dump" in the international market where we must compete with them. This is a painful pattern familiar to many of us.

If anyone doubts that amorphous metals are the target of Japan's top planners, MITI recently announced a new initiative, the MINERVA 21st Century Project, which is targeting additional applications of amorphous metal technology such as high performance aluminum alloys and high temperature superconductors. Both of these applications are being developed by Allied-Signal.

In the face of all of this, we concluded that we had to take action to open the Japanese market to high efficiency transformers containing Metglas alloy cores or risk being locked out of it forever. To this end we filed our petition with USTR asking that office to open an investigation and to take appropriate action. We have worked closely with USTR over the past months and have received excellent cooperation from them. As you know, on April 18 we agreed to a request from Ambassador Hills to withhold consideration of our petition for 150 days so that her staff could enter into direct negotiations with the Japanese government to resolve this situation. We are pleased with this action for three reasons. First, it holds out the promise for expedited resolution of this matter. Second, USTR has affirmed that our petition meets the statutory criteria for initiating a 301 action. Third, if after 150 days we have not achieved a satisfactory resolution, USTR will open an investiga-

tion and will proceed as if the clock had started on April 19, the day our petition was due for initiation.

In conclusion I would like to say that we at Allied-Signal are pleased with the support and encouragement that we have received from our government. We are particularly thankful to the Members of Congress who have contacted the Executive Branch in support of our petition. We are grateful to Ambassador Hills who prevailed on her Japanese counterparts to begin immediate talks to resolve this matter and we look forward to achieving a positive outcome from these discussions.

Amorphous metals hold untapped potential in aerospace, automotive and electronic application. The annual market for use in transformers alone in Japan is $100 million. Unless Japanese markets are opened to Metglas alloys now, a familiar pattern will have been established that will be impossible to break. We must establish the rules now or, for American companies that invest to compete in the global market with advanced technologies, the game will be over before it ever began.

Attachment.

BEFORE THE OFFICE OF THE UNITED STATES TRADE REPRESENTATIVE SECTION 301 COMMITTEE

PETITION UNDER SECTION 301 OF THE TRADE ACT OF 1974, FILED ON BEHALF OF ALLIED-SIGNAL INC., REGARDING JAPANESE TARGETING OF AMORPHOUS METAL

[Volume I, Petition]

Allied-Signal Inc. ("Allied") [1] submits this petition for relief pursuant to Section 301 of the Trade Act of 1974, as amended,[2] as a result of a pattern of concerted acts by the Japanese Government and certain Japanese companies to target amorphous metals and to exclude Allied's patented amorphous metals from the lucrative Japanese market.[3]

EXECUTIVE SUMMARY

Over the past two decades, Allied pioneered the invention, commercial development and patenting of amorphous metals—revolutionary "new materials" that, among their other qualities, dramatically reduce energy loss in electrical devices. Commercial applications for amorphous metals extend from electric transformer cores to aircraft components. The potential global market for amorphous metals totals many billions of dollars annually.

As cores for electric transformers—the most promising current commercial use—amorphous metals conserve about 70 percent of the electricity that is lost by conventional silicon steel transformers. The annual world market for metal used in transformer cores already exceeds one billion dollars.

The Japanese Ministry of International Trade and Industry ("MITI") quickly recognized the potential of amorphous metals and, together with other Japanese agencies and companies, engaged in concerted targeting behavior that, starting in the late 1970's, included the following:

- Organization of a 34-company "Amorphous Metal Group" by the Japan Research and Development Corporation ("JRDC"), a Japanese Government agency, for concerted JRDC-led dealing with Allied;
- Provision of JRDC subsidies to Japanese steel companies to develop amorphous metals production capability—using Allied's technology and in preparation for the expiration of Allied's composition patent in 1993;
- Orchestrated manipulation of the Japanese patent system to defeat Allied's efforts to protect its intellectual property rights in amorphous metal products and technology in Japan;
- Concerted refusal by Japanese electric utilities to buy amorphous metal transformers despite the clear superiority of amorphous metal cores;
- Pressure by the JRDC on Allied to license its technology to Japanese companies on unreasonable terms, backed by threats from the JRDC that Japanese companies would block the issuance of and, if necessary, "evade" Allied's patents.

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[1] Allied-Signal Inc. was formed by the merger of Allied Corporation and The Signal Companies, Inc. in 1985. The term "Allied" as used hereinafter refers both to Allied Corporation prior to the merger and to Allied-Signal Inc. after the merger.

[2] 19 U.S.C.A. §2411 *et seq.* (1980 & Supp. 1989). Unless otherwise specified, references herein to "Section 301" include the provisions of 19 United States C.A. §§2411–2419.

[3] On February 16, 1990, Allied also filed a Statement with the Office of the United States Trade Representative pursuant to 19 U.S.C.A. §2420 (1980 & Supp. 1989).

This is a classic pattern of targeting. It is compounded by the fact that Allied holds United States, Japanese and third-country patents on amorphous metal compositions, applications and processes. Allied's key Japanese composition patent will expire in 1993. Japanese electric utilities—currently the largest potential customers in Japan for amorphous metals—are being pressured to delay purchases of amorphous metal transformers until 1993, when we expect they will buy transformers using amorphous metals from Japanese rather than United States producers.

It is a familiar story. If Allied remains excluded from the Japanese market, then Japanese manufacturers of amorphous metals may soon dominate first the Japanese market and later the world market for this high technology product. If that happens, another United States-created high technology industry will be lost.

This petition is divided into four sections. Section I describes how the standards of Section 301 are met. Section II describes Allied's invention and development of amorphous metals. Section III outlines how the Japanese Government, after learning about the development of amorphous metals by Allied, targeted amorphous metals as a critical material for Japanese development. The Japanese Government then set out to promote the rise of a dominant Japanese amorphous metals industry by funneling subsidies to Japanese companies and by organizing a decade-long concerted effort by Japanese companies to circumvent Allied's patent rights.

Section IV focuses on Allied's extraordinary efforts to penetrate the Japanese market, and describes how Japanese electric utility companies are cooperating in the targeting strategy by effectively boycotting commercial purchases of amorphous metal transformers until Allied's Japanese composition patent expires. At that time, we expect that the Japanese utilities intend to buy transformers made with amorphous metals produced by JRDC-financed Japanese companies. Section IV also shows how the Japanese Government (and the companies coordinated by it) frustrated Allied's plans to license its technology in Japan on commercially reasonable terms.

I. THIS PETITION SATISFIES THE STANDARDS OF SECTION 301.

The basic standards of Section 301 are the following:

(a) Mandatory Action

(1) If the United States Trade Representative determines under section 2414(a)(1) of this title that—

(A) the rights of the United States under any trade agreement are being denied; or

(B) an act, policy, or practice of a foreign country—

(i) violates, or is inconsistent with, the provisions of, or otherwise denies benefits to the United States under, any trade agreement, or

(ii) is unjustifiable and burdens or restricts United States commerce . . . .

* * * * * * * *

(b) Discretionary Action

If the Trade Representative determines under Section 2414(a)(1) of this title that—

(1) an act, policy, or practice of a foreign country is unreasonable or discriminatory and burdens or restricts United States commerce . . . .

All of these standards are met—some of them many times over—in this case.

Targeting behavior by both MITI and JRDC involves governmental "act[s], polic[ies], or practice[s]" within the meaning of Section 301. The acts, policies and practices of the Japanese Government, and of companies coordinated by the Japanese Government, are unreasonable and discriminatory. Those acts, policies and practices effectively precluded Allied from selling its patented amorphous metals for distribution transformers in Japan; prevented Allied from concluding licensing agreements with Japanese suppliers of distribution transformer core materials on acceptable terms; and delayed the issuance to Allied of Japanese patents while Japanese companies freely used Allied's amorphous metal technology to build their own production capabilities with strong encouragement and financial assistance from the Japanese Government. Surely this pattern of activity meets the general definition of "unreasonable" under Section 301:

> An act, policy, or practice is unreasonable if the act, policy, or practice, while not necessarily in violation of, or inconsistent with, the international legal rights of the United States, is otherwise unfair and inequitable.

19 U.S.C.A. §2411(d)(3)(A).

In addition, the pattern of activity by the Japanese Government and by companies coordinated by the Japanese Government is covered precisely by several of the specific examples of "unreasonable" acts, policies, or practices that are provided in Section 301.

As one example, under 19 U.S.C.A. §2411 (d)(3)(B)(i)(III), an act, policy, or practice is unreasonable if it "denies fair and equitable"

> market opportunities, including the toleration by a foreign government of systematic anticompetitive activities by private firms or among private firms in a foreign country that have the effect of restricting, on a basis that is inconsistent with commercial considerations, access of United States to purchasing by such firms.

In this case, at a minimum, the Japanese Government tolerated (i) refusal by certain individual Japanese companies to negotiate separate license agreements with Allied which would allow Allied to enjoy significant participation in the Japanese market; (ii) a boycott by Japanese electric utility companies of purchases of clearly superior amorphous metal transformers; and (iii) coordinated, concerted opposition to Allied's patent applications. Our evidence strongly points to a conclusion that the Japanese Government not only tolerated those activities, it actively initiated and coordinated them, while providing extensive subsidies for the build up of Japan's own production capability.

As a second example, under 19 U.S.C.A. §2411(d)(3)(B)(ii), an act, policy, or practice is unreasonable if it "constitutes export targeting." Export targeting is defined as:

> . . . any government plan or scheme consisting of a combination of coordinated actions (whether carried out severally or jointly) that are bestowed on a specific enterprise, industry, or group thereof, the effect of which is to assist the enterprise, industry, or group to become more competitive in the export of a class or kind of merchandise.

19 U.S.C.A. §2411(d)(3)(E).

It would strain credulity to believe that the Japanese Government, and companies coordinated by the Japanese Government, are putting so much effort into targeting amorphous metals for the Japanese market alone. The prize, for Allied and for any competitors after Allied's Japanese patents expire, is the world market for this revolutionary metal forming technology and products made therefrom.[4]

As a third example, 19 U.S.C.A. §2411(d)(3)(B)(i)(II) states that an act, policy, or practice is "unreasonable" if it:

> . . . denies fair and equitable
> . . . provision of adequate and effective protection of intellectual property rights . . .

The facts are that it took the Japanese Patent Office ("JPO") *11 and 12 years*, respectively, to issue to Allied Japanese patents on amorphous metal compositions and a fundamental process; that during these unreasonably long periods Allied's patent applications were under attack by members of the JRDC-led Amorphous Metals Group; that a MITI-sponsored consulting study concluded that Allied's patents could present a problem for the development of Japan's own amorphous metals industry; that Japan's largest electric utility company, which is regulated by MITI, has stated that it is waiting until Allied's Japanese patents expire so that it can buy amorphous metal transformers from Japanese producers; that one member of the Amorphous Metal Group is continuing a legal attack which significantly reduces Allied's ability to enforce its Japanese amorphous metals composition patent; and that since the mid-1970's—18 months after Allied applied for Japanese patents—Japanese companies have had access to Allied's technology.

As a fourth example, 19 U.S.C.A. §2411(d)(3)(B)(i)(I) states that an act, policy, or practice is unreasonable if it:

> . . . denies fair and equitable

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[4] As an indication of what was meant by the term "targeting," the Senate version of the Trade and Competitiveness Act of 1988 contained specific illustrations of targeting behavior that included: protection of the home market; promotion or toleration of cartels; and special restrictions on technology transfer for reasons of commercial advantage. All of these acts have occurred in this case. See Legislative History of Trade and Competitiveness Act of 1988, House Conf. Rep. No. 100-576, P.L. 100-418, pp. 1599-1601.

. . . opportunities for the establishment of an enterprise

The cartel-like refusal of most members of the 34-company Japanese Amorphous Metal Group, led by JRDC, to conclude licensing arrangements with Allied on acceptable terms, and the JRDC-led isolation of Allied's Japanese joint venture, as described in Section IV., surely meet this standard

Allied also believes that the acts, policies and practices described herein are inconsistent with Japan's obligations under the General Agreement on Tariffs and Trade (such as the "national treatment" provisions of Article III), and also with Japan's obligations under the United States-Japan Treaty of Friendship, Commerce and Navigation, 4 UST 2065 (April 2, 1953)

Finally, the Japanese Government's targeting actions burden and restrict United States commerce. Allied has been and continues to be excluded from the Japanese market despite extraordinary sales efforts Enormous export sales of amorphous metals to Japan are being lost because of this government-coordinated pattern of unfair trade practices. *See* Section IV. *infra*. *II. ALLIED INVENTED AND DEVELOPED AMORPHOUS METALS*

Amorphous metals are revolutionary new materials with a broad spectrum of potential uses. In contrast to conventional crystalline metals, amorphous metals have a random atomic structure similar to that of glass. This structure gives these alloys exceptional qualities of strength, flexibility, hardness and corrosion resistance. Amorphous metals also have unusual magnetic properties that make them superior materials for many electronic and electrical uses.[5]

Over the past two decades, Allied invested more than $200 million on research, development and commercialization of amorphous metals.[6] In 1972, Allied developed the first commercially usable alloy compositions and applied for a United States patent, which was granted in 1974.[7] In December 1975, Allied invented a new process that succeeded in casting amorphous metals in strips wide enough for broad commercial use. Allied applied for a United States patent on this process in October 1976, and was granted a patent in March 1979.[8]

Allied also applied for Japanese composition and process patents in 1973 and 1977. These Japanese patents did not issue until 11 and 12 years after Allied's applications, in 1984 and 1989, respectively. They will expire in 1993 and 1997.

Amorphous metals have significant advantages over conventional metals. Because amorphous metals are easily magnetized, they significantly reduce the amount of energy lost as heat in electrical devices. Currently the most developed commercial use of amorphous metals is as cores for electric distribution transformers.[9]

Amorphous metal transformers reduce electricity losses by as much as 70 percent compared to traditional silicon steel transformers.[10] General Electric and the Electric Power Research Institute estimate that the United States would save 60 billion kilowatt-hours of electricity annually by replacing existing silicon steel transformers with amorphous metal transformers.[11] In Japan alone, using amorphous metal transformers would save 25 million barrels of oil each year. Alternatively, it would eliminate the need to build two 750 mega-watt power plants.[12]

Beyond the profitable utility transformer market, there is a multi-billion dollar potential world market for amorphous metals and the accompanying process technology. These uses include aircraft structural components, elements of jet turbine

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[5] *See* Exhibit 1 (Affidavit of David C Hill, Mar 3, 1990, Pars 3, 4)

[6] *See* Exhibit 1 (Hill Affidavit Par. 2).

[7] United States Letters Patent No. 3,856,513; reissued in 1989 as United States Letter Patent Re No. 32,925.

[8] United States Letters Patent No. 4,221,257. Because of early limitations in casting amorphous metals, they initially could be produced only in narrow strips, and thus could be used only in small electronic devices, such as in power supplies for computers and tape heads for tape recorders. The '257 patent process vastly increased the usefulness of amorphous metals.

This new process technology also represents a new method of direct casting of conventional crystalline metal that has significant capital and operating cost advantages over crystalline metal processing. This process technology can be applied to the direct casting of steel sheet for the automotive and appliance markets as well as to the production of thin gauge stainless steel.

[9] *See* Exhibit 1 (Hill Affidavit Par. 4). The most common type of transformer used by utilities in both Japan and the United States is the distribution transformer, which usually sits atop a utility pole and transforms the high voltage current from power lines to low voltage current used by the consumer. A distribution transformer generally will serve 4-6 homes.

[10] *See* Exhibit 1 (Hill Affidavit Par. 4). As a result of this greater efficiency, amorphous metal transformers operate at lower temperatures than silicon steel transformers; therefore, amorphous metal transformers also are safer to operate and require less frequent maintenance.

[11] *See* Exhibit 2 (*Financial Times*, Nov. 8, 1988, at 22).

[12] *See* Exhibit 1 (Hill Affidavit Par. 4).

engines, integrated circuit components, high temperature superconductors and many other electrical and electronic applications.[13]

The potential world market for amorphous metals for electric utility transformers alone is approximately $1 billion annually.[14] Allied estimates that by 1995 approximately 50 percent of the utility distribution transformers manufactured in the United States will contain amorphous metal cores.[15] In Japan today, the size of the market for amorphous metals for electric utility transformers is approximately $90 million annually.[16] When other current and potential uses are included, the annual potential market for amorphous metals amounts to hundreds of millions of dollars in Japan and many billions of dollars worldwide.[17]

III. JAPAN TARGETED ALLIED'S AMORPHOUS METALS TECHNOLOGY

A. The Japanese Government Targeted Amorphous Metals

Since the late 1970's, the Japanese Government has targeted amorphous metals as one of the "new materials" areas to be developed by Japanese industry. *Nihon Keizai Shimbun*, in August 1982, reported the Japanese view as follows:

> In order to catch up with Allied that had taken the lead, a joint research and development project by both government and private enterprises "feared by all the rest of the world" is underway led by . . . [the JRDC] . . .
>
> . . . . . .
>
> It goes without saying that Allied, which appears to be an Invincible Armada in Europe and the United States, is inevitably concerned about Japan's move. In terms of general capability concerning materials for the metal, Japanese steel makers are far superior to the United States, not to mention influential establishments such as electronic and electric appliances manufacturers. Thus, it will be no other than Japanese companies themselves that are going to make Allied's dream of world conquest collapse.[18]

1. MITI targeted Allied's amorphous metals technology.

MITI is "the co-ordinating force behind the new materials effort" and is "spending big money to support research initiatives."[19] MITI also has been providing substantial funding for amorphous metal research through its ongoing nine-year research and development project for new alloys and ceramics.[20] In 1985, the Financial Times reported that:

> Japan is mounting a broad-based effort to compete on the four most important fronts—fine ceramics, carbon fibers, engineering plastics and amorphous metals. More than half of all Japanese Government spending on high technology research and development goes to advanced materials, according to a new International Business Information report.[21]

In 1988, MITI predicted that the Japanese market for amorphous metals for electrical steel uses would grow to 20 billion ($143 million) in 2000, if the Japanese Government would advance such technological development programs as national projects and would coordinate private efforts in this area.[22]

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[13] For example, amorphous metal process technology can produce aluminum alloys with greater strength and enhanced thermal stability. Indeed, Allied recently completed a pilot facility in New Jersey to manufacture these alloys for use in the F-15E, ATF, F-18 and 7J7 aircraft programs. Allied also has established a commercial supply of high performance nickel-based brazing materials, whose improved bonding capabilities make them desirable for jet turbines, and a commercial supply of superior lead and silver based solders for integrated circuit manufacturing.

[14] *See* Exhibit 1 (Hill Affidavit Par. 5).

[15] *See* Exhibit 1 (Hill Affidavit Par. 7).

[16] *See* Exhibit 1 (Hill Affidavit Par. 5).

[17] *See* Exhibit 1 (Hill Affidavit Par. 5).

[18] *See* Exhibit 3 ("Amorphous Metal Cold War," *Nihon Keizai Shimbun*, Aug. 21, 1982, at 4-5 (translated)).

[19] *See* Exhibit 4 (Cane, "The Most Material Factor in Japan," *Financial Times*, Apr. 18, 1985, at 8).

[20] *See* T. Pepper, M. Janow, and J. Wheeler, *The Competition, Dealing with Japan*, Praeger Special Studies, Hudson Institute, New York, 1985, 226, n.45.

[21] *See* Exhibit 4 (Cane, "The Most Material Factor in Japan," *Financial Times*, Apr. 18, 1985, at 8).

[22] *See* Exhibit 5 (Facsimile from S. Kato to Mr. Harry Knutson, Apr. 6, 1988). On April 5, 1988, *Nihon Keizai Shimbun* reported that MITI issued a report on steel in which these figures are cited.

Last year, MITI began a new research and development program, called the "21st Century Metal Industry Engineering Research Vitalization Activity" (MINERVA 21), in part aimed at promoting "practical application in the production of amorphous metals." [23] MITI recently commissioned the development of Japanese industrial standards for amorphous metals.[24]

MITI also regulates Japanese electric utility companies, which are the customers for electric transformers. In many cases, the senior executives of these utilities are former MITI officials.[25] These utilities are now boycotting Allied's amorphous metal products. One leading United States authority has concluded that the relationships between the Japanese Government and Japanese public utilities are so intertwined that ". . . it [is] impossible to say whether [the electric power industry] belongs to the public, the private, or the public corporate sector." [26]

2. JRDC coordinated the targeting

After MITI targeted amorphous metals, JRDC implemented the targeting strategy. JRDC is a special corporation funded exclusively by the Japanese Government.[27] JRDC is a branch of the Japanese Government's Science and Technology Agency ("STA") and serves as that agency's vehicle for disseminating new technologies into the Japanese private sector.[28] JRDC funds development of new technologies that MITI has targeted to promote Japan's future economic development.[29]

JRDC commissions and underwrites the development costs of Japanese companies with the best prospects of commercializing promising technologies.[30] If the project is successful, the beneficiary company repays the development costs over five years without interest. If the project fails, JRDC does not require any repayment.[31]

In the late 1970's, JRDC organized a group of 34 Japanese companies (the "Amorphous Metal Group") to develop Japan's own amorphous metals technology [32] and to ensure that its members, under the direction of JRDC, would "refrain from making any exclusive move with outsiders for introducing 'amorphous' technology." [33]

This strategy included the granting of subsidies by JRDC to members of the group to support their research and development of amorphous metal technology. In 1977, JRDC funneled approximately 960 million Yen ($6.85 million) in subsidies to several Japanese companies for research projects on amorphous metals for use in electrical devices.[34]

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[23] *See* Exhibit 6 ("MITI Establishes MINERVA 21 for Promotion of Non-Ferrous Metal Technologies," *Comline Chemicals & Materials*, Mar. 31, 1989, at 5).

[24] *See* Exhibit 7 ("Amorphous Metal Standards to Come Out," *Nihon Keizai Shimbun*, Aug. 26, 1989, at 22).

[25] *See* Exhibit 8 (List of Former MITI Officials Employed by Japanese Utilities Companies).

[26] *See* Chalmers Johnson, *Japan's Public Policy Companies*, American Enterprise Institute for Public Policy Research, Washington, DC, 1978, at 139; (*generally* at 131-39).

[27] The JRDC was established pursuant to the Research Development Corporation of Japan Act (Law No. 82, enacted May 6, 1961). *See* Exhibit 9.

[28] *See* T. Pepper, M. Janow and J. Wheeler, *The Competition Dealing with Japan*, Praeger Special Studies, Hudson Institute, New York, 1985, at 194-96. The STA, which funds and supervises JRDC, also funds the Japan Atomic Energy Research Institute and the Power Reactor and Nuclear Fuel Corporation, both of which are crucial to the electric utilities because they work directly with them in the development and construction of nuclear generating facilities. The Japanese electric utilities boycott of amorphous metals is discussed in Section IV.B. *infra*.

[29] The objective of the JRDC is to commercialize new technologies developed in experimental research projects conducted by universities, research institutes and private companies. *See* Exhibit 10 (Research Development Corporations Japan, 1979).

[30] Id.

[31] Id.

[32] *See* Exhibits 11-15 (Letters from Research Development Corporation of Japan to Allied Chemical, May 8, 1979, Sept. 11, 1979, Dec. 27, 1979 and Memoranda from H. Knutson to File, Jan. 16, 1981, May 19, 1983).

[33] *See* Exhibit 16 (Letter from T. Ohta to Allied Chemical Corporation, July 17, 1980). *See also* Exhibit 3 at 4 ("In addition to [the JRDC], there also exists an organization called Amorphous Technology Development Promotion Conference consisting of 32 leading Japanese companies . . . . Its object is to cope with Allied's attitude toward the patent matter. With respect to the warning letter from Allied, each Japanese company of the Conference gave a flat refusal by clarifying its intention of 'not buying a patent working right . . . .' ").

[34] *See* Exhibit 17 (List of Commissioned Projects Related to the Production of Technology of Amorphous Metal). For additional examples of JRDC subsidies for amorphous metals, *see* Exhibit 18 ("New Amorphous Material for Optical Disks Developed," Jiji Ticker Service, Oct. 26, 1984, at 9).

In December 1980, JRDC announced that 1,688 million Yen ($12 million) had been awarded to Nippon Steel to develop the technology for producing amorphous metals for use in distribution transformer cores.[35] Nippon Steel used this JRDC subsidy and information disclosed in Allied's Japanese patent applications to develop amorphous metal process technology.[36] Six and a half years later, on June 30, 1987, JRDC announced the successful completion of this project.[37]

Ignoring the fact that Allied had already patented this technology, JRDC claimed credit for a "new" production technology for the production of amorphous metals used in transformer cores. It stated that "recognition of [Nippon Steel's] success by JRDC at this time means that a technology to produce amorphous metals has been established." [38] JRDC also recognized that amorphous metals would save approximately two-thirds of the electric power consumed by transformers.[39] JRDC's targeting of Allied's amorphous metal transformer technology continues today.

B. The Japanese Government Coordinated The Targeting Of Allied's Patents

JRDC also orchestrated the Amorphous Metal Group's manipulation of the Japanese patent system so as to delay and obstruct Allied's efforts to receive patent protection in Japan. During this period of delay and obstruction, members of the Japanese Amorphous Metals Group were able to exploit the technology that Allied was forced to disclose as part of the Japanese patent application process.

On November 6, 1973, Allied filed for a Japanese composition patent for commercially useful amorphous metal alloys. While the average time from filing of a patent application to granting of a patent in Japan is between five and seven years, (compared with 18 months in the United States), Allied was not granted a patent until 11 years later, in May 1984.[40] Soon after issuance, in January 1985, Hitachi Metals filed an invalidation appeal in the JPO. Five years later, the issue is still being litigated.[41] While subject to this invalidation appeal, Allied's ability to enforce this patent is significantly diminished. Thus, the intellectual property protection that Allied supposedly gained in Japan after an 11-year struggle has been significantly undermined by the pendency of the appeal.

Allied next applied for a Japanese process patent in October 1977. This Japanese patent was not granted until October 1989, 12 years after it had been filed.[42]

The Japanese strategy of targeting Allied's amorphous metal patents was revealed in a 1983 consulting report commissioned by MITI:

> In JRDC's special structured amorphous metals field, a large problem exists in connection with Allied's patents. One of Allied's patent applications constitutes a material patent covering a very wide range of composition. If this

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[35] *See* Exhibit 19 (*Nikkan Kogyo Shimbun*, April 1981).

[36] *See* Exhibit 20 ("R&D at Nippon Steel," *Nippon Steel News*, Mar. 1982).

[37] *See* Exhibit 21 ("Successful Development of Manufacturing Technology for Amorphous Metal Used as Iron Core in Power Transformers," JHDC Report No. 440, June 30, 1987).

[38] Id.

[39] Id.

[40] On August 4, 1974, the application was published and the contents released to the public. In 1977, Allied requested that the patent be examined, and it was published for opposition on May 20, 1980. On June 7, 1980, six Japanese companies and individuals filed oppositions. *See* Exhibit 22 ("Amorphous Metals Get Ready for the Big Time," *Business Week*, Aug. 22, 1983, at 116). On June 28, 1982, Allied's application was rejected, and in December 1982, Allied appealed. As a result of the appeal, on November 14, 1983, the application was allowed, and on May 21, 1984, the patent was registered. This 11-year delay was the subject of a six column *New York Times* article. *See* Exhibit 23 (Pollack, "The Patent as a Trade Barrier," *New York Times*, July 5, 1984).

[41] The invalidation appeal was in part the result of a decision by the United States International Trade Commission ("ITC") in *Certain Amorphous Metal Alloys and Amorphous Metal Articles*, Inv. No. 337-TA-143, USITC Pub. 1664, Nov. 1984, in which the ITC determined that Nippon Steel and Hitachi Metals had infringed Allied's process patent, and issued an exclusion order. The opinion of the Administrative Law Judge included the finding that, due to a lack of documentary evidence proving that the inventor had actually performed the experiments described in the application, Allied's composition patent was invalid. As a result, Allied applied for a reissuance of the patent before the United States Patent and Trademark Office ("PTO"). The PTO rejected the findings of the ITC Administrative Law Judge and reissued the patent. (Re No. 32,925, issued May 19, 1989).

[42] After filing, the contents of the application were published for public inspection on April 4, 1978. Allied requested examination on August 28, 1979, but the JPO did not allow the patent until almost six years later, on February 21, 1986. Oppositions were filed on March 4, 1986, by seven companies and individuals, including Nippon Steel, Hitachi Metals and Kawasaki Steel, all of which are members of the JRDC-organized Amorphous Metal Group. After a lengthy trial, the JPO issued an opposition decision favorable to Allied on August 4, 1989, and the patent was registered on October 12, 1989.

> application based on prior invention under US patent system becomes issued with such a broad coverage on composition, JRDC would incur enormous damage. Namely, a substantial portion of work heretofore promoted by JRDC will no longer be realized. Under such a circumstance, the Japanese research groups are exerting their full force in opposing Allied's application so that Allied's patent now remains pending.[43]

The delay in granting Japanese patent protection to Allied for an advanced material is typical. As Joseph Massey, Assistant United States Trade Representative for Japan and China, testified before Congress:

> United States firms seeking patents in Japan in such high technology fields as amorphous metals, advanced ceramics, and fiber optics, report having had to wait as long as from ten years to more than 13 years for their key patents to be granted.[44]

These efforts often are coordinated by the Japanese Government:

> There is a very strong presumption of influence by the Ministry of International Trade and Industry upon the [Japanese] Patent Office. The Patent Office is a subsidiary of the Ministry of International Trade and Industry. It is managed and directed by MITI, and MITI is the senior management committee of Japan, Incorporated. . . . MITI periodically declares certain technologies as "technologies of national importance." Advanced ceramics is one such technology, as are superconductivity, photovoltaics, solar energy, and *amorphous metals.* It seems to be more than coincidence that these are the technologies that seem to have the roughest time in the Patent Office. These are the technologies that experience the most oppositions and the most oppositions which are collusive. . . .[45] (Emphasis added).

Allied was seriously harmed by this delay in receiving Japanese patent protection, in part because the Japanese patent system mandates public disclosure of a patent application within 18 months after it is filed. The disclosure of Allied's patent application allowed Japanese companies that were obstructing Allied's patents an unrestrained opportunity to review, reproduce, further develop and/or design around Allied's technology for over 10 years prior to that technology receiving patent protection, without having to compensate Allied for the use of its technology.

More significantly, by coordinating the vigorous opposition to Allied's patent applications by members of the Amorphous Metal Group, JRDC was able to reduce substantially the useful life of Allied's patents. The life of a Japanese patent expires 20 years after the date of *filing,* as contrasted with 17 years after the date of *issuance* in the United States.

Allied's Japanese composition patent will be effective for only three more years, and the usefulness of that patent is still limited by the ongoing invalidation proceeding brought by a potential Japanese competitor. This has further weakened Allied's position in attempting to negotiate patent licenses with its JRDC-led Japanese competitors.

IV. JAPANESE ELECTRIC UTILITY COMPANIES ARE BOYCOTTING AMORPHOUS METAL TRANSFORMERS UNTIL ALLIED'S PATENT EXPIRES.

Allied took all the "right steps" to sell amorphous metals in Japan. It attempted to license a Japanese steel company as an additional source. It entered into a joint venture with the Mitsui Group to market and eventually build a plant for amorphous metals. It demonstrated the superiority of amorphous metals. Its sales efforts in Japan since 1985 were led by Ryusuke Hasegawa, a Cal Tech Ph.D. who spent his first 24 years in Japan before becoming a United States citizen, who holds 15 patents, and who has published two books and more than 100 articles on amorphous metals. Over the past two decades Allied has invested over ten million dollars on research, development and commercialization of amorphous metals in Japan.[46]

Despite more than a decade of intensive efforts, Allied has been unable to sell commercial quantities of amorphous metals for transformers in Japan because of a boycott by Japanese utilities, which, under pressure, are delaying a switch from sili-

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[43] *See* Exhibit 24.

[44] Hearings on the Effect of the Japanese Patent System on American Business, Subcommittee on Foreign Commerce and Tourism, Committee on Commerce, Science and Transportation, United States Senate, S. Hrg. 100-874, 100th Cong., 2d Sess., June 24, 1988, at 22.

[45] *Id.* at 57 (Testimony of Larry W. Evans, Director, Patent and License Division, BP America, Inc.).

[46] *See* Exhibit 1 (Hill Affidavit Par. 2).

con steel to amorphous metal transformers until Allied's Japanese composition patent expires in 1993. Allied also is unable to license its technology because Japanese companies have refused to accept reasonable terms, and have instead challenged Allied's patents or are awaiting for them to expire or intend to ignore them.

A. Allied Made Extraordinary Efforts To Sell Amorphous Metals In Japan.

In 1979, Allied representatives visited Japan to find joint venture partners for the marketing, and possible production, of amorphous metals in Japan. They gave presentations to representatives of Mitsubishi, Sumitomo and the Mitsui Groups and also met with a JRDC manager.[47] JRDC strongly opposed the idea of Allied forming a joint venture and, instead, urged Allied to license its amorphous metals technology to members of the Japanese Amorphous Metal Group, which it had formed. Allied itself, however, was told to stay out of Japan.[48]

Despite this warning from the Japanese Government, Allied found that members of the Mitsui Group were interested in pursuing a joint venture. After two years of negotiations, Allied and members of the Mitsui Group formed the Nippon Amorphous Metals Company ("NAMCO") in 1981 with the objective of establishing a commercial scale production facility in Japan by 1985.[49]

NAMCO was able to establish commercial sales of amorphous metals for electronic devices, such as tape recorders. The small volume of amorphous metals used in these applications did not, however, justify Allied's investment in an amorphous metals producing facility in Japan. NAMCO needed to penetrate the distribution transformer market in order to justify such a plant and to develop a sizable Japanese business.[50]

Allied, through NAMCO, used a two-pronged strategy for selling amorphous metals for use in Japanese electric utility transformers. The first prong was to work with Japanese transformer manufacturers to develop amorphous metal core transformers in Japan, and to persuade Japanese public utilities to buy them. The second prong was to seek to license a Japanese company to serve as a primary supplier in Japan for amorphous metal core transformers. Considering that Nippon Steel and Kawasaki Steel had for many years been the primary suppliers of silicon steel to transformer manufacturers, Allied believed that it would be difficult for an American company to be the primary supplier of amorphous metal for transformers, and that the licensing of a Japanese primary supplier was a sensible strategy. Thus, Allied accepted the probability that NAMCO could be only a secondary supplier.

Coordinated efforts of the Japanese Government and Japanese companies prevented both prongs of the Allied/NAMCO strategy from succeeding. As a result, it has not yet been feasible for NAMCO to construct a commercial-scale facility in Japan.

B. Japanese Electric Utilities Are Boycotting Allied's Amorphous Metals.

Allied's efforts to sell amorphous metals to Japanese transformer manufacturers showed initial promise. Japanese transformer manufacturers, with assistance from Allied, were ready as early as 1986 to provide commercial supplies of amorphous metal transformers to Japanese utilities. However, despite continuing technological improvements and a decline in the price of amorphous metals, Japanese public utilities simply refused to buy transformers containing Allied's amorphous metals.

Japanese utilities have made little effort to conceal the fact that their motive is to delay purchases of amorphous metal transformers until after Allied's Japanese patents expire, so that they can buy transformers containing Japanese-made amorphous metals. The Tokyo Electric Power Company ("TEPCO"), Japan's largest and most influential public utility, has specifically told a Japanese subsidiary of Westinghouse that its strategy is to postpone purchases of amorphous metals until after the expiration of Allied's patents.[51] TEPCO, which provides service to Tokyo and surrounding areas, acts as a leader for Japanese utilities, with other such utilities looking to TEPCO's acceptance of a concept or innovation before they themselves will accept it.

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[47] *See* Exhibit 25 (Affidavit of Harry Knutson Par. 3).

[48] *See* Exhibit 25 (Knutson Affidavit Par. 4).

[49] Most of NAMCO's officers and other employees were Japanese businessmen on loan from NAMCO's Japanese participants who had extensive experience conducting business in Japan. Allied was initially represented in NAMCO by Harry Knutson and later by Dr. Hasegawa.

[50] *See* Exhibit 25 (Knutson Affidavit Par. 6).

[51] *See* Exhibit 26.

1. Amorphous metal transformers could have been sold commercially in Japan as early as 1986

Beginning in 1980 and continuing today, Allied and NAMCO are involved in an amorphous metal transformer joint development program with Daihen, a large producer of electric utility transformers in Japan.[52] This project demonstrated that commercially feasible amorphous metal transformers could be made in Japan. In 1985, Daihen began construction of a multi-million dollar automated facility to produce up to 1000 amorphous metal core transformers a month.[53] Unfortunately, that facility remains idle, largely because of the refusal of Japanese utilities to buy amorphous metal transformers.[54]

In the early 1980's, other Japanese transformer manufacturers, including Aichi Denki and Takaoka, used Allied's amorphous metals to build several successful demonstration transformer units.[55] During 1986 and 1987, other major transformer manufacturers in Japan completed construction and evaluation of prototype amorphous metal transformers.[56] NAMCO also promoted full commercialization through lower prices for amorphous metals.

2. Japanese utilities are making weak excuses to delay purchases of amorphous metal transformers until Allied's composition patent expires

Even though amorphous metal core transformers have been ready for commercial sale in Japan for several years, only a handful of transformers have been sold for evaluation—mostly to customers of Daihen.[57] The Japanese electric utilities are boycotting this product even though both they and the Japanese Government recognize its superiority. In an effort to justify this boycott, the utilities have made a string of increasingly lame excuses for delaying purchases.

Japanese utilities initially claimed that they had no way to determine whether the energy savings promised by amorphous metal transformers would justify the higher initial purchase price. The utilities asserted that they lacked an official published system of transformer loss evaluation.[58]

The reality, however, is that the Japanese utilities had organized a group, which included transformer makers and Nippon Steel, to develop just such a loss evaluation standard.[59] NAMCO was excluded from this group, and the report of this group was never officially published. However, NAMCO later was able to learn that the loss evaluation reported by this group for all Japanese utilities was 1200/watt—well within the range for which Allied's amorphous metal is competitive with silicon steel.[60] The utilities, however, ignored this argument, stating that because there was no officially published standard, there were no means in Japan to quantify and evaluate the energy savings that would result from using amorphous metals.

The Japanese utilities next contended that amorphous metals were too expensive. NAMCO responded by lowering the price for amorphous metals to 1.5 times the price of silicon steel, a level that TEPCO acknowledged would make amorphous metal transformers price competitive.[61] In addition, in November 1987, Daihen began offering amorphous metal transformers at prices that were fully competitive with silicon steel transformers.[62] The Japanese utilities nevertheless continued to refuse to make any commercial purchases of amorphous metal transformers.

The utilities next contended that they could not consider purchasing amorphous metal transformers until the product was fully commercialized in the United States. In response, NAMCO made sure that the Japanese utilities were fully and promptly informed about the rapid commercialization of the product in the United States.[63]

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[52] Until 1986, Daihen was known as Osaka Transformer Company.
[53] *See* Exhibit 27.
[54] *See* Exhibit 1 (Hill Affidavit Par. 12).
[55] *See* Exhibit 28.
[56] *See* Exhibit 29.
[57] *See* Exhibit 25 (Knutson Affidavit Par. 7).
[58] *See* Exhibit 25 (Knutson Affidavit Par. 19).
[59] *See* Exhibit 25 (Knutson Affidavit Par. 20).
[60] *See* Exhibits 30 and 25 (Knutson Affidavit Par. 20).
[61] *See* Exhibit 25 (Knutson Affidavit Par. 21). This price concession was possible in part because of economies of scale afforded by Allied's 60,000 tons/year-capacity amorphous metal facility in the United States. *See* Exhibits 31 and 32.
[62] *See* Exhibit 33. Unfortunately, the only sales that Daihen was able to make as a result of this program were 30 transformers to Shikoku Electric and 30 transformers to Chugoku Electric. *See* Exhibits 34 and 35.
[63] *See* Exhibit 36 at 28/30 (NAMCO Memorandum, "Sales of Amorphous Transformers to Utility Companies," Sept. 1987. In fact, not only did NAMCO provide information about amorphous

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Once NAMCO was able to demonstrate that the use of amorphous metals for distribution transformers was a fully commercialized business in the United States, TEPCO and some of the other utilities grudgingly accepted a few demonstration units for "evaluation." [64]

Beginning in March 1987, TEPCO finally commenced two year field tests of amorphous metal transformers. NAMCO was led to believe that if these tests were successful, TEPCO would begin commercial installation of amorphous metal core transformers.[65] In March 1989, TEPCO revealed its test results indicating that amorphous metal transformers outperformed silicon steel transformers in all test categories except noise.[66] Despite these favorable results, TEPCO refused to install amorphous metal transformers, and instead, continued making excuses.

For example, TEPCO next complained that the percentage variation in electricity loss among amorphous metal transformers was higher than for silicon steel transformers and could not meet Japanese standards. The reality is that in absolute terms the loss performance for amorphous metals transformers is one-half that of the loss performance for silicon steel units; however, because amorphous metal transformers have only 30 percent of the losses of silicon steel transformers, the variation, in percentage terms, is greater for amorphous metal transformers.[67] Thus, this excuse is without merit.

Next, in the late 1980s, the Japanese utilities began claiming that falling oil prices and the appreciating yen substantially devalued the economic benefits of energy conservation. The "unofficial" Japanese loss evaluation was revised from 1,200 Yen/watt in the early 1980's to 1,000 Yen/watt today.[68] This argument is spurious for at least two reasons: (1) it is not credible to argue that energy conservation, and savings associated with the use of energy-efficient equipment, are no longer priorities in Japan; and (2) the economic advantages of amorphous metal transformers remained substantial.[69]

The downward revision of the cost of producing energy, (and the value of saving it), moreover, ignores the substantial savings in having to build fewer new generating facilities.[70] The amount of energy that can be saved annually in Japan through converting to amorphous metal transformers is estimated to be equivalent to building two 750 mega-watt generating plants or a savings of 25 million barrels of oil.[71] The energy saved also would help meet Japanese goals of lessened dependence on imported fuel and a cleaner environment.

Recently, the Japanese public utilities have resorted to the argument that amorphous metal transformers are too bulky and would spoil the beauty of Tokyo's streets. In reality, amorphous metal transformers are at most only ten percent larger than silicon steel transformers—a size difference which, atop transformer poles already in place on the Tokyo streets, would not alter the existing aesthetics appreciably.[72]

Behind this veil of weak excuses lies the fact that Japanese utilities are simply delaying purchases of amorphous metal transformers Allied's Japanese patents expire.[73] At that time, Japanese utilities will buy transformers containing amorphous metals made in Japan.

The delays in amorphous metal purchases have been the result of a coordinated effort by the Japanese Government and the government-created Amorphous Metal Group to exploit their relationships with Japanese utilities to keep Allied out of the market and to favor unfairly their own Japanese industry.

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metal development in the United States, it also arranged for a September 1987 visit by TEPCO to two major United States utilities using amorphous metal transformers. In November 1987, Allied sent experts to Japan to discuss United States developments with various utilities.

[64] *See* Exhibit 25 (Knutson Affidavit Par. 24).

[65] *See* Exhibit 25 (Knutson Affidavit Par. 24).

[66] *See* Exhibit 35 and Exhibit 37.

[67] The Japanese standard requires variations no more than plus or minus 10 percent. The most efficient 25 KVA silicon steel transformers have electricity losses of 60 watts, with a variation of plus or minus 6 watts. Amorphous metal transformers have electricity losses of 17-18 watts, with variations of about plus or minus 3 watts. *See* Exhibit 1 (Hill Affidavit Par. 9).

[68] *See* Exhibit 1 (Hill Affidavit Par. 10).

[69] See Exhibit 1 (Hill Affidavit Par. 10).

[70] *See* Exhibit 38.

[71] *See* Exhibit 1 (Hill Affidavit Par. 4).

[72] *See* Exhibit 1 (Hill Affidavit Par. 11). *See also* Exhibit 26 (Photographs attached to Westinghouse Electric (Japan) K.K. Memorandum from R. Okamura to R.R. Schrieber, Aug. 27, 1987).

[73] *See* Exhibit 26 (Westinghouse Electric (Japan) K.K. Memorandum from R. Okoaura to R.R. Schrieber, Aug. 27, 1987).

The benefits to the Japanese are obvious. If commercialization of amorphous metal transformers occurs before the expiration of Allied's composition patent in 1993, Nippon Steel and Kawasaki Steel, members of the JRDC-created Amorphous Metal Group, will immediately lose sales of silicon steel. More importantly though, Allied would then be able to establish itself as a supplier of core material for transformers in Japan. The Japanese Government's heavy subsidies for the development of Japanese amorphous metal production would be threatened. If, on the other hand, such commercialization is delayed until Allied's composition patent expires, Nippon Steel and Hawasaki Steel could be in position to capture the Japanese market to the exclusion of Allied. At the same time, they may be in position to challenge Allied in the United States and elsewhere.

Nippon Steel and Kawasaki Steel are in a position to exert pressure on the Japanese utilities because the two companies supply almost all of the silicon steel used in Japanese transformers.[74] Even after they begin to convert to amorphous metals, these utilities will still have some need for silicon steel. Furthermore, five of the top ten industrial customers of TEPCO are steel plants including Nippon Steel's Himizu plant and Nawasaki Steel's Chiba plant.[75]

C. Japanese Companies Refuse To Accept Reasonable Licenses.

Allied also planned to penetrate the Japanese market by entering into commercial and licensing arrangements with Japanese companies. This strategy failed because JRDC and the Amorphous Metal Group (i) insisted on licensing terms that would effectively exclude Allied from the Japanese market; (ii) refused to consider crosslicensing of amorphous metal technology developed with JRDC assistance; and (iii) refused to negotiate licenses on commercially reasonable terms.

1. The Amorphous Metal Group demanded licensing arrangements that would exclude Allied from the Japanese market

The Amorphous Metal Group was organized by JRDC, in part, to negotiate with Allied on licensing agreements for amorphous metal technology.[76] Allied, when it learned of the existence of the Group, told JRDC that it intended to negotiate license arrangements directly with individual Japanese companies. JRDC responded, stating:

> We, Research Development Corporation of Japan (JRDC), have called each representative of the parties . . . interested and researching in manufacturing methods or applications of amorphous alloys, and discussed with them of your proposal to us on the subject.
>
> As a result of the discussion between the parties and us, we, JRDC, decided to negotiate with you based on their wishes on the subject, representing all the parties interested in the subject in Japan.
>
> Therefore, we are very pleased *if you negotiate only through us, and do not directly negotiate with each companies or persons in Japan.*[77] (Emphasis added).

In 1979, JRDC began to apply intense pressure on Allied to license its technology on very favorable terms to Japanese companies and to refrain from any direct involvement in the Japanese market.[78] While Allied did not object to licensing a Japanese company as a supplier of amorphous metals, it insisted on being able to participate itself in the Japanese market. In August 1980, Allied informed JRDC that its intention was to establish a manufacturing plant in Japan.[79] JRDC officials again insisted that Allied grant broad and exclusive licenses to Japanese companies in lieu of direct participation in the Japanese market.[80]

On December 3, 1980, Allied visited the JRDC office for a meeting chaired by Mr. Nakagani, Vice President of JRDC, at which JRDC again insisted that Allied license its patents to the Japanese companies in the Amorphous Metal Group. JRDC implied that if Allied did not do so, efforts would be made to "evade" Allied's patents.[81] The substance of that meeting is reflected in a memorandum prepared soon after the meeting by Mr. Harry Knutson, Allied's representative at that meeting:

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[74] *See* Exhibit 39 (NAMCO Memorandum, Supplemental Information No. 4, "Moves of Silicon Steel Manufacturers in Japan and Abroad").

[75] *See* Exhibit 40.

[76] *See* Section III.A.2. *supra*; Exhibits 11-15.

[77] *See* Exhibit 11 (Letter from Research Development Corporation of Japan to Allied Chemical, May 8, 1979).

[78] *See* Exhibit 13 (Letter from Research Development Corporation of Japan to Allied Chemical, Dec. 27, 1979).

[79] *See* Exhibit 41.

[80] *See* Exhibit 25 (Knutson Affidavit Par. 4).

[81] *See* Exhibit 14 (Memorandum from H. Knutson to File, Jan. 6, 1981).

> The Japanese government through JRDC, has spent a large amount of research money in the field in which [Allied's] patent was published. Many companies thought that they would be granted licenses to manufacture when they were ready to commercialize products. [Allied's] letter of August 12 indicated to JRDC that we would not grant licenses and that we preferred to set up a joint venture to manufacture. [Mr. Nakagani] said that various of these companies would comment and explain their position. There was a group called the Amorphous Trade Group which held many patents and had a lot of know-how in which they were sharing under auspices of JRDC. *Mr. Nakagani doubted that a joint venture could be successful in Japan in which it had a monopoly position. He recommended that we change our ideas and license the technology, expand the uses of amorphous metals, and thereby gain more profits for Allied Chemical.*[82] (Emphasis added.)

Mr. Knutson's memorandum further records that, at this meeting, Allied was warned that if it did not agree to a simple license of all of Allied's rights, then the Japanese would simply "work harder to evade [Allied's] patents."[83] As Mr. Knutson's memorandum concludes:

> the entire thrust of the meeting [with the JRDC] was to convince [Allied] that our position was wrong; we were heading in the wrong direction; we were going with the wrong people, and that we were generally heading for an impasse with Japanese electronic companies.[84]

2. Direct negotiations with Japanese steel manufacturers failed.

Allied realized that in the Japanese business environment NAMCO might encounter resistance to acting as the sole, or even the primary, supplier of amorphous metals in Japan. As a result, Allied accepted that NAMCO would be only a secondary supplier, but it wanted to preserve at least that position. Allied's plan was to license Nippon Steel for a reasonable up-front payment and royalty and to let Nippon Steel develop the market. Nippon Steel was the logical choice because it supplied about 60 percent of the electrical steel used in Japan and was heavily involved in amorphous metal research funded by JRDC.[85]

After a decade of negotiations, however, it has become clear that Nippon Steel has no real intention of entering into a license with Allied. Rather, its apparent strategy is to stall until 1993, and then to sell amorphous metals developed with JRDC assistance. To successfully implement this strategy, however, Nippon Steel is relying on Japanese public utilities (for which Nippon Steel is a very large customer) to delay their purchases of amorphous metal transformers until that time. So far the utilities have cooperated.

In 1981, Allied approached Nippon Steel with a joint venture proposal. In response, Nippon Steel stated that although it had no objection to such an arrangement, JRDC might.[86] Nippon Steel apparently believed that entering into a joint venture with an overseas company might create problems with the Japanese Government, which was subsidizing Japanese development efforts.

When Allied entered into its joint venture agreement with the Mitsui Group to form NAMCO, Allied and NAMCO continued to negotiate with Nippon Steel, but now these negotiations centered on a possible licensing agreement. During licensing negotiations in 1983, NAMCO offered Nippon Steel a license to make and sell amorphous metal for transformers in exchange for a reasonable royalty and an ongoing technology exchange. NAMCO's intention was to cross-license Allied's technology with Nippon Steel's technology, which had been developed with JRDC funds.[87]

After several rounds of negotiations between NAMCO/Allied and Nippon Steel, some progress had been made toward reaching an agreement. In 1984, however, Nippon Steel advised Allied that JRDC would not permit Nippon Steel to license any technology to Allied because of secrecy agreements between JRDC and Nippon Steel.[88] In early 1987, Nippon Steel confirmed to Allied that JRDC would not permit a license of JRDC-funded technology.[89]

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[82] Id.
[83] Id.
[84] Id.
[85] *See* Exhibit 39.
[86] *See* Exhibit 42.
[87] *See* Exhibit 25 (Knutson Affidavit Par. 12).
[88] *See* Exhibit 25 (Knutson Affidavit Par. 13).
[89] *See* Exhibit 43 and 44.

Because Nippon Steel refused to license JRDC-funded technology, NAMCO was compelled to raise the price it was asking in order to justify granting a license under Allied's patents.[90] At that point, negotiations effectively broke down. Considering the early disclosure of Allied's technology by publication of its Japanese patent application, and JRDC financing, Nippon Steel had already developed amorphous metal technology and only needed to wait for Allied's Japanese patents to expire before making commercial sales.

This attitude was confirmed when, in 1988, NAMCO tried again by proposing to Nippon Steel a license under Allied's patents in exchange for a payment of $15 million. Nippon Steel declined this offer, stating that if NAMCO did not license Nippon Steel for a more modest amount, Nippon Steel would simply wait until the composition patent expires in 1993.[91]

D. Allied Successfully Sells Amorphous Metals In Other Countries

In contrast to its inability to sell in Japan, Allied has successfully sold amorphous metals, especially those for transformers, in the United States and in several other countries. To meet increasing demand, Allied recently began operating a 60,000 ton per year amorphous metals plant in South Carolina.

Amorphous metal transformers have been sold on a commercial basis in the United States since early 1987.[92] Sales to utilities were made as early as 1982, and, since that time, approximately 40,000 amorphous metal core transformers have been installed in the United States. Allied is not aware of a single reported failure related to the amorphous metal cores.[93] Allied expects that, by 1995, one half of all new transformers manufactured in the United States will have amorphous metal cores.[94]

This success in the United States contrasts sharply with Allied's experience in Japan. The economic and environmental reasons for adopting amorphous metal transformers in the United States are even more compelling for Japan. The Cost of electricity in Tokyo is twice that in New York City, which has the highest electricity cost in the United States. The cost of carrying the capital investment in amorphous metal transformers also is lower in Japan because Japanese interest rates are lower.

Finally, the various technical objections to amorphous metals raised by the Japanese utilities were resolved prior to the commercialization of amorphous metal transformers in the United States. This information was available from United States utilities and transformer manufacturers, but Japanese utilities refused to rely on it. Japanese utilities insisted on delaying their purchases of amorphous metal transformers for several years while the evaluation work done in the United States was recreated in Japan.[95]

In other countries, Allied invested significantly less money and commenced serious sales efforts much more recently than in Japan. Nevertheless, it has been more successful in those third countries than in Japan.[96]

For example, Allied began sales efforts in India in late 1987. Allied's effort in India has been less than four percent of its effort in Japan over the past decade. Yet, Indian utilities already have placed orders for 600 transformers using Allied amorphous metals and have requested quotes for an additional 250, while Japanese utilities have purchased only 80 units for evaluation purposes and none for commercial use. To meet the manufacturing need, Daihen has licensed its transformer manufacturing process to an Indian company.[97]

Both India and Japan have strong incentives to encourage energy conservation. The governments of both countries have recognized the potential of amorphous metal transformers to save large amounts of electricity. India has put its policy into action, while Japan delays. In India, the government-owned Rural Electrification Corporation actively encouraged Indian transformer manufacturers to develop transformers using Allied amorphous metals.[98] Furthermore, the Indian Govern-

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[90] *See* Exhibit 25 (Knutson Affidavit Par. 13).
[91] *See* Exhibit 25 (Knutson Affidavit Par. 14).
[92] *See* Exhibit 45.
[93] *See* Exhibit 1 (Hill Affidavit Par. 6).
[94] *See* Exhibit 1 (Hill Affidavit Par. 7).
[95] *See* Exhibit 25 (Knutson Affidavit Par. 27).
[96] *See* Exhibit 1 (Hill Affidavit Par. 14).
[97] *See* Exhibit 1 (Hill Affidavit Par. 15).
[98] *See* Exhibit 46 (Letter from G.L. Dua to Shri Mahesh Gidwani, Aug. 20, 1987).

ment recognized the contribution that amorphous metal core transformers can make towards India's important goal of increased energy conservation when it significantly lowered the import duty on Allied's amorphous metals.[99]

In Canada, the utilities attribute even greater savings than in the United States through the use of amorphous metal core transformers. Hydro Quebec, the largest Canadian utility, has expressed a strong interest in purchasing amorphous metal core transformers. Allied is presently negotiating arrangements with Canadian transformer manufacturers, and substantial commercial sales are expected in the near future.[100]

Because transformers are constructed differently in Europe,[101] Allied is still in the development stage of creating the proper amorphous metal product for the European utility market. Nevertheless, Allied's sales of amorphous metals in Europe for utility transformers are greater than its sales in Japan, and European utilities have shown a strong interest in purchasing amorphous metal transformers as soon as possible. In fact, Italy's only electric utility has instructed its transformer suppliers to begin to supply amorphous metal core transformers. Allied has several active programs with European transformer manufacturers to perfect stacked core amorphous metal transformers for the European market, so as to be able to introduce this technology at the earliest possible time.[102]

Elsewhere, Allied's sales efforts are still in the early stages. However, these efforts are being met with much more positive reception from electric utilities than has been the case in Japan. In Asia, both government agencies and utilities in China, Korea, and Taiwan, including the Korea Electric Power Company and the Taiwan Ministry of Economic Affairs, have expressed strong interest in the promise of amorphous metal transformers.[103] Taiwan Power is already field testing three transformers, purchased from Daihen in Japan, using amorphous metals produced by Allied.[104]

Nevertheless, the effects of the boycott by the Japanese are being felt even in these countries. Allied's marketing efforts are being hampered by Taiwanese and Korean concerns over the Japanese failure to make commercial quantity purchases of amorphous metal transformers. Allied's efforts to sell in China have been hampered by Nippon Steel and Kawasaki Steel, which control silicon steel sales to China from Japan.[105]

CONCLUSION

For the reasons given above, Allied requests the institution of a Section 301 investigation.

If there is a negotiated conclusion to such an investigation, then Allied believes that the following points should be secured in such a negotiation:

1. Agreement by the Japanese Government, industry and utilities to honor Allied's patents, to cease their invalidation actions against those patents and to extend the life of Allied's basic composition and process patents until 1998 and 2002, respectively;
2. Agreement by Japanese utilities to phase in the use of amorphous metal core transformers to ensure that, by 1995, one-half of all transformers will use amorphous metals; and
3. Agreement that Allied, the patent holder, will have a significant market share of amorphous metals for these transformers and for other applications.

In exchange, Allied would be willing to encourage NAMCO to grant a patent license to produce amorphous metals in the Japanese market to one Japanese company so that there could be two suppliers for the Japanese market.

If such a solution cannot be obtained, then Allied encourages the United States Government to use its authority under Section 301 to (i) impose a retaliatory tariff

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[99] *See* Exhibit 47 (Letter from A.C.R. Das to Usha Rectifier Corporation, July 7, 1989). Silicon steel, which is used in conventional transformers, continues to have a much higher duty rate.

[100] *See* Exhibit 1 (Hill Affidavit Par. 16).

[101] *See* Exhibit 1 (Hill Affidavit Par. 17). Because European countries use 220-240 voltage, while the United States (and Japan) use 110-120V, European distribution transformers are three phase, while those in the United States and Japan are one phase.

[102] *See* Exhibit 1 (Hill Affidavit Par. 17).

[103] *See* Exhibit 1 (Hill Affidavit Par. 18).

[104] *See* Exhibit 1 (Hill Affidavit Par. 18).

[105] *See* Exhibit 1 (Hill Affidavit Par. 19).

of $100 per ton on all Japanese steel entering the United States; and (ii) exclude Japanese amorphous metals from the United States indefinitely.

Respectfully submitted,

SKADDEN, ARPS, SLATE, MEAGHER & FLOM

By: Robert E. Lighthizer, Thomas R. Graham, William J. Guzick, Douglas A. Rediker

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PREPARED STATEMENT OF JOHN E. HOWARD

I am John Howard, executive director of the United States Chamber's Market Access Subcommittee. The Chamber welcomes this opportunity to appear before you to discuss the "Super 301" provisions of the Omnibus Trade and Competitiveness Act of 1988. That Act contains various provisions relating to general market access issues and procedures, e.g., section 301, as well as to such specific issues as restrictions on access to foreign telecommunications and government securities markets, inadequate intellectual property protection and discriminatory government procurement. However, the most widely noted and broadly applicable feature of the 1988 Act is the "Super 301" provision. This provision was designed to combat generic or systemic practices that restrict United States access to foreign markets across the board.

Congress enacted the "Super 301" provisions because, under the "regular" section 301 process, the executive branch found itself embroiled in lengthy and tedious negotiations involving specific practices and sectors. The foreign county therefore lacked an incentive to correct its broader, systemic trade-restriction policies. Moreover, the United States executive branch lacked enough resources and negotiators to address the problems effectively. For these reasons, Congress decided that United States trade law should seek to eliminate entire systems of trade barriers, not just individual barriers or sector-specific problems one at a time.

The Chamber strongly supports aggressive use of "Super 301" procedures to obtain trade liberalization agreements with designated countries. The Chamber does not view "Super 301" and the other market access provisions in the 1988 Act as simply a series of "hit lists." The ultimate objective of "Super 301" is not to punish other countries by erecting new barriers to their exports. Instead, as the legislative history of this provision clearly states, Congress intended for "Super 301" to be used to open markets, not close them. Achievement of this objective will benefit not only United States exporters but also exporters from third nations and, indeed, consumers in restricted markets who pay higher prices as a result of trade restrictions. Moreover, "Super 301" also requires the executive branch to focus more clearly on elevating trade policy to a priority consistent with other foreign policy and national security interests.

The Chamber believes that United States trade liberalization priorities can be best outlined as follows:

BRAZIL

Brazil is the dominant market in South America and has a history of maintaining pervasive barriers to United States exports and investment. The new Brazilian constitution, the fundamental law of the land, further institutionalizes such restrictions as market reservation, discriminatory credit preferences to Brazilian companies and ban on foreign company participation in mining and oil exploration contracts. Discriminatory import licensing, local content requirements and inadequate technology licensing safeguards have also been problems.

Over the past year, Brazil's stated intentions regarding its trade policies have moved in the direction of liberalization. As a candidate, Brazilian president Fernando Collor de Mello campaigned as an economic reformer. Since his inauguration on March 15, and in the context of his *Brazil Novo* economic restructuring program President Collor has expressed his opposition to such impediments as market reservation and the informatics law. While the Chamber strongly supports the philosophical underpinnings of the *Brazil Novo* program and notes with approval certain liberalizations in the law of similars and the treatment of intellectual property royalties, it is not yet at all clear that a major component of President-elect Collor's stated intentions will be translated into concrete actions. Brazilian trade and invest-

ment policies remain highly restrictive and continue unfairly to deny substantial opportunities to United States firms.

INDIA

India's market potential lies in the fact that, despite its low per capita income, it actually has a middle class that is arithmetically larger than most European countries (at least 80 million, according to some estimates), as well as the world's largest pool of scientists and engineers. The dominant economic power in South Asia, India maintains a wide range of government restrictions on imports and foreign investment, such as mandatory technology transfer, among the world's highest tariffs and a virtual ban (through the licensing process) on the importation of any consumer or domestically producible goods.

Recent elections in India resulted in a new coalition government led by Prime Minister V. P. Singh. The new government's policies toward foreign investment and trade have not been fully articulated, and there is considerable uncertainty about the barriers that United States business may continue to face in India. There are reports that there could be some setbacks. For example, India is reportedly considering termination of a recently initiated import liberalization scheme sooner than originally planned. Also, some United States investments that were approved during the previous administration are being subjected to review by the new government. For these reasons, India and its trade and investment policies and practices should once again be identified as "priorities" within the meaning of "Super 301." It is the obligation of the new Indian government to take meaningful actions that will restore the confidence of its trading partners in India's commitment to an open and expanding world trading system.

JAPAN

In the case of Japan, whose bilateral United States trade is enormous, trade barriers were seen as pervasive. Although not necessarily a function of Japanese law, these barriers reflect systematic practices, e.g., restrictive distribution channels and "administrative guidance," that effectively discriminate against imports and, as such, are actionable under United States trade law.

Last May, Japan's trade restrictions were subject to a "two-track" negotiating approach: the "Super 301" process for three specific industry sectors and a more flexible "Structural Impediments Initiative" ("SII") for the more "systemic" categories of trade barriers and distortions.

The Chamber notes that agreements have been concluded on supercomputers, satellites and wood products, and that an interim "Structural Impediments Initiative" (SII) agreement to address some of Japan's structural impediments to imports was announced on April 5. Japan has also announced that it intends to implement "comprehensive import expansion measures," e.g., tax incentives and increased domestic consumption, by this spring, assuming parliamentary approval. However, other similarly ambitious proposals have been announced in past years, and they have had little or no positive impact on the efforts to open Japan's market to imports and incoming foreign investment. While recognizing the importance of this progress, the Chamber still prefers the identification of Japan and its trade barriers and distortions under "Super 301." It believes that much of this progress can be attributed directly to leverage afforded under "Super 301," and that a failure to identity once again these priorities may result in a loss of momentum toward additional progress.

Nonetheless, the Chamber looks forward to the implementation of these new initiatives and agreements in a manner that will result in significant new market opportunities for United States firms in those industries. Any loss of momentum that may arise from decisions made this April can be revisited later in the year, after the final $11 announcement is issued and an appropriate "grace period" for execution has passed.

SOUTH KOREA

South Korea's barriers have been as pervasive as Japan's. Moreover, they are frequently mandated in law. They have included high tariffs and taxes on imports, restrictions on foreign firms' imports into South Korea, discriminatory import licensing rules, export performance requirements, and forced technology licensing and transfer as a precondition to entry into the South Korean market. It was on this basis that in March 1989, the Chamber recommended that South Korea and its trade policies and practices be designated as priorities under "Super 301."

On May 19, 1989, South Korea and the United States entered into trade and investment liberalization agreements that were intended to increase substantially

United States business access to the South Korean market. At that time, completion of the May 19 agreements justified the exclusion of South Korea and its trade and investment policies and practices from identification as "priorities" under "Super 301." It Is too early to determine clearly whether South Korea is in substantial compliance with the May 19 agreements. Additional information is necessary before such a determination can be made.

In its April 1990 report entitled *United States-Korean Trade Issues*, the American Chamber of Commerce in South Korea reports that considerable progress was made during 1989 in resolving United States-South Korean trade conflicts. For example, American companies are now largely free of export and technology transfer requirements as a condition for doing business in South Korea and eventually will be able to invest there with fewer delays and restrictions. South Korea has also agreed to streamline preimport and import procedures, which should facilitate the sale of United States goods in South Korea

Nevertheless, South Korea continues to maintain significant trade barriers and distortions. If in the future it is determined that South Korea has failed to comply with the May 19 agreements, United StatesT.R. should take action required under sections 301(a)(1) and 301(c) of the 1974 Act to obtain the elimination of (or compensation for) the South Korean trade and investment barriers and distortions that are prohibited by the May 19 agreements. The United StatesT.R. should also take all appropriate and feasible action to obtain the elimination of (or compensation for) the South Korean trade and investment barriers and distortions that are not prohibited by the May 19 or other trade and investment agreements.

OTHER COUNTRIES

In 1989 and 1990, the Chamber declined to recommend that United StatesT.R. identify any other nations or their trade and investment policies and practices as "priorities" under "Super 301." However, restrictive practices of other countries continue to be brought to the Chamber's attention. The Chamber will closely monitor such developments and will recommend such steps as may be appropriate to obtain the elimination of (or compensation for) trade barriers and distortions that burden or restrict United States commerce.

"SUPER 301" AND THE "SII"

As discussed earlier, on April 5 of this year, the governments of Japan and the United States released "interim reports" on the progress of the SII, with final reports expected later this summer. In its report, Japan agreed in principle to make substantial changes in its policies concerning inadequate domestic consumption and investment (relative to savings), land use, infrastructure, restrictive distribution systems, exclusionary business practices, "keiretsu" relationships and pricing mechanisms. (For its part, the United States cited its intentions and activities with respect to increasing savings and investment, strengthened competitiveness, corporate behavior and decisionmaking, research and development, export promotion and work force education and training.) The Japanese government has outlined ambitious objectives, which, taken together, will likely take years to achieve. However, taken separately, there is a significant difference between Japanese *behavioral* traits as reflected, for example, in its high personal savings rates, and Japanese government *institutions and policies*, which more directly impede imports and which can be more readily modified by changes in law or its enforcement.

In the latter instance, the Chamber has already cited a number of Japanese institutional or policy impediments that, it believes, are actionable under United States trade law and should also have been subject to "Super 301" timetables and procedures. They include:

- Export targeting;
- Administrative guidance;
- Discriminatory government procurement;
- Toleration of anticompetitive business practices and distribution systems;
- Restrictive customs administration; and
- Discriminatory application of product standards.

While the Chamber has already expressed its reservations over the SII's lack of specific timetables and procedures as they apply to such impediments, it also recognizes that "SII" is the currently operative approach for resolving these impediments and should be given a chance to succeed. It is also the Chamber's position that any final "SII" agreement should provide for the resolution of these impediments in a manner comparable to the conditions stipulated under "Super 301."

CONCLUSION

Preservation of the American position in the world marketplace requires that the United States address its own competitive challenges. In particular, lower capital costs and strengthened educational performance are critical to meeting successfully this challenge. However, while the United States clearly must act to correct its own structural impediments and elevate the importance of trade in its policymaking circles, this in no way justifies weakening its resolve to open foreign markets, whether through multilateral, bilateral or even unilateral means. United States businesses continue to face a wide range of trade barriers and distortions in other countries that do not burden those countries' businesses operating in those countries or in the United States The United States must continue to give the necessary support to its negotiators and even prod them into tougher positions when they appear to falter. The United States must make it even clearer that it takes its legitimate trade rights very seriously and is prepared to take unilateral action if necessary and appropriate to defend those rights.

History tells us that, all too often, when Japan makes relatively small concessions, the United States reacts as if the battle has been won, even though Japanese trade policies remain significantly more protectionist than those of other advanced industrial democracies. Neither Congress nor the business community should be under any illusions that the real progress that has been achieved is the result of unilateral Japanese conversion to free market principles. Such progress is the result of the sustained application of leverage through negotiation and, as Ambassador Hills herself has said on a number of occasions, a credible threat of retaliation.

There is nothing protectionist about asserting America's legitimate trade rights. On the contrary, it is clearly in the best interests of not only the United States economy but also the world trading system.

This concludes my testimony, and I will be glad to attempt to answer any questions that you may have.

U.S. Chamber of Commerce

1615 H Street, N.W.
Washington, D.C. 20062
202 463-5460

March 24, 1989

International Division

The Honorable Carla A. Hills
United States Trade Representative
600 17th Street, N.W.
Washington, D.C. 20506

Dear Ambassador Hills:

Pursuant to your request for public comments (Federal Register Docket No. 89-4950) concerning identification of priority trade barriers and distortions under the so-called "Super 301" provisions of the 1988 Trade Act (section 310 of the Trade Act of 1974 as amended), and on behalf of the U.S. Chamber of Commerce, its International Policy Committee, and the Subcommittee on Market Access, I am pleased to submit the attached description of such barriers and distortions. The Chamber believes that those practices are especially significant in Brazil, India, Japan and South Korea, and warrant initiation of proceedings under section 310. The attached paper describes these practices in greater detail. In addition, we will be providing you with a "watch list" of other countries at a later date that warrant close monitoring.

The International Policy Committee and its Market Access Subcommittee have considered these issues since last summer, when we first began considering how the 1988 Trade Act should be implemented. It is our view that elimination of the trade barriers and distortions described herein would provide the greatest benefit to U.S. business in terms of its potential to increase United States exports and foreign investment, either directly or through the establishment of a beneficial precedent. The U.S. Chamber believes that the assertion of the United States' legitimate international economic and commercial interests as called for under section 310 and other provisions of U.S. law is central to our national interests, and can only serve to bolster the world's free market trading system.

The U.S. Chamber's International Division staff stands ready to assist you in your efforts to obtain negotiated trade-liberalizing agreements with the identified countries, as well as any other countries which may be so identified in the future, pursuant to the terms and timetables of section 310. Please contact me or John Howard (202-463-5464), the Subcommittee's Executive Director, if there is anyway we can be of further assistance.

Respectfully yours,

Michael Hodin, Chairman
Subcommittee on Market Access
of the
International Policy Committee

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SOME OBSERVATIONS ON "SUPER 301" AND ITS LEGISLATIVE HISTORY

The so-called "super 301" provisions of the 1988 Trade Act (section 310 of the 1974 Trade Act as amended) were designed to combat generic or systemic trade practices that restrict U.S. access across the board. This is not to say that narrower, sectoral concerns may not be addressed under super 301. Nonetheless, earlier versions of the legislation, Congressional floor debate, and the legislative history of the conference report clearly indicate that the intent of the legislation was to obtain the elimination of system-wide foreign trade restrictions by going beyond such sectoral concerns:

- The original House provision (the Gephardt amendment) explicitly targeted "a pattern of unjustifiable, unreasonable or discriminatory trade policies" in high-surplus countries that harmed U.S. commerce.

- The original Senate "super 301" provision explicitly targeted "a consistent pattern of import barriers and market-distorting practices", taking into account the National Trade Estimates and the costs of the barriers to U.S. business in terms of lost exports, among other things.

- With respect to the final "super 301" language, the trade bill conferees' Joint Explanatory Statement states that:

> "the (conference agreement) change in language to priority practices and priority countries is not intended as a limitation on the scope of the original provision, and is not intended to result in the identification of only token practices and countries. The identification of priority practices is also not limited to those barriers in the NTE report. The USTR is expected to use all information readily available about foreign trade practices."

BRAZIL

PRIORITY TRADE BARRIERS AND DISTORTIONS*

The New Brazilian Constitution

Entering into force on October 5, 1988, and requiring the enactment of implementing legislation within 180 days of that date, the new constitution (Article 171) provides for the establishment or continuation of "protection and incentives" to develop industries deemed essential to the country's development. Such "protection and incentives" include a prohibition of foreign company participation in oil and mineral exploration contracts, and a requirement that all mining companies be majority-controlled by Brazilians.

The new constitution gives so-called "Brazilian national capital companies" ("BNCCs") certain preferences over non-BNCCs, such as easier access to long-term credit and the ability to enter into government contracts. BNCCs are defined as those in which the majority of the physical persons who control the company are Brazilian nationals.

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*Various impediments to trade and investment in Brazil are discussed more fully in Improving the Economic Relationship Between Brazil and the United States, a March 1986 study. Additional information can also be obtained from The New Brazilian Constitution, published in 1988, and from USTR's 1987 National Trade Estimates report.

Market Reservation

Pre-dating the new constitution but further sanctioned by it, market reservation policies constitute the general framework for governing foreign investors' access to Brazilian markets. Such policies entail the denial or closing of certain markets to foreign companies by law. Access to such markets is often denied or terminated without warning to the affected foreign company. These policies, which have been extended to a diverse array of service and high-technology sectors, actively discourage investment and even cause disinvestment by foreign companies already established in Brazil.

Application of market reservation policies has proven particularly pernicious with respect to the informatics industry, where it is estimated that, barring significant change for the better, the U.S. computer industry could lose up to $12 billion in low-end sales by 1992.

The "Law of Similars"

Just as market reservation policies govern investment, this law establishes the underpinning of Brazil's policies toward imports. It authorizes denial of import licenses if comparable products are produced in Brazil. The law is administered through a pervasive and complex import licensing process that is applied to over 90 percent of all imports, and is subject to extensive delays. The government procurement process is also governed by the Law of Similars. While Brazil recently repealed a law which prohibited foreign companies from bidding on government contracts financed by international financial institutions, many state governments still limit access to their contracts to "national" firms.

National Content Requirements and Import Restrictions

Such requirements necessarily discriminate against foreign input providers, while forcing both Brazilian and foreign manufacturers to use inputs that do not necessarily meet optimal quality or technology standards. For example, Brazil prohibits the importation of all motor vehicles except tanks, other armored fighting vehicles and tractors.

At the same time, there are delays and restrictions on obtaining the permits necessary to import various kinds of machinery which is not sufficiently available from Brazilian sources.

Intellectual Property

The need for improved protection of the various forms of intellectual property is pervasive. There is no adequate legal recourse for halting the unauthorized appropriation of proprietary technical information. Patent working requirements are outdated; patent terms are unduly brief. Copyright and trademark protections have a number of difficulties, including lengthy application processing, and have generally been historically inadequate. No protection exists for pharmaceutical patents and mask work (semiconductor chip design) rights. Officials of the National Institute of Industrial Property ("INPI") often exercise administrative discretion to deny patent protection even where Brazilian law itself does not do so.

Technology Transfer and Licensing

Under INPI regulations, if technology is considered "know-how", then licensing agreements cannot exceed five years, at the end of which such know-how can be used by the licensee free of charge. If transferred

technology is patented legally in Brazil (within Paris convention rules), then agreements can be renewed after five years, up to the period of the patent's validity. Confidentiality in the entire process is a problem.

INDIA

PRIORITY TRADE BARRIERS AND DISTORTIONS

Intellectual Property

The 1970 Indian Patents Act significantly weakened patent rights in India. Patent terms are exceptionally short (14 years from the date of filing). Product patent protection is generally unavailable in many chemical arts areas. Licensing of patents is often compulsory simply at the request of a voluntary license holder or pursuant to the order of the Controller of Patents; in effect this amounts to an expropriation of patent rights. Similarly, licenses of right can be secured merely on request at any time after expiry of 3 years from the date of patent grant.

India also maintains severe restrictions on the licensing of foreign trademarks to Indian users. As a matter of general policy, the Indian government introduces, in the letters of approval for foreign collaboration, a condition to the effect that the use of a foreign-owned trademark will not be permitted in relation to goods for sale in the domestic Indian market. Trademark registration is vulnerable to cancellation for non-use; defense against such cancellation is available in Indian courts, but is difficult. India has no formal recognition of internationally famous trademarks. Service marks are not formally protectible under Indian law. There are restrictions against registration and usage of trademarks in respect to certain single active ingredient pharmaceuticals. The trademark registration period takes up to four years, and it is often difficult to obtain up-to-date trademark search information.

Technology Transfer Licensing Procedures

India requires (U.S.) licensors to indemnify (Indian) licensees against worldwide infringement of third-party patents. This constitutes a prohibitive obstacle to the voluntary transfer of sophisticated technology to India. On the other hand, the Indian government often requires that technology be transferred to a local firm as a condition of foreign investments or joint-venture approvals.

The Indian government imposes limits on licensing fees, maximum royalty bearing production levels, and the length of time royalties may be paid. Prohibitions on minimum license fees apply, as they also do against the payment of patent royalties in the period after the expiration of the license agreement, and interest charges for late payments.

India mandates deductions from the royalty base, and of Indian taxes (other than income taxes) from payments made to the licensor.

Investment

Government approval is required for all foreign investment on a case-by-case basis, resulting in significant bureaucratic delays. In addition, a foreign company is restricted to 40% equity if it is to be treated as a domestic company. Export performance and technology transfer requirements are often imposed as a condition for approval of foreign investment.

Tariffs

India's tariffs are among the highest in the world. It is estimated that 60% of India's tariffs fall between 120-140%.

Import Licensing

India restricts imports of consumer goods and most goods that can be produced domestically. This is India's most prominent trade barrier, although there has been some improvement with respect to high technology.

Restrictions on Local Agent Contacts with the Indian Government

Due to a scandal involving the Ministry of Defense and a foreign company, foreign companies can no longer use local agents to sell to the Ministry of Defense. Since most U.S. companies do not have local offices, this poses a disproportionately large burden on the very companies that are least likely to offer illegal "facilitative" payments: U.S. companies, whose conduct is so proscribed under the Foreign Corrupt Practices Act.

Services Barriers

Foreign participation in Indian financial services markets is sharply limited in both functional and geographic terms. In some cases, foreign participation is prohibited outright.

Local Content

India's "Phased Manufacturing Program" entails local content requirements over time. Although it does not affect all companies, it is a deterrent to many potential investors and imposes tremendous costs to companies that are subject to these requirements.

JAPAN

PRIORITY TRADE BARRIERS AND DISTORTIONS[1]

Targeting

The Japanese government's full range of practices involving administrative guidance, public procurement and restrictive business practices (discussed below in greater detail) constitutes a significant and actionable policy of targetting, with adverse implications for a wide range of U.S. industries.

Administrative Guidance

Japanese government officials offer commercial "suggestions" and "advice" to businesses and public organizations over whom they have regulatory jurisdiction. Such officials possess broad authority to provide or deny loans, grants, subsidies, licenses, tax breaks, government contracts, permission to import, and approval of cartel

[1] A more detailed discussion of many of these, and other, Japanese trade barriers and distortions can be found in Analysis of the U.S.-Japan Trade Problem, issued in February 1989 by the Advisory Committee for Trade Policy and Negotiations.

arrangements. As a result, their suggestions and advice include implied threats to deny such benefits and/or impose new restrictions if certain arrangements are not agreed to by the business or public organization.

Such guidance has been effective in limiting the importation of refined pretroleum products, as well as automobiles, steel, cotton and high technology products.

Public Procurement

Japanese government public procurement practices exclude foreign bidders through reliance on single tenders, short bid times, complex qualification procedures, and a general lack of transparency. Such exclusion has also been accomplished by setting work experience as a selection criterion. Since foreign contractors' work experience in Japan has been limited, this criterion effectively excludes most foreign competition.

Restrictive Business Practices and Distribution Channels

The Japanese government tolerates a variety of complex and systematic anti-competitive activities which allow Japanese companies to collude and which discriminate against foreign-made goods. Such activities would constitute anti-trust violations in the United States. For example, it is virtually impossible for a foreign company to sell in Japan without having an affiliated (Japanese) company doing the marketing and distribution. The result is an inordinately complex distribution network which causes the import to become very expensive by the time it reaches the consumer.

Vertical distribution chains in various industries limit imports by operating on the basis of long-term contracts, with rebates provided by the manufacturer to ensure the loyalty of wholesalers and retailers. In cases where Japanese importers and distributors belong to the same group ("keiretsu"), they will favor purchases from within the group, or from another Japanese group, over foreign imports.

Customs Administration

Japanese customs officials are known for their exacting interpretation of customs regulations. Regardless of their intentions, these interpretations have had the effect of restricting trade. For example, imports can be blocked, and complaints by foreigners can be delayed, until a "competent" Japanese importer has been identified. This gives the Japanese government total control over the level of imports, thus sharply limiting foreign companies' right to complain to the Japanese government over market access problems.

Japanese import licenses restrain trade. They are granted for a limited period of three to seven years, after which the application period must start over again. Moreover, the permits are given to Japanese importers, rather than the foreign exporter. This limits the exporter's ability to use his own marketing skills to gain market penetration or to switch importers if he is unsatisfied.

Standards, Testing, Certification and Regulatory Requirements

Discrimination against foreigners in the application of standards arises from (1) the exclusion of foreigners from the standard-making process; (2) insufficient notice provided to foreigners of changes in standards; and (3) the basing of standards on design, rather than performance criteria. Moreover, the lack of transparency, bureaucratic delays, and biases favoring domestic companies present significant obstacles to U.S. companies.

Imports have not had access to the so-called factory registration and model approach for self-certification that Japanese producers use. Instead, imports have generally been subject to a time-consuming "lot testing" system.

While preferential handling is given to auto manufacturers, the 1,000 vehicle-per-model limit on such handling amounts to a de facto quota, since a complex "homologation" (standards adherence) process applies to all vehicles over that limit.

Inadequate Intellectual Property Protection

The Japanese Patent Office ("JPO") takes six years to issue a patent, compared to two in the United States. Once the patent application has been filed in Japan, it is vulnerable to the unauthorized use of the patent by competing firms. Since the term of patent protection is 20 years, only for 14 of those years does the patent holder enjoy exclusive rights.

The delays in the issuance of patents in Japan arise from two principal factors: (1) understaffing of the JPO, which in 1986 received 609 applications per examiner (compared to 94 in the U.S.), and (2) continued reliance on pre-grant opposition proceedings which have been abandoned in Europe on the grounds that they have been abused by competitors to delay the issuance of the patent.

Trade Agreement Violations

Japan's continuing failure to implement effectively certain market-oriented sector-specific ("MOSS") agreements to which they are parties constitutes an actionable violation of trade agreements.

KOREA

PRIORITY TRADE BARRIERS AND DISTORTIONS[1]

Restrictions of Foreign Invested Firms' Imports of Related Products

Foreign firms with manufacturing operations in Korea may market only those products that they manufacture or add value locally (a de facto 10% local content requirement exists). Raw materials and equipment necessary for local production may be imported. However, completed product lines are excluded from importation.

Taxation and Restriction of Imports

Broad tariff reduction programs notwithstanding, Korean tariffs on finished products remain in the 30-50% range. Moreover, some luxury items (e.g., foreign-made cars) are subject to a combination of duties, "defense taxes", and consumption taxes totalling approximately 130% of the C.I.F. price.

The system of computing total taxes on imported goods, which includes cumulative application of the various levies, increases their cost by more than the published duty might suggest. For example, 2.5% of a product's dutiable value might be levied as a defense tax, with an additional 10% of the total of the dutiable value and the actual duty might be levied as a value-added tax, in addition to the duty.

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[1]Many of these, as well as other, Korean trade barriers and distortions are discussed more fully in United States-Korean Trade Issues, published in July 1988 by the American Chamber of Commerce in Korea.

Volume quotas, and in some instances embargoes, are applied to some articles of trade. Such quotas are sometimes determined as a percent of the Korean production of a competing article.

Restrictions on Trade Activities

Notwithstanding the announced intention of the Korean Ministry of Trade and Industry to permit the free importation and distribution of products by foreign-invested companies, only licensed traders are authorized to import products for their own account. The criteria upon which issuance of licenses is based, and the scope of the activity allowed under the licenses, are more restrictive for foreign companies than for Korean companies.

In addition, unlike Korean companies, foreign non-manufacturing importers may only import products actually produced by parent and affiliated companies.

The government also limits the availability of foreign exchange to purchase imports.

"Unnecessary and Luxurious" Imports

In concert with government-sponsored TV campaigns against such imports (beginning in 1985), the Association of Foreign Trade Agents of Korea ("AFTAK") sent letters to members advising them not to purchase such imports. Importers who fail to heed this advice risk expulsion from AFTAK, and a resultant loss of their business. Foreign exchange banks are also provided with lists of these imports; they give "guidance" to firms as to whether the import to be financed is on the list.

Moreover, despite a 1987 announcement that the list would be liberalized, and an apparent reduction in the number of cases of government intimidation, fears of harassment in the forms of tax audits and other methods persist.

Customs Administration

Customs officials have wide latitude to restrict or block imports within the context of Korean government exhortations to "conserve foreign exchange for national prosperity." Actions may include anything from minor time delays to the imposition of heavy duties and other charges on imports of little or no significant commercial value. In addition, unwritten and informal "guidelines" often have the effect of undercutting the value of written Customs regulations and policies.

Almost all foods are subject to quarantine approval and/or other clearance procedures from the Ministry of Health and Social Affairs.

Forced Licensing and Technology Transfer

The Korean government requires technology licensing and transfer as a precondition to entry into the Korean market, and usually insists on designating the local licensee.

Prohibition of Foreign Ownership and Participation

Korean law and government practice virtually ensures that a foreign-owned enterprise will never have the opportunity to wholesale a wide variety of foods, beverages, drugs, cosmetics, publications and other products. In general, foreign companies, even those with manufacturing investments in Korea, must market their products through Korean companies. In addition, foreign ownership and participation are prohibited in certain service industies.

Intellectual Property

Substantial progress was made in 1987 on correcting a number of serious deficiencies in the Korean intellectual property laws. However, much work and follow-up needs to be done before U.S. companies in Korea will enjoy the full benefits of the protection promised under the Agreement between the U.S. and Korea arising out of the section 301 settlement. The need for further work extends to all areas of intellectual property law, including patents, trademarks, copyrights (including protection of computer software), trade secrets, and semiconductor design protection.

U.S. Chamber of Commerce

1615 H Street N.W.
Washington D.C. 20062
202 463-5460

International Division

February 16, 1990

The Honorable Carla A. Hills
United States Trade Representative
600 17th Street, N.W.
Washington, D.C. 20506

Dear Ambassador Hills:

Pursuant to your request for public comments (Federal Register Docket No. 90-859) concerning identification of trade liberalization priorities under the so-called "Super 301" provisions of the 1988 Trade Act (section 310 of the Trade Act of 1974 as amended), and on behalf of the U.S. Chamber of Commerce, its International Policy Committee, and the Subcommittee on Market Access, we are pleased to submit the attached description of such barriers and distortions. While the attached paper describes these practices in greater detail, the Chamber's general observations and recommendations are as follows:

- On March 24, 1989, in a similar submission, the Chamber recommended that U.S.T.R. identify various trade and investment policies and practices in Brazil, India and Japan as "priorities" under section 310 of the Trade Act of 1974, as amended ("Super 301"). The Chamber has since concluded that no change has occurred that would justify not identifying those nations, and those policies and practices, as "priorities" in 1990 under section 310.

- Also on March 24, 1989, the Chamber recommended that U.S.T.R. identify various trade and investment policies and practices in South Korea as "priorities" under that Act. However, on May 19, 1989, South Korea and the United States entered into trade and investment liberalization agreements that were intended to substantially increase U.S. business access to the South Korean market. At that time, completion of the May 19 agreements justified the exclusion of South Korea and its trade and investment policies and practices from identification as "priorities" under section 310.

- It is too early to clearly determine whether South Korea is in substantial compliance with the May 19 agreements. Additional information is necessary before such a determination can be made. Nevertheless, the Chamber believes that South Korea continues to maintain significant trade barriers and distortions. While the Chamber does not now recommend that the U.S.T.R. alter South Korea's status under section 310, it does recommend close surveillance of South Korean policies and practices.

- If in the future it is determined that South Korea has failed to comply with the May 19 agreements, the U.S.T.R. should take action required under sections 301(a)(1) and 301(c) of the Trade Act to obtain the elimination of (or compensation for) the South Korean trade and investment barriers and distortions that are prohibited by the May 19 agreements. The U.S.T.R. should also take all appropriate and feasible action to obtain the elimination of (or compensation for) the South Korean trade and investment barriers and distortions that are not prohibited by the May 19 or other trade and investment agreements.

- In 1989, the Chamber declined to recommend that U.S.T.R. identify any other nations or their trade and investment policies and practices as "priorities" under section 310 of the Trade Act. However, restrictive practices of other countries continue to be brought to the Chamber's attention (including, most recently, Taiwan). The Chamber will closely monitor such developments and, in the future, will recommend such steps as may be appropriate to obtain the elimination of (or compensation for) "priority" trade barriers and distortions that burden or restrict U.S. commerce.

The International Policy Committee and its Market Access Subcommittee have considered these issues since last summer, after we submitted our first recommendations in accordance with the "Super 301" provisions of the Trade Act. It remains our position that elimination of the trade barriers and distortions described herein would provide the greatest benefit to U.S. business in terms of its potential to increase United States exports and foreign investment, either directly or through the establishment of a beneficial precedent. The U.S. Chamber believes that the assertion of the United States' legitimate international economic and commercial interests as called for under section 310 and other provisions of U.S. law is central to our national interests, and can only serve to bolster the world's free market trading system.

The U.S. Chamber's International Division staff stands ready to assist you in your efforts to obtain negotiated trade-liberalizing agreements with the identified countries, as well as any other countries which may be so identified in the future, pursuant to the terms and timetables of section 310. Please contact either of us, or John Howard (202-463-5464), the Market Access Subcommittee's Executive Director, if there is any way we can be of further assistance.

Respectfully yours,

Edward Donley

Edward Donley, Chairman
International Policy Committee

David Raymond

David Raymond, Chairman
Market Access Subcommittee

PRIORITY TRADE BARRIERS AND DISTORTIONS

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BRAZIL

Summary. Over the past year, Brazil's stated intentions regarding their trade policies have moved in the direction of liberalization. However, no major changes appear to have occurred which would justify not identifying in 1990 Brazil and its policies and practices as "priorities" within the meaning of section 310 of the 1974 Trade Act as amended ("Super 301"). Brazilian president-elect Fernando Collor de Mello campaigned as an economic reformer, and has expressed his opposition to such impediments as market reservation and the informatics law. However, given the continuing structural character of Brazilian trade and investment restrictions, it is not yet at all clear that President-elect Collor's stated intentions will be translated into concrete actions. Brazilian trade and investment policies remain highly restrictive, and continue to unfairly deny substantial opportunities to U.S. firms.

The New Brazilian Constitution

Entering into force on October 5, 1988, and requiring the enactment of implementing legislation within 180 days of that date, the new constitution (Article 171) provides for the establishment or continuation of "protection and incentives" to develop industries deemed essential to the country's development. Such "protection and incentives" include a prohibition of foreign company participation in oil and mineral exploration contracts, and a requirement that all mining companies be majority-controlled by Brazilians.

As of this writing, no changes have been made. The Brazilian constitution provides for a reappraisal of its provisions within five years of its adoption -- by 1993. While the constitution can be amended by a simple majority vote of the Brazilian Congress, there is no specific indication at this time that the restrictive trade and investment provisions adopted in 1988 will be changed.

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The new constitution gives so-called "Brazilian national capital companies" ("BNCCs") certain preferences over non-BNCCs, such as easier access to long-term credit and the ability to enter into government contracts. BNCCs are defined as those in which the majority of the physical persons who control the company are Brazilian nationals.	
Market Reservation	
Pre-dating the new constitution but further sanctioned by it, market reservation policies constitute the general framework for governing foreign investors' access to Brazilian markets. Such policies entail the denial or closing of certain markets to foreign companies by law. Access to such markets is often denied or terminated without warning to the affected foreign company. These policies, which have been extended to a diverse array of service and high-technology sectors, actively discourage investment and even cause disinvestment by foreign companies already established in Brazil.	No changes. However, the new Brazilian president, Fernando Collor de Mello, has indicated that he opposes market reservation as an economic policy.
Application of market reservation policies has proven particularly pernicious with respect to the informatics industry, where it is estimated that, barring significant change for the better, the U.S. computer industry could lose up to $12 billion in low-end sales by 1992.	President Collor has discussed "sunset" of the informatics law, but no specific proposals for achieving this have been tabled.
The "Law of Similars"	
Just as market reservation policies govern investment, this law establishes the	Approximately 18 months ago, the Law of Similars (which is actually a regulation)

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underpinning of Brazil's policies toward imports. It authorizes denial of import licenses if comparable products are produced in Brazil. The law is administered through a pervasive and complex import licensing process that is applied to over 90 percent of all imports, and is subject to extensive delays. The government procurement process is also governed by the Law of Similars. While Brazil recently repealed a law which prohibited foreign companies from bidding on government contracts financed by international financial institutions, many state governments still limit access to their contracts to "national" firms.	was changed so that it now applies only to purchases by the state and to imports benefitting from fiscal incentives such as reduced duties and VAT rates. However duties and VATs, while lower than before, are still high (generally in the 25-40% range, but in some cases as high as 85%). In addition, duties are bound on only about 20% of all products.
<u>National Content Requirements and Import Restrictions</u>	
Such requirements necessarily discriminate against foreign input providers, while forcing both Brazilian and foreign manufacturers to use inputs that do not necessarily meet optimal quality or technology standards. For example, Brazil prohibits the importation of all motor vehicles except tanks, other armored fighting vehicles and tractors. At the same time, there are delays and restrictions on obtaining the permits necessary to import various kinds of machinery which is not sufficiently available from Brazilian sources.	No major changes.
<u>Intellectual Property</u>	
The need for improved protection of the various forms of intellectual property is	No major changes. An inter-ministerial commission is considering ways to

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pervasive. There is no adequate legal recourse for halting the unauthorized appropriation of proprietary technical information. Patent working requirements are outdated; patent terms are unduly brief. Copyright and trademark protections have a number of difficulties, including lengthy application processing, and have generally been historically inadequate. No protection exists for pharmaceutical patents and mask work (semiconductor chip design) rights. Officials of the National Institute of Industrial Property ("INPI") often exercise administrative discretion to deny patent protection even where Brazilian law itself does not do so.

modernize the intellectual property protection system where legislatively feasible.

Technology Transfer and Licensing

Under INPI regulations, if technology is considered "know-how", then licensing agreements cannot exceed five years, at the end of which such know-how can be used by the licensee free of charge. If transferred technology is patented legally in Brazil (within Paris convention rules), then agreements can be renewed after five years, up to the period of the patent's validity. Confidentiality in the entire process is a problem.

INPI has gradually increased the allowable term of licensing agreements to ten years in some cases involving high technology. However, there is still a requirement that parent (foreign) companies "donate" technology to majority (50%+) owned or controlled subsidiaries. If a foreign company owns 50%+ of a Brazilian subsidiary, it cannot register a license with INPI.

INDIA

Summary. Recent elections in India resulted in a new coalition government led by Prime Minister V.P. Singh. The new government's policies toward foreign investment and trade have not been fully articulated, and there is considerable uncertainty about the barriers U.S. business may continue to face in India. There are reports that there could be some setbacks. For

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example, India may terminate its import liberalization scheme sooner than originally planned. Also, some U.S. investments that were approved during the previous administration are being subjected to another review by the new government. For these reasons, India and its trade and investment policies and practices should once again be identified as "priorities" within the meaning of section 310 of the Trade Act. It is the obligation of the new Indian government to take meaningful actions that will restore the confidence of its trading partners in India's commitment to an open and expanding world trading system.

Intellectual Property

The 1970 Indian Patents Act significantly weakened patent rights in India. Patent terms are exceptionally short (14 years from the date of filing). Product patent protection is generally unavailable in many chemical arts areas. Licensing of patents is often compulsory simply at the request of a voluntary license holder or pursuant to the order of the Controller of Patents; in effect this amounts to an expropriation of patent rights. Similarly, licenses of right can be secured merely on request at any time after expiry of 3 years from the date of patent grant.

India also maintains severe restrictions on the licensing of foreign trademarks to Indian users. As a matter of general policy, the Indian government introduces, in the letters of approval for foreign collaboration, a condition to the effect that the use of a foreign-owned trademark will not be permitted in relation to goods for sale in the domestic Indian market. Trademark registration is vulnerable to cancellation for non-use; defense against such cancellation is available in Indian courts, but is difficult. India has no formal recognition of internationally

No significant change. While there are preliminary indications of somewhat greater Indian government cooperation in reviewing intellectual property protection at the GATT, the Indian government has not even discussed, let alone agreed to, any specific improvements in Indian law or practice.

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famous trademarks. Service marks are not formally protectible under Indian law. There are restrictions against registration and usage of trademarks in respect to certain single active ingredient pharmaceuticals. The trademark registration period takes up to four years, and it is often difficult to obtain up-to-date trademark search information.	
Technology Transfer Licensing Procedures	
India requires (U.S.) licensors to indemnify (Indian) licensees against worldwide infringement of third-party patents. This constitutes a prohibitive obstacle to the voluntary transfer of sophisticated technology to India. On the other hand, the Indian government often requires that technology be transferred to a local firm as a condition of foreign investments or joint-venture approvals.	No significant change.
The Indian government imposes limits on licensing fees, maximum royalty bearing production levels, and the length of time royalties may be paid. Prohibitions on minimum license fees apply, as they also do against the payment of patent royalties in the period after the expiration of the license agreement, and interest charges for late payments.	
India mandates deductions from the royalty base, and of Indian taxes (other than income taxes) from payments made to the licensor.	

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Investment	
Government approval is required for all foreign investment on a case-by-case basis, resulting in significant bureaucratic delays. In addition, a foreign company is restricted to 40% equity if it is to be treated as a domestic company. Export performance and technology transfer requirements are often imposed as a condition for approval of foreign investment.	No significant change. The new Indian government is engaged in a review of various joint venture proposals that were approved during the Ghandi administration, thereby adding to U.S. business uncertainty over the future of their investment plans in India.
Tariffs	
India's tariffs are among the highest in the world. It is estimated that 60% of India's tariffs fall between 120-140%.	No significant change.
Import Licensing	
India restricts imports of consumer goods and most goods that can be produced domestically. This is India's most prominent trade barrier, although there has been some improvement with respect to high technology.	No significant change. However, India's policies in this regard may be moving in an even more restrictive direction. On January 15, the Indian commerce ministry reportedly indicated that it would terminate a year earlier than originally planned an "open licensing" policy under which certain specified goods could be imported without special permission. While this has yet to be confirmed, approximately 100 goods could be affected.
Restrictions on Local Agent Contacts with the Indian Government	
Due to a scandal involving the Ministry of Defense and a foreign company, foreign companies can no longer use local agents	No significant change.

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to sell to the Ministry of Defense. Since most U.S. companies do not have local offices, this poses a disproportionately large burden on the very companies that are least likely to offer illegal "facilitative" payments: U.S. companies, whose conduct is so proscribed under the Foreign Corrupt Practices Act.	
Services Barriers	
Foreign participation in Indian financial services markets is sharply limited in both functional and geographic terms. In some cases, foreign participation is prohibited outright.	No significant change.
Local Content	
India's "Phased Manufacturing Program" entails local content requirements over time. Although it does not affect all companies, it is a deterrent to many potential investors and imposes tremendous costs to companies that are subject to these requirements.	No significant change.

JAPAN

Summary. Last May, Japan's trade restrictions were subject to a "two-track" negotiating approach: the "Super 301" process for three specific industry sectors, and a more flexible "Structural Impediments Initiative" ("SII") for the more "systemic" categories of trade barriers and distortions. Such issues include its discrimination against foreigners in the application of product standards and its restrictive distribution system. Nonetheless, no significant progress has been achieved in obtaining the elimination of the identified Japanese barriers to U.S. trade and investment. Japan has announced that it intends to implement "comprehensive import expansion measures", (e.g., tax incentives and increased domestic consumption) by the spring of 1990,

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assuming parliamentary approval. However, other similarly ambitious proposals have been announced in past years. However, they have had little or no positive impact on the efforts to open Japan's market to imports and incoming foreign investment. No changes have occurred that would justify Japan's exclusion from identification as "priorities" under section 310.

Targeting

The Japanese government's full range of practices involving administrative guidance, public procurement and restrictive business practices (discussed below in greater detail) constitutes a significant and actionable policy of targetting, with adverse implications for a wide range of U.S. industries.

No significant change. However, in June 1989, the Japanese government passed a new law entitled the "Temporary Measures Law for the Facilitation of the Realization of Specified New Enterprises," which (according to a rough English translation) seeks to provide financial and information support for the "full realization of these (multifaceted new) industries." This law took effect December 1, 1989.

Administrative Guidance

Japanese government officials offer commercial "suggestions" and "advice" to businesses and public organizations over whom they have regulatory jurisdiction. Such officials possess broad authority to provide or deny loans, grants, subsidies, licenses, tax breaks, government contracts, permission to import, and approval of cartel arrangements. As a result, their suggestions and advice include implied threats to deny such benefits and/or impose new restrictions if certain arrangements are not agreed to by the business or public organization.

Such guidance has been effective in limiting the importation of refined petroleum products, as well as automobiles, steel, cotton and high technology products.

No significant change. Back in the early 1970s, the Japanese government refused to even admit the existence of "administrative guidance." However, the Administrative Reform Council has lately submitted recommendations on how to reform adminitrative guidance, earlier denials of its existence notwithstanding.

Also, in September 1989, the Ministry of International Trade and Industry ("MITI") began exhorting large Japanese companies (especially exporting companies) to begin importing more, as opposed to exporting less (e.g., through VERs). However, it is too early to quantify the impact of such MITI exhortations.

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Public Procurement	
Japanese government public procurement practices exclude foreign bidders through reliance on single tenders, short bid times, complex qualification procedures, and a general lack of transparency. Such exclusion has also been accomplished by setting work experience as a selection criterion. Since foreign contractors' work experience in Japan has been limited, this criterion effectively excludes most foreign competition.	No significant change.
Restrictive Business Practices and Distribution Channels	
The Japanese government tolerates a variety of complex and systematic anti-competitive activities which allow Japanese companies to collude and which discriminate against foreign-made goods. Such activities would constitute anti-trust violations in the United States. For example, it is virtually impossible for a foreign company to sell in Japan without having an affiliated (Japanese) company doing the marketing and distribution. The result is an inordinately complex distribution network which causes the import to become very expensive by the time it reaches the consumer.	No significant change. However, these and related issues are subject to negotiation under the "Structural Impediments Initiative."
Vertical distribution chains in various industries limit imports by operating on the basis of long-term contracts, with rebates provided by the manufacturer to ensure the loyalty of wholesalers and retailers. In cases where Japanese	

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importers and distributors belong to the same group ("keiretsu"), they will favor purchases from within the group, or from another Japanese group, over foreign imports.	
Customs Administration	
Japanese customs officials are known for their exacting interpretation of customs regulations. Regardless of their intentions, these interpretations have had the effect of restricting trade. For example, imports can be blocked, and complaints by foreigners can be delayed, until a "competent" Japanese importer has been identified. This gives the Japanese government total control over the level of imports, thus sharply limiting foreign companies' right to complain to the Japanese government over market access problems.	No significant change.
Japanese import licenses restrain trade. They are granted for a limited period of three to seven years, after which the application period must start over again. Moreover, the permits are given to Japanese importers, rather than the foreign exporter. This limits the exporter's ability to use his own marketing skills to gain market penetration or to switch importers if he is unsatisfied.	
Standards, Testing, Certification and Regulatory Requirements	
Discrimination against foreigners in the application of standards arises from (1) the exclusion of foreigners from the	No significant change.

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standard-making process; (2) insufficient notice provided to foreigners of changes in standards; and (3) the basing of standards on design, rather than performance criteria. Moreover, the lack of transparency, bureaucratic delays, and biases favoring domestic companies present significant obstacles to U.S. companies.	
Imports have not had access to the so-called factory registration and model approach for self-certification that Japanese producers use. Instead, imports have generally been subject to a time-consuming "lot testing" system.	
While preferential handling is given to auto manufacturers, the 1,000 vehicle-per-model limit on such handling amounts to a de facto quota, since a complex "homologation" (standards adherence) process applies to all vehicles over that limit.	
Inadequate Intellectual Property Protection	
The Japanese Patent Office ("JPO") takes six years to issue a patent, compared to two in the United States. Once the patent application has been filed in Japan, it is vulnerable to the unauthorized use of the patent by competing firms. Since the term of patent protection is 20 years, only for 14 of those years does the patent holder enjoy exclusive rights.	No significant change.
The delays in the issuance of patents in Japan arise from two principal factors: (1) understaffing of the JPO, which in 1986	The JPO has increased the size of its staff somewhat, but not significantly from the standpoint of increased patent processing

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received 609 applications per examiner (compared to 94 in the U.S.), and (2) continued reliance on pre-grant opposition proceedings which have been abandoned in Europe on the grounds that they have been abused by competitors to delay the issuance of the patent.	efficiency.
Trade Agreement Violations	
Japan's continuing failure to implement effectively certain market-oriented sector-specific ("MOSS") agreements to which they are parties constitutes an actionable violation of trade agreements.	No significant change.

SOUTH KOREA

Summary. On May 19, 1989, South Korea and the United States entered into trade and investment liberalization agreements that were intended to substantially increase U.S. business access to the South Korean market. At that time, completion of the May 19 agreements justified the exclusion of South Korea and its trade and investment policies and practices from identification as "priorities" under section 310. It is too early to clearly determine whether South Korea is in substantial compliance with the May 19 agreements. Additional information is necessary before such a determination can be made. Nevertheless, South Korea continues to maintain significant trade barriers and distortions. If in the future it is determined that South Korea has failed to comply with the May 19 agreements, the U.S.T.R. should take action required under sections 301(a)(1) and 301(c) of the Trade Act to obtain the elimination of (or compensation for) the South Korean trade and investment barriers and distortions that are prohibited by the May 19 agreements. The U.S.T.R. should also take all appropriate and feasible action to obtain the elimination of (or compensation for) the South Korean trade and investment barriers and distortions that are not prohibited by the May 19 or other trade and investment agreements.

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Restrictions of Foreign Invested Firms' Imports of Related Products	
Foreigns firms with manufacturing operations in Korea may market only those products that they manufacture or add value locally (a de facto 10% local content requirement exists). Raw materials and equipment necessary for local production may be imported. However, completed product lines are excluded from importation.	Agreement of May 19, 1989 between the U.S. and the R.O.K. (hereinafter referred to as the "May 19 agreement") commits the R.O.K. to the elimination of these requirements.
Taxation and Restriction of Imports	
Broad tariff reduction programs notwithstanding, Korean tariffs on finished products remain in the 30-50% range. Moreover, some luxury items (e.g., foreign-made cars) are subject to a combination of duties, "defense taxes", and consumption taxes totalling approximately 130% of the C.I.F. price.	May 19 agreement does not directly address these restrictions. However, the agreement commits R.O.K. to a review of its import laws for GATT consistency. While, prior to the agreement, the R.O.K. had unilaterally committed to a number of tariff reductions, high "layered" tariffs and taxes persist in numerous categories.
The system of computing total taxes on imported goods, which includes cumulative application of the various levies, increases their cost by more than the published duty might suggest. For example, 2.5% of a product's dutiable value might be levied as a defense tax, with an additional 10% of the total of the dutiable value and the actual duty might be levied as a value-added tax, in addition to the duty.	
Volume quotas, and in some instances embargoes, are applied to some articles of trade. Such quotas are sometimes determined as a percent of the Korean production of a competing article.	

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Restrictions on Trade Activities

Notwithstanding the announced intention of the Korean Ministry of Trade and Industry to permit the free importation and distribution of products by foreign-invested companies, only licensed traders are authorized to import products for their own account. The criteria upon which issuance of licenses is based, and the scope of the activity allowed under the licenses, are more restrictive for foreign companies than for Korean companies.

In addition, unlike Korean companies, foreign non-manufacturing importers may only import products actually produced by parent and affiliated companies.

The government also limits the availability of foreign exchange to purchase imports.

While the Korean non-agricultural wholesale market has been liberalized, the retail market remains completely restricted. Moreover, wholesalers cannot import products that are on the restricted retail list (except for cigarettes, cosmetics, confectionery and non-alcoholic beverages). They therefore must rely on a large chain of middlemen.

"Unnecessary and Luxurious" Imports

In concert with government-sponsored TV campaigns against such imports (beginning in 1985), the Association of Foreign Trade Agents of Korea ("AFTAK") sent letters to members advising them not to purchase such imports. Importers who fail to heed this advice risk expulsion from AFTAK, and a resultant loss of their business. Foreign exchange banks are also provided with lists of these imports; they give "guidance" to firms as to whether the import to be financed is on the list.

Moreover, despite a 1987 announcement that the list would be liberalized, and an

The May 19 agreement commits R.O.K. to phasing out associations' participation in pre-import reporting and notification requirements. However, the Korean government and media remain engaged in a vociferous "excessive consumption" campaign against expensive foreign consumer durables -- the high prices of which are in turn exacerbated by high Korean duties and taxes. The Korean government has also threatened to raise duties to stem such "excessive consumption."

The effect of this campaign is increased

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apparent reduction in the number of cases of government intimidation, fears of harassment in the forms of tax audits and other methods persist.	government support for the anti-foreign bias of Korean buying habits.
Customs Administration	
Customs officials have wide latitude to restrict or block imports within the context of Korean government exhortations to "conserve foreign exchange for national prosperity." Actions may include anything from minor time delays to the imposition of heavy duties and other charges on imports of little or no significant commercial value. In addition, unwritten and informal "guidelines" often have the effect of undercutting the value of written Customs regulations and policies.	The May 19 agreement commits R.O.K. to "transparency" in and expeditious application of customs procedures. However, significant change has yet to occur.
Almost all foods are subject to quarantine approval and/or other clearance procedures from the Ministry of Health and Social Affairs.	Food import restrictions continue. Moreover, the growing Korean "consumerist" movement is aimed primarily at imports and their alleged negative impact on Korean society, e.g., hardship to farmers, health hazards, "excessive consumption" of luxury goods.
Forced Licensing and Technology Transfer	
The Korean government requires technology licensing and transfer as a precondition to entry into the Korean market, and usually insists on designating the local licensee.	The May 19 agreement commits R.O.K. to the elimination of these requirements. However, it is too early to gauge with adequate precision Korean compliance with these requirements.

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Prohibition of Foreign Ownership and Participation	
Korean law and government practice virtually ensures that a foreign-owned enterprise will never have the opportunity to wholesale a wide variety of foods, beverages, drugs, cosmetics, publications and other products. In general, foreign companies, even those with manufacturing investments in Korea, must market their products through Korean companies. In addition, foreign ownership and participation are prohibited in certain service industies.	While this problem was addressed somewhat prior to the May 19 agreement, the Korean "Chaebol" (conglomerate) system (similar in some respects to the Japanese "keiretsu" system) has the effect of requiring U.S. joint venture partners not to do business with rival Chaebols. Chaebols require exclusive business contracts.
Intellectual Property	
Substantial progress was made in 1987 on correcting a number of serious deficiencies in the Korean intellectual property laws. However, much work and follow-up needs to be done before U.S. companies in Korea will enjoy the full benefits of the protection promised under the Agreement between the U.S. and Korea arising out of the section 301 settlement. The need for further work extends to all areas of intellectual property law, including patents, trademarks, copyrights (including protection of computer software), trade secrets, and semiconductor design protection.	Not addressed in the May 19 agreement; under consideration in separate negotiating "tracks".

PREPARED STATEMENT OF R.K. MORRIS

Mr. Chairman, Members of the Subcommittee, I am R. K. Morris and I am Director for International Trade for the National Association of Manufacturers. The Super 301 process, which was established by the Omnibus Trade and Competitiveness Act of 1988, and the Administration's decisions that flow from it are first and foremost statements of American priorities. As such, they are among the most important decisions the Administration makes in the areas of trade and international economic policy.

The 1990 Super 301 decisions are due by the end of this month. We very much appreciate the opportunity to express NAM's views on the relevant issues, and we commend you, Mr. Chairman, for providing this important and timely opportunity for an open, constructive discussion of the implications of these decisions.

On April 5, NAM wrote to Ambassador Hills, forwarding to her our statement on Japan and the Super 301 decisions of 1990. Briefly, Mr. Chairman, it is NAM's view that Japan should again be named as a priority foreign country under Section 310(a)(1)(b) of the 1974 Trade Act as amended; that the Structural Impediments Initiative should be continued for at least another year; and that new Super 301 practices should be cited for action and negotiations during the coming year.

These recommendations follow from a single premise. This is that it would be a mistake for the Administration to indicate in any way that the problems in the United States-Japan economic relationship are less serious or less important today than they were in 1989. We believe that the Super 301 decisions the Administration announced last May were excellent, and we have said so publicly on numerous occasions. We were especially pleased with the announcement of the Structural Impediments Initiative or SII. From the outset, SII was at the very least a promising technique for dealing with some of the most troubling issues between the United States and Japan. The April 5 Interim Report on SII strongly suggests that it is a technique that can produce results. If that is the case, then it would seem to us that both governments have an obligation to stick with it.

UNITED STATES MANUFACTURING'S RELATIONSHIP WITH JAPAN

In 1989 and again this year, NAM's comments on Super 301 dealt exclusively with Japan. For us, the Japanese issues are, at this time, the most critical, at least of those which can be effectively addressed bilaterally. I am not here to suggest that the United States-Japan relationship is the most important. In today's increasingly interconnected world it would be foolish to try to describe any commercial relationship that way. I will argue that the United States economic relationship with Japan is the one that our government should be most concerned about.

Japan is the world's second largest economy with a GNP well over $2.6 trillion. It is our largest trading partner after Canada and a major investor with a rapidly rising stock of assets in the United States. At the end of 1988, Japanese foreign direct investment in the United States stood at over $53 billion, which itself was a 53 percent increase over the 1987 figure of $35 billion.

Moreover, Japanese manufacturers are our leading competitors in numerous industrial sectors. In some sectors, such as certain segments of the consumer electronics industry, they now completely dominate the United States market. It would, however, be a gross oversimplification to see Japan and Japanese companies only as rivals to American firms. They are more than that. They are their customers, their suppliers, their partners, and, in some cases, their bankers.

All of these relationships represent a large and growing aspect of the economic life of both countries. Unfortunately, their aggregate is a serious, unsustainable imbalance in the relationship. The persistent United States trade deficit with Japan is only the most visible symbol of this imbalance. That deficit has held steady in the range of $50 billion dollars for the last several years. There is some evidence that it may decrease slightly in 1990, but hardly enough to suggest that these problems will henceforth take care of themselves. They will not. They cannot as long as Japan remains only half as open to foreign investment and imports as is the United States. That this is so was one of the conclusions collectively expressed by those NAM members who responded to our survey this past year on the Structural Impediments Initiative. It is also the implicit conclusion of those economists who have demonstrated:

(i) that Japan has a dramatically lower propensity to import manufactured goods than other industrial countries; and

(ii) that she engages in far less intra-industry trade than other industrial countries.

The disturbing fact is that, while the United States and Japanese economies are already interdependent and likely to grow more so, a satisfactory economic *modus vivendi* between the two countries does not exist. The naming of Japan as a Super 301 country this year is not an exercise in stigmatization. It is an acknowledgment of the importance and the urgency of improving the economic relationship between the two countries, of finding or creating a satisfactory *modus vivendi*.

REACTIONS TO THE 1989-90 NEGOTIATIONS

During this past year, the United States and Japanese governments have been engaged in negotiations over Japanese practices affecting the importation into Japan of satellites, supercomputers and forest products. These are the so-called Super 301 issues. The two countries have also been involved in intense discussions on dozens of other issues associated with the Structural Impediments Initiative. In a legalistic sense, these are separate exercises. In a practical sense, they are part of the same fabric, the same effort. Both appear to have been successful in the sense that they have produced important results, and both should be continued.

In a moment, I shall discuss the considerations which, in our view, should guide the United States Trade Representative in her selection of Japanese trade practices for the next Super 301 cases. First, Mr. Chairman, I would like to comment on the progress to date in the Structural Impediments Initiative talks.

COMMENTS ON SII

As I have already indicated, NAM regards SII as an outgrowth of the Super 301 process established by the Congress in the 1988 Trade Act. We believe it is the most important component of the overall effort to improve the United States-Japan commercial relationship, and, for that reason, we were especially pleased with the Interim Report on these talks that was released earlier this month by the United States and Japanese governments. That report bespoke an impressive commitment on both sides. Promising starts have been made in many of these areas. It is essential that these beginnings be built upon forcefully and diligently, lest they become merely yesterday's expressions of good intentions.

Phrases such as "the Government of Japan will" and "the Government of Japan is committed" feature prominently in the Japanese sections of this report. Yet those same sections give rise to new concerns. Five of these are in our view separate and compelling reasons for redesignating Japan as a priority foreign country under Super 301 and for continuing the SII negotiations.

I. Japan's Varying Levels of Interest in SII Topics . . .

First, it seems obvious to us that the Government of Japan has considerably more enthusiasm for making progress in some areas than in others. SII needs to continue to ensure that the actual results of the process are responsive to the needs of American business.

The way the report is organized, each chapter or issue group section starts with a paragraph headed "Basic Recognition." The basic recognition paragraph on land policy asserts:

> The land problem is one of the most serious domestic problems facing the Government of Japan.

By contrast, the parallel paragraph on *keiretsu* relationships starts with this far more equivocal observation:

> Certain aspects of economic rationality of Keiretsu relationships notwithstanding, *there is a view* that certain aspects of Keiretsu also promote preferential group trade, negatively affect foreign direct investment in Japan, and may give rise to anti-competitive business practices. (emphasis added)

Notwithstanding the fact that this sentence is followed by commitments to take new actions affecting keiretsus, it is reasonable to conclude that the view cited is not one that the Government of Japan has fully embraced. Yet NAM's evidence suggests keiretsus and Japanese exclusionary business practices are more troubling to United States businesses than Japan's land use policies.

II. Need To March To The Same Drum . . .

A second, related consideration affects those areas of the Interim Report that do appear to reflect a genuine Japanese commitment to change. Land use policy, cited above, is a good example. United States and Japanese commercial interests will both benefit from new policies in this area. But it is not impossible to imagine a situation in which the Japanese came up with changes in their tax laws and zoning

regulations that met the needs of Japanese firms while causing new difficulties for United States and other foreign interests.

In making this observation, Mr. Chairman, I am not suggesting that the Japanese have acted in bad faith or that they intend to. I am only pointing out that it is a mistake to assume that those in Japan who are today the allies of United States business have exactly the same interests that we do. They do not; no ally ever does. United States interests need to be a part of the process of change that is promised by the Interim Report.

III. Need To Address New Issues . . . .

We were pleased to see that in many respects SII is covering more ground than we thought it would, and it appears to be doing so successfully. It was not clear from the early SII topic headings, for example, that the negotiations would effectively address certain Japanese practices affecting the protection of intellectual property in Japan or Japanese administrative guidance. As a result of the Interim Report, we now expect progress in both of these areas.

Even so, the SII process has hardly exhausted the list of potentially divisive policies and practices that should be dealt with through the cooperative and constructive process of Structural Impediments Initiative negotiations. Japan's use of tied aid, the role of government sanctioned and/or government sponsored cartels in Japan, and certain questionable practices of Japanese investors overseas should all be included.

IV. Need to Move United States Commitment Beyond the Status Quo . . .

As you know, Mr. Chairman, SII is not just about the structural impediments in Japan. It also addresses impediments in the United States economy, which have been singled out by the Government of Japan for discussion. In most cases, the Japanese criticisms are right on the mark. To that extent, it is unfortunate that the United States Interim Report does not go farther than it does.

We would like to have seen more in the section on the United States savings rate. The section on export promotion does not even mention the Export-Import Bank, which desperately needs to be strengthened. As for the discussion of United States export controls in the report, it is helpful, but it is only a beginning. In view of the opportunity presented by the upcoming reauthorization of the Export Administration Act, it is disappointing that the Administration did not stretch further in its effort to cut this serious drag on American competitiveness.

V. Need To Follow Through . . .

With few exceptions, the substance of the SII Interim Report dealing with Japan is contained in a series of promises and proposals. Many of these are quite important and likely to be implemented. The manner in which Japan follows through on these commitments could well turn out to depend upon the level of political interest expressed on this side of the Pacific.

As indicated above, that interest can and will be measured in part by the United States action on the upcoming Super 301 decisions of 1990 and the next phase of the SII talks. To repeat, Japan should be designated a priority foreign country and the SII negotiations should continue.

In addition, Congress and the Administration together need to decide what actions here in the United States will help us get the most out of the progress that has been made. To take but one example, Japan has promised to make MITI's administrative guidance more open. Henceforth, Japan will "implement its administrative guidance in writing as far as possible, and unless there are good reasons not to do so, it will make the administrative guidance public when it is implemented," according to the Japanese section of the Interim Report.

This leads to certain questions: What will the United States Government do in response to this change? Will it ensure that published information is collected, translated, analyzed, and distributed? Will it be prepared to advise American firms of developments associated with Japanese administrative guidance? Will it be in a position to challenge Japanese authorities on the issue of "good reasons" for not making things public if it appears that a significant amount of such guidance is not being made available beyond the affected Japanese industry?

In one sense, these questions are rhetorical. It is obvious what the answers should be. Unfortunately, it is not at all clear what they will be.

NAM believes that redesignating Japan as a Super 301 country and continuing the SII talks, at least for another year, will have some important effects here. It should underscore America's own obligation to do what should be done to improve both United States competitiveness and the United States-Japan economic relationship.

CHOOSING PRIORITY PRACTICES

Surely some of the success of the 1989-90 United States-Japan trade and economic negotiations is due to the fact that they included a serious treatment of several large, structural differences between the two economies on the one hand and highly focused discussions in three sectors on the other. We see no reason not to repeat that pattern, as we explained in our recent submission to the United States Trade Representative. We did not recommend any specific practices for selection. Instead we urged the United States Trade Representative to take certain criteria into account. Briefly, these are:

(i) that the practices chosen should relate to the larger problems in the United States-Japan economic relationship; and

(ii) that they should be credible. The thought here is that we should not bite off more than we can chew or threaten obviously hollow retaliation.

Mr. Chairman, I should like to suggest a third criterion. The Administration may be aware of cases where companies are reluctant to act for fear of commercial retaliation. We need to see cases that address this issue. Section 301 has for sometime recognized that companies operating internationally generally do not, as a practical matter, have the luxury of being able to call other governments, or even rival foreign firms, to account. The threat of foreign retaliation is real, and it can more than outweigh any good feeling that might be associated with filing a case.

In light of this well appreciated reality, NAM hopes the United States Trade Representative will give special consideration to any practice which is indeed a burden on United States commerce within the definitions set out in Section 301 but which is unlikely to be challenged by any individual company for fear of retaliation. Even in such cases, of course, the interests of the affected United States firms should be taken into account.

SUPER 301 AND THE URUGUAY ROUND

The Super 301 decisions announced in 1989 reinforced the high priority that the Bush Administration correctly placed on the successful conclusion of the Uruguay Round. In general, the practices cited in Japan, India and Brazil dealt with issues being negotiated in Geneva. This year too the Super 301 decisions offer an opportunity to help pave the way for a successful Uruguay Round, but it is a different kind of opportunity.

As broad and as ambitious as the Uruguay Round is, it cannot be expected to deal with all of the trade issues that need to be addressed. Specifically, it is not a forum in which the United States can expect to achieve the important goals it must achieve with respect to the economic relationship with Japan. A clearly identifiable, separate, and (we hope) successful set of negotiations with Japan should serve to support the round in two ways:

(i) it may protect the Round from the build-up of unrealistic expectations with respect to its ability to solve the problems of the U.S-Japan bilateral relationship; and

(ii) by increasing the ability of Japan and the United States to deal effectively with the inevitable tensions of the coming year, it should make it easier for all concerned to judge the Uruguay Round on its merits when the agreements reached in Geneva are reviewed and voted on by the Congress in 1991.

CONCLUSION

Mr. Chairman it would be disingenuous to deny that citing trading partners as priority foreign countries under Super 301 can be seen as blacklisting, stigmatizing them as bad traders. Presumably, it was to avoid just such a stigma that Korea and Taiwan were as forthcoming as they were in last year's negotiations. With some countries that may still be the case.

Surely, though, we are beyond that point with Japan. The question to be decided now is not whether Japan behaved well in the last year. Clearly, Japan's leaders have made a real effort to deal with a series of potentially very divisive issues. The question today is whether we in this country will again state our trade priorities clearly. Silence is readily understood as consent, and the United States should not consent to the status quo with Japan.

Let us speak up: Let us name Japan as a priority country under Super 301. Let us continue the SII talks, and let us work hard to make our partnership with Japan an asset to both countries.

Thank you, Mr. Chairman. I would be happy to respond to questions.

Attachment.

NAM PRESIDENT TO BUSH: MISTAKE TO LET JAPAN OFF THE HOOK

WASHINGTON, DC, April 26, 1990—National Association of Manufacturers President Jerry Jasinowski urged President Bush this week to rename Japan as an unfair trading partner under the Super 301 section of the 1988 trade law.

"A decision not to name Japan as a Super 301 country this year would be a costly one," Jasinowski warned President Bush in a letter sent Tuesday.

"The Japanese would misinterpret such a decision as a lack of political will in this country to follow through with the issues already on the table," the letter continued.

"The Congress is likely to see it as the end of the cooperation on trade policy . . . that has been the hallmark of your administration . . . and some in the business community may be led to doubt the administrations commitment to international competitiveness," Jasinowski wrote.

"The Super 301 designation is not blacklisting or stigmatizing. It is simply a statement of what is important to the United States in the areas of trade and international economic policy," he continued.

"NAM and its members strongly believe that Japan should again be designated as a priority foreign country; that the Structural Impediments Initiative (SII) should be continued, at least for another year; and that new Super 301 practices should be cited," the letter went on to say.

"We believe that the actions of your administration this past year under Super 301 and SII have opened the door to genuine progress in a number of areas . . . We thank you and commend you for that effort . . . Our fear is that, if Japan is not redesignated as a priority foreign country, critical political momentum will be lost," Jasinowski wrote.

Jasinowski sent the same message to Congress in testimony Tuesday before the House Subcommittee on Commerce, Consumer Protection and Competitiveness. He commented: "To decrease pressure on Japan now is the wrong signal. We have part of the blueprint we've called for—not the building."

Copies of NAM's letter to President Bush are available by calling Laura Brown in NAM's media department at (202) 637-3087.

NAM, the nation's largest national industrial trade association, has more than 13,500 members who account for 85 percent of the manufactured products and manufacturing jobs in the United States. An additional 158,000 businesses are affiliated with NAM through its Associations Council and National Industrial Council.

PREPARED STATEMENT OF SUZANNE P. TICKENOR

PUBLIC SECTOR PURCHASES PRIOR TO THE INTRODUCTION OF SUPERCOMPUTERS FROM JAPANESE VENDORS

Good morning, Mr. Chairman. On behalf of Cray Research's Chairman, John Rollwagen, thank you for the opportunity to testify before your subcommittee today on our experiences marketing to the Japanese public sector and the United States Government's efforts to open that market under "Super 301." I have prepared a written testimony which follows and have also submitted for the record a paper prepared by Cray Research which explains in greater detail our competitive position against the Japanese supercomputer manufacturers and the barriers which have prevented us from selling to the Japanese public sector.

Cray Research, manufacturer of the world's first true general purpose supercomputer, introduced its product in the United States in 1976, made its first European public sector sale in 1977, and entered the Japanese market in 1980. Although Japanese vendors were working on various supercomputer technologies at this time, none had a commercial product available until 1983. Even though Cray was the only supercomputer vendor in the Japanese market between 1980 and 1982, no supercomputer acquisitions were made by the public sector throughout this period. Not a single sale occurred in the public sector until Japanese companies manufactured their own supercomputers in 1983. We do not know if it was official government policy to wait for indigenous suppliers, but we have no other explanation for the unwillingness of Japan's public sector to purchase supercomputers when Cray was the only available vendor. Throughout this period European and United States public sector purchases grew substantially.

Once Japanese supercomputer manufacturers began to market their systems in 1983, Japan's public sector engaged in a rapid acquisition program to fulfill consid-

erable pent-up demand. The failure of Japanese public sector entities to purchase even one supercomputer from a foreign supplier during the high growth period of 1983 to 1987 cannot be explained by any reasonable assessment of competitive factors. Japanese vendors could not argue that they had "caught up" with United States vendors in terms of supercomputer capabilities. Cray was and continues to be substantially ahead of the Japanese competition with a wide range of advanced hardware and software capabilities. Many of these are either not available or only available in a rudimentary form from Japanese vendors.

In these pivotal acquisition years, vague procedures, closed bidding practices, and a subtle, though unstated, "buy Japanese" policy effectively kept Cray Research and other United States supercomputer manufacturers out of the Japanese public sector market. In 1987 a United States Government Section 305 study found that United States firms were being excluded unfairly from Japan's government and public university market. It also concluded that deep Japanese price discounting, which had been occurring in Japanese as well as overseas markets, could seriously harm the United States industry. As a result of this study, the United States entered into market access negotiations with the Japanese.

In August 1987, these negotiations produced a Procurement Agreement. Japan agreed to implement new procurement procedures which, at least in concept, were expected to assist United States supercomputer manufacturers in gaining access to Japan's public sector market. The 1987 Agreement was intended to eliminate the bias in Japan's procurement process that had kept United States firms out of the public sector market. For example, under its terms, United States vendors were entitled to participate in the early stages of procurement planning when important discussions such as setting criteria for the final selection were made.

While the 1987 Agreement did provide transparency in the procurement process, an important first step in gaining access into Japan's public sector, it had several drawbacks. One of its most problematic limitations was that it did not require benchmarks of real workloads. Japanese public entities have regularly relied upon evaluations of theoretical peak performance numbers instead of actual performance data. Theoretical peak performance numbers are misleading, providing only a measure of the potential maximum speed a supercomputer might achieve under unusual circumstances. Using peak performance numbers is akin to purchasing an auto based on potential maximum RPM without ever testing it over the road. Instead, users must be allowed to "test drive" a supercomputer with real work in the operating environment in which the supercomputer will be installed. Use of real-world benchmarks clearly demonstrates Cray's superior performance in achieving high levels of throughput, indicating that Cray supercomputers offer a better value than Japanese supercomputers in the number of calculations that can be purchased per dollar.

While the 1987 Agreement mandated new procurement procedures, these process changes did not overcome the inadequate budgets allocated for supercomputer purchases, and the massive discounts offered by Japanese supercomputer manufacturers. These discounts to the Japanese Government and publicly funded universities have often been as large as 80 percent, reflecting the extremely low budgets the Japanese Government commits to supercomputer purchases as well as the willingness of Japanese vendors to incur large losses to enter this market.

Growth in the Japanese public sector procurements declined substantially after 1987. In 1988, the United States Department of Commerce even organized and lead four United States supercomputer trade missions to promote United States sales to Japan. Although United States sales to the Japanese private sector increased during this period, United States access to Japan's government and university supercomputer markets did not improve.

In the first formal review of the 1987 Agreement in October 1988, the United States government determined that United States supercomputer companies still faced severe obstacles in Japan's public sector market, despite the fact that competitive data showed clearly that Cray Research remained the principal supplier in the open and competitive markets of Europe and the United States. Even in Japan's private sector, where it is difficult to influence existing vendor-purchaser relationships, Cray had made considerable headway and had become the supercomputer supplier of choice to the Japanese auto industry. Additionally, when users had the final say regarding their supercomputer of choice, such as in the Japanese service bureaus, Cray machines were virtually their only choice. Only in Japan's public sector, where competitive criteria were not considered, was Cray denied access.

Practices such as (i) preference for existing vendors, which often included substantial cooperation between existing vendors and public entities in tailoring specifications to disqualify or discourage competing vendors from making bids, (ii) insuffi-

cient funding for supercomputer purchases, and (iii) massive discounting by the large vertically integrated computer manufacturers, continued to protect the public sector market from foreign penetration. The practices persisted, and the 1989 National Trade Estimate Report on Foreign Trade Barriers noted prominently the lack of supercomputer purchases in Japan's public sector. The United States subsequently listed Japan as an unfair trading partner under the Super 301 provisions of the Omnibus Trade and Competitiveness Act, citing this continuing market access problem as a principal reason.

After extensive negotiations in late 1989 and early 1990, the United States and Japanese governments agreed upon a revised Supercomputer Procurement Agreement. This 1990 Agreement addresses a number of Japan's informal barriers. For example, purchase decisions now must be based on value and performance, and not simply the lowest price. Additionally, Japanese vendors can no longer use theoretical peak performance numbers as a selection criteria. Instead, benchmarks of real workload will be required and must be conducted on existing machines. Also, the Japanese habit of bidding "future products" (i.e., not yet in production) is curtailed. Finally, low bids which are determined to impede fair competition will not be considered and the bidder will be ineligible to participate in that procurement.

Japan's public sector market is growing rapidly and gaining access to that market under open and competitive circumstances continues to be a priority for United States vendors seeking to sustain technological advances in supercomputers. Substantial growth is expected in the Japanese supercomputer market in the next five years. The total installed base in both the private and public sectors could rise to 230 systems worth approximately 1.2 billion dollars.

In the past, sales to the United States market alone could support the development of a new generation product. This is no longer the case. Development costs for Cray supercomputers are illustrative of the escalating price of remaining competitive in the industry. For example, while R&D expenditures topped ten million dollars for the CRAY-1, they are projected to reach one hundred million dollars for Cray's C-90 project, the follow-on to our present CRAY Y-MP product line. To put the Japanese market into perspective, if Cray were to capture 25 percent ($300 million) of this 1.2 billion dollar market, the additional revenue would equate to over one-third of Cray's 1989 total revenue and would be triple the estimated amount required for R&D for Cray's follow-on supercomputer project.

In addition to the direct benefit of additional revenues, opening Japan's public sector to United States supercomputer vendors is important because it provides access to a diverse user base, and it is a broad user base which is the most important asset of any supercomputer vendor. The scientists and engineers using supercomputers gain valuable insight into how to apply these systems to present day problems as well as increase system performance. As these users share their ideas and requirements with their supercomputer vendor, the vendor is able to enhance its product to better meet the changing demands of the market. Supercomputers thus act as technology receivers, transferring back to the vendor important information which can be used to accelerate system development efforts for follow-on products.

Marketshare is therefore critical not only for the revenue it generates, but also for the diverse user base it provides to the vendors and the resultant increase in know-how the vendor gains. The larger the marketshare the vendor is able to acquire, the more technology receivers the vendor is able to place, thus ensuring a continuous flow of ideas and insights necessary for continued product advancement. For this reason, access to Japan's public sector market, with so many emerging technological requirements and associated supercomputer applications represents a key component in sustaining the competitive edge for the United States supercomputer industry. The longer United States firms are unable to place their own technology receivers in the Japanese public sector, the longer they will be denied access to this rich knowledge base so important for sustaining performance leadership.

While this latest Agreement is encouraging, it is important to remember that procedural changes alone are not sufficient. The 1987 Agreement instituted new procedures to no avail. The true test of the success of this new Agreement will be in the number of sales that result. Such sales should not be a one-time occurrence. Rather, the sales must be ongoing, resulting in a significant increase in our share of the supercomputer installed base in the Japanese public sector commensurate with our marketshare in public sector markets outside of Japan. Only then can the Agreement be considered a success and the Japanese public sector market considered open. If the United States is to remain competitive then we must have the most advanced products. To produce these advanced products we must have access to all the major world markets, especially Japan's.

The Japanese Public Sector:
Problems and Prospects for U.S. Supercomputer Vendors

Cray Research, Inc.

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THE BENEFITS OF SUPERCOMPUTERS

I. INTRODUCTION

Cray Research, Inc. (CRI) introduced the world's first supercomputer, the CRAY-1, in 1976. Until the introduction of the CRAY-1, conventional computer processing, or scalar processing, was serial, i.e., only one operation was performed at a time. The speed at which a computer could solve a problem was limited by the speed of serial operations, and serial operations quickly were (and still are) constrained by the style of the electronics and packaging technology.

Cray Research, Inc. introduced the world's first supercomputer.

The CRAY-1 was able to overcome many of the limitations of serial operations through development of an architecture well suited to the computational requirements of many engineering and scientific problems. Most engineering and scientific problems are composed of matrices of numbers requiring similar calculations to be performed on every number in the matrix. Traditional scalar processing of these numbers can be bypassed, to some extent, by performing simultaneous operations on many, if not all, of the numbers in the matrix. This simultaneous performance of operations is known as vector processing and brings about substantially improved computational performance.

Many other improvements have been introduced since 1976, including, but not limited to, parallel processing, high speed input/output (I/O) channels, networking, and user friendly software. Even with these improvements, supercomputer vendors continue to search for architectural designs, components, materials, and both operating system and applications software, to improve the speed and performance of future systems.

II. WHY SUPERCOMPUTING?

Supercomputers leverage productivity throughout many of the world's modern economies. Today, oil and gas production, aerospace development, computer and electronics design, computer services, weather forecasting, computational ocean sciences, nuclear energy development, vehicle crash analysis, pharmaceutical and chemical development, and structural analysis are just a few examples where supercomputers have made important productivity contributions.

Supercomputers leverage productivity throughout many of the world's modern economies.

The productivity gains are not realized in the same manner in all industries. For some industries a supercomputer provides a unique opportunity to enter the market earlier with a new product. In other cases a supercomputer can lower design costs, shorten development cycles, or improve quality through the simulation of literally hundreds of thousands of tests. Finally in some circumstances, a supercomputer will permit a problem to be completed of the size and magnitude that just cannot be done elsewhere. It is these problems which are pushing the limits of science and engineering. In all these cases, the speed and large computational power of a supercomputer permits the simulation of physical phenomena.

III. IMPORTANCE OF GAINING ACCESS TO JAPAN'S PUBLIC SECTOR MARKET

By the end of 1989, Japan's public sector, including both the national laboratories and public universities had installed approximately 27 Japanese systems with an estimated value at list prices of approximately 66 billion yen. It is our estimate that these systems were purchased at an average discount of up to 80 percent limiting government expenditures for these systems to approximately 13 billion yen. (It is difficult to determine the precise value in U.S. dollars since these purchases occurred over a period of time when the dollar value of the yen changed frequently.) In contrast, during that same period only two U.S. supercomputers were installed in the Japanese public sector, one by the Ministry of International Trade and Industry (MITI) and the other by the Tokyo Institute of Technology (TIT). The two U.S. systems were purchased under an emergency import budget to diminish U.S./Japan trade friction.

Japan's public sector market is growing rapidly and gaining access to that market under open and competitive circumstances is becoming more important for U.S. vendors seeking to sustain technological advances in supercomputers. In the past, sales to the U.S. market alone could support the development of a new generation product. This is no longer the case. Development costs for each generation of CRI's supercomputers are illustrative of the escalating price of remaining competitive in this industry. For example:

- $10.1 million was required for the CRAY-1
- $33 million was required for the CRAY X-MP
- $52 million was required for the CRAY-2
- $63 million was required for the CRAY Y-MP
- $100 million is projected for the Cray C-90 project
- $200-250 million is projected for the CRAY-3

In the past, sales to the U.S. market alone could support the development of a new generation product. This is no longer the case.

As of the end of 1989 the total number of supercomputers in Japan's private and public sectors was approximately 110. As shown in Table 2-1, substantial growth is expected in the Japanese supercomputer market through 1993 and the total installed base in both the private and public sectors could rise to 230 systems with a potential value of 1.2 billion dollars.

Table 2-1

Projected Increases in Public and Private Purchases of Supercomputers in Japan 1989-1993

	1989	1993	% Growth
Total Installed Base	110	230	209%
Public Sector	30	65	217%
(National University)	(14)	(29)	
(National Laboratory)	(16)	(36)	
Private Sector	80	165	206%
(Industry)	(65)	(136)	
(Other)	(15)	(29)	

Source: Cray Research, Inc.

In addition to the direct benefit of additional revenues, opening up Japan's public sector to U.S. supercomputer vendors is important because it provides access to a diverse user base, and it is a broad user base which is the most important asset of any supercomputer vendor. The scientists and engineers using supercomputers gain valuable insight into how to apply these systems to present-day problems as well as increase system performance. As these users share their ideas and requirements with their supercomputer vendor, the vendor is able to enhance its product to better meet the changing demands of the market.

The loss of technological leadership in supercomputing in the U.S. would have consequences far beyond the fortune of a single vendor.

Supercomputers thus act as "technology receivers," transferring to the vendor important information which can be used to accelerate system development efforts for follow-on products. Marketshare is therefore critical not only for the revenue it generates but, more importantly, for the diverse user base it provides to the vendor and the resultant increase in know-how the vendor gains. The larger the marketshare a vendor is able to acquire, the more "technology receivers" that vendor is able to place thus ensuring a continuous flow of the ideas and insights necessary for continued product development. For this reason, access to Japan's public sector market, with so many emerging technological requirements and associated supercomputer applications represents a key component in sustaining the competitive edge for the U.S. supercomputer industry. The longer U.S. firms are unable to place their own "technology receivers" in the Japanese public sector, the longer they will be denied access to this rich knowledge base so important for sustaining performance leadership.

Finally, supercomputers are used in virtually every facet of science and engineering. A corporation, university, or country should have access to the best product available, otherwise the quality of the research is lessened. Accepting machines solely on the basis of discounting could cost the organization more than time as the quality and pace of the work falls behind. The loss of technological leadership in supercomputing in the U.S. would have consequences that go far beyond the fortunes of a single vendor. If the United States is to remain competitive then we must have the most advanced products. To produce those products we must have access to all the major world markets, especially Japan.

CRAY RESEARCH, INC.'S COMPETITIVE EDGE

I. INTRODUCTION

The historical assessment of the Japanese public procurement of supercomputers, presented in the next chapter entitled "Barriers to Entry," shows that U.S. vendors have faced enormous obstacles in attempting to sell to the Japanese public sector. Whether these procurement practices represent a specific industrial strategy promoted by the Government of Japan (GOJ), or are merely an unintended consequence of Japanese budgeting and funding priorities is not important. The net effect is that U.S. firms have been excluded from the growing public sector market in Japan for supercomputers. Access to this market is essential if the U.S. is to maintain the technological edge in world competition for supercomputer sales.

Outside of Japan, benchmarking evaluations point to Cray as the supercomputer of choice.

Critics of this assessment could argue that circumstances have changed and that more recent procurements reflect the selection of superior Japanese supercomputers, if not in terms of raw computing power, at least from a cost/performance perspective. This assessment, however, is not borne out by a review of the relevant data. Cray Research, Inc.'s (CRI) strength in the world public and private sector markets outside of Japan, the preference of paying users at computer service bureaus, and benchmarking evaluations of real-world applications all point to CRI as the supercomputer of choice.

II. MARKET ANALYSIS

Perhaps the most compelling arguments that CRI represents the dominant choice among supercomputer customers are the decisions made in the marketplace. Although sales to the newly industrialized world are rising, the worldwide installed base is almost entirely restricted to North America, Europe, and Japan.

Figure 3-1 presents an overview of the worldwide customer installed base for supercomputers as of December, 1989. Note that CRI holds 63 percent of the installed base worldwide. When the installed base is adjusted to reflect the number of central processing units, a measure of computational power, CRI holds 79 percent (Figure 3-2) of the installed base worldwide. Although this large world market share reflects a strong position in the United States, it closely parallels CRI's success in Europe. As shown in Figures 3-3 and 3-4, CRI holds 84 percent of the installed base in Europe and 81 percent of the installed base in North America. The lower figures for CRI's worldwide market share, as compared to Europe and the United States, are the direct result of relatively few sales in Japan.

CRI holds 63% of the installed base worldwide.

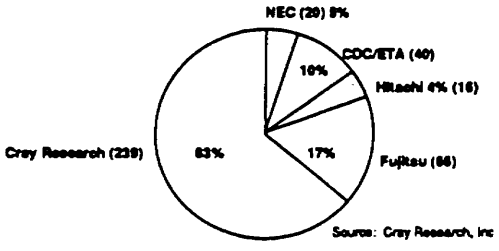


Figure 3-1

Worldwide Supercomputer Customer Installed Base by Vendor - Systems (1989)

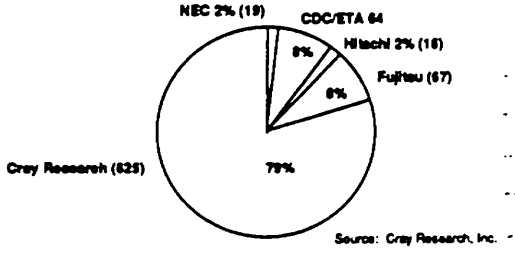


Figure 3-2

Worldwide Supercomputer Customer Installed Base by Vendor - CPUs (1989)

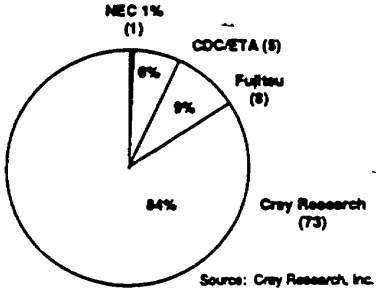


Figure 3-3

Supercomputer Customer Installed Base - Europe (1989)

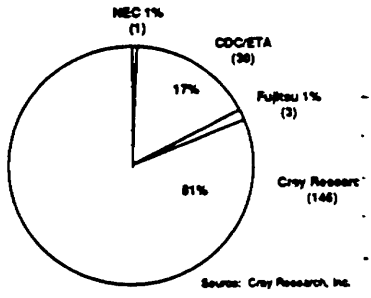


Figure 3-4

Supercomputer Customer Installed Base - North America (1989)

CRI's large share of the world supercomputer market outside of Japan does not reflect a niche of some specialized applications nor is it solely focused on the government and academic sectors. As shown in Figure 3-5, CRI's installed base is highly diversified including installations in the automotive, aerospace, nuclear, petroleum, and chemical industries.

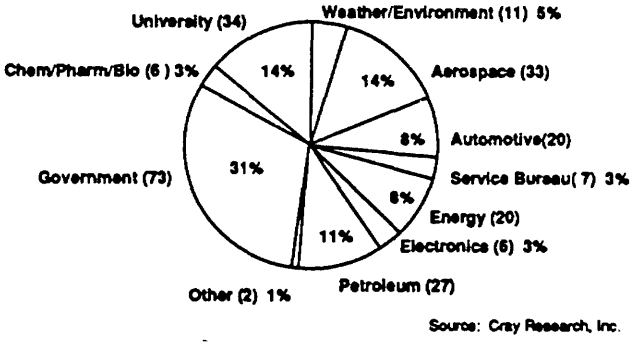


Figure 3-5

Cray Research Supercomputer Customer Installed Base by Industry (1989)

In the large European market, Japanese supercomputers have not been able to make much headway.

A. CRI's Supercomputers Dominate the European Market

CRI does not have any unique advantage in Europe in competing with Japanese vendors. CRI and the Japanese vendors, NEC, Hitachi, and Fujitsu, are all foreign competitors in the European market. In addition, the supercomputer market in Europe is an open and competitive environment with users that have a large and diversified range of computational requirements. Furthermore, with 87 installed systems, the European market is large enough be a reliable test of CRI's superior competitive position vis-a-vis the Japanese vendors. In the large European market, Japanese supercomputers have not been able to make much headway even when large discounts are offered. For example, Daimler-Benz selected a Cray machine even though the company was offered three Fujitsu VP-100's for the price of two, and has since ordered a second Cray system.

In this open market environment, Japanese vendors have only made nine sales, eight by Fujitsu and one by NEC, and two of these sales were made to public universities by offering discounts well below 50 percent of list prices. Furthermore, since some of the Fujitsu sales were made under marketing arrangements with the German company Siemens, Fujitsu was able to take advantage of a "buy German" requirement. Germany also requires its states to rotate sales among different vendors which gave the Japanese vendors a few sales that would not normally have been possible through a purely competitive evaluation.

In the Japanese public sector, however, CRI has been able to obtain only one procurement.

Even though the installed base for supercomputers in Japan is roughly equivalent in size to the European market, the respective market shares of U.S. and Japanese vendors in Japan are dramatically different. As shown in Figure 3-6, with a total installed base estimated at 110 supercomputers, U.S. firms (CRI plus one machine sold by ETA) have only been able to obtain 17 percent of the total market. Virtually all of CRI's success has occurred in the private sector where competitive concerns and market forces can play a much stronger role. In the public sector, however, CRI has been able to obtain only one procurement and this sale was a one time purchase by MITI through a supplemental budget.

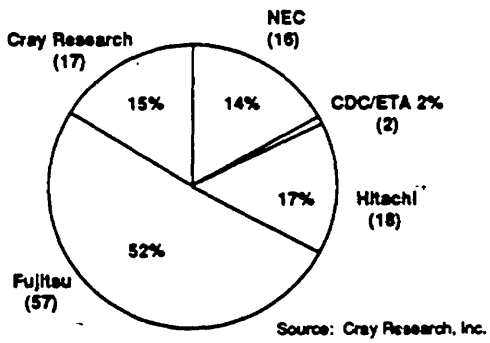


Figure 3-6

Supercomputer Installed Base by Vendor - Japan (1989)

B. Where Competition Exists Users Select CRI Supercomputers

CRI's success has been in the "user driven" markets in the private sector where competitive pressures can overcome a preference for a Japanese vendor. Nissan, Honda, Toyota, Mazda, and Mitsubishi have all purchased supercomputers from CRI and customer survey data show that users are satisfied. More importantly, the automotive market is highly competitive and the selection of a CRI supercomputer represents a business decision driven by the need to meet a wide range of engineering and production objectives.

For these companies CRI supercomputers are the supercomputers of choice.

Recent decisions by Toyota and Mazda represent good examples of Cray meeting a key requirement not possible by supercomputers from Japanese vendors. Both of these companies switched supercomputers last year. According to a report that appeared in Asahi Shimbum on June 15, 1989, Toyota had been using a Fujitsu supercomputer, while Mazda had been using a NEC. When the two companies wanted to use a crash analysis program developed by the French company ESI on their respective supercomputers, they found that the software could not run on their existing machines.

The management of Japan's leading automotive companies understand that the purchase of a Japanese supercomputer would place their companies at a competitive disadvantage in the world automobile market. Note also that in contrast to Japanese procurements in the public sector, theoretical peak performance benchmarks on so-called "paper machines" i.e., supercomputers which are not yet in production, are not acceptable within the automotive industry when competing for a sale. The automobile industry insists on benchmarks which can be performed on machines currently in production with real-world problems. For these companies, CRI's supercomputers are the supercomputers of choice even when Japanese vendors offer substantial discounts.

Another excellent example of a major Japanese firm which relies on CRI machines is Toshiba. Toshiba performs simulations on Cray supercomputers as a cost-effective alternative to traditional electronics design. Simulations are used for electronics problems such as fault simulation, memory design, heat flow analysis, circuit optimization, and many other applications.

The electronics design work Toshiba has accomplished on its Cray machines have been so successful that the company recently stated publicly that, "A Cray computer system has helped Toshiba reach the top of the 1-Megabit DRAM market."

Toshiba's research and development efforts are not limited to electronics design. Toshiba engineers and scientists make extensive use of Cray supercomputers for research in fluid dynamics and structural analysis. Toshiba is so convinced that Cray supercomputers outperform all competition from Japanese vendors that the company recently purchased the top of CRI's product line, a multiprocessor CRAY Y-MP system. At the time of contract, this particular sale represented the largest commercial contract in CRI's history. This sale was made by CRI even though NEC offered Toshiba its SX-3, which is planned to be available in mid-1990, under conditions in which no payment was required until Toshiba had an opportunity to determine if the machine was acceptable.

Even though NEC offered substantial concessions ... MRI still selected a CRI machine.

III. SERVICE BUREAUS

Service bureaus represent the most user driven market for supercomputers. Service bureaus purchase computers and maintain a center at which users can purchase time to run either proprietary or third-party software. Within Japan, there are three such service bureaus with CRI supercomputers, Century Research Center, Mitsubishi Research Institute, and Recruit Corporation. Century Research was the first Japanese firm to purchase a CRI product, the CRAY-1 in 1979, and in January, 1988 purchased a CRAY X-MP/18. Cray machines have been extremely popular at Century Research and have utilization rates at near capacity.

The pattern at Mitsubishi Research Institute (MRI) is similar to Century Research. MRI recently installed a CRAY Y-MP2/116 system. MRI was attracted to CRI's product because of networking capability, the wide availability of third party software applications and ultimately because of the profitability from the sale of time on a Cray machine. NEC offered MRI their SX-2. Even though NEC offered substantial concessions by agreeing to give MRI a new computer room, pay for all power and maintenance costs, and only charge MRI for the hours used, MRI still selected a Cray machine.

Recruit Corporation has two CRI systems, a CRAY X-MP/216 installed in 1986 and a CRAY X-MP/18 installed in 1987. Recruit also has a Fujitsu VP-400 and a NEC SX-2. The VP-400 was sold for a heavy discount and the NEC supercomputer was provided at such a large discount that it was virtually free. The Japanese vendors wanted these machines placed at Recruit in the hope that they could encourage academics at Japanese universities to use them to develop software applications. Nevertheless, the Japanese machines are infrequently used and Recruit's profitability is almost entirely tied to the operation of the Cray machines.

The service bureaus play an important role in supporting the Japanese electric utility industry by providing time on Cray machines for Japanese vendors who do engineering design and construction of nuclear reactors and boilers designed for fossil fuels. Analysis of reactor operations, safety analysis, and specialized structural assessments are routinely performed on CRI machines by contractors to the Japanese utilities, such as Mitsubishi Electric and Toshiba. Government funded corporations and agencies, such as the Power Reactor and Nuclear Corporation (PNC) have many supercomputer research requirements. It should be noted that even though PNC is considered an entrenched Fujitsu "shop," when it comes to performing critical research and development work for the nuclear power industry, contractors to this agency generally turn to Cray Research machines at the service bureaus.

The service bureaus represent the best example of an open and competitive market. It is not surprising that ... CRI's machines are the computers of choice.

The service bureaus represent the best examples of an open and competitive market. It is not surprising that in this market, CRI's machines are the computers of choice. In the service bureau market, users are not held captive to a decision made by senior managers at a university or research institute. If the computational services offered are not acceptable, users will not buy them. The success of CRI machines in service bureaus make a strong case that the public sector is more restrictive than the private sector when considering the purchase of a supercomputer from a U.S. vendor.

IV. WHY DO CRI'S PRODUCTS OUTPERFORM JAPANESE SUPCOMPUTERS?

The best test of the performance of CRI's machines are the evaluations made by users in an open market. Clearly, in the United States and Europe, as well as the user driven markets in Japan, CRI's machines are very competitive and generally are viewed as offering superior technology. This is because users evaluate the total product.

CRI holds the dominant position in the supercomputer market by delivering a total product.

CRI holds the dominant position in the supercomputer market by delivering a total product which balances CPU speed, memory, I/O, software, applications, and network connections. Japanese vendors, however, often have used just peak performance numbers as evidence that their machines are competitive. These numbers generally reflect only the capability of a single CPU to perform floating point operations on relatively small kernels i.e., a few lines of computer code. In addition, achieving a high theoretical peak performance on a kernel does not represent a unique technological breakthrough. Both U.S. and Japanese vendors understand the technology involved in obtaining high processing rates on a single CPU.

The real challenge is to achieve high computational speed with the following characteristics; (1) a balanced architecture than can solve a wide range of engineering and scientific problems, (2) a robust operating system accessible to users from other hardware environments, and (3) a large volume of "ready to use" applications software. These are some of the more important factors which give CRI products a competitive advantage.

A. Balanced Architecture

Throughput on the CRI machines is high because of a fast access rate from main memory and a much larger channel (I/O bandwidth) for moving information stored on disks or coming in from remote (network) locations. The high access rate on the CRAY Y-MP actually represents the more difficult technological challenge since it can only be achieved through smaller, more efficient, and densely packed components. These features, as well as parallel processing (more than one CPU working on the same code), are only some of the architecture design characteristics which other vendors have not been able to replicate.

₂. Operating System, Networking, and Connectivity

CRI supercomputers offer a fully functional open environment perating system based on UNIX System V which is not vailable from any Japanese vendor. This means users from eterogenous computing environments, whether workstation mainframe, can perform key operations such as interactive ccess and file transfer under standard "rules of the road." To dapt UNIX for science and engineering computing, CRI has plemented selected features of Berkeley UNIX and made ex- nsions of UNIX for performance, batch services, distributed vices, security, tape support and numerous other areas. RI's UNICOS operating system leads the industry in perform- ice and servicability for science and engineering capability.

Japanese vendors do not now have parallel processing hardware.

nning "underneath" UNICOS is the CFT77 Fortran compiler h autotasking which automatically converts programs to run parallel across multiprocessor systems. This particular ature can save days or even months of a programmer's time ice he does not now have to manually convert a large Fortran rogram to run efficiently on a parallel machine. Japanese ndors do not now have parallel processing hardware or the oftware to convert programs to run on parallel machines.

Networking and connectivity also contribute to CRI's total roduct capability. With CRI, users know they can perform computational tasks in a common operating environment which offers access over a variety of networks, direct and interactive access to the supercomputer, and a mature, stable, optimized oftware in terms of language compilers and application codes.

₃. Applications Software

addition to CRI system and applications software, a wide ariety of third-party and public domain applications programs an be run on Cray supercomputers. These codes can take mmediate advantage of the higher performance of parallel rocessing available on the CRAY Y-MP models. Over 500 different applications, including fluid dynamics, circuit simula- on and design, structural analysis, quantum chemistry, artifi- ial intelligence, genetic engineering, and petroleum engineer- ng and recovery are now available.

V. PERFORMANCE MEASURES

Supercomputers are regularly evaluated through "benchmarks," a measure of a machine's performance. A critical question is what benchmark should be used to evaluate performance when comparing CRI's machines to those of other vendors, i.e., what benchmark most closely reflects workload in a real-world environment.

Japanese public institutions often specify theoretical peak performance criteria, rather than real workload based benchmarks.

In many cases, benchmarks are limited to calculations of processing times for specific tasks. These processing times can vary widely depending upon the nature of the calculations involved, the way the computer code is written, and the software and hardware available. However, supercomputers do much more than simply make calculations through the use of a central processing unit or units. Supercomputer performance in a real-world environment also includes storage, transmission, and presentation of information. Ideally then, a benchmark should consider all those factors and represent a real workload sample.

To date, when Japanese public institutions have procured supercomputers, they have often specified theoretical peak performance criteria rather than real workload based benchmarks. Use of such real-world benchmarks would demonstrate CRI's superior performance in achieving high levels of throughput, i.e., performing a large volume of real work in a short period of time. As discussed below, theoretical peak performance numbers can be misleading, providing only a measure of the potential maximum speed a supercomputer might achieve under unusual circumstances. Using peak performance numbers as a criteria is akin to purchasing an automobile based on potential maximum RPM without ever testing its performance over the road.

A. Livermore Loops

One of the most common benchmarks is the Livermore Loops. This benchmark is a collection of 24 sets of Fortran kernels, i.e., a few lines of computer codes for solving a single equation.

When running the Livermore Loops no changes are permitted in the benchmark code to improve its efficiency. As in all benchmarks, there are important limitations that do not adequately describe the performance of the total product. Nevertheless, CRI's supercomputers consistently deliver more performance on Livermore Loops than supercomputers from other vendors. A comparison of supercomputer performance using Livermore Loops for three Japanese vendors and CRI machines is presented in Table 3-1.

CRI's supercomputers deliver more performance than supercomputers from other vendors.

Table 3-1

Average Performance of Livermore 24 Loops
MFLOPS[1]

	CRAY			Hitachi	NEC	Fujitsu
	X-MP/1	X-MP/4	Y-MP8	S-820/80	SX-2A	VP-200
Arithmetic Average	89.7	328	938	256	210	59
Relative Ratio	1.0	3.8	10.5	2.8	2.3	0.66
Harmonic Mean Values	25.3	92.6	237	45.2	22.3	10.5
Relative Ratio	1.0	3.6	9.4	1.8	0.88	0.42

[1] Millions of floating point operations per second
Source: Cray Research, Inc.

Summary data of the Livermore Loops in Table 3-1 show the performance of selected supercomputers using an arithmetic average and harmonic mean values. Since some of the Livermore Loops are relatively simple calculations, the arithmetic average does not provide a good measure of actual workload accomplished. In contrast, the harmonic mean values (the average MFLOPS for all the kernels with each kernel executing the same number of floating-point operations) weigh each kernel according to the volume of work accomplished. When harmonic mean values are used, CRI's CRAY X-MP/4 and CRAY Y-MP8 models with parallel processing demonstrate performance levels that are well over 50 percent higher than any machine from the Japanese vendors. The only Cray model that did not outperform the Japanese machines was the seven year old single processor CRAY X-MP/1 system which is no longer in production. All the machines from the Japanese vendors were released within the last two years.

B. LINPACK One Hundred by One Hundred

One of most widely quoted benchmarks is the LINPACK 100 by 100. This is a solution of a system of 100 equations with 100 unknowns. As in the example above done on the Livermore Loops, no changes were allowed in the LINPACK 100 x 100. However, the supercomputer may automatically generate optimized code that itself accesses special hardware features.

CRI's use of available theoretical performance was far superior.

The results of the LINPACK 100 by 100 are presented in Table 3-2. As in the case of Livermore Loops, CRI machines dominate the top of the list in actual performance, holding the first 12 positions. For all supercomputers evaluated, the LINPACK 100 by 100 yields results in actual performance levels that are relatively small when compared to each machine's theoretical peak. Nevertheless, CRI's use of available theoretical performance, as shown in the last column, was far superior to that of machines from other vendors. The one exception is the eight processor CRAY Y-MP system which had the highest actual performance at 200 MFLOPS but only used 7 percent of its theoretical peak performance. As discussed in more detail below in the section on Dongarra's TPP benchmark, CRI's parallel processing machines will deliver actual workload at an extremely high percentage of their theoretical peak performance in most real workload environments. Parallel processing is still not available from any Japanese vendor.

Table 3-2

LINPACK Using all Fortran
100 x 100
MFLOPS

Computer	# of Processors	Actual Performance MFLOPS	Theoretical Peak Performance MFLOPS	Actual Performance as a Percent of Theoretical Peak (%)
CRAY Y-MP/832	8	200	2667	7
CRAY Y-MP/832	4	185	1333	14
CRAY X-MP/416	4	149	940	16
CRAY Y-MP/432	2	129	667	19
CRAY X-MP/416	2	103	470	22
CRAY Y-MP/832	1	84	333	25
CRAY-2S/4-128\	4	82	1951	4
CRAY X-MP/416	1	66	235	28
CRAY-2/4-256	4	62	1951	3
CRAY-2S/4-128	2	56	976	6
CRAY X-MP/14se	1	53	200	25
CRAY-2/4-256	2	48	976	5
NEC SX-2	1	43	1300	3
CRAY-2S/4-128	1	41	488	8
CRAY-2/4-256	1	38	488	8
NEC SX-1	1	36	650	6
Hitachi S-820/80	1	36	3000*	1*
NEC SX-1E	1	32	325	10
CONVEX C-240	4	27	200	14
CRAY 1S	1	27	160	17

*From Hitachi product information

Note: LINPACK 100x 100 is solved without any changes to LINPACK software. Problems solved are a system of 100 linear equations with 100 unknowns.

Source: Jack J. Dongarra, "Performance of Various Computers Using Standard Linear Equations Software," October 12, 1989. Computer Science Dept., Univ. of Tennessee, and Technical Memo No. 23, Argonne National Laboratory, February 9, 1990.

C. Dongarra's Toward Peak Performance (TPP)

Although no benchmark will reveal a supercomputer's genuine capabilities as well as real workload, Jack Dongarra from Oak Ridge National Laboratory has been working on several benchmarking estimators that at least reflect some aspects of a real workload environment. Dongarra collected the results of solving a system of 1000 equations with 1000 unknowns. For this particular benchmark, the manufacturer was allowed to make any software changes to solve the problem. It is as if the manufacturers were only told they needed to get from point A to B and they could then optimize their solution to take advantage of the best features of their hardware and software.

CRI had nine out of ten best performing benchmarks.

The results of Dongarra's "toward peak performance" (TPP) benchmark are shown in Table 3-3. In terms of actual performance, CRI's products had nine out of the ten best performing benchmarks and the top five machines were CRI machines. More importantly, in the important category of actual performance as a percent of theoretical peak performance, many of CRI's products delivered actual performance close to or above 90 percent. The only Japanese machine that came close was Fujitsu's VP-200 which achieved 79 percent of its theoretical peak. As pointed out above, there are serious limitations to any benchmark, but Dongarra's TPP represents a more realistic representation than most because of the large size of the calculation and the fact that the manufacturers were allowed to optimize solutions.

Table 3-3

Toward Peak Performance
MFLOPS

Computer	# of Processors	Actual Performance MFLOPS	Theoretical Peak Performance MFLOPS	Actual Performance as a Percent of Theoretical Peak (%)
CRAY Y-MP/832	8	2144	2667	80
CRAY-2S	4	1406	1951	72
CRAY Y-MP/832	4	1158	1333	87
CRAY-2S	3	1084	1463	74
CRAY Y-MP/832	3	887	1000	89
NEC SX-2	1	885	1300	68
CRAY X-MP/4	4	822	940	87
CRAY-2S	2	741	979	76
CRAY X-MP/4	3	626	706	89
CRAY Y-MP/832	2	604	667	91
Hitachi S-810/20	1	N.A.	840	N.A.
Amdahl 1400-E	1	N.A.	1714	N.A.
Amdahl 1200-E	1	N.A.	857	N.A.
Amdahl 1400	1	521	1142	46
IBM 3090/600J VF	6	540	828	65
Amdahl 1100-E	1	N.A.	571	N.A.
Amdahl 1200	1	424	571	74
Fujitsu VP-200	1	422	533	79
NEC SX-1	1	422	650	65
CRAY X-MP/4	2	426	470	91
IBM 3090/600J VF	5	458	690	66
CRAY-2S	1	384	488	79
CRAY-2/4-256	1	360	488	74
IBM 3090/400J VF	4	370	552	67
CRAY Y-MP/832	1	308	333	92
IBM 3090/300J VF	3	284	414	68
NAS AS/EX 90	3	281	363	89
Amdahl 1000	1	248	286	87
Amdahl 800-E	1	N.A.	286	N.A.
NEC SX-1E	1	221	325	68
CRAY X-MP/4	1	218	236	93
IBM 3090/380J VF	3	282	414	68
CDC Cyber 205	1	186	400	46
CRAY X-MP 1/4a	1	184	210	88
IBM 3090/200J VF	2	182	276	66
IBM 3090/280J VF	2	181	276	66
NAS AS/EX 80	2	173	242	71
CONVEX C-240	4	166	200	83
Amdahl 800	1	133	142	94
CDC Cyber 205	1	113	200	57
CRAY-1S	1	110	160	69

N.A. = not available

Source: Jack J. Dongarra, "Performance of Various Computers Using Standard Linear Equations Software," October 12, 1988 Computer Science Dept., Univ. of Tennessee, and Technical Memo No. 23, Argonne National Laboratory, February 8, 1990.

D. "Perfect" Benchmarks

To answer the need for a more comprehensive method to evaluate supercomputer performance in a real-world environment, industry and academic affiliated representatives and the Center for Supercomputer Research and Development (CSRD) at the University of Illinois collected an industry-wide set of 13 applications programs to measure supercomputer performance. The suite of 13 programs, called the Perfect Benchmarks, are representative of the workloads running on installed supercomputers today.

The Perfect Benchmarks are representative of the workloads running on installed supercomputers.

The benchmark suite was defined by representatives from CSRD, IBM, the California Institute of Technology, the Houston Area Research Center (HARC), and Cray Research, Inc. The 13 programs, totaling over 60,000 lines of Fortran code, are from four application areas: fluid dynamics, physics and chemistry modeling, engineering design, and signal processing. These application areas comprise several of the primary uses of supercomputers worldwide. CSRD administered and reported performance results of the Perfect Benchmarks on 22 computer systems, including supercomputers from Cray Research, Fujitsu, Hitachi, NEC and IBM, and a number of minisupercomputer and workstation vendors. Table 3-4 lists the baseline performance for one central processing unit (CPU) of a CRAY Y-MP system, a Fujitsu VP-100, a Hitachi S-820/80, IBM 3090-600S/VF and a NEC SX-2.

Table 3-4

Perfect Benchmarks

Baseline Performance Results			
Vendor	**Machine**	**Average MFLOPS**	**Price/Performance**
Cray Research	Y-MP 1 CPU	50	0.10
Fujitsu	VP-100	10	0.45
Hitachi	S-820/80	8	3.21
IBM	180S/VF	8	0.41
NEC	SX2/400	25	0.61
(Price/performance is in $M/MFLOP)			
(Price is list price as of December, 1989)			

Source: Center for Supercomputing Research and Development at the University of Illinois

One CPU of a CRAY Y-MP system is 3.8 times faster than a NEC SX-2 and eight CPUs of a CRAY Y-MP are over 16 times faster.

In the baseline performance test only those changes necessary to make the codes run on a vendor's system were allowed; no manual optimization changes were permitted. The results show that one CPU of a CRAY Y-MP system is twice as fast as the NEC SX-2, five times faster than the Fujitsu VP-100 and six times faster than the Hitachi S-820/80 for the average MFLOPS (millions of floating-point operations per second) calculated for these 13 codes. Table 3-5 lists the optimized Perfect Benchmarks for one, two, four, and eight CPUs of a CRAY Y-MP system, for an IBM 3090-600S/VF, and a NEC SX-2. (Fujitsu and Hitachi did not submit optimized results to CSRD.) The optimized results show that one CPU of a CRAY Y-MP system is 3.8 times faster than a NEC SX-2 and eight CPUs of a CRAY Y-MP system are over 16 times faster than the NEC SX-2. The other results from the report show that:

- The CRAY Y-MP systems obtained the best baseline performance, the best optimized performance and the most speedup due to optimization.

- The CRAY Y-MP systems provide the highest performance for each of the 13 programs, with the baseline performance up to 330 MFLOPS (versus 226 MFLOPS on the Hitachi S-820/80 for the same code) and optimized performance up to 1.1 GFLOPS (versus 33 MFLOPS on the NEC SX-2 on the same code). The highest NEC SX-2 optimized performance on one code was 136 MFLOPS versus 595 MFLOPS for the eight-CPU CRAY Y-MP system, 310 MFLOPS for the four-CPU CRAY Y-MP system and 161 MFLOPS for the two-CPU CRAY Y-MP system for the same code.

- Twelve (of thirteen) optimized programs demonstrated significant speedup with CRI's Autotasking. The average speedup was four times with eight CPUs.

Table 3-5

Perfect Benchmarks

Optimized Performance Results			
Vendor	Machine	Average MFLOPS	Price/Performance
Cray Research	Y-MP 1 CPU	130	0.039
	Y-MP 2 CPUs	234	0.028
	Y-MP 4 CPUs	385	0.028
	Y-MP 8 CPUs	553	0.033
IBM	3090-600S/VF	14	0.990
NEC	SX-2	34	0.450
(Price/performance is in $M/MFLOP) (Price is list price as of December, 1989)			

Source: Center for Supercomputing Research and Development at the University of Illinois

Published results by Japanese analysts confirm that CRI delivers superior performance.

In the price/performance area, $million/MFLOP with the prices for each vendor defined as the list price as of December 1989, one CPU of the CRAY Y-MP system was over ten times better in price/performance than the NEC SX-2 and two CPUs of the CRAY Y-MP system were 15 times better than the cost/performance of the NEC SX-2 for the optimized performance results. In the baseline performance results, one CPU of the CRAY Y-MP system was six times the price/performance of the NEC SX-2.

B. Real-World Workload

Published results by Japanese analysts confirm that CRI delivers superior performance in a real-world workload environment. An article by Kozo Fujii and Yoshiaki Tamura of the Japanese Institute of Space and Astronautical Science (ISAS) presented results of computational fluid dynamics calculations on CRI's CRAY Y-MP and several machines from Japanese vendors. The project was carried out cooperatively with the United States Office of Naval Research (ONR), but the computer code was developed by Kozo Fujii at ISAS. The results

are presented in Figure 3-7 and show that CRI's CRAY Y-MP 8/832was more than twice as fast as the nearest Japanese competitor, the Hitachi S820/80. Here CRI's compiler with autotasking, which automatically takes some of the code and processes it in parallel, plus some directed parallelization, was able to take a code entirely developed in Japan and achieve speeds much higher than available from the Japanese vendors.

CRI's CRAY Y-MP8/832 was more than twice as fast as the nearest Japanese competitor.

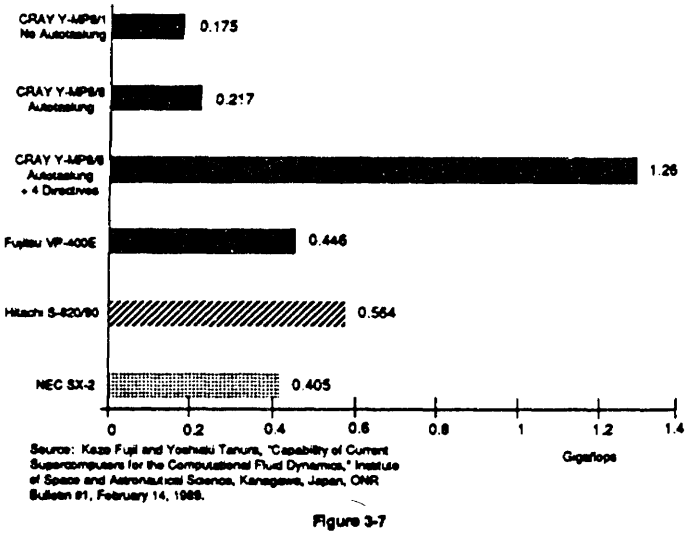
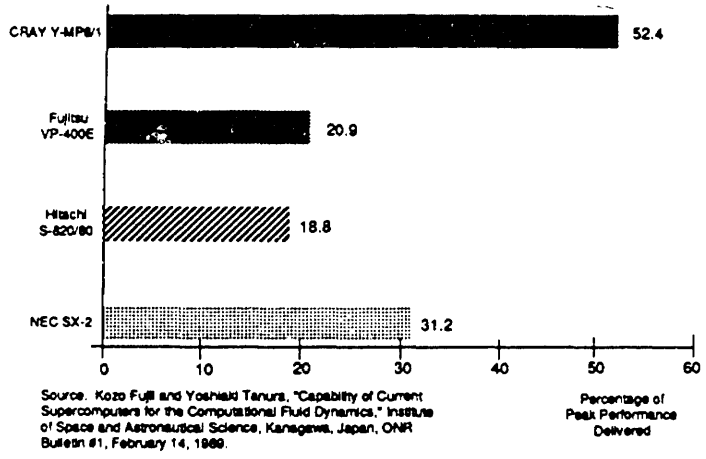


Figure 3-7

ONR Benchmark - LANS3D

A more interesting conclusion of Fujii's analysis is presented in Figure 3-8. The data presented in this Figure show the percent of each machine's theoretical performance that was actually achieved when running the ONR benchmark. Note that CRI's single processor CRAY Y-MP/1 delivered over 50 percent of its theoretical peak compared to its nearest competitor, NEC's SX-2 which delivered only 31.2 percent of its theoretical peak. This is a key data point because if a customer relies upon theoretical peak numbers when purchasing a supercomputer, it is very likely that the computer center will pay for potential performance which will never be realized in a real-world environment.



Source. Kozo Fujii and Yoshiaki Tanura, "Capability of Current Supercomputers for the Computational Fluid Dynamics," Institute of Space and Astronautical Science, Kanagawa, Japan, ONR Bulletin #1, February 14, 1989.

Figure 3-8
ONR Benchmark - LANS3D-UP

Advertised theoretical peak performance numbers are meaningless.

Another important conclusion from the ONR benchmark is that in the absence of a real-world benchmark, advertised theoretical peak performance numbers are meaningless for supercomputers which are not yet in production. Nevertheless, this is a common practice among Japanese vendors who claim very high theoretical peak performance numbers for their next generation machines as evidence that they are coming out with a product that is superior to those currently available from U.S. vendors. Most private sector customers are well aware of the limitations of these claims, but public sector entities in Japan have relied heavily on theoretical peak performance criteria.

Perhaps one of the most illustrative real-world benchmarks is the Semtner-Chervin Ocean Model, which is the first numeric global model to calculate the transport of heat by ocean eddies. Such calculations are essential for developing accurate weather forecasts and climate studies because of the critical role the oceans play in heat transfer which is a requisite for understanding weather and climate patterns. The model is 98% vectorized and 99% parallelized. This particular model requires state-of-the-art supercomputers to produce scientific results in a reasonable amount of time. On the four processor CRAY X-MP/4, the model runs for 100 wall-clock hours at 450 MFLOPS to simulate a decade of ocean circulation. On the eight processor CRAY Y-MP8, the same simulation runs at 1.1 GIGAFLOPS.

Sustained application-level performance at this level is why most weather centers in the world either now have installed, or have contracted to install Cray Research supercomputers.

Most weather centers in the world either now have installed or have contracted to install Cray Research supercomputers.

Finally, data from the Japanese auto industry provides a detailed assessment of how CRI's products perform in the real-world production environment. Scientists and engineers in the Japanese auto industry have requirements for structural analysis, crash analysis, computational fluid dynamics, and chemical/electronics analysis. A summary of the workload requirements, percent vectorization of the codes used and average sustained performance is presented in Table 3-6. The data in this Table are from a real-world workload assessment performed by a major Japanese automobile manufacturer. The harmonic mean, which weighs workload accomplished, shows that all of Cray's systems, including the seven year old CRAY X-MP/1, delivered more throughput than Fujitsu's VP-400E.

Table 3-6

Performance in the Japanese Automobile Industry

	Distribution of Workload		Average Sustained Performance (MFLOPS)					
	Vectorization	Load Ratio	CRAY X-MP-1	CRAY X-MP/4	CRAY Y-MP2/1	CRAY Y-MP2/2	CRAY Y-MP8	Fujitsu VP-400E
Structure Analysis	50-70%	0.4	42.5	170	56.9	113	455	22.8
Crash Analysis	80-90%	0.3	94.9	380	129.0	258	1032	60.4
CFD	90%	0.2	123.0	490	168.0	336	1340	85.9
Chemical/ Electronics	10-20%	0.1	21.0	84	28.0	56	224	10.6
Harmonic Mean			527	211	70.8	141	566	29.2

Source: Data are from real world evaluation developed by a major Japanese automobile manufacturer.

VI. THE COST OF PERFORMANCE

The documentation on performance, particularly when the total product is evaluated, clearly demonstrates the superiority of CRI's machines. A critical factor is cost, especially the cost to the customer for any given level of performance. Once again the decisions made in the marketplace reflect CRI's lower cost-of-performance. Figures 3-9 and 3-10 summarize the cost-of-performance data for existing U.S. and Japanese supercomputers assuming the facility is running computer code that is 70-80% vectorized. This level of vectorization reflects a reasonable portrayal of the typical workload at a large supercomputer center.

The decisions made in the marketplace reflect CRI's lower cost of performance.

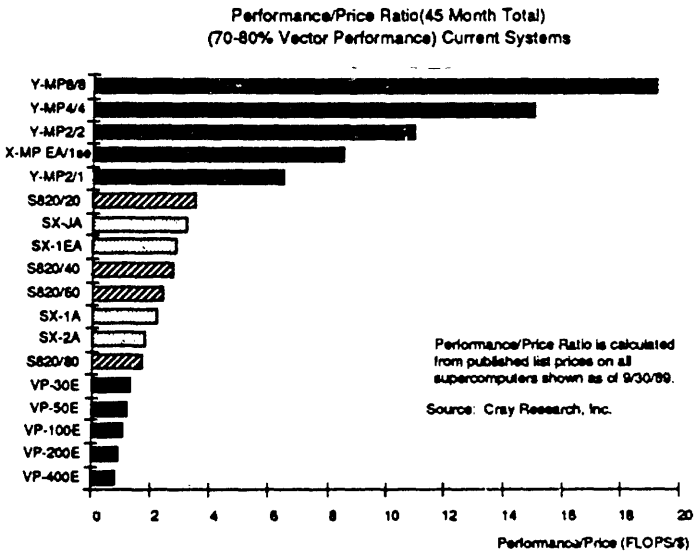


Figure 3-9

Number of Floating-Point Operations Per Dollar (45-Month Lease)

The cost-of-performance data in Figure 3-9 show that CRI machines offer better value, in the number of floating point operations that can be purchased per dollar, than any machine from all three competing Japanese vendors when comparisons are made at list prices (from publicy quoted prices as of September 30, 1989). As shown in Figure 3-10, even when Japanese vendors discount their list prices by 50%, CRI machines still hold four of the top five positions. Note, however, that Fujitsu, NEC, and Hitachi have all announced major list price reductions. As excessive discounts become politically unpalatable, the same low bids can continue to be offered by combining smaller discounts on lower list prices.

Cost-of-performance data show that CRI machines offer a better value.

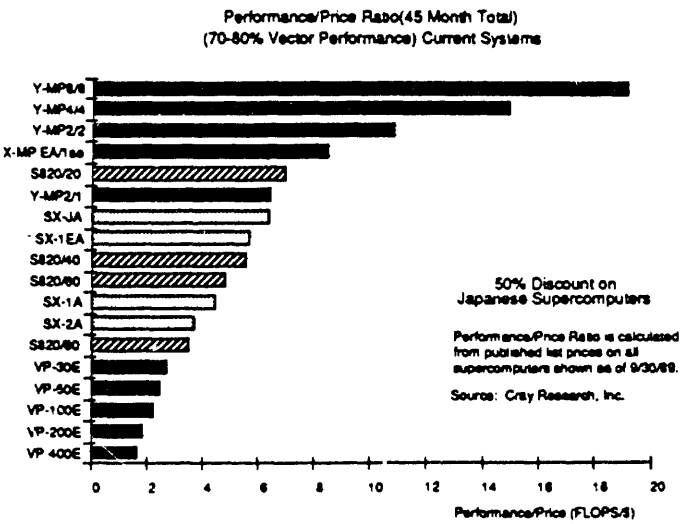


Figure 3-10

Number of Floating-Point Operations Per Dollar
(45-Month Lease)

VII. CONCLUDING OBSERVATIONS

The assessment in this chapter provides a careful and systematic presentation of the competitive edge of Cray Research, Inc.'s supercomputers. In open and competitive markets, such as in Europe and the United States, CRI is the principal supplier. Even in Japan's private sector, where it is difficult to influence existing vendor-purchasing relationships, CRI has made considerable headway and is now the supplier of choice of supercomputers to the Japanese auto industry. When users have the final say regarding the supercomputer of choice, such as in the Japanese service bureaus, CRI machines are virtually their only choice and this is reflected in the purchasing decisions of the service bureau owners. It is only in Japan's public sector, where competitive criteria have not been considered, that CRI has been denied access.

In open and competitive markets, such as in Europe and the U.S., CRI is the principal supplier.

Japanese vendors often quote various theoretical peak performance numbers in an attempt to demonstrate that they produce supercomputers which can compete on the same level with CRI. However, CRI delivers considerably more than raw computing power, with a total product that includes a balanced architecture, a robust operating system, networking and connectivity, and a rich library of applications software. Cost of performance data also show that CRI supercomputers offer a better value than Japanese supercomputers in the number of floating point operations that can be purchased per dollar. These features, combined with CRI's superior performance in a real-world environment, gives its supercomputers their competitive edge over the competition.

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BARRIERS TO ENTRY

I. INTRODUCTION

Although Cray Research Inc. (CRI) has gained a strong position in the private sector in Japan, substantial informal trade barriers have dominated the public sector market for supercomputers. These trade barriers have been complex and not easily understood, but very effective at preventing U.S. vendors from gaining access to the Japanese public sector market.

Informal trade barriers have dominated the public sector market for supercomputers.

Until 1987, foreign vendors had few, if any, opportunities to compete for supercomputer procurements in the public sector. New procurements were not publicized and competitive bids were rare. In 1987, however, in response to these concerns over access to the public sector market, the U.S. negotiated an agreement with Japan calling for a transparent, nondiscriminatory procurement process for supercomputer purchases. The agreement established an open competitive bidding process, including advance notification of procurements, publication of specifications, and procedures for making complaints and protests. Even though the agreement made the process of public sector supercomputer procurements more transparent than in the past, U.S. vendors still did not make any sales under regular procurements. U.S. vendors have only been able to make two sales, both of which were acquisitions made under an emergency import budget.

No one single practice among Japanese public sector entities can adequately explain why U.S. vendors have faced difficult barriers in making supercomputer sales to these institutions. Instead, the barriers have resulted from a complicated interaction among the following attributes of the Japanese public sector procurement process: (i) preference for existing vendors, which often includes substantial cooperation between existing vendors and public entities in tailoring specifications to either disqualify or discourage competing vendors from making bids, (ii) insufficient funding for supercomputer purchases, and (iii) massive discounting by large vertically integrated supercomputer manufacturers.

All of these forces have combined to "lock-in" the procurement for the incumbent vendor to the detriment of both U.S. and other Japanese vendors. A corresponding result has been that these practices limit competition by harming all perspective vendors except the incumbent. Public entities often have been denied access to the supercomputers that could best assist them in carrying out their missions.

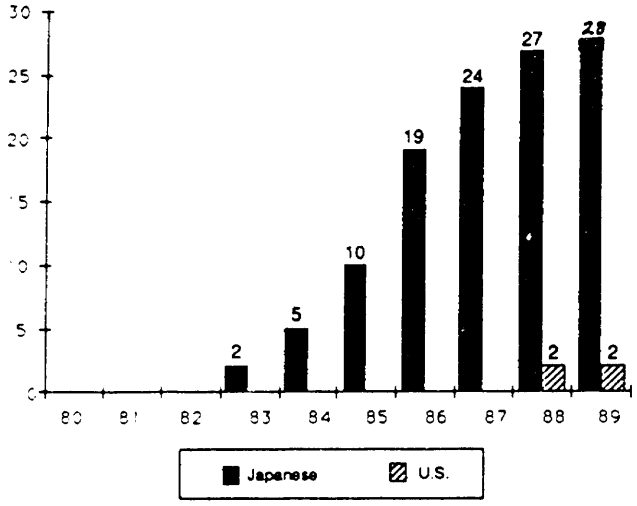
Not a single sale occurred in the public sector until Japan's first supercomputer was available.

II. PUBLIC SECTOR PURCHASES ONLY OCCURRED AFTER SUPERCOMPUTERS WERE AVAILABLE FROM JAPANESE VENDORS

A. Public Sector Purchases Prior to Introduction of Supercomputers from Japanese Vendors

Supercomputers are clearly a product in which the U.S. has had, and continues to have, a commanding technological lead over Japanese vendors. As discussed in "Cray Research Inc.'s Competitive Edge," CRI's lead includes both computational performance across the widest possible range of applications and a capability to deliver that performance at a cost substantially lower than is available from Japanese vendors. CRI, as the world's first true general purpose supercomputer manufacturer, introduced its first system in 1976, made the first European public sector sale in 1977, and entered the Japanese market in 1980. Although Japanese vendors were working on various supercomputer technologies throughout this period, none of these vendors had a commercial product available until 1983.

Even though Cray was the only supercomputer vendor in the Japanese market between 1980-1982, no supercomputer acquisitions were made by the public sector throughout this period. As shown in Figure 4-1, the acquisition pattern for supercomputers in Japan's public sector, not a single sale occurred in the public sector until Japan's first supercomputer was available in 1983. We do not know if it was official government policy to wait for indigenous suppliers, but we have no other explanation for the unwillingness of Japan's public sector to purchase supercomputers when CRI was the only available vendor. Throughout this period European and U.S. public sector purchases grew substantially.



Once Japanese vendors had supercomputers available, the public sector engaged in a rapid acquisition program.

Source: Cray Research, Inc.

Figure 4-1

Public Sector Installed Base in Japan

B. Japan's Public Sector Purchases of Supercomputers after Introduction of First Indigenous Machine

Once Japanese vendors had supercomputers available, the public sector engaged in a rapid acquisition program. Referring again to Figure 4-1, the first acquisition did not occur until 1983, the year the first Japanese supercomputer was offered for sale. When Japanese vendors had supercomputers to sell, the public entities moved quickly to fulfill considerable pent up demand and engaged in a rapid acquisition program. As a result, the installed base grew rapidly, rising to nearly 25 machines by 1987.

The failure of Japanese public sector entities to purchase supercomputers from Cray during the high growth period between 1983 and 1987 cannot be explained by any reasonable assessment of competitive factors. Table 4-1 presents a comparison of technological developments in the U.S. and Japan for supercomputers between 1976 and the present. Note that throughout the 1983 to 1987 period Japanese vendors cannot argue that they had "caught-up" with U.S. vendors in terms of supercomputer capabilities. The data show that Japanese vendors did not even have a supercomputer for sale until 1983.

The failure to purchase supercomputers from Cray... cannot be explained by any reasonable assessment of competitive factors.

Even after the Japanese vendors entered the supercomputer market in 1983, CRI was (and continues to be) substantially ahead of the Japanese competition through the introduction of a wide range of advanced capabilities in both hardware and software. As shown in Table 4-1, these capabilities include, among many others, the largest library of third party applications software for supercomputers, common software operating environment, widespread connectivity and networking among different vendors, high speed input/output channels, user friendly compilers, and parallel processing. For the most part these features are either not available or only available in a rudimentary form from Japanese vendors.

TABLE 4-1

COMPARISON OF FEATURES OF US AND JAPANESE SUPERCOMPUTERS

1976-1989

YEAR	CRAY RESEARCH	FUJITSU	NEC	HITACHI
1976	CRAY-1 - First general purpose supercomputer introduced Proprietary operating system First automatic vectorizing compiler	No supercomputer available	No supercomputer available	No supercomputer available
1977	1st European sale (public sector)	No supercomputer available	No supercomputer available	No supercomputer available
1978	First commercial sale	No supercomputer available	No supercomputer available	No supercomputer available
1979	CRAY-1/S is introduced with faster input/output (I/O) channel from new external I/O device	No supercomputer available	No supercomputer available	No supercomputer available
1980	First Cray Japan commercial sale	No supercomputer available	No supercomputer available	No supercomputer available
1981	Rapid sales growth in US, Europe for commercial/public sector	No supercomputer available	No supercomputer available	No supercomputer available
1982	CRAY X-MP/2 (2-processor) introduced - providing 1st generation parallel processing system Greater than 100 applications software packages Large growth in connectivity to different mainframes First large external memory (SSD) Industry standard Fortran compiler introduced (CFT77) Higher speed I/O; 10 Megabytes/sec	No supercomputer available	No supercomputer available	No supercomputer available

TABLE 4-1 (continued)

COMPARISON OF FEATURES OF
US AND JAPANESE SUPERCOMPUTERS

1976-1989

YEAR	CRAY RESEARCH	FUJITSU	NEC	HITACHI
1983	CRI continues to sell first and second generation supercomputers	First generation supercomputer, VP-200 introduced		
	CRI supercomputers continue to offer general purpose capabilities since 1976	First generation Japanese supercomputers were vector processors attached to one of the manufacturer's mainframes. Fujitsu and Hitachi were IBM compatible, NEC was not.		
	Sales of first generation parallel processing machines expand	No parallel processing	No parallel processing	No parallel processing
	Over 150 third-party applications software packages	No third-party applications software packages	No third-party applications software packages	No third-party applications software packages
	CRI's public sector sales grow in US and Europe - none in Japan	First Japanese public/private sector puchases of Fujitsu machine	First Japanese public/private sector puchases of NEC machine	First Japanese public/private sector puchases of Hitachi machine
	CRI 10 megabyte I/O channel available since 1982	3 megabytes I/O channel introduced	3 megabytes I/O channel introduced	3 megabytes I/O channel introduced
1984	CRI's sales expand worldwide, except Japan's public sector	Growth in sales to Japan's public/private sector only	Growth in sales to Japan's public/private sector only	Growth in sales to Japan's public/private sector only
	Over 200 third-party applications software	Virtually no third-party applications	Virtually no third-party applications	Virtually no third-party applications
	CRI 10 megabyte I/O channel available since 1982	Only 3 megabyte I/O channel available	Only 3 megabyte I/O channel available	Only 3 megabyte I/O channel available
	CRI continues to offer connectivity to many different vendors	No connectivity outside Fujitsu/IBM family	No connectivity outside NEC family	No connectivity outside Hitachi/IBM family
	CRAY X-MP/4 (4 processor) introduced, second generation parallel processing supercomputer	Fujitsu introduces enhanced first generation supercomputer, VP-400: no parallel processing	NEC introduces enhanced first generation supercomputer, SX-2: no parallel processing	No new models, no parallel processing
	CRI introduces first very large memory supercomputer, CRAY-2	No large memory supercomputer, existing systems have small memory	No large memory supercomputer, existing systems have small memory	No large memory supercomputer, existing systems have small memory

TABLE 4-1 (continued)

COMPARISON OF FEATURES OF US AND JAPANESE SUPERCOMPUTERS

1976-1989

YEAR	CRAY RESEARCH	FUJITSU	NEC	HITACHI
1984	CRI introduces world-wide standard based operating system (UNIX) - connectivity expands to more vendors	Proprietary operating system, no connectivity outside Fujitsu/IBM family	Proprietary operating system, no connectivity outside NEC family	Proprietary operating system, no connectivity outside Hitachi/IBM family
	Easy and standard networking capability (TCP/IP)	No networking	No networking	No networking
	Greater than 250 third-party applications software packages	Less than 25 third-party applications software packages	Less than 25 third-party applications software packages	Less than 25 third-party applications software packages
1985	In addition to Fortran, two standard software languages introduced - Pascal and C	Only Fortran language available	Only Fortran language available	Only Fortran language available
	CRI 10 megabyte I/O channel available since 1982	Fujitsu still only has 3 megabyte I/O channel	NEC still only has 3 megabyte I/O channel	Hitachi still only has 3 megabyte I/O channel
1986	Rapid growth in private/public sector sales, growth in sales in Japan restricted to private sector	Growth in public/private sector sales only in Japan	Growth in public/private sector sales only in Japan	Growth in public/private sector sales only in Japan
	Parallel processing gaining widespread acceptance among world-wide user community	No parallel processing	No parallel processing	No parallel processing
1987	CRI introduces first high speed channel, 100 megabyte I/O	No high speed channel	No high speed channel	No high speed channel
	CRI continues large number of multi-vendor connectivity, available since 1982	No connectivity outside Fujitsu/IBM family	NEC offers connectivity to DEC computers as well as NEC family	No connectivity outside Hitachi/IBM family
	CRI continues to offer expanded external memory (SSD), available since 1982	No expanded external memory (SSD)	NEC introduces expanded external memory (SSD)	No expanded external memory (SSD)

TABLE 4-1 (continued)

COMPARISON OF FEATURES OF US AND JAPANESE SUPERCOMPUTERS

1976-1989

YEAR	CRAY RESEARCH	FUJITSU	NEC	HITACHI
1988	More standard software language introduced in addition to Fortran, Pascal and C: Ada, LISP, PROLOG are added	Only Fortran available	Only Fortran available	Only Fortran available
	Standard based operating system (UNIX) spreads to more vendors worldwide - widespread easy connectivity to many more vendors	Only proprietary operating system, no connectvity outside Fujitsu/IBM family	Only proprietary operating system, no connectivity outside NEC, except for DEC computers	Only proprietary operating system, no connectivity outside Hitachi/IBM family
	TCP/IP networking standard available since 1985	No TCP/IP networking standard, only proprietary networking	Adoption of TCP/IP networking standard	No TCP/IP networking standard, only proprietary networking
	CRI introduces third generation supercomputer, Y-MP/8 with 8 parallel processing units	No new models, no parallel processing	No new models, no parallel processing	Hitachi introduces second generation supercomputer, S-820, no parallel processing
	Greater than 500 third-party applications software packages	Less than 100 third-party applications software packages	Less than 100 third-party applications software packages	Less than 100 third-party applications software packages
	Cray continues to offer high speed channel, 100 megabyte I/O available since 1987	No high speed channel	No high speed channel	No high speed channel
	Cray continues to offer expanded memory (SSD) available since 1982	First introduction of expanded memory (SSD)	NEC continues to offer expanded memory (SSD) available since 1987	First introduction of expanded memory (SSD)
1989	CRI introduces new compiler (software) which automatically converts code to run in parallel	No parallel processing	No parallel processing	No parallel processing
	Enhanced multi-level security system	No multi-level security system	No multi-level security system	No multi-level security system
	TCP/IP networking standard available since 1985	TCP/IP networking standard introduced	TCP/IP networking standard available since 1988	TCP/IP networking standard introduced

C. The 1987 U.S./Japan Supercomputer Procurement Agreement

In the pivotal acquisition years from 1983 to 1987, vague procedures, closed bidding practices, and a subtle, though understated, "buy Japanese" policy had effectively kept U.S. manufacturers out of the Japanese market. By August of 1987 there had been 24 supercomputer procurements in the public sector with little or no public disclosure or transparency in the process. In fact, CRI only knew about five of these procurements and was unable to bid because funding provided by the Government of Japan (GOJ) was inadequate. Each of these five procurements was eventually won by incumbent vendors with an estimated discount of 80 percent or more.

The closed bidding and other practices were routinely experienced by U.S. vendors.

The closed bidding and other practices described above were routinely experienced by U.S. vendors attempting to sell to Japan's public sector. As could be expected, these practices by Japan's public sector entities eventually escalated into a trade dispute. In August 1987, after nine months of discussion, Japan agreed to implement new procurement procedures which, at least in concept, were expected to assist U.S. supercomputer manufacturers in gaining access to Japan's public sector market.

The agreement was intended to eliminate the bias in Japan's procurement process that had kept U.S. firms out of the public sector market. Under the terms of the agreement, U.S. vendors were entitled to be involved in the early stages of procurement planning when important decisions, such as setting criteria for the final selection, are made. The agreement also established a new discussion phase in the procurement process, which was to provide all potential vendors with an opportunity to demonstrate the merits of their product to the purchasing entity. In addition, the new procedures called for significantly longer time periods in which companies could prepare bids. They also made it more difficult to use sole-source procurements, and they established complaint and protest procedures that could be initiated by the company itself.

The agreement did provide transparency in the procurement process; an important first step in gaining access to Japan's public sector. Unfortunately, the agreement had several drawbacks, the most important of which was that it did not require benchmarks of real workloads. Japanese public entities have regularly relied upon evaluations of theoretical peak performance numbers instead of actual performance numbers. Theoretical peak performance numbers are often very misleading because they only provide a measure of the potential maximum speed a computer might achieve under unusual circumstances. Using peak performance numbers as a selection criteria is akin to purchasing an automobile based on maximum RPM without ever testing its performance over the road. The procurement process would be more open and competitive if users were permitted to "test drive" a supercomputer with real workload in the operating environment in which it will be installed. This is especially important in a multi-user environment, such as government laboratories and universities, where many different codes are run simultaneously. In this environment, actual supercomputer performance is always substantially lower than its theoretical peak performance.

Process changes alone will not overcome the inadequate budgets ... and the massive discounts.

While the agreement was written to address procurement procedures, process changes alone have not overcome the inadequate budgets allocated for supercomputer purchases and the massive discounts offered by Japanese supercomputer manufacturers. These discounts to the Japanese government and publicly funded universities have often been as large as 80 percent, reflecting both the willingness of Japanese vendors to take large losses to enter this market, as well as the extremely low budgets the Japanese government commits to supercomputer purchases.

The practice of submitting extremely low bids is not restricted to the supercomputer market. In November of 1989, both Fujitsu and NEC made token bids of one yen to obtain public sector procurements to design conventional computer systems for two different public sector projects, a waterworks facility and a library. According to press reports from Japan, the GOJ

reacted quickly when the disclosures occurred. The Japan Fair Trade Commission (JFTC) launched an investigation and the Ministry of International Trade and Industry (MITI) publicly chastised both Fujitsu and NEC for undermining competition in the public sector computer market. One of the concerns the JFTC raised was that these vendors may be attempting to design computer systems which will only work with the winning bidder's hardware-already a common problem in the public sector market for supercomputers.

D. Public Sector Purchases Since the 1987 Procurement Agreement

Growth in public sector procurements declined substantially after the agreement was signed.

Growth in public sector procurements declined substantially after the agreement was signed. Prior tc the agreement there was virtually no public information regarding prospective procurements and details of awards, including winning vendors and winning bids, were limited. CRI's experience with the five "open" procurements that have occurred subsequent to the agreement are summarized in Table 4-2. As stated previously, two of the six purchases were for U.S. machines (installed in 1988 and 1989), but these purchases occurred as a result of an emergency import budget. These two sales were an unusual event and do not reflect any systemic improvement in the fundamental problems of gaining access to the public sector market.

TABLE 4-2

SELECTED PUBLIC SECTOR SUPERCOMPUTER PROCUREMENTS AFTER IMPLEMENTATION OF 1987 AGREEMENT

Public Entity	First Kampo	Tender	Specifications	Incumbent Vendor	Winner of Bid/Model	Comments
Japan National Railway	Jan. 1988	Aug. 1988	Theoretical peak, no requirement for real world benchmark	None	NEC SX-2	In Nov. 1987, JNR selected NEC machine without competitive bid. GOJ made JNR redo the bid under the procurement agreement. Cray forced to bid more expensive machine to meet theoretical peak performance specifications. Cray ran some JNR code, many times faster than same code on NEC machine. CRI submitted bid. NEC won bid with 80% discount, installed SX-2.
High Energy Physics Lab	Oct. 1987	Apr. 1988	Theoretical peak of 2.5 Gigaflops, 64 million words of memory Had to meet existing Hitachi footprint. Allowed to bid product not yet in production.	Hitachi	Hitachi S820/80	CRI met theoretical peak requirement, no real-world benchmarks were run. CRI could not meet Hitachi footprint - CRI agreed to build new facility. Computer center would not accept CRI bid because of dispute over delivery date for memory. Hitachi won bid with 70-75% discount.
Hokkaido Univ.	Oct. 1987	June 1988	Had to be compatible with and connect to Hitachi operating environment. Specifications were performance based.	Hitachi	Hitachi M-682H	Could only connect to Hitachi if outside vendor had access to Hitachi software. Software not available from Hitachi. Shared disk requirement was unique to Hitachi environment. Virtually eliminates competitors. No benchmarks were made on CRI machines and none requested. CRI made no bid. Hitachi won bid with a discount of approx. 80%.

TABLE 4-2 (continued)

SELECTED PUBLIC SECTOR SUPERCOMPUTER
PROCUREMENTS AFTER IMPLEMENTATION OF 1987 AGREEMENT

Public Entity	First Kampo	Tender	Specifications	Incumbent Vendor	Winner of Bid/Model	Comments
Tohoku Univ.	Oct. 1987	June 1988	Theoretical peak of 1 Gigaflop, 2 million words. Benchmarks were permitted.	NEC	NEC SX-2	Some real benchmarks were run. Cray was superior performance at list price. Director of computer center stated he would buy a NEC machine before bids were submitted. CRI submitted bid; NEC won bid by offering 80% discount.
Japan Atomic Energy Research Institute	March 1989	Dec. 1989	Two systems; theoretical peak of 4 Gigaflops, one systems to have 64 million words, other system to have 32 million words.	Fujitsu	Fujitsu VP-2600/10 (2 systems)	Some real benchmarks were run. Incumbent vendor was in strong position because of shared disk requirement. No Cray bid was submitted. Fujitsu won bid with 53% discount. VP-2600 was not a production machine

Several important trends dominate CRI's experience with these five procurements. First, the initial surge of public procurements that occurred prior to the agreement (1983-1987) gave incumbent vendors a natural advantage in any upgrades. At the High Energy Physics Laboratory, Hokkaido University, and Tohoku University, the existing vendor's machine ran a proprietary operating system or had other features which made it inconvenient to transition to a new vendor. To some extent a computer center's reluctance to transition to a new machine, with a new operating system, is understandable. The lesson here is that U.S. vendors must have access in the initial period when public institutions are first considering a supercomputer.

Preventing U.S. firms from having access to these entities for even a single sale will have long-term consequences when the institutions seek upgrades. Another factor that was common in each of these procurements was the computer center's emphasis on theoretical peak performance numbers over real-world benchmarks. The drawbacks of such performance measures are discussed fully in the chapter on "CRI's Competitive Edge." When CRI was permitted to run real-world benchmarks, as was done at Japan National Railway and Tohoku University, it was apparent CRI had the superior technology. In the end, however, the most important consideration was the large discounts, sometimes as high as 80 percent, that the Japanese vendors provided to ensure that their machines could be placed in the facilities at existing budget levels. Clearly, the Japanese vendors are not enthusiastically endorsing these large discounts, but the low budgets from the government leave them with no alternative. A good case in point is the procurement at Tohoku University where the vendor tried to limit the discount. After CRI dropped out of the bidding process, Tohoku forced NEC to go through seven rounds of bids by themselves until NEC finally offered a bid with an 80 percent discount.

In the end the most important consideration was the large discounts, sometimes as high as 80 percent.

We do not know if the GOJ has had a policy in place prohibiting or discouraging public sector entities from purchasing foreign supercomputers. The net effect, however, is that U.S. firms have been excluded from the public sector supercomputer market in Japan even though progress has been made in gaining access to the private sector. The outcome, as shown in Figures 4-2 and 4-3, is that the distribution of the installed base for supercomputers in the private and public sectors is lopsided. U.S. vendors have captured over 21 percent of the private sector market (Figure 4-2) and there is substantial potential for increasing this position over time. No foreign vendors have installed supercomputers in the public sector except for the two systems imported under the special emergency import budget.

Unfortunately, there is no evidence that the relationships between vendor and public entities are more open now to outside competitors than before the 1987 agreement was in place. Just as Japan's public sector institutions waited for the development of a supercomputer from a domestic vendor before making their first purchase, a similar pattern is now underway for follow-on supercomputer products.

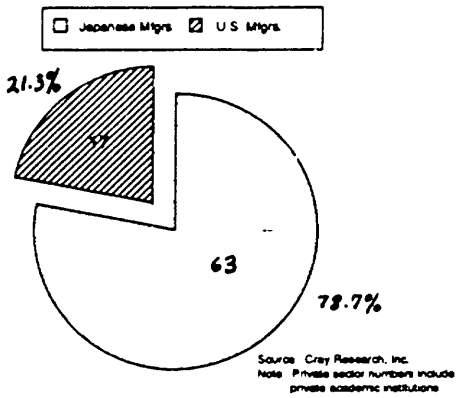


Figure 4-2

Japanese Market Distribution
Private Sector - 1989 Installed Supercomputer Base

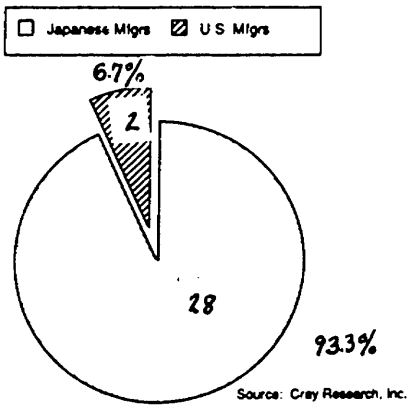


Figure 4-3

Japanese Market Distribution
Public Sector - 1989 Installed Supercomputer Base

On December 6, 1988 Fujitsu announced its new VP-2000 series of supercomputers. The following five traditional Fujitsu "shops" subsequently announced supercomputer procurements specifying requirements that mirrored those of the announced, but not yet manufactured product:

Kyoto University Data Processing Center - Dec 10, 1988
Japan Atomic Energy Research Institute - March 10, 1989
Nagoya University Comput r Center - April 11, 1989
Kyushu University Computer Center - April 11, 1989
National Institute for Fusion Science - April 21, 1989

Japan's public sector entities appear to be waiting for these same capabilities to be offered by Japanese vendors.

NEC announced the future SX-3 supercomputer on April 10, 1989. Two new procurements for supercomputers with performance requirements of the anticipated SX-3 were immediately announced by the following traditional NEC customers:

Institute for Laser Engineering - April 11, 1989
Tohoku University Computer Center - April 21, 1989

Hitachi has not yet made a public announcement of its new supercomputer. It is not surprising, therefore, that five traditional Hitachi customers who are expected to buy new systems have not yet announced new supercomputer procurements:

Hokkaido University Computer Center
University of Tokyo Computer Center
National Laboratory for High Energy Physics
Institute for Molecular Science
Japan Meteorological Agency

As the entire range of capabilities offered from CRI's supercomputers expands, Japan's public sector entities appear to be waiting for these same capabilities to be offered by Japanese vendors before requiring them in new procurements. As discussed previously, this is a recurring practice that seems to reserve the public sector market for less capable Japanese machines. For example, CRI supercomputers offer a fully functional, open environment operating system based on UNIX System V not available from any Japanese vendor. This means users from different computing environments, be it workstation or mainframe, can perform key operations under standard rules of the road. This includes interactive access, batch services,

file transfer, applications, distributed services, and network management. Although these are features routinely required by public sector entities in Europe and North America, they are not required, and probably will not be required by Japan's public sector, until similar features are available from Japanese vendors.

III. HOW THE PROCUREMENT PROCESS REALLY HAS WORKED

The public sector has been dominated by a decision-making and budgeting process that favors Japanese vendors.

The public sector, because it has not faced traditional competitive pressures, has been dominated by a decision-making and budgeting process that favors Japanese vendors. Public sector budgets have been extremely low for supercomputer acquisitions. Instead of refusing to bid, Japanese vendors have provided the public institutions with their best equipment at a discount large enough to meet the budget. The question is why does the vendor sell at such a large discount?

One obvious reason is that the vendor benefits by selling a less capable machine for which the laboratory or university will provide extensive work on the supercomputer's operating system and compiler, as well as the development of applications software. (This work would not be necessary on an advanced system, such as a Cray Research machine.) In addition, the public sector institutions give the Japanese vendors a much larger user base than would be the case in a fully competitive environment. The user base provides access to a pool of engineering and software development skills that are important to improving the vendor's technology.

Despite the fact that this arrangement may make sense for the vendor, the real question is does this arrangement make sense for the public entity? While there may be some unique instances where it is useful for a public institution to purchase a less capable machine at a very low price, e.g., an institute which is wholly dedicated to developing supercomputer technology and related operating systems, it hardly makes sense for entities which have specific missions outside this arena. For example, laser engineering, nuclear power development, weather forecasting, aerospace development, most academic research, and a large array of other missions could justify and probably get adequate budget for an

advanced supercomputer. In fact, one could argue that an advanced supercomputer is essential for accomplishing their mission. Existing evidence suggests this is the viewpoint of similar public institutions in Europe and North America who have refused to buy Japanese machines even at substantial discounts. In a real sense the existing procurement process has subordinated the mission of these Japanese public entities to the needs of the vendor.

The public sector seems reserved for less capable Japanese machines.

The evidence that the public entity is willing to subordinate its mission for the benefit of the vendor can be found in the procurement specifications. Most public sector procurements in Japan have omitted as requirements features in Cray Research systems which are used around the world. For example, CRI can offer compiler software which automatically converts code to run in parallel. Standard software languages such as Pascal, Ada, Lisp, and Prolog are only available on CRI systems. CRI offers an operating system based on UNIX and supports the TCP/IP standard protocol for local area networks allowing CRI machines to integrate into heterogencus, multi-vendor, standards oriented computing environments. These are common features required by universities around the world, except for Japan where no indigenous vendor can offer such capability. We do not know if these practices, low budgets, large discounts, and tailored procurement specifications represent official policy of the GOJ. The effect however, is that these policies have served to promote the interests of Japanese vendors. This is evident in the fact that the public entity is paying for the development of operating systems and applications software that would not be necessary if a more sophisticated system were installed.

More importantly, the actual cost of these procurements would be substantially higher if the public entity involved had to account for the extra work and reduced output associated with the purchase of a Japanese system. Most of these procurements are not the good deals they seem since much of the development cost is eventually borne by the purchasing organization in trying to make a less capable machine meet the mission requirements.

Similarly, these practices also appear to benefit GOJ's initiatives to improve indigenous supercomputing capabilities. Knowing that U.S. vendors cannot provide large discounts, the existing policy of low budgets has cordoned off, or provided a "hot house" environment within the public sector market to foster development of the Japanese supercomputer industry. Japanese vendors have not been able to sell worldwide and acquire a diverse user base to develop appropriate operating systems and applications software. In effect, the interaction of the low budgets and discounts represents a large subsidy program to attempt to improve the worldwide competitive position of Japanese supercomputer manufacturers.

The existing policy of low budgets has cordoned off the public sector market to the Japanese.

If the public institutions are subordinating their mission to the interest of the vendors, why don't the institutions object to this process and instead fight for adequate budget to purchase appropriate technology to meet their mission requirements? Unfortunately, the anti-competitive aspects of the procurement process appear to be reinforced by an intricate network of supercomputer vendor executives and the managers at the university or federally funded research laboratories where they studied. This web of contacts tends to unite laboratories and Japanese vendors in an almost familial relationship which is difficult for foreign and non-incumbent vendors to break.

This is not to say Japanese researchers don't object to subordinating their mission requirements. Key decision-makers at government funded laboratories and universities occasionally have informed CRI that a Cray Research machine would be the optimum choice, but researchers and users at these sites have little influence in the selection of a supercomputer. Furthermore, we are also told that any such request would be politically expensive for individuals raising objections. As stated previously, we do not know if these practices are encouraged by the GOJ. However, since the current process does provide an approach for getting government laboratories and universities to assist the Japanese supercomputer industry in improving their technology, it appears there has been little official government interest in changing these practices. Eventually competitive forces may penetrate the public sector market and break down these vendor/laboratory relationships. However, the GOJ will have to discontinue encouraging this process through low budgets. Some direct action will be required by the GOJ to discourage discounting, ensure adequate budgets, and insist that appropriate technical evaluations occur including the use of real-world benchmarks as selection criteria. Only then will U.S. vendors have an opportunity to participate in the next surge of supercomputer purchases in the public sector.

PAPER MACHINES

I. BACKGROUND

A common problem in public sector procurements for supercomputers in Japan has been that vendors have been permitted to bid machines not yet in production, so called "paper machines." Permitting a vendor to bid a paper machine tends to encourage the practice of relying upon theoretical peak performance numbers instead of an assessment of real-world workload. In addition, features which are available now only from a U.S. vendor, such as a UNIX based operating system, parallel processing, and a large library of applications software can be promised at some future delivery date in an attempt to show that a competitive supercomputer is available

Japanese vendors have been permitted to bid machines not yet in production.

In the course of normal business practices, it is not unusual to promise, and contract for, delivery at some future date of a product which is not now in production. In general, competitive pressures in the marketplace will act as a brake on performance claims which cannot be achieved and some contracts may even call for penalty clauses for failing to meet a delivery date or specifications. In competitive markets, customers quickly learn to assess their requirements, evaluate the total product and make decisions on the cost of performance.

As was discussed in the chapters on "CRI's Competitive Edge" and "Barriers to Entry," a traditional competitive environment has not existed in the procurement of supercomputers among Japan's public entities. In the public sector, Japanese vendors have had a clear advantage in winning a bid because specifications often have been tailored to meet the characteristics of the incumbent vendor's anticipated new product. In practice, this often means a Japanese vendor will meet a specification based on theoretical peak performance numbers instead of real-world workload.

II. ARE CLAIMS OF FUTURE PERFORMANCE ACCURATE?

One Japanese vendor now claims it has produced the world's fastest supercomputer. NEC's advertising copy for the SX-X, also known as the SX-3, has been stating for over a year that its top of the line system, which will have four central processing units (CPU's), served by four vector pipelines for each CPU "..Is the fastest supercomputer in the world." This is an interesting claim because the SX-3 does not exist and will not even be available for benchmarking until late second quarter of 1990 or 15 months after the press release (single processor version). Nevertheless, NEC's advertising literature points out that the SX-3 "runs" at a theoretical peak performance of 22 gigaflops (GFLOPS), 22 billion floating point operations per second.

The SX-3 does not exist and will not even be available for benchmarking until late second quarter of 1990.

Whether these claims are true, or even relevant, are of little consequence in competitive markets. NEC must meet a market test. The problem, however, is that Japanese officials and public entities may use these claims to support existing procurement practices for supercomputers among public institutions.

Although it is difficult to evaluate a supercomputer which does not yet exist and on which no real world benchmarks have been run, some assessments have already been made in the marketplace by the European Center for Medium-Range Weather Forecasting (ECMWF) in the United Kingdom. Although NEC is not the only supercomputer manufacturer to make such claims about so-called paper machines, they are among the more publicly visible vendors.

ECMWF is considered the premier weather forecasting agency in the world today. It is an international organization supported by 18 nations formed to produce highly accurate medium-range weather forecasts of three to ten days. It is located in Reading, Berkshire, England. The center prides itself on using the most sophisticated models to provide the best possible weather forecasts for the European Continent.

Although the NEC SX-3 machine is not yet available, ECMWF gave it a very thorough evaluation because of NEC's claims that it would have a theoretical peak performance of 22 gigaflops. The assessment of the NEC SX-3 required extrapolation from performance of existing NEC technology. After performing an exhaustive evaluation ECMWF selected an existing CRAY Y-MP system with eight processors rather than the NEC SX-3 or any other paper machine from another vendor. More importantly, ECMWF concluded that CRI's upgrade path for the follow-on supercomputers would keep Cray as the technology leader.

ECMWF selected an existing CRAY Y-MP rather than the NEC SX-3.

III. CONCLUDING OBSERVATIONS

The purpose of this discussion is to make clear once again that theoretical peak performance numbers, whether they refer to existing or paper machines, do not represent a reasonable method for selecting a supercomputer vendor. Where competitive pressures and mission requirements are the driving force in the selection of a supercomputer vendor, claims of superior performance must meet a market test. However, as discussed previously, both competition and emphasis on mission requirements are absent in Japan's public sector procurements. Furthermore, claims that Japanese vendors now exceed U.S. vendors in supercomputer performance cannot be documented and certainly cannot be used as a rationale by Japanese public entities for preference for Japanese vendors in future procurements.

REVISED SUPERCOMPUTER PROCUREMENT AGREEMENT

The U.S. and Japanese governments have recently agreed upon a revised Supercomputer Procurement Agreement. This Agreement addresses many of the barriers identified in this paper. Purchase decisions now must be based on value and performance, and not simply the lowest price. Theoretical peak performance will not be used as a specification. Instead, benchmarks of real workload will be required and must be conducted on existing systems. A supplier cannot bid a future product ("paper machine") unless it is the first of a new model machine. In that instance all other suppliers in the procurement will also be allowed to offer a future model. The supplier with the winning bid must deliver the machine by the announced delivery date or the entire procurement will be subject to rebidding. Further, the winning system must satisfy the benchmark tests before delivery with results equal to or better than the forecasted results or the specifications. Otherwise the procurement will be subject to rebidding. Finally, low bids which are determined to "impede fair competition" will not be considered and the bidder will be ineligible to participate in that procurement.

While the Agreement is encouraging, it is important to remember that procedural changes alone are not sufficient. The 1987 Agreement instituted new procedures to no avail. The true test of the success of this Agreement will be in the number of sales that result. Such sales should not be a one-time result of this Agreement. Rather, these sales must be ongoing, resulting in a significant increase in our share of the supercomputer installed base in the Japanese public sector commensurate with our marketshare in public sector markets outside of Japan. Only then can the Agreement be considered a success.

COMMUNICATIONS

STATEMENT OF THE INTERNATIONAL DEVELOPMENT INSTITUTE

Mr. Chairman and members of the Committee, we thank you for this opportunity to submit testimony before the Senate Committee on Finance.

I am Dr. Peter Nelsen, an economist and President of the International Trade Council (ITC). ITC is a trade association dedicated to the expansion of free trade world-wide. The companies we represent are largely United States based.

We wish to address the issue of United States-Japan Trade Relations, specifically, the progress made on Super 301 negotiations.

I. SECTION 301: PURPOSES AND GOALS

Section 301 of the Trade Act of 1974 provides the authority and procedures for the United States Trade Representative (USTR) and the President to enforce United States rights under international trade agreements and to respond to certain unfair foreign trade practices. It is designed to help United States exporters redress trade discrimination abroad in order to expand our export markets. The statute was enacted in response to a growing sentiment in the United States that other nations were unfairly closing their markets to United States goods, causing our current trade imbalance, depriving our industries of the ability to export and depleting our economy as a result.

Section 301 was designed to help United States industries to increase their exports by creating procedures whereby trade barriers could be eliminated by negotiations, bilaterally, between the United States and the offending nation. Section 301, therefore, encourages negotiations to end unfair trade practices. Where negotiations fail to occasion the elimination of the trade barriers in question, Section 301 authorizes the USTR to initiate an investigation. If the investigation proves that the offending nation did, in fact, treat United States products in a discriminatory fashion, the USTR, with Presidential consent, may impose retaliatory measures ranging from suspension of the benefits of trade agreement concessions to the impositions of duties or other import restrictions.

II. SUPER 301: A STRONGER HAND

Whereas Section 301 creates in the USTR the authority to negotiate and investigate, Super 301 expands the authority. Super 301 requires her to identify "priority" countries with the most restrictive trade barriers to United States exports and to announce those practices that most impede United States exports. The targeted practices are those which, if eliminated, would be most likely to increase United States exports. The USTR must determine the number and pervasiveness of the unfair practice in question, as well as the level of United States exports that would be expected were the practices to be eliminated. These priority countries would, then, be first on line for the negotiation/investigation phases of Section 301.

Super 301 was enacted in consequence of ever increasing Congressional frustration with our current trade imbalances. It is designed to target specific offending nations for their violations. This is done in the hopes that they will lower their trade barriers which will result in increased potential for United States industry exports.

III. THEORETICAL PROBLEMS AND RISKS OF TRADE LEGISLATION

Although Congress has only the best intentions for our domestic producer/exporters, we fear that a road to hell is in the making. We realize that the trade regulation statutes are designed to promote exports. However, we fail to see how the retaliatory measures specified by the law will promote that purpose. We are increasingly

concerned, furthermore, by the even more stringent standards which Congress is currently proposing whereby the USTR must, by a certain time schedule, either retaliate or develop an "action plan." This proposal hampers her flexibility to arrive at a mutually negotiated settlement, a result which often takes much time.

More importantly, however, we are concerned with the remedy of retaliation itself. We must remember that retaliation represents the failure, not the success of this law. Retaliation does nothing to increase United States exports or to provide access for United States companies to that country's markets. Moreover, retaliation can be counterproductive and has an adverse impact on United States consumers, and United States exporters because other countries respond to retaliation by counter-retaliation. Consequently, we believe that Section 301 and its progeny should be implemented with a clear understanding that increased exports, not reduced imports, are the goal of this statute.

Moreover, we believe that the USTR should insure that only the most serious cases, in terms of potential increases in United States exports, will be subject to our trade legislation remedies. Invoking Section 301 frivolously will do nothing to advance domestic industry standing in the world market and, in fact, will alienate the United States from its trading partners.

IV. PROBLEMS IN PRACTICE

Not only does the 301 family of trade legislation suffer theoretical flaws, but as more cases are defined by the USTR, its practical flaws are coming to light as well.

In this piece of legislation, Congress mandated action against nations which restrict United States imports most heavily. However, calculating the impact of individual trade barriers on exports from the United States, is practically impossible. Claude Barfield, a commentator for the Washington Post, labeled the process "capricious and ultimately ruled by the kind of political judgments the United States argues against in the trade practices of other nations." The USTR's basis for calculation is inherently flawed. It bases its calculation on the National Trade Estimates Report. This document is nothing more than a self-serving claim by trade representatives without the benefit of sufficient economic or statistical evidence.[1]

Not only is its basis is flawed, but its application is inconsistent. Recently, for example, the EC announced that it planned to institute domestic content quotas against television programs coming from the United States. This action will cost the United States companies hundreds of millions of dollars. Yet, in the face of this attack, the Administration saw fit to pursue "other means of redress." Fair trade would not allow the EC escape citation under Super 301 while Japan, Brazil and India are cited.[2]

V. CONCLUSION

We believe that the 301 family of trade legislation is dysfunctional, erratically applied and entirely unnecessary. Section 301 and its progeny should be repealed as soon as possible. At a time when the Uruguay Round of GATT negotiations is attempting to open up barriers, why is the United States rattling sabers with protectionism legislation such as Section 301? By enacting 301, Congress has decided to wrest control of the economy from market forces and to place it in the hands of the Administration. Congress has granted the Administration the right to discipline the economy and bring it under its heel. This action can only hurt the United States economy in the long run. As the United States prosecutes nations under this statute, it also is protecting domestic industries from the discipline of foreign competition. Without this discipline, our industries risk becoming inefficient producers who pass the cost of their inefficiencies right onto the consumers. We all pay for industrial inefficiency in terms of higher prices and poorer service and quality.

Allowing the market to control itself, without 301/government interference, however, can only benefit producers and consumers alike. Market competition imposes discipline on producers. Producers under a market regime are forced to be efficient or else they fail. Company failure benefits the economy by giving room to more efficient and competitive producers to produce and grasp a share of the market. More efficient producers benefit consumers by keeping costs to a minimum. Company failure also allows for greater proliferation of research and development. As old, inefficient producers are swept away by market forces, newer, more modern ideas have the ability to prove themselves in the open market. This keeps industry modernized.

Some would argue that allowing industries to fail if they must would cause employment dislocation. To this we respond that our unemployment rate is the lowest of all industrialized nations, currently at about five percent. We have, despite the exaggerated auguries of some, a very vibrant economy with limitless possibilities.

Any dislocation of labor would be temporary as the new and emerging enterprises could more than take up the slack for the dislocated labor in the old retired companies. Also, protecting industries actually threatens our work force with even more severe unemployment. Since Americans refuse to suffer the indignity of high prices and poor quality for domestic goods (and rightfully so!) they will naturally look to the foreign competition to meet their needs. This trend results in lost jobs as our national companies, whose inefficiencies are protected by our national government, lose out to foreign competition. Thus, labor loses by inefficient management.[3]

301 also paves a clear road to counter-retaliation. Let us remember that retaliation and counter-retaliation brought about the Smoot-Hawley tariffs of the 1930's. We need not remind ourselves of the ghastly predicament which the United States government, through the actions of Messrs. Smoot and Hawley, visited upon the United States economy with their tariffs as virtually all trade was blocked by all nations, causing the greatest economic depression in history.[4]

In short, Kenichi Ohmae summarized it best when he wrote:

> The Role of government. . . is to represent and protect the interests of its people, not of its companies or its industries. It should let in the light and then allow its people to make their own choices. Anything less is to put the class and career interests of government bureaucrats ahead of the people they are sworn to serve.[5]

VI. RECOMMENDATION

In conclusion, we are stating that 301 is flawed in theory and practice. Its potential application can be devastating for our economy in view of the risk that our trading partners may be led to believe that the Administration's real priorities are, in fact, to retaliate. We believe that the Administration should proceed as it has done heretofore: by careful negotiation. If the Administration chooses to use retaliation, it should do so cautiously, in harmony with the views of domestic firms and workers, consumer interests and United States product exporters, as well as other relevant, affected groups such as port authorities, importers, retailers, conserving industries and companies, and their workers. If retaliation would have an adverse effect on the United States economy and its benefits are not significant, it should be avoided.

NOTES

1. Barfield, C., "The Grand Inquisitor on Trade," *The Washington Post*
2. *Ibid.*
3. Ohmae, K., "Toward a Global Regionalism," *The Wall Street Journal,* April 27, 1990
4. Canto, Victor A., United States Trade Policy: History and Evidence, *The Cato Journal,* p.679 (Winter 1983-84)
5. *Op. Cit.*, Ohmae, K.

PAUL SIEGEL
April 16, 1990

LAURA WILCOX, *Hearing Administrator,*
Committee on Finance,
United States Senate,
Washington, DC

Dear Madam: Last year I was appointed Director in charge of a major new division of Daiwa Securities America, Inc. ("Daiwa"), the United States subsidiary of Japan's (and the world's) second largest securities firm. Recently, I was suddenly and maliciously dismissed from this position without cause or notice. Once Daiwa had utilized my knowledge and talent to achieve its goals, they decided to renege on their employment contract with me, to avoid paying significant commissions on my procurement of multi-million dollar investment banking deals.

As you will learn in what follows: (1) Daiwa continues to retain personal property I brought with me to their offices on the first day of my employment (in fact, I have only recently been returned a briefcase after almost a two month delay), (2) Daiwa has taken actions which indicate it will attempt both to financially and personally injure me in the ongoing investment banking business affairs, and (3) this treatment is part of a wider pattern of abuse among American executives employed by Japanese firms. I appeal to each of you to intervene in this matter before it progresses to

the level of "Japan bashing" and in any way injures the continuing progress made in trade negotiations.

After working closely with Japanese businessmen for the majority of my career I urge you to reexamine two questions: (1) does American business really have a partner in "Japan Inc.?"; and (2) how can United States business deal in domestic and international venues when the motivations of its Japanese counterparts are so out of keeping with United States experience? I will relay the details of my own experience with two purposes in mind: (1) as a case in point in the larger United States/Japan trade of "services" and (2) to enlist your help in remedying the injury caused by Daiwa.

The division I led at Daiwa, later to be called Real Estate Investment Banking, was as yet substantially unformed on the day of my arrival. For approximately five years to that point Daiwa had devoted significant Japanese and American staff to attempt to establish itself in this business. Their efforts had, in substance, failed and resulted in merely $60,000 of cumulative gross revenues to that point in time. To remedy this obvious failing, within sixty days of my arrival I assembled a 250+ page business plan that reviewed the history and market developments of my division's prospective business segments, examined Japanese and other relevant foreign investor experience in this area, and detailed new business formation goals, business requirements, legal considerations, new investment products/markets, market growth channels (market share, strategic alliances, costs to entry, etc.) and internal resource needs (personnel, etc.). I concluded I would be able to lead a group that, if the business plan ideas were carefully implemented, would produce approximately $17 million in revenues during the first full year, and $68 million in the second year. The plan was enthusiastically endorsed by Daiwa's Japanese chairman, president and executive vice president, to whom I reported; each was skeptical, if not somewhat bemused, however, that we would produce this volume of earnings according to my plan.

Ten days after the business plan was approved we committed Daiwa's capital on a small financing I had developed. As a rapid "securities trade," within minutes I earned roughly $200,000 for Daiwa's account. My colleagues (around the world) were exultant, and called in their congratulations. Yet an eerie silence seemed to overtake my immediate superiors which at the time I could not define.

During this same ten-day period I initiated negotiations with various "bulge bracket" United States investment banks to form a strategic alliance to create a particular form of securities not commonly available in Japan: real estate/asset backed debt and equity which would be widely distributed among small to middle sized investors. Daiwa had no knowledge of how these securities were created, nor how to organize to distribute them to their investor base in Japan. I was soon to lead Daiwa in successful negotiations with Goldman Sachs & Co. and to lead seminars in the United States and Japan examining legal, tax and business considerations of this new strategic alliance and the securities it would create; the new venture was prospectively called Daiwa/Goldman Sachs Partners. Its implementation is certain to generate the very substantial revenues we projected.

As the negotiations of this alliance proceeded smoothly, and Daiwa became increasingly aware of its benefits, the reason for their discomfort at my rapid achievements for them became increasingly evident to me. Upon hiring me Daiwa had created a written employment contract which afforded me a moderate salary plus 15% of all gross investment banking revenues I generated for them. When I was hired my Japanese colleagues had been willing to hold out substantial incentives for me; no one imagined, I now surmise, how rapidly my efforts would enable them to successfully compete in these United States markets (one can only guess they were reflecting on the experience of foreigners in Japan). Now, however, the fruit of the incentives offered me were ready to be picked: revenue projection estimates for my division are large by any measure and most likely would, using conservative measures during the next seven years, result in millions in revenues accruing to me. Abruptly upon realizing the value of my contributions, Daiwa fired me without any cause to avoid paying me the anticipated commissions due me.

Unfortunately I am now unemployed, somewhat dazed and searching for a reason why the knowledge and talent I brought to Daiwa was not fairly treated. Among other things, my dismissal was entirely without warning and came within four working days of my return from a business trip to Tokyo to discuss the Daiwa/Goldman Sachs Partners venture. The "explanation" for the termination was simply: a difference of "corporate styles," with no further elaboration.

In fact, however, fundamentally I can only reach one conclusion: Daiwa and I had negotiated an American employment contract using the ink of Japanese culture. The Japanese for whom I worked had eagerly sought-out my abilities, paying multi-

ples of the standard rate to an executive search firm that had located me. I suppose Daiwa believed they could offer what in hindsight looked like a lucrative contract for a combination of reasons: their prior efforts had ended in such abysmal results they had little to lose by enticing a seasoned professional into their employ; or never felt it had any binding effect (and were confident that their ruthless business practice would rule, with little if any concern for normal international ethical standards). From Daiwa's point of view, once the bulk of my ideas and effort had been transferred to them, as an American I was redundant and therefore expendable. Even though Daiwa had struggled for years with issues I helped them sail through in a matter of months, they had acquired the essential ingredients they needed from me, and now attempted to void my contract.

In my capacity as head of the Daiwa's real estate investment banking group, and according to my employment contract, I was also responsible for developing a significant "portfolio" of real estate projects. These include specific real estate transactions, as well as transactions that derive from ventures I procured for Daiwa. Many of the projects within this portfolio of potential transactions have yet to close, and would result in significant additional compensation for me. I am also due compensation from any and all transactions, worldwide, that result from the direct or indirect activities of the Daiwa/Goldman Sachs Partners relationship.

To date I have attempted to secure other employment in the real estate investment banking field by contacting long-standing business associates and clients. On more than one occasion, Daiwa has deliberately called my clients and cancelled my personal meetings and general business opportunities without warning or provocation. Most recently Daiwa attempted to cancel my appearance on my own behalf at a speaking engagement in Los Angeles. In addition, Daiwa has refused to return to me personal files and property brought with me to my Daiwa office on the initial day of my employment. Short of filing a lawsuit I do not see another means of retrieving this property. Since that time I have found it difficult to secure other employment because many of the necessary materials I require to reconstruct my career are in Daiwa's offices.

What is so perturbing, however, is that I devoted long hours to—insuring the highest quality division performance (and which produced approximately 80% of Daiwa's Corporate Finance division revenues in the third quarter of 1989), only to be tossed out when the true longer-term "cost" of acquiring my ideas was recognized by them, and the task of implementing new innovations was laid-out in the Real Estate Investment Banking Business Plan I developed. Certainly, Daiwa will enormously profit from my efforts regardless of my presence, as will many Japanese firms that hire American talent only to terminate them after exploiting the talent used to solve the immediate problems at hand.

My experience with Japanese investment banks, and real estate related firms, is not unique. I have documented at least four other cases where senior American businessmen residing in the United States were fired or renegotiated out of lucrative employment contracts with Japanese businesses once a crucial portion of their "intellectual technology" had been transferred. In each case the dismissal closely paralleled that of my experience.

I can only conclude that "Japan Inc.," and its "satellite" businesses around the world, merely view the United States as a convenient "downlink" connection to be sapped for its innovative talents and hard assets otherwise unavailable in Japan. Policy and practice must dictate caution in unveiling so-called trade secrets or intellectual property (whether product or, as in my case, process), and severe penalty for its theft. My business and experience with Japan, and recent misadventure, should sound a warning about the risks and costs of blind trust in these international relationships.

I do not wish to pursue this matter as a "public event" and would like to resolve the issue without further feeding the public fires of acrimony and mistrust. To do so, however, in my particular case, I believe your collective assistance will be necessary; moreover we must work toward an international understanding that will not allow this type of practice to continue into the future.

I look forward to your responses and will contact your offices shortly.

Sincerely,

PAUL E. SIEGEL.

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