SMALL BUSINESS AND INNO

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BEFORE THE

SELECT COMMITTEE ON SMALL BUSINESS

OF THE

UNITED STATES SENATE

NINETY-SIXTH CONGRESS

FIRST SESSION

ON

SMALL BUSINESS AND INNOVATION

AUGUST 2, 1979

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SMALL BUSINESS AND INNOVATION

THURSDAY, AUGUST 2, 1979

U.S. SENATE,
SELECT COMMITTEE ON SMALL BUSINESS,
Washington, D.C.

The committee met, pursuant to notice, at 9:30 a.m., in room 323, Russell Senate Office Building, Hon. Walter D. Huddleston, presiding.

Present: Senators Huddleston, Stewart, Schmitt, and Hayakawa.

STATEMENT OF HON. WALTER D. HUDDLESTON, A U.S. SENATOR FROM THE STATE OF KENTUCKY

Senator HUDDLESTON. The committee will please come to order.

This is the first in a series of hearings which the Senate Small Business Committee will hold prior to the beginning of the White House Conference on Small Business next year.

The scope of the hearings will be to provide congressional input for the Conference and to establish the basis for additional action on the recommendations which may come out of the Conference.

Tbis undertaking by the committee is monumental in its proportions.

I commend the distinguished chairman, Senator Nelson, and all the members of the committee, who have agreed to devote a considerable amount of time to the project.

A special "thanks" goes to Senator Stewart, who has taken a strong position of leadership on this project.

I am convinced that the fruits of these hearings will provide an important point of reference for the White House Conference and for congressional action afterwards.

The hearings today will focus on the need for adjusting Federal laws and policies in order to encourage and promote small business innovation.

The ultimate benefit to be derived from this will be a healthier economy which will be able to meet the needs of all Americans.

Small business innovation will have many beneficial effects.

However, the major contributions will be increased jobs to reduce our excessive unemployment, increased productivity to counter inflation, an improved competitive "edge" to help us create and keep international markets, and new technologies to improve our standard of living.

Milton Stewart, chief counsel for advocacy of the Small Business Administration, has done an excellent job in preparing the report which is the principal topic of discussion today.

He bas demonstrated his innovative talents by combining the three separate studies and evaluating the consensus which flows from them.

It is this type of creative factfinding which will produce beneficial results.

While a great deal of blame can be attributed to the Federal Government for failing to devise policies which benefit small businesses, I will be striving to stay away from a "finger pointing" approach during these hearings.

Our goal should be, not to lay blame for present inadequacies, but to focus on what positive steps can and should be taken to utilize the vast creative potenital of the American small businessman.

I believe that constructive criticism and cooperation should be the keynote of these hearings, if we are to arrive at a final consensus on the type of economic atmosphere which is most beneficial to small businesses.

I mentioned Senator Stewart has been a leader in organizing this series of hearings and in prevailing upon the other members of the committee to undertake this rather large undertaking. Senator Stewart, we would appricate having your comments at this time.

STATEMENT OF HON. DONALD W. STEWART, A U.S. SENATOR FROM THE STATE OF ALABAMA

Senator STEWART. I have a written statement which I will ask be made a part of the record. It somewhat reiterates the statements you made about the thrust of these hearings. Not just the hearing this morning, but the others the committee plans to hold to examine the role of Federal department and agency programs and policies and how they affect small businesses in this country. We plan to examine what the Government can do, and what it perhaps ought not do in some instances. There might be a better way of operating, as far as small businesses are concerned.

I am glad to be a part of these hearings, and I look forward to working with you, Senator Gaylord Nelson, and with other members of this committee in making these hearings a successful venture.

Hopefully, we can have ready for the delegates to the White House Conference on Small Business, as well as others, some kind of game plan that we can follow at the national level to assure that government will do what it ought to do in the area of small business.

I want to say a special word of thanks, Senator Huddleston, to the members of this committee's staff, who have worked very hard to try to get these hearings underway.

A lot of times we hear criticism leveled at members of congressional staff. I think these folks have done an excellent job and I want to thank them publicly for their help.

I particularly want to commend Milton Stewart with SBA for the work he has done, not only in preparation of the innovation report, but for his counsel in connection with the planning of these hearings. His assistance has been invaluable. Frankly, I think it is an example of the kind of work that the Small Business Administration ought to be doing. I want to tell you that publicly, Milton, and I commend you for it. I am hopeful that one of the fruits of this hearing will be to get that agency in more of these kinds of activities.

I will end my remarks by saying I know we have some people here who are rather shy. [Laughter.]

Seriously, I will not take any more of your time. We look forward to hearing from you. You have all done an excellent job on this report. Our job this morning is to hear from you.

Senator Hayakawa, I know you want to introduce a witness from California.

Senator HUDDLESTON. Senator Hayakawa?

STATEMENT OF HON. S. I. HAYAKAWA, A U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator HAYAKAWA. Thank you, Mr. Chairman.

It is a real pleasure to welcome members of the Small Business Administration Task Force on Small Business Innovation.

This is a good example of cooperation between government and business, and I look forward to learning more about the findings of this task force.

We are especially grateful to you, Mr. Stewart, and to your presence here as a witness to be with us, and I am especially pleased to welcome Mr. George Lockwood, a general partner of Monterey Abalone Farm in Monterey, Calif.

He is interested especially in exploring and in expansion of the aquaculture industry, and he appears today as Chairman of the Domestic Policy Review on Industrial Innovation, which was conducted by the Department of Commerce, and as a member of the SBA Task Force on Small Business and Innovation, so he is an expert on this general subject by now.

Mr. Lockwood is a civil engineer, the founder of his company, and he was associated before that with a pioneer firm in offshore drilling.

The task force has agreed to look into Federal policies affecting innovation thoroughly, as it has, and with representatives like Mr. Lockwood, who is part of an operation such as an abalone farm, this is quite innovative in itself. I was talking to him, before we sat down, about our sturgeon farms, where an observer saw these fishermen along the Sacramento catching sturgeon and degutting them and walking away, and he realized there are hundreds of dollars' worth of caviar being thrown away. I am talking now about this Russian emigrant, this professor, so starting from that, he got the agricultural people at the University of California interested in cultivating sturgeons, and I think he got to the point where they operate, take out the eggs, and sew them up again, and put them back to work, and this is fantastic. I have had some of this caviar, and last January I was in the Soviet Union, and we were treated to fantastic good food, including the Russian caviar, and by God, the California caviar is a damn sight better! Mr. Lockwood assures me that the California abalone is better than Japanese abalone, and I am perfectly ready to believe him.

Instead of going on with the prepared remarks I have here, I would like to call your attention to an article that I think is in the November 1978 issue of Harper's magazine. Mr. Stewart, I think you would be especially interested in this, it is either September or November, it is written by George Gilder, and he says in effect that the difference between liberals and conservatives is very, very frequently misunderstood, so he does not use this term, but he says it is a constant struggle between those who would preserve the status quo and the people who start innovating, and creating new ideas, such as Thomas Edison in his workshop, and Henry Ford, and Mr. Honda in his bicycle shop in Tokyo from the end of World War II, these are people who are dreamers, whose ideas are regarded with considerable skepticism, and the

relatives are asked to invest in their new idea, do so out of kindness rather than out of any real belief in his project, but these are the glowing points of culture. The real conservative forces, Mr. Gilder says, are the conservative types of big business, the big labor unions and big Government, as opposed to the free independent-minded individuals, whether in Government, or in academia, for that matter, as in the area of my experience, or in business, who are threading new paths.

My father was a small businessman, but my own academic experience is fascinating to me in light of what people are doing—like your "crazy abalone farm."

You know, when I became interested in semantics, back there in the late 1930's, the professor under whom I earned my Ph. D., a professor I respected highly, told me not to mess around with semantics.

You are establishing a reputation as a literary scholar, so do not please mess around with semantics, it will ruin your career, so I should have listened to him.

Senator HUDDLESTON. And look where you are.

Senator HAYAKAWA. Right. [Laughter.]

So I should have listened to my professor. Anyhow, you see how I have sympathy for those with the wiser heads, not with those who say do not mess around with the abalone farm, or do not mess around with trying to develop a new type of motorcycle engine, whatever, for these are creative to the culture, and in a police state as in the Soviet Union, there is no creativity, absolutely none, and this is why we are ahead of them and will remain ahead of them indefinitely. This is why I am glad to be a member of this committee, I am glad to take part in your deliberations.

Mr. Chairman, thank you.

Senator HUDDLESTON. Thank you very much, Senator.

For the record, all prepared statements submitted by members of the committee, including that of the chairman, Senator Nelson, will be made a part of the record at this point.

[Additional prepared statements follow:]

STATEMENT OF HON. GAYLORD NELSON, A U.S. SENATOR FROM THE STATE OF WISCONSIN, AND CHAIRMAN, SENATE SMALL BUSINESS COMMITTEE

Today's hearing is a first in a series of comprehensive hearings which will explore the role of small and independent enterprises in our economy and our quality of life and how they can contribute in solving many of our most pressing national problems.

In the next three months we intend to examine how federal agencies and departments assist or hinder small businesses in stimulating real economic growth, increasing productivity, expanding job opportunities, arresting inflation, expanding exports and providing alternative energy sources.

At the conclusion of these hearings, the Committee will foward to all delegates to the White House Conference on Small Business a summary of its findings together with recommended legislative and administrative solutions in the areas of taxes, capital and credit needs, technology transfer and innovation, procurement, economic concentration and anti-trust, regulatory and paperwork reduction, energy, rural assistance, international trade, and small business advocacy within the Federal Government.

Today we will hear from witnesses who served on one or more of three task forces which concluded that federal policies have systematically excluded small firms from fully participating in government sponsored or initiated research and development. The Office of Management and Budget has found that independent entrepreneurs have accounted for half of major innovations between 1953 and

1973. Other studies by GAO, the Commerce Department, the National Science Foundation, and leading academic institutions conclusively demonstrate that small companies are producing a disproportionate share of innovative ideas and products in relationship to either their asset size, number of people employed or sales volume. All of these findings, I should mention, have been introduced in previous Committee hearings.

The Committee, in hearings held last summer, examined the underutilization of small business in industrial innovation. At that time I served notice that those Federal departments and agencies responsible for strengthening the innovative process should singularly or collectively provide Congress with specific recommendations for better utilizing innovation produced by the small business sector. Since our hearings in August, 1978, the administration has been silent on the subject—no program or legislative initiatives have been forthcoming.

I think that the views and recommendations of the leading small business experts who comprised the three innovation task force groups deserve to be heard and seriously considered. It is therefore my intention to introduce after the recess an omnibus small business innovation bill which will incorporate many of their suggestions.

The national climate for the growth of innovative small concerns has to be changed and I for one intend to help bring that change about.

STATEMENT OF HON. DONALD W. STEWART, A U.S. SENATOR FROM THE STATE OF ALABAMA

Today the Senate Small Business Committee will begin a series of comprehensive hearings aimed at examining the impact of federal policies on the productivity, efficiency and creativity of the American small business community. We will take a look at the problems faced by innovative small businesses and we will examine the role the federal government can play in contributing to the growth and development of this vital sector of our economy. This may include legislative remedies where necessary or regulatory and policy changes by pertinent executive branch agencies.

Earlier hearings of this committee as well as numerous studies by private and governmental organizations have established without a doubt that small business has traditionally been the principal source of innovations. It is a well documented fact that 45 percent of all economic growth comes from technological innovation and that the small business sector accounts for at least half of that innovation.

For years we have seen the large and disproportionate contribution innovative small businesses have made to the creation of jobs and to increases in productivity. At the same time we have all encountered numerous examples of government regulations and policies which have hindered the ability of independent enterprise to tackle present problems such as the growing threat of recession, drastic declines in productivity, concerns over our nations strategic military strength, an energy crisis, widening trade deficits, and soaring inflation.

It has been almost 12 years since any congressional committee held a series of hearings on the government's effect on small business and it is time to update the previous efforts. It is the Small Business Committee's hope that the result of these hearings will be a series of written policy recommendations submitted to the President early next year, in time to provide meaningful Congressional input into the White House Conference on Small Business.

Today's hearing comes on the heels of an SBA Office of Advocacy task force report titled, "Small Business and Innovation." It represents the combined efforts of a distinguished group of small business entrepreneurs, many of whom are testyfying today.

In addition to examining the problems faced by technology oriented firms, the task force report outlined seven areas where legislative action is most desperately needed. The seven areas include taxes, research and development, regulations, capital formation and investment, procurement, patents, and exports and trade.

Today we will examine the task force report and hear first hand from some of the folks who participated in putting it together.

Senator HUDDLESTON. For the record, I will identify the members of the panel who are here. We will start with the moderator, Mr. Milton Stewart, who is the Chief Counsel for Advocacy of the Small Business Administration, followed by Mr. Sherman Abrahamson,

special assistant to the chief executive officer, Control Data Corp.; Mr. Dan Cronin, Ampersand Associates, Boston, Mass.; Mr. Alfred C. W. Daniels, H. H. Aerospace Design Co., Bedford, Mass.; Dr. Clyde R. Goodheart, president, Bio Labs, Inc., Northbrook, Ill.; Mr. Sid Green, Terra Tek, Inc., Salt Lake City, Utah; Mr. Harold Guller, Essex Cryogenics Industries, St. Louis, Mo.; Mr. George Lockwood, Monterey Abalone Farm, Monterey, Calif.; and Dr. Robert Springborn, president, Springborn Labs, Enfield, Conn.

Mr. Stewart, you may proceed with your statement and with the panel.

STATEMENT OF MILTON STEWART, MODERATOR OF PANEL DISCUSSION, CHIEF COUNSEL FOR ADVOCACY, U.S. SMALL BUSINESS ADMINISTRATION

Mr. STEWART. Mr. Chairman, Senators, I would just like to take the time to state that I appeared before this committee which recommended my confirmation to the Senate just about 1 year ago.

One of the things I said then was that a great void in the Federal Government was the absence of a point of spokesmanship for the small businessman, particularly the innovative entrepreneur, which Senator Hayakawa has been pleased to call attention to, and while innovation and entrepreneurship are not unique, there are innovative entrepreneurs even in the executive branch of the Government, as well as in both Houses of Congress, the innovator has a particularly hard role to play in a society particularly dominated by large-scale institutions.

I would like to mention that the men who are innovators, who are entrepreneurs, are the kind of men who have put together the document that is before you. They are all listed in that document, so you can make easy reference as they talk to you today.

There are three reports contained in this document. In one of those Mr. Sherman Abrahamson, directly to my right, represents 14 people who prepared a study for the Assistant Secretary for Commerce for Science and Technology on the Significance of Small Innovative Businesses for Job Creation.

That is chronologically the first of the reports, and in that document 12 recommendations are cited. There are biographies of the 14 people involved at the tail end of the document.

George Lockwood and Bob Springborn, over to the left here, represent six members of the Domestic Policy Review Layman's Group which the Commerce Department set up as part of the President's Domestic Policy Review Study.

The other five people represent the SBA Advocacy Task Force on Innovative Small Business People in general.

They are all included in the document's biographies of these gentlemen and I will let them tell you about themselves, as we proceed during the morning.

What I would like to make a matter of record is how these groups came to be pulled together for this purpose.

First of all, the Administrator for the SBA designated me to represent the agency in the Domestic Policy Review, and as a part of that process, it became clear to me we needed some input directly from

people engaged in full-time and innovative activities, either as entrepreneurs, or as financiers of such ventures.

We know the two groups referred to and were exposed to their deliberations.

The statute establishing the Office of Advocacy, Public Law 94–305, imposes on me the express responsibility to study among other things the contribution that small business can make in stimulating innovation.

That is in section 202(1) of the Advocacy Statute. Section 9 of the Small Business Act imposes on our agency research and development responsibilities which the Administrator and I during these months have been discussing at great length. Among other things, we have been concerned from an agency standpoint that SBA become, as it were, concerned more affirmatively with the "best" of small business, as well as the marginal hard-pressed companies which we must so often finance. I am very proud to be able to tell you I think that is what you have before you here.

These matters are not just in market terms. They are successful in innovative creative terms, and represent the kind of significance you all mentioned in your opening remarks.

I would like to explain how and why the final group was selected.

I took the responsibility for the choices. I looked at well over 100 people, identifying people who met certain standards.

First, I looked for chief executive officers, senior officers of innovative entrepreneurial enterprises, for profit businesses. Second, they had to represent a range of scientific disciplines, all the way from biology and medicine.

For example, Dr. Goodheart is a doctor of medicine involved in engineering and space. He has a range of experiences that include the Government, big business, small business, and extended academic experience. But I also wanted geographical representativeness, so that there is at least one person on this task force for every 1 of the 10 SBA regional districts.

The group was convened early in January of this year for an initial 2-day meeting. Extensive bibliography is included on a couple of pages. A mountain of paper was sent to them. They reviewed the background of this subject matter from the standpoint of public policy, and examined studies that have been done, including studies done under the auspices of this committee and its sister committee in the House.

We had 2 full days of discussion, followed by 2 full days of public hearing after notice in the Federal Register, so anybody that wanted to come in and make a contribution was on notice and could have done so.

These folks were then asked to meet with various public officials. We heard a representative of OSBP, the National Science Foundation, the Commerce Department, the Treasury on taxes, some MIT folks with long experience in the study of innovative activity. Then followed 4 months of extensive discussion and exchange of correspondence telephone and in person. A number of these fellows met on their own, and various draft documents were prepared.

They decided that they in effect would want to add to the literary output of the advisory groups, because two excellent documents were almost completed. The one which Mr. Ambrahamson's group has—the third document—has an excellent review of a number of major

national problems and their relationship to small science-based companies. In turn George Lockwood played the lead part for the six members of the Domestic Policy Review Group, which is the second document reported here.

The final group limited its considerations. The six members of the Commerce Group were co-opted for discussion purposes, hut joined in approving the document. What in effect they decided they would do is actually draft a layman's version of what kind of law they would like to see on the books.

The central question they were trying to answer is most simply put this way: What do we as innovative entrepreneurs need from the Federal Government, affirmatively and negatively? What shoud they do and stop doing, to bring back to the economy the kind of entrepreneurial environment we had in the late fifties and early sixties, when men and women felt very freely they could leave Government, or major corporations, academic campuses, and go on their own, and start the kinds of businesses these people run?

There has been a generally noted decline in that activity, and we raised the question of what kinds of changes do we need to make or what contribution to Government policy are needed to bring back that entrepreneurial climate for all of the reasons set forth in these studies.

There are some dissents noted, These, like all small business prople, are very stiff-necked people. They would put things in their own very special way. You will find trouble in getting them to agree or disagree but with reference to their shyness, they are all very articulate people.

Not all of the people involved are here today. Sherman Abrahamson represents a task force of 14 people; George Lockwood and Robert Springborn, a task force of 6 people; Dan Cronin, 7 venture capital managers, all of whom have financed innovative businesses. The other five fellows are heads of small innovative businesses. They are not here today, but they are represented in the conclusions.

For your convenience, we have included a comparative table of the recommendations and comments of all three groups. They are under five or six headings, tax recommendations, research and development recommendations, regulatory procedures, capital investment recommendations, procurement recommendations and patent recommendations.

By way of conclusion, my contribution to this process is summarized in three brief pages at the beginning of the document. In summary I have tried to explain something about the nature of the consensus. With your permission, I would like to read these 9 sentences which summarized what seems to be the heart of the agreement among the 14 people involved in this project.

One: The critical need is for an entrepreneurial environment far more favorable to innovation and risktaking than we have had for the past 10 years;

Two: Primary reliance for innovation can and should be placed on the private sector;

Three: The unsatisfactory environment for innovation and risktaking results from the cumulative impact of a number of Federal policies;

Four: Small business is the most underutilized particpiant in the Nation's innovation process;

Five: There is a compelling national stake in closing the gap between small business' potential contribution to innovation and its present utilization;

Six: General Federal policy changes, important as they are, will not help small business enough: The changes needed must be specifically targeted to it.

Seven: Two typical yet central deficiencies cited among many are: (*a*) Inadequate Federal targeting of Federal R. & D. procurement to small business; and (*b*) inadequate incentive for converting Federal R. & D. results to market sector civil technology innovation.

Eight: To meet those deficiencies a gradual buildup to a 10-percent set-aside for small business research and development procurement is recommended. That would almost triple small business' share in a few years. Transfer to the private sector would be further stimulated by using 1 percent to follow a model program developed by the National Science Foundation.

Nine: Those Federal policy changes necessary for creating a favorable environment are practicable and achievable in the near term.

Finally, Mr. Chairman, our country has been blessed with numerous attainments in the world, not the least of which is that we have more Nobel Prizes in our citizenry than any country in the world.

I do not think that Japan has a single Nobel Prize winner yet. But what they have is the fruits of the application of the basic research done by our Nobel Prize people. The men before you represent the critical transition between basic research, the marketplace, the homes, the factories, the streets, our lives as people, as a people together, and all I have to say is that there is a clear discrepancy between our attainments in basic research, and our capacities as a people to put their fruits to work. It is a discrepancy that has widened in my lifetime.

I have watched it as a venture capital manager, and I have watched it as a lawyer. We cannot afford to have it continue.

I would like to excuse myself, I have another pressing meeting, but there is a good reason for me to leave too.

I really think you ought to hear from these people without the presence of any irrelevant people, and believe me, that is what I am.

Thank you very much.

Senator HUDDLESTON. Thank you, Milton. In what order do you wish to proceed?

Mr. STEWART. I have left Mr. Cronin, his name starts first, as our chairman.

Senator HUDDLESTON. All right.

Mr. CRONIN. I think it might be appropriate to hear first from the gentleman from California on regulations, Mr. Lockwood.

STATEMENT OF GEORGE LOCKWOOD, MONTEREY ABALONE FARM, MONTEREY, CALIF.

Mr. LOCKWOOD. Thank you, and thank you, Senator Hayakawa, for your kind comments.

Let me briefly outline for you the report which begins on page 56 of the report document.

I know this report was put together, as you all know, President Carter approximately 1 year ago became concerned that industrial

innovation in America had declined during the past decade and ordered the Secretary of Commerce conduct a review of matters affecting innovation.

The Secretary of Commerce put together an Advisory Committee of some 150 executives of a broad range of American enterprise, some 6 or 7 of us where from small businesses interested in innovation.

There were seven subcommittees that we were assigned to, having to do with economic policy, regulatory policies, Federal procurement, Federal R. & D., patents, concentration, industrial concentration, and an information exchange.

After the completion of the reports of these task forces, it was decided by those of us from the small business community that we might possibly wish to prepare our own report, having learned from their larger experience, but directing it more toward the peculiarities of small businesses in the innovative process, so that is why this report was prepared for the Secretary of Commerce, Mr. Stewart has included it in his particular document, and it is interesting that many of the conclusions we have reached, and many of the recommendations we have made are the same that keep emerging from other studies, even though the genesis of our work was in the domestic policy review.

We make recommendations in basically five areas. We have concluded that a major iinpact is being made on innovation by small independent firms because of the tax policies of our country.

Also the policies that have to do with flow of retirement savings, and the policies of the Securities and Exchange Commission.

These are having a major impact on the flow of capital which is an essential tool for small business innovation.

Second: In the area of innovation, it is quite clear to us that regulations that are intended to affect all other areas of business and to apply equally to all areas of business, when they apply to small business are disproportionately discriminatory, that small innovative businesses are having a very difficult time complying with and meeting the regulatory standards that are coming out from the Congress, and from our regulatory agencies.

In the area of Federal procurement, the small innovative firm basically has been excluded from this area of this huge and important market.

In the area of Federal R. & D., there has been a very disastrous trend over the years to have more and more of our applied research done out of the private sector, and done in universities, and yet small innovative firms have an enormous potential to contribute in this area.

In the area of patents, we have seen a disastrous trend occur, again in the past 10 years, where the value of patent protection for small firms particularly has declined substantially.

Patent litigation is very expensive, and for a small firm to be faced with a $250,000 suit in order to defend their patent rights simply means that many small firms cannot properly enforce the patent they have, and on top of that, the quality of patents has substantially declined, something like 50 percent of the patents contested in court are now found to be invalid, so there is again the small businessman and small businesswoman who simply cannot pursue technology with the same degree of protection as can large companies.

I think something else is very significant that has come out of our work, and it is quite obvious to us in the innovative fields that we are in, that small business can make a disproportionate contribution to innovation.

A study made by the National Science Foundation a few years ago showed in the postwar period, approximately 50 percent, I think the figure was 48 percent of the most significant innovation in the American economy were made by firms of less than 1,000 employees, and 24 percent of these most significant innovations were made by firms of less than 100 employees, and if one looks at the history of the economy of the United States, it is replete with many, many examples, even the modern industry, how the IBM, the Stewart-Packards, were all at one time a small wild innovative firm struggling to become successful, so that gives you a background of the types of conclusions we have reached, and the road that we traveled, and we have made some seven areas of recommendations, many of them legislative, Mr. Stewart has captured these in his summary at the beginning, most of them.

Some people have criticized us for having too many recommendations. I can only say it was the consensus of our group of six, that we should, wherever we saw a significant constraint on the process, we wanted to bring it to your attention, and these are brought out in the seven areas of recommendations that we have.

Thank you.

Senator HUDDLESTON. I think we will first hear from each member of the panel, and then we will ask our questions.

STATEMENT OF DAN CRONIN, AMPERSAND ASSOCIATES, BOSTON, MASS.

Mr. CRONIN. First, the good news is the reduction in the capital gains tax, which is affecting the Reform Act of 1978, has significantly revitalized the venture capital market.

Over $1 billion in new venture money has been made over the past 18 months, more than 10 times the amount available just 2 years ago.

The new issues market has come back to life. You will recall that during 1974, only nine new issues were completed raising a mere $16 million. During the first 6 months of this year 15 new issues were raised, and as a result of this improvement in the new ventures market, old venture capital was freed up, and it is being recycled, and there is a line of force between fund raising investment and the achievement of hope for results, innovation, job creation, economic wealth, increased tax revenues and return to the investor.

We are moving to the second phase, however, venture investments made during the first 6 months of 1979 have already exceeded the total made during the full year of 1978, so it seems the reduction in capital gains is a key reason for this sudden market and marked improvement in capital formation prospects.

I suspect too that investors are anticipating additional proinvestment legislation, again changes in SEC regulations have simplified the registration so that venture capital can be recycled out of old investments, into more new ones more quickly, and since the first

of the year, $50 million is pension fund money has been invested in venture funds, so I think the Congress ought to be commended for the positive steps it took in producing positive results by reducing the capital gains tax.

In our review, three of the recommendations applied to encouraging capital formation, one of those is to defer the tax so that the capital is reinvested in other qualified small companies during a certain period of time.

Second: Another important recommendation is the restoration of qualified stock option, this is particularly important I would say for innovative companies, because they are a long time in becoming successful.

Enhancement of subchapter S provisions permitting up to 100 investors, including corporations to be stockholders in subchapter S corporations is important.

Other recommendations are targeted more specifically at special kinds of small companies. The young innovative companies on the threshold of new technology, these are the very high risk stocks, they are not ready yet for investment by venture funds under the current rules of the game.

They can be capitalized by leaning on management capacity, they are the ultimate ventures. These are the kinds of companies that usually absorb far more funds for their venture products.

Venture capitalists are risk takers, and their careers can be short-lived.

It follows that in the companies for which the task force is concerned are classified as long shots, and the odds for venture capitalists have frequently invested in the unknown.

The recommendation is to tax capital gains from investment in firms held for a minimum of 5 years, and one-half the regular rates, 14 percent maximum.

What we are trying to do is improve the odds on long shots.

Second: Allowing losses of such companies to flow through to individual investments. This would lighten the loss on the losers, and then finally extend the period of exercising stock options, for a maximum of 10 years, and this is to encourage the employees to stay with the company.

I think this is a critical thing. We are getting a better deal in business, but still the raising of capital is phase 1, and then you have to make the investments and the trick is to have people take the risk.

I think the point is to encourage people to quit the good job with the nice pension, and all of the benefits, to take the risk in forming a new company, and to help the company itself preserve cash, we made these recommendations, to extend the period for loss carryover from 5 to 10 years, second, allow the company to write off specialized equipment, instrumentation, for developing testing, over the period of 5 years; and third, allow the company to set up a research and development program for use in periods of distress.

I think these are critical and important recommendations for these unique companies, companies that frankly are not being supported vigorously by the venture capital community.

We have a fiduciary responsibility for our investors, and you will find if you look at the average venture capital portfolio, about 1 out of every 10 is what you would call a long shot.

There were two long shots we gambled on, one was computer vision, and it was the pioneer use of mini-computer for industrial and electronic drafting.

The key here was the development of an optical technology. Today that company is doing $100 million in sales, and has 40 percent of the world's market, and we have invested in precision strategies, and they have developed software which allows software to be portable from one computer to another, and which allows one terminal by one manufacturer to communicate with a terminal by another manufacturer.

I think we have one general partner who understands that company, and I think the rest of us are totally mystified as to how that thing works.

Some of the young innovative companies we did not invest in, one is a plywood plant which got funded for $32 million. What it is is a means by which plywood is manufactured from scrap wood, and it is the first major plant in the world that can do this up in Maine, which makes sense, because we import a lot of plywood from the west part of the country, and it would be good to have that import replacement. That is a wild deal, it is $32 million, which is a lot of money, and as I said, it is an untested idea, and we did not have guts to do that one or get involved in it.

Another one we turned down was working on a cancer cure, 17 years history, scores of papers endorsed this by people like John Hopkins, but as one fellow said, to invest in this looks like buying a ticket to the third act of a very long play.

I think these extra incentives could improve the ratio of investment in young innovative companies, and that they ought to be considered by the Senate.

Maybe we would like to hear from you.

STATEMENT OF CLYDE R. GOODHEART, M.D., PRESIDENT, BIO LABS, INC., NORTHBROOK, ILL.

Dr. GOODHEART. Mr. Chairman and members of the committee: Our small company in the suburbs of Chicago has several product possibilities that we have been developing over the last several years.

We have run into many problems in implementing these. We thought it would perhaps be worth discussing these and injecting a personal note as to some of the problems that we face.

For the last 8 or 9 years, our company has been involved largely in doing Government research contracts, primarily for the National Cancer Institute. We have had some spinoff possibilities from that research that we would like to commercialize.

In doing that work, we have found that among the many impediments, one is that our largest competitors are the universities and other tax-exempt organizations.

When we bid against those kinds of organizations, our costs naturally are higher than theirs because we have taxes to pay which they do not. Not only do we bid against them on research contracts, but we also find that in many instances the universities are doing routine testing under contract from the Government as well as from industry.

In a couple of instances, I have actually received telephone calls inquiring whether we could do a certain kind of test. I said, "Yes, we

could, but I know somebody who can do it a lot cheaper. We cannot compete on price, and in good consciousness, I must tell you about it." Then I give them the name of the University. Naturally, they have not had us do their testing.

This is one area of competition that is unfair: Universities are tax exempt, and that seems to me an abuse of the tax-exempt status.

We also have had problems with patent protection—I am sure others here this morning will speak about this also.

We found that if we come up with an idea for a new product or a process that is not patentable, it is virtually impossible to get it funded. The capital risk involved is too large, and that virtually kills it. We do need stronger patent protection.

A few years ago, I was talking to officials at the National Science Foundation about a project.

We proposed to go in with a large pharmaceutical company to develop some better uses of certain blood products.

The National Science Foundation officials pointed out that the other company had many patents in this area, and therefore, it would be impossible for the Government to get a controlling patent. They said that if the Government cannot get a controlling patent, they would not be interested, so that idea was dropped.

What I am trying to stress is that ideas for new products often get killed in the idea stage before anything else is pursued on them, and there is an unknown and immeasurable loss. Sure, a few ideas get through, and we hear of examples. But how much more could be done, that is the important thing, really so much more could be done is the climate were better, so that the ideas would not have to get killed.

I have a prepared statement covering the above remarks in more detail which I would like to ask be made a part of the record.

Senator HUDDLESTON. Without objection, so ordered. Thank you very much.

[The prepared statement of Dr. Goodheart follows:]

STATEMENT OF CLYDE R. GOODHEART, M.D., PRESIDENT, BIO LABS, INC., NORTHBROOK, ILL.

INTRODUCTION

Mr. Chairman and Members of the Committee, my name is Dr. Clyde R. Goodheart. I am founder and President of BioLabs, Inc., located in Northbrook, Illinois, one of the northern suburbs of Chicago.

Briefly, my background is as follows. After finishing medical school and my internship, I took a three-year fellowship at the California Institute of Technology in cancer virology and tissue culture. My director was Dr. Renato Dulbecco, recently a Nobel Laurcate. Then I did basic research in virology at Childrens Hospital of Los Angeles for four years. When the American Medical Association-Education and Research Foundation opened its Institute for Biomedical Research at its Chicago headquarters, I started and directed the laboratory for cancer virology. Our work was devoted to basic research in understanding the cancerization process. Five years later, in 1970, the AMA discontinued the Institute, and I founded BioLabs. Now, in addition to being President of BioLabs, I hold the rank of Professor, Department of Microbiology, Rush Medical College. Recently, it has been a great pleasure for me to work with Mr. Milton Stewart, Chief Counsel for Advocacy, Small Business Administration, on the Task Force for Innovation by Small Business.

BioLabs is a small, independent laboratory providing services in research. product development, quality control and sterility testing, and sterile bottling, We also make and distribute products for laboratories doing tissue culture. Our work is therefore primarily in microbiology and tissue culture. This is the first

year since its inception that BioLabs has not had at least one contract to do research for the federal government. Our prior contracts have been with the National Cancer Institute. Most of our work involved developing a new, rapid, and relatively inexpensive test in animal cells for determining whether a chemical has the potential to induce cancer. In addition to the government, our clients have included many large and small companies.

Recent years have seen several new developments in basic concepts in biology that could be commercially developed to benefit the American people. Basic research is simply an exercise unless its results can be used to improve people's lives. Because of my own background, and the personnel, facilities, and equipment available at BioLabs, we could pursue these new developments. But many obstacles face a small company such as ours. I would like to spend the balance of my presentation describing some of these new areas briefly, and then I would like to discuss the problems facing us, and other small companies, in further developing these new product areas.

Before doing so, however, I would like to point out that all the items I will discuss are new—new products that would result in new jobs, rather than increasing employment at BioLabs at the expense of other companies. The taxation base would increase, and because of a worldwide market waiting for the products, our country's exports would also increase.

POTENTIAL AREAS FOR INNOVATION

1. The first recent development from basic research that I would like to describe is a new way of preparing antibodies. These protein molecules are produce by certain cells in animals and protect the animal against infection or against a foreign substance. A new technique has been worked out in a number of laboratories for preparing large amounts of antibodies in test tubes or plastic dishes, that is, tissue culture, without the large-scale use of animals. The antibodies obtained are extremely pure and much more effective than those obtained by conventional methods. Thus, they will greatly improve the many diagnostic tests that are available, and will permit the development of new tests. The diagnostic tests I am referring to are used widely in testing for diseases of the liver, thyroid, heart, and soon, hopefully, for cancer. Blood units in blood banks are presently screened for hepatitis to avoid transmitting the disease by tranfusion. The new source of antibodies also likely will soon provide new means of treatment of many diseases.

2. Another item, originally described in 1957, has recently become important in the scientific world and has received wide coverage in the public press. This is interferon, a substance released by cells under stimulation by viruses or certain chemicals. Interferon acts on neighboring cells, rendering them resistant to virus infection. During the past ten years or so, many laboratories have found interferon effective in the treatment of experimental cancers in animals. A very limited number of experiments in humans indicates that interferon is well worth a closer look to see whether it may also be effective for treatment of human malignancies. The American Cancer Society has decided to undertake a major clinical trial of interferon in humans to resolve the question. Because interferon is in extremely short supply, however, the Society was forced to purchase the inteferon from Finland—no American company could supply their needs. That first purchase was $2.5 million worth of business lost to the United States and a negative amount for our balance of payments. Methods for producing interferon economically on a large scale would clearly be advantageious, especially if the clinical trials show that interferon can be used for the treatment of human cancers.

3. We have all heard a lot recently abont genetic engineering. The science fiction aspects of genetic engineering have led to the imposition of some extremely restrictive guidelines by the National Institutes of health. The rules pertain to work involving development of new bacterial strains given new genetic instructions to produce a substance of interest—such as insulin, human growth hormone, specific antibodies, interferon, or enzymes that could be used in industry. Plants could be given the genetic instructions to produce their own fertilizer from the air—this is being pursued by the Department of Agriculture. It seems possible that bacteria could be developed that would turn sewage and garbage into crude oil that could be refined into gasoline. This obviously would not only get rid of wastes that are now a problem for disposal, but the product could be extremely useful. Animal cells could also be used for genetic engineering to produce similar substances, but the technology is not as advanced as it is for bacteria. The use of animal cells would completely eliminate the possibility of hypothetical accidents such as those that possibly could occur with bacteria, and that prompted the extremely cautious governmental restrictions.

4. The last item I would like to mention is a new idea we have for growing cells in culture. In this new method, we would grow the cells in a flowing stream of nutrients, rather than using individual test tubes, bottles, or flasks. The output of cells, and cell products, would be greatly increased, and the cost would be much lower than with the present methods. Machines using this new concept could readily be controlled with small computers. The low cost production of large quantities of cells would make the innovations described in preceding paragraphs much more feasible. It would also permit the development of new products that now would get only a brief consideration because of untenably high costs.

The above examples have been chosen to illustrate some of the innovative concepts that could be worked on by a small company. It should be clear that not all of them originated at BioLabs; the concept of a new method of cell growth, however, did originate with BioLabs, and that idea, if it can be brought to commercial realization—thus qualifying it to be called an innovation—will permit the others to be undertaken at much higher probability of success and at much lower cost.

OBSTACLES TO INNOVATION

Many problems stand in BioLabs' way in bringing these, and other, products to the benefit of the people. During the ten years of BioLabs' existence, I have frequently had to cope with these problems. I would like now to discuss some of them, including those we have encountered while attempting to work on other potential innovative concepts we have had, but which we have been forced to abandon.

The biggest problem of a company such as ours is obtaining capital with which to work. The last ten years have been particularly lean in this respect, largely due to the removal of the favorable tax treatment of long-term capital gains that occurred in the late 1960's. The tax change that eased that burden has had some effect in again making capital available. The report of the Small Business Administration Office of Advocacy Task Force on Innovation has many recommendations for creating a more favorable environment for small companies to obtain capital, and I will not go into more detail here. Suffice it to say that adequate capital markets are essential to a healthy climate for business in general, and for small business in particular. The capital needs of small businesses, especially small, innovative, high-technology businesses such as BioLabs, are very different from the needs of giant corporations. This fact needs to be understood and faced in any legislative proceedings. We hope our report makes this clear.

BioLabs has submitted a proposal for a Phase I grant for funds under the Small Business Innovation Research solicitation of the National Science Foundation. This would be a study of the feasibility of growing cells, as described in a preceding paragraph. If the grant is awarded, the value of that program of the NSF will be illustrated graphically. The merits of the program are so great that our task force felt it should be extended to other agencies of government, as indicated in our report.

Another problem area concerns patents. Of the examples of potentially innovative products BioLabs could develop, as discussed above, the only one that I believe to be patentable is the new way of growing cells, and apparatus we would design based on that concept. We have made disclosure of the concept, thus establishing a date and priority. Because of probable nonpatentability of the other items, we may have to drop further development. Acquisition of capital is difficult even under the best of conditions; if a new product is not subject to patent protection, the risks become impossibly large for investors who might otherwise provide capital. A large company with impressive marketing strength does not face this problem. If BioLabs were to develop a new product on which there was not any patent protection, that is successful enough to appeal to a large company, that company could very quickly take the market away from us. Thus, there would be more concentration of power in the large company and less competition. Contrary to some popular belief, strong patent laws help create a healthy innovative climate and increase competition, as was foreseen by the writers of the Constitution.

You may be interested in an incident that occurred a few years ago concerning patents. I was discussing a proposed project with a National Science Foundation official. BioLabs proposed to work with Armour Pharmaceutical Company to develop a way to utilize waste blood from packing houses as a new protein source. We were told that Armour had so many patents in this area that the government would not be able to obtain a controlling patent, and therefore the NSF was not interested in the project. Yet only a few of the government-controlled patents ever get used for the good of the people.

A major problem, in my opinion, is unfair competition. For BioLabs, universities and other tax-exempt organizations are one of the most important sources of competition. Various agencies of the government for whom we contract (or would like to contract) have policies against placing contracts with tax-paying firms. We have had research contracts with the National Cancer Institute, as noted above. A recent policy change, however, has shifted their funding from contracts to grants—and BioLabs is not eligible, under present policy, to receive an NCI grant. Thus, my training and prior experience in basic research related to cancer, and their facilities and equipment of our laboratory, geared toward that type of research, cannot be utilized. Several years ago, we submitted a grant application to the NSF—whose stated policy permits grants to tax-paying firms—and the grant was judged worthy of funding. But only if it had come from a university! We were told informally (I could not persuade the one in charge to subject it to writing) that the proposal would have been funded if it had been from a non-profit organization.

One of the reasons for the problem with NSF was in the presentation of the overhead rate. Universities customarily treat fringe benefits and certain other expenses as direct expenses, whereas we treat them as indirect expenses, in accord with the Internal Revenue Code and with a directive we received from the National Institutes of Health. The presentation does not alter the actual dollars involved in fringe benefits; it does, however, alter the overhead rate, so the casual, nonaccountant reviewer assumes that the government is getting more for the dollar with a university. I have been informed that government reviewers of proposals have been alerted to this source of unequal treatment; the results remain to be seen.

A related problem arises with universities and other tax-exempt organizations doing various service work on a fee basis, and even selling various products produced in-house. Cosst for an organization not paying federal, state, and local taxes are substantially reduced below the costs for a tax-paying firm doing the same work. Student labor is frequently used, and the per-hour cost is much lower than a company would have to pay for similar help. I have had personal experience with universities doing various testing procedures for the government and for industry, which could have been done by a small company, and have seen production contracts that could have been similarly placed going to universities. When we have bought laboratory animals from a university, we ordered them just as from a company, with a purchase order, and we were then invoiced on an official university invoice. Of course, I have no knowledge of how the income and expenses were shown on the books of the university.

It is very difficult to compete against the tax-exempt organizations. They are a large and favored group. Yet when they do routine testing and produce and sell products in competition with tax-paying firms, it seems to me this is an abuse of their tax-exempt status. I do not know of any mechanism to monitor them and to bring such abuses to light. Public accountability seems to be lacking.

CONCLUSION

I have tried in this presentation to show how government policies inhibit innovation by small businesses. The desire to prevent a few people from getting rich by investment resulted in a high long-term capital gains tax, with the result that all people are subjected to high unemployment, inflation, and stagnation of economic growth. The desire to protect investors against loss has resulted in such restrictive stock regulations that a small company cannot obtain capital by this means. The desire to avoid granting a competitive edge to an inventor by awarding a patent with strong protection removes that incentive for invention. Tax-exempt organizations are permitted to compete on an unequal basis with tax-paying firms.

Granted, innovation and invention continue at some level, giving the appearance of good conditions. Yet many ideas are lost. Government policies that are hostile to innovation and to the creation of new companies are enormously costly to the American people, but the cost is hidden. All too often, a creative, innovative person who has an idea for a new product or service, quickly dismisses the idea as too costly, too difficult to get regulatory approval, or too difficult to get patent protection. Who can count the new jobs that could have been, the new and better products that could have been, the improved technology that could have been, the increased exports that could have been, indeed, even the increased tax return to the government that could have been.

STATEMENT OF HAROLD GULLER, ESSEX CRYOGENICS INDUSTRIES, ST. LOUIS, MO.

Mr. GULLER. Thank you.

I guess our first opportunity to be innovative was to begin in a defunct funeral parlor, where to progress, did not take much, everything had to look up from that point on.

Senator SCHMITT. You started out with a few skeletons.

Mr. GULLER. I had not thought about that, but that is absolutely true.

Part of my task in payment of rent was to assist the other organization in moving some of the caskets around, some of which did rattle.

Our office was parlor A, our engineering department was in parlor B, and we kept our spare parts in a little room in back of the chapel.

Senator SCHMITT. Spare parts room?

Mr. GULLER. Right.

It has been a little while since then, and we are now a small family of companies; 5 small companies together, which employ about 300 people.

It was 30 years ago we started in the defunct funeral parlor, and in between we were blessed to find as we expanded a defunct bank in which to grow. Our machine shop had the only marble floor and marble columns in that particular area of town, and we were able to use the vault for our spare parts.

Our efforts are primarily in the field of aerospace products, and each of our companies has a definite direction or discipline.

For example: Our cryogenics company deals with many components in the low temperature liquid gas field. Our subsidiary Propellex produces products in the pyrotechnic field, items that function in the ejection systems of aircraft, that permit a pilot and his crew to be ejected from the aircraft in a time-delayed sequence to avoid the rocket blast from the forward seat.

We also have the capability and have demonstrated the possibilities of delivering ordnance from aircraft today. Many of our existing military aircraft carrying ordnance are not like the ones in the World War II movies, where the bomb bay doors open and the 500-pound bombs drop out. Some of these aircraft fly so fast that they have to gently kick the ordnance away from the aircraft airstream. Propeller engineered products assist in that area.

We have a screw machine subsidiary that fabricates a lot of the detailed machined work. We recently acquired an organization that manufactured and designed special valves and controls that are used in general aviation industry, business industry as well, and our parent company handles most of the designs in other fields, such as electromechanical items, hydraulic, jet fuel, pneumatic, and so forth.

An example of our products is the pilot's grip assembly—the grip stick with which the pilot flies his aircraft. Our design is being used on McDonnell's F–4, and the McDonnell's F–15, on the Rockwell B–1, and on the F–18 aircraft.

INNOVATION THROUGH APPLIED RESEARCH

There are engineers in our small company who are capable of good ideas, just as well as good engineers from many large organizations. With borrowed funds, and the earnings of our companies, we are able

to develop some of those ideas. I think an example of the things we can do in which innovation and applied research result in new products comes from our cryogenics subsidiary. In that activity, we design and manufacture the liquid oxygen converters that are used by pilot and crew of all military aircraft. I am sure you all know that contrary to the way we travel these days in airlines whose cabin pressures are held for our comfort, the pilot and crew of most military aircraft must depend on a breathing source of pure oxygen or diluted oxygen from an oxygen storage container.

In World War II, they discovered they could carry a lot more oxygen, if they were able to carry the oxygen in a liquid state, because in that state a volume of liquid would generate 800 volumes of the comparable oxygen gas, and so from that technology, the mission profile of these aircraft could be extended, and an aircraft could then be able to be refueled in the air without any necessity to come down for the life supporting oxygen.

Our example of innovative technology continues: An opportunity led us to the application of a liquid air converter, air instead of liquid oxygen, to be used in coal mines, the coal mines of large steel companies. The liquid air converter is being used by the operator of a continuous coaldigger to permit him to breathe fresh clean air. Contrary to existing regulation, the problem is not to try and ventilate the mine that may be 10 miles into the hillside and maybe 50 years in the making, consuming tremendous usage of energy to exhaust all of the dust, but rather the problem is to give the operator a 7 liter container of liquid air, which weighs less than 18 pounds, which he picks up, together with his equipment, which he can carry down into the shaft to his point of work, put on his machine, apply his face mask, and have enough fresh air to breathe for his entire shift or to the extent of 10½ to 11 hours. Should he encounter any hazardous situation, opening a pocket of mine gas, he is still breathing fresh air. Should he be covered by a roof fall and to the extent that he is not seriously injured, he still has a breathing source of fresh air.

This device which has been in use now for a couple of years also has an attachment whereby, if the operator chooses to walk away from a hazardous situation, he can attach another mask and help someone to survive. This is an example of innovation made possible by the knowledge we have gleaned from the military product design, but the limitations and the frustrations are that we can only invest a given amount that is taken from our earnings. I do believe in this report "Small Business and Innovation" at the request of our task force, would make it a lot easier for younger companies to come up and dedicate their efforts in that technology. Modest as they are if we were able to continue in this kind of work, more progress might be recorded. This technique, with regards to liquid air, is being used by a large corporation today in home care units where oxygen is made available for emphysema and cardiac patients.

Cryogenic technology, the science of low temperature liquids, has another application in the use of fuel conversion systems for liquid natural gas. You may know that liquid natural gas has been used for years as a fuel, in combustion engines. It's not readily available because liquid natural gas as such comes from a rather limited source. It is not too well distributed, but dual fueled vehicles powered by liquid natural gas and gasoline are not uncommon. They have been used in California for a long time and were used in an effort to clean up the

air by controlling emissions. When the administration sought to find other ways to take care of some of the budget funds, the efforts to clean up the air seems to have taken a back seat, yet in many utilities around the country, where liquid natural gas is used, for storage of liquid form of energy, the some 200 utilities who store liquid natural gas can use that fuel in their fleet of cars, trucks, meter vans, and so forth.

In the liquefaction of natural gas, a byproduct is propane, and now with the gasoline shortage, propane and its conversion systems, is being used as a fuel, as a dual fuel. You can drive your car with gasoline and when that supply runs low, or the red flags go up at the gas pumps, if you had propane or liquid natural gas, all you would need do is turn off the gasoline supply and ride on either propane or natural gas.

The economy of that type of move is well known. I think propane runs approximately 27–40 cents a gallon.

Liquefaction of liquid natural gas would cost something less than 20 cents a gallon, and each gallon of this fuel is comparable in its efficiency, and in its energy to about 95 percent of gasoline. There are some examples of innovative ideas that can be developed from existing technology.

In the past month our small company has been besieged by a number of requests for the propane and natural gas conversion systems. There is a growing industry in alternate fuels for vehicles which would take more funding, and more financing than our earnings can justify. The recommendations of the small business innovative task force would go well to help in these respective areas.

I would just like to add one thing more about the possibility that small business would have with regard to exports. There are a number of countries today supplying oil to the United States and these countries are burning off the natural gas which may be a byproduct of their oil exploration, to the extent that their skies look like the aurora-borealis. It seems some of these countries that may have asked for some assistance from the United States to find a market for the natural gas, and/or the propane, have not yet met with favorable response, and it may be that perhaps the action of one such country to reduce its support of oil may be a ploy on their part to get attention to the fact that they have all of this energy that is being burned. Our efforts now with regards to the propoane, and the liquid natural gas systems have caught the attention of people in that area, and perhaps we as small business will have an opportunity to find an export market in that field.

I would like to just close with the comment that in our applied research, we have been able to accomplish a great deal with our earnings, but I wish that other organizations such as ours would have or could have the opportunities that may be possible if the recommendation in this task force study are accepted.

I think the innovation process which our administration has noted as declining at this time as opposed to that in the fifties and the sixties, may be accelerated by the administration similar to the goal set by President Kennedy when he said we will put a man on the Moon. Now that President Carter has said that we will develop synthetic fuels, and work on the energy program, perhaps we have here again an area whereby our country's industrial efforts can be galvanized, and all of the companies, small and large, can enter into that developed field with regard to research.

In the past the Government has been inclined to assist such large companies who run into difficulty as Lockheed, cities like New York, and today we hear another big organization in the automotive field is looking for tax help to the tune of about $1 billion, but I hope the many, many small businesses across this country will be remembered, and that they too with regards to their requests as submitted in a report of an SBA office of advocacy task force entitled "Small Business and Innovation" will be heard, and dealt with first. I would like to now yield to Sid Green, who would like to talk about basic research, and I apologize for having taken the opportunity to speak first.

STATEMENT OF SID GREEN, TERRA TEK, INC., SALT LAKE CITY, UTAH

Mr. GREEN. For the record, I am Sid Green, president of Terra Tek, Inc., which is a high technology company in Salt Lake City, and in addition to the parent company, Terra Tek is nurturing four other companies that are providing financial assistance, management assistance, scientific help, and the combined companies employ about 150 to 175 people.

I participated in the Small Business Administration's advocacy task force that presented the report that is the topic of this hearing today, and I participated on a number of committees, I have been active in professional societies, I have been on the National Science Foundation, the Department of Energy, the Department of Defense committees, and usually we are attacking problems at least of indirect assistance to me, but when I became acquainted with the advocacy task force, I suddenly felt that they were saying, Sid Green, today we will talk about your problems, and I think that is the subject of this hearing today, so today I am pleased that we are talking about my problems, I am very happy about that.

I believe that Government R. & D. spending plays a significant role in the small business development innovation, and we are talking about high technology, new companies, innovative companies, that are bringing on new products, new techniques, et cetera.

I would like to comment on my feelings regarding this role that Government research development plays in the small business development innovation area.

I am aware of the studies that have been made, primarily with regard to basic research, that show that there is not a direct relationship between innovation and basic research, and I do not dispute these studies, I think they are thorough, and done by competent people and competent groups, and I am not disputing that there are series of information that suggests there is not a one-on-one basis of correlation of research and innovation, but I think that such studies can really be misleading, and I do not believe that such studies and such information should in any way suggest that Government R. & D. spending does not play a very significant role in small business development in the innovation process.

The basic, the research of basic and applied, Federal technology money provides the resources and cohesion in my opinion to really allow the small business innovations in many cases.

For example, in a very pointed example, a Government research contract frequently supports the new venture.

One of the sayings I often use, I say you do not have a company without sales, and, second, I say go get a Government contract in the related area for activities that are in the very early stage, where we have not even found a product yet, that are really high risk areas, and it is because of this ability to support the right cohesion, that I think Government spending, it really plays a significant role in small business development, in the innovative process.

I do think when this happens, that we accomplish two things, we accomplish performing the research and advancement of the state-of-the-art, which is usually the main product of the Government contract, we also end up in many cases in developing, in nurturing small business endeavor.

The role of Government R. & D. spending has come up over and over again in our task force deliberations, it is in this report, it is one of the recommendations that the Government takes certain action regarding spending R. & D. funds, and it came up in another report as I mentioned.

I personally believe this is a very high priority item. If I could leave one message at this hearing, it would be that I think in the early stages of innovation, the really early stages in forming the company, the scientists and the engineers have not even yet defined their product very clearly, that people are struggling awfully hard to get these basic resources, and the best talent, you are tying up the brightest engineers, scientists, the best managers, to try to get their early resources to keep your venture going.

That talent can show you a lot more toward innovating, if they could spend a little less time in seeking out these baxic resources.

I think this business is in a stage where a little bit of Government action would have a very big impact 10 to 15 years from now, that may not he the case though.

It may be that a lot of Government action has little impact, but I believe a small Government action can have a very large impact.

Thank you.

Mr. CRONIN. We will now hear from Mr. Alfred Daniels.

STATEMENT OF ALFRED C. W. DANIELS, H. H. AEROSPACE DESIGN CO., CIVIL AIR TERMINAL, BEDFORD, MASS.

Mr. DANIELS. Thank you.

The company I come from is a technology intense company, we like to think we are an aerospace company, but we found that in the transportation field there is lots more money in railroads and in surface transportation and in automobiles, so we spend a good bit of our time in applying the aerospace knowledge to new uses.

I think I would like to comment for the record that I also am president of other companies, and that I have a board position with the National Association of Black Manufacturers, I likewise am a member of the Procurement Task Force for the Small Business White House Conference.

Dan would frequently tell you I like to think of myself as better versed in procurement than in almost all of the other subjects you have talked about.

I have tried to figure out how to synopsize some thoughts for you.

It has been stated by Sid, and I agree, that we have to look at the Government to fund an awful lot of innovative work. It is clear that the Dan Cronins are not going to make much money available to us, particularly at the stage we need it. Such a company has to have Government funding, and it must recognize that the first threat to it is that it will have the likelihood of the loss of its patent rights, that its debt service will not be considered as a part of its expenses, that in fact it has a very narrow field to get into because the basic research is going primarily to universities, that likewise it has to compete with as mentioned by Dr. Goodheart tax exempt organizations, as well as the Federal contract research centers and the Government laboratories.

If such a company, recognizing all of these pitfalls, still decides to do business with the Government, it might have to as I have done, just going back 4 days at Langley Field on Monday, where we were operating under the NASA procurement regulations, having tried to close the contract yesterday with the DOD, where the old armed services procurement regulations would have been applicable, but as you know, they have been changed, and, finally, having just today been by two of the civilian agencies in Washington prior to these hearings, where I was operating under Federal procurement regulations, that of course, is the significant loss to small businessmen, trying to keep track of the various difficulties in each of the systems.

It is the case that, as you well know, the Office of Federal Procurement Policy, has been operating quite vigorously in trying to do without horizontal integration of all of these regulations that come up with a thing called the Federal acquisition regulations, channelized by S. 5, the Federal Acquisition Reform Act, as it is now called, nevertheless, that horizontal integration could turn out to be a high cost to small business, because, in fact, what we need is maybe now a vertical look at those regulations, so that those that impact more seriously on those of us in small business might be eased for our benefit in order to lower the access barrier to Government procurement.

You may or may not know that many of our constituent organizations shy away from Government work just because of these barriers to entry.

Likewise, targeting some of the things, I think it is not just the major dollars to get started, but after one has a contract, there are lots of small impacting items that affect cash flow.

One of the contracts I put in for today is a fixed price contract which is limited to 85 percent of cost, as a return until after the job is fully completed, and I could do the mathematics for you, but obviously that makes it tougher for us to keep rolling.

There are in the foreign military sales area, there are limits that go to 95 percent, we think that would be an important contribution.

Likewise, there has been a proposal for independent research and development costs, that they be handled on a 3-year averaging mechanism, I am sure you can guess that all of us to average out the costs over 3 years, does not really fund any given year's expenses.

Delay is an important problem to us, and we have suggested that to look at penalty costs is another area of improvement.

I think I would like to stand ready to answer questions in the general procurement area at a later discussion.

Senator HUDDLESTON. Thank you.

Mr. CRONIN. We will now hear from Bob Springborn, president of Springborn Labs.

STATEMENT OF DR. ROBERT SPRINGBORN, PRESIDENT, SPRINGBORN LABS, INC., ENFIELD, CONN.

Dr. SPRINGBORN. Thank you very much.

To try to save time, I would like to briefly present our credentials as requested by the chairman.

I have had 15 years experience in directing large corporation R. & D. and new venture companies, 5 years in venture capital activities, and I have been involved in helping develop 22 companies including start-ups, either as chief executive officer or as an active director.

For the past 6 years I have been developing a company called Springborn Laboratories, Inc., an international R. & D. testing and consulting company which employs about 150 people.

We have special expertise in safety, health, and in environmental issues as well as materials science and technology, testing and marketing.

We do very little Government work, less than 15 percent.

We do almost 20 percent of our work with overseas corporations.

I have been very interested in the innovation process in the United States for a number of years, and my primary reason for being involved in this national assessment of innovation is I think at this moment, we have a window which is going to last maybe a year at the most to help the small innovative business.

For many of you that have been involved with these issues for many years, you may recall that in 1967, Bob Sharpy—president of Cabot Corp.—put together an excellent report on innovation in the United States and what should be done to encourage innovation. His report states many of the same problems our ad hoc SBA committee report states. Also, Prof. Richard Morrison published a report on innovation about 10 years ago and recently reported to Congress on what had been done to date on the recommendations his committee made, his answer was "nothing!"

When reviewing the recommendations of our ad hoc SBA committee, one finds our recommendations are not much different from those of the reports and recommendations of a decade ago. We simply cannot allow another decade to elapse with no activity because the small innovative company may not survive that long.

My own concern about the lack of Government concern about the small innovative company developed during the Department of Commerce Industrial Innovation Advisory Committee hearings. As one of the six small innovative company representatives on the committee, I became very concerned about the lack of understanding of the needs of the small innovative company. Frankly, I think that small business was treated with benign neglect.

I wrote to President Carter's staff, Mr. Eisenstatt, and he did not even have the courtesy of answering the letter.

I then asked Members of the Senate to be involved in helping small business including Senator Weicker from my home State of Connecticut with no enthusiasm. The only person that responded was Milt Stewart. As a result of Mr. Stewart's efforts we got together our own ad hoc group to make recommendations to the legislative branches of Government regarding what is needed to rekindle the spirit of the

small innovative company. What we really need in the Senate is someone that will carry the flag and develop a bill based on the report that we have given. Otherwise this report will die.

I hope the leadership will come from this committee. The committee has done some very good work. They published some excellent reports. I support most of the findings that they have reached but we need an omnibus small innovative company bill, and I hope it comes out of these discussions.

I hope we have the courage to really look at the small innovative community, and what we can do for the country. We are not asking for more, we are asking for less! We want less Government involvement and a fair share of Government R. & D. procurements. The report that we put together is very sincere, and if I can get nothing else across, what I would like to try to get across is the point that we need leadership in Government to get appropriate legislation to help the small innovative company. We'll help as you see fit.

I think Milt Stewart in the administrative side, at this time, is the only person from the executive branch who actively supports this effort. For example, if you examine the President's report on science, he never once mentioned the small innovative business—only large universtities and large business.

We talk about the needs of innovation, we have ideas, and as I said before, we do not need more, we need less, and let us hope from the Senate, we see leadership developing, and we come out with a good strong bill that will aid the innovative community.

Thank you very much.

Senator HUDDLESTON. That is our objective too.

Mr. CRONIN. It is encouraging to see presidents of large companies take a particularly keen interest in small business.

Certainly Bill Morrison has made an unusual contribution to the concerns of small business, and today we have Mr. Sherman Abrahamson, a special assistant to Bill Norris.

STATEMENT OF SHERMAN ABRAHAMSON, SPECIAL ASSISTANT TO THE CHIEF EXECUTIVE OFFICER, CONTROL DATA CORP., ARLINGTON, VA.

Mr. ABRAHAMSON. Thank you, Mr. Chairman.

A brief word of background as to what is called the Norris report.

The origins of Bill Norris' interest in participating in a report of this kind goes back a number of years, and particularly to discussions with the late Senator Humphrey of Minnesota on their deeply felt concerns about unemployment in the United States.

These concerns were expressed in the Humphrey-Hawkins bill, and although he had some reservations about it Bill Norris came to Washington to support that bill. At that time Control Data had grown into a big business, but it did not exist at all 20 years earlier.

The entrepreneurial climate was different then than it is today. I have heard Mr. Norris testify before a numbr of committees, both in the Senate and House, that he could not start Control Data today. Conditions have changed substantially since that time, and you have heard from my colleagues some of the specifics about those changes. We want to see a new climate that will favor entrepreneurial business, and that is why we are here.

Today Mr. Norris is still concerned about unemployment, but additionally about the declining productivity in our country, which runs right to the heart of our inflation situation. We know that there is technology being developed today, we know it can be improved and we know it can be stimulated. But we also know that it is not moving from the Government laboratories, from the universities, into the business community at the proper rate, and that technology unused is social waste.

We cannot afford the social waste, so we have to improve the climate to foster its use. You have heard a number of specific recommendations here, and the Norris work group made 12 recommendations, many of which deal with changes in the tax laws and in Federal policies. I should like to emphasize the point that none of those recommendations require an increase in Federal appropriations.

We endorse what Mr. Springborn just said. In many areas we need less Government; not more. Therefore, gentlemen, we commend your interest in this issue, and we are pleased to be here. Now, in representing the Norris work group, I am reay to answer any questions you may have.

Senator HUDDLESTON. Thank you very much.

I wish to thank all of you gentlemen for a very excellent presentation that rounds out the material we have in the prepared report. Your comments will be very helpful to us in gaining a better perspective.

I can certainly understand the concerns and some frustrations that have been expressed, particularly by Mr. Springborn, because this area has been examined before. The problems have been apparent, but you have not seen much activity to correct them.

As a matter of fact, this committee held a joint hearing with the House 1 year ago this August on the subject of innovation. One of my former fellow Kentuckians, Congressman Breckinridge of Kentucky, expressed his frustration in that we develop facts about the importance of small businesses, the contribution they make to employment, development, and innovation—they are responsible for half of American innovation—but small businesses do not receive one-half of the Federal Government's research and development funds.

It is the hope of this committee that we will be able to move more aggressively now. I believe that there is a better sentiment in the Congress for addressing such problems as capital formation, taxation, and certainly regulation.

These are issues still on the front burner and I hope we can keep the interest and the pressure there through this kind of hearing to implement some corrections that need to be made either through the regulatory process or legislative process.

You mentioned tax laws Mr. Cronin. That was very interesting information you gave us about capital formation which came about as a result of the capital gains reduction enacted last year.

It was my judgment at the time that there would be great benefit from such a reduction, but I have not seen any specific figures yet indicating how rapidly investors have responded to the legislation. You indicate a very impressive record whereby much more capital has been made available.

Before we get into specific questions dealing with your proposed innovation legislation, I wanted to ask whether we should try to accomplish virtually everything in one bill?

Mr. CRONIN. This was kind of an interesting committee, and you look around, and you say it is supposed to be 1 committee of 27, and there were times when we thought we had 27 committees of 1.

Every small businessman suffers from one particular headache; even when you talk about regulations, it depends upon what regulatory agency is the big headache.

In the medical business, you are concerned about the FDA; if you are in the trucking business, you are concerned about that agency.

It is very hard as venture capitalists. I think the whole key to the problem is tax legislation.

Senator HUDDLESTON. Tax changes could probably overcome a lot of other problems facing small business.

Mr. LOCKWOOD. I might add to what Dan said. I think, if you look at the mix of small innovative business, there is a wide diversity of Government policy impacting on them, and I think it would be a serious mistake to take any one area and focus in on that at the neglect of others.

If you were looking for the 1 month's important area, it would be our opinion that our tax policies that have dried up the flow of capital in innovative businesses probably have had a more major impact than the rest of them.

That does not mean the whole regulatory environment that has emerged from Government in the last 10 years has not had a serious impact too. It drains enormous amounts of energy and time away from the entrepreneur, procurement can have an enormous impact on the mix of innovation which occurs in America, as does our applied research and development, shifted from the small business sector to a large extent to our universities, and likewise patents and other policies have exclusivity.

A very major keystone to stimulating innovation is the right that an individual has to apply his particular innovation for a reasonable period of time, and yet we have policies that are protecting that patent area; but we also have policies that are working against that in many areas of Government, so what I am saying, sir, I think that in our work, in our particular committee, that as we report in our report, that probably the tax policies are having a greater impact, but, nevertheless, there are a wide range of others that we hope the Congress would attend to.

Senator HUDDLESTON. In a sense, it would not be fair or necessarily productive to try to zero in on just two or three issues.

Mr. GREEN. I would not argue, or not even talk against tax being very important, nor would I try to pick out a comment, but I would state that the spending of Government R. & D. money is an area that may not even require legislation in general, not require any added funds, but as a practical matter, it may be an area where progress could more rapidly be made despite that, and that is an important area, I know, Senator Schmitt, you have two laboratories in your State, the people I know there are highly qualified and working very hard and doing many good things.

Unfortunately, there are some bad side effects as with almost everything, they do become competition for those out in industry, and I am not speaking against anyone personally, they are good people and working hard, I know it is a fact they are spending money to the tune of millions of dollars, and Senator Hayakawa has a laboratory in his

State, all very fine people and working very hard, but they are all competition.

Dr. SPRINGBORN. I do think the innovative approach should be on the broad front also, I am sure it has been expressed to you by others, the thought that relates to the regulatory process. I believe our great country was founded on the principle of innocent until proven guilty, but in the regulatory field we are guilty until proven innocent. There can be a tremendous financial and negative manpower impact to the small business just trying to defend ourselves against the regulatory processes.

I know George Lockwood deals with 42 agencies, and any one of them could destroy his business, and he is guilty until proven innocent, and I wish we could get back to the fundamental concept of innocent until proven guilty, and the burden of proof should be on the Government, not the burden of proof on us, so either that or provide a tax credit for all costs incurred in defending ourselves against the regulators.

Senator HUDDLESTON. I will not disagree with that. There are some efforts being made to require congressional review of some agency regulations. There is another measure pending that would reimburse a litigant for his legal fees if he prevails when challenging regulations.

Senator STEWART. That has just been passed.

Senator SCHMITT. It has passed the Senate.

Senator HUDDLESTON. I think passage of that measure indicates there is more interest now in equalizing the situation and not putting all of the burden on the business person.

Many times we forget that regulation is sometimes more difficult to deal with than law.

I would much rather go to court on a matter of law than have to confront a regulatory problem.

I think your chances of prevailing are better and it is usually less expensive.

Senator STEWART. I want to interject one comment. Since I have been here 7 or 8 months, I have had a number of visits from some large-sized concerns in the country. They are not urging deregulation. Instead they are talking about regulating certain aspects of a given industry. I am not trying to point the blame, certainly not at this group, because you are talking about a very real problem, but it might be that the patent laws, procurement policies or other policies are done the way they are, because of business. They have been established by business. Milton talks about the large-sized institutions. I think we have to recognize that as a practical matter business sometimes is as much to blame as the Government for regulation. You people are going to have to help us in dealing with that problem.

I understand that small business concerns are independent; that is the reason they are small businesses; that is the reason they are innovators. But I find sometimes when I sit down with a group of them and talk to them about getting their act together and helping to establish a broad consensus of opinion that legislators can deal with, that this intangible problem exists. I think we need to talk about it, to address it because it is a reality, and it is a problem.

I have seen lobbyists for large-sized concerns, probably one or two a day, and they are certainly not talking to me about lessening Government regulations. They do not seem to want to be regulated

themselves, but they are generally talking in a very nice way about regulating one of their competitors. You might all fit in that category so I think you need to begin to deal with the problem.

I would bet you that many of our patent policies were not only devised by Government, but they were devised by some other institutions in this country.

If I were from a large-sized concern, and I had some difficulty innovating with some small-sized concerns, I just might not want the patent laws changed.

Senator SCHMITT. Would the Senator yield on that?

I think that may be one area where small business patent lawyers, everybody agrees that things are a shambles.

We are in the process in the Commerce Committee of holding hearings on S. 1215, which is a bill to establish uniform patent policy with the presumption to license industry or the university rather than the Government, and that is certainly very specific as a criteria that must be met, and I would call your attention to that bill and ack you to supply us with comments relative to your interests.

I know it is right on the line of what you are saying, and it is a positive step, Senators Cannon and Stevens are sponsors, and there are people in this Congress who think that anybody the Government or the taxpayers pay for ought to stay in the Govenment, and so there will be opposition, and what happens is it stays there, and nothing is done with it.

There are 28,000 patents sitting in the Government that nobody uses, and something has to be done, and the Senator is right, there have been forces operating to prevent a reasonable patent policy, and a reasonable revision of patent law and how it operates in this Government, but unfortunately there is much more interest from big industry than from any other part of the private sector.

Senator STEWART. My only concern is that when we make these changes, that we make them so they actually benefit small innovative companies.

Who gets the portion of the procurement you are talking about? I want to see a sufficient portion of that go to small business.

Mr. LOCKWOOD. Something now like 200 firms in America is getting 80 percent.

So we ask, what are those firms?

Are they the large size firms, the small size firms?

Let us identify part of the problem. We want to know who gets the benefit of the patent law.

Senator SCHMITT. Right now it is the Government.

Mr. GREEN. Could I comment on the procurement part?

I think that is fact, although I do not have the numbers in front of me, the small business portion of Government R. & D., after you take out the in-house spending, which is the biggest amount anyway, it is 77 percent. As far as who gets the technology money that the Congress allocates every year, the universities and the national labs probably get the largest part.

The Department of Energy laboratory I think is like 120,000 people, and those 120,000 people are getting the biggest chunk of the money.

Mr. LOCKWOOD. On page 18 of the document, it says of additional concern to us is four agencies, Defense, Space, HEW, and one other which funds 88 percent of Federal R. & D.

Similarly there is a concentration of U.S. industrial R. & D., into a few industries and into a few companies.

According to the numbers in a Government publication, in 1976, six industries account for 85 percent of total U.S. industrial R. & D.

Ten companies do 36 percent and 31 do over 60 percent.

Greater than 80 percent administrative R. & D. is carried out by only 200 firms.

Senator SCHMITT. Is that large size firms or small size firms?

Mr. CRONIN. Those are large. McDonnell Douglas——

Senator SCHMITT. Do you see the benefit of subcontracts, are they generally exchanged?

Mr. CRONIN. No; I see no benefit.

Dr. GOODHEART. The majority of that does go to large firms. We are not in the aerospace business, so I am not aware of that from a personal standpoint; however, we used to be eligible for contracts through the NCI. Technically, I suppose we still are; however, the NCI has recently changed policy, so that it specifically does not award as many contracts anymore. They have shifted to a grant mechanism; the great majority of the work for basic research through the National Cancer Institute is to be awarded by grant rather than contract.

The implication is that companies such as ours are not eligible to work in the cancer program because we are not eligible to receive grants, so that cuts out work that we have been doing over the last 8 or 9 years. No longer is it fundable by the contract mechanism.

We dropped more than 50 percent in size when that happened. We had 26 employees before the termination of the contract, and we now have 10 people.

Dr. SPRINGBORN. The Federal basic research funds, by performance, the latest data I have, and this goes to 1960 to 1977, the source is National Patterns of R. & D. Resources, National Science Foundation, I can leave a copy of this if you would like. In 1977, $3.5 billion was spent, the Federal Government laboratories received $750 million, or 21 percent, industry received $175 million or 5 percent, and the large universities and colleges received 55 percent. The associated Government laboratories received 10 percent, and nonprofits 8, and some of the industry, that includes large industry, only 5 percent, and some small innovative businesses received a small percentage of 5 percent, that may be a little more precise answer to your question.

This is from the National Science Foundation. That is basic research. I also have the data for applied research, but these data are all available.

Senator HUDDLESTON. In regard to development of your fresh air mechanism, how extensive is that in use now?

Mr. GULLER. Senator, it is being used in Gary, W. Va., quite extensively in several of the mines that are run by United States Steel.

It has been in use now for a couple of years, sir.

Senator HUDDLESTON. Did your company develop this?

Mr. GULLER. Yes, sir.

Senator HUDDLESTON. Were you under contract?

Mr. GULLER. No. We took it—the development costs—out of our earnings.

Senator HUDDLESTON. What about your Air Force contract in the oxygen area?

Mr. GULLER. That is competitive, sir. Those contracts are awarded after competitive bidding.

Senator HUDDLESTON. Is that with the Air Force?

Mr. GULLER. Yes, or the Navy in some cases. In some instances, as an example, General Dynamics with its F–111, was opposed to the Government's design using 10 liter converters. Instead of requiring two 10 liter converters, General Dynamics specified one 15 liter which fit into the well previously assigned to the 10 liter unit.

Some aircraft because of their mission profile were unable to use existing size converters and had permission to have a company project for their specific needs.

Senator HUDDLESTON. Were you the prime contractor?

Mr. GULLER. We were prime.

We were a prime contractor to the aircraft company.

Their request for quotes came out. Our design proposal and our price was evaluated, and the order was placed.

Senator SCHMITT. Mr. Chairman, could I follow up on that a little bit? Mr. Guller is doing things that are tremendously exciting in the patent area. The reason I got interested in patents, is that knowing there was a resource of technology, including cryogenic technologies, communications, automated control, materials substitutions, et cetera, that could be applied to underground coal mining in order to increase the efficiencies and the safety of such mining, by factors of 10 or more, I went with hat in hand to the Department of Interior, which had a prime responsibility in the Government for those kinds of activities. I said let us get together, let us work out a program which NASA would take their knowledge of the aerospace technologies, and we could begin to figure out how we could apply them to this kind of problem on the ground.

We got everybody agreed, we had a beautiful program laid out, and the lawyers got a hold of the patent policy, and the program was never implemented because two agencies of Government could not agree on what the patent policy was going to be; and on what background rights were going to be given up by industry if they bid on those contracts. That is when I got started on patent law.

It is ridiculous to have a major opportunity go through the cracks because two agencies could not agree on patent policy. So now we are really moving on this issue and I hope you all will look at S. 1215, because I think this bill takes into account these concerns.

Mr. GULLER. May I just respond, Mr. Chairman?

Had you been successful with the patent, at least have achieved compatibility, you might have run up against another bit of bureaucracy where perhaps the Bureau of Mines may not have wanted to consider this fresh air supply as the right application, they would rather have the entire mine ventilated, and that is a different problem.

Senator SCHMITT. We had that, the Bureau of Mines and NASA agreed that the basic inherent safety of the mine will be greater if you let it fill up with gas, if you can have those controlled supplies for the individual miners than if you had ventilation. When you ventilate, you supply oxygen to those explosions. We had them convinced, but we spent 1 year talking about it, and they finally agreed that if it

could be implemented, it was the right philosophy. I am very, very excited to hear you are making some progress in the industry.

Mr. GULLER. This is the industry, not the Bureau of Mines.

Senator SCHMITT. I understand.

Senator STEWART. It took you 1 year to solve that one problem?

Senator SCHMITT. It is one of the reasons why we have to do what these gentlemen are requesting us to do. Innovation is in a crisis, and for small business, it is innovation that says the independent exploring companies and producers are to discover energy supplies.

You all have the same kind of mentality about risk taking, the need to turn over capital so it further stimulates innovation. I think that we have to do something, and I do not think we are nearly doing enough. It is my hope that this committee will become the champion on the good news side. The 95th Congress did take some steps as you described in tax policy and there is an effort under way now with S. 1597 which provides R. & D. incentives, depreciation incentives, and also savings, investor savings incentives.

We would also call your attention to the progress that the chairman has already mentioned is being made, in trying to get legislative control over the major rulemaking activity of the Federal Government. The suggestion now is to decide how do we pull these things together, so this list of recommendations that has been made can be implemented. If we do not do it these opportunities may pass.

All you have to do is look at the record of small business formation versus small business formations of years ago, and obviously there are a lot of things wrong because things are not happening as they should.

Mr. ABRAHAMSON. May I sort of summarize this by explaining that whereas none of our recommendations requires increase in any Federal appropriations—not a nickel—one of them would require some adjustment in the portion of R. & D. funds going to small businesses. At present only 3 percent of the R. & D. funding is going to small business.

What we are calling for is that each Federal agency receiving R. & D. funds be required to direct some percentage of those funds, let us say 1 percent for the first year, and increasing by 1 percent increments annually, so that at the end of 10 years, 10 percent of that agency's R. & D. funding goes to small business.

I do not think there is an agency in town that could make a credible argument that that is impossible.

I do not think 1 percent per year over a 10-year period is going to be a hardship on any agency receiving R. & D. moneys, so I would urge you to consider very seriously that recommendation.

I think it is extremely well founded; it has been carefully researched and discussed widely.

Thank you.

Senator HUDDLESTON. I want to express my personal appreciation to all of you for appearing before us today. Senator Nelson hoped to be able to get here, but unfortunately was unable to do so. I know he is very interested in this subject and the whole range of recommendations you have made. He will give his energy and considerable talent to this cause.

You are making a very good record. I appreciate the frankness with which you are presenting your views. Thank you.

I regret that I now have to leave for another hearing which is in progress. Senator Stewart will chair the balance of this session.

Senator STEWART. Thank you.

Senator SCHMITT. Could I give a followup on that, I ran into a problem when I was in NASA. We needed a lunar surface camera, and it was one of those procurements that was on the market. There was a question as to whether it should go to small business or not. With the existing regulations it was ruled it would go to small business.

It turned out it was just too much of a job for the company that got it, it was not quite what they could do, and we eventually never got the camera. Had we gone to the other side, it was pretty clear the large company would have built the camera.

They had already built one for a very special purpose in a period of 6 months.

How do we handle that particular kind of problem?

Mr. ABRAHAMSON. We are recommending annual increases in 1 percent increments to a level of 10 percent.

The residual is 90 percent plus of the R. & D. money, and there should be ample funding from that.

Senator SCHMITT. There was a dollar cutoff. It had nothing to do with the quality, or the capability of the individual company.

There are some companies, very small companies that will do anything in a particular focused area that a large company can, and there are others where a total integrated resource, in this case, the small company that got it was an excellent optics company, but they never put anything together in the form of a camera, and that is where they fell down.

They are great optics, but they could not integrate it in the camera, in the timeframe, and at the cost we were asking.

Mr. ABRAHAMSON. It seems to me the problem is not with the principle I have been trying to advocate. I think this is an individual problem, and whoever was running the program in the particular agency might have been a little short on foresight.

Senator SCHMITT. Do you advocate then a specific dollar cutoff for certain kinds of procurements?

Mr. ABRAHAMSON. I am advocating that HEW, for example, which receives I do not know how many billions of dollars, indeed be required to increase the allocation to small business firms.

Senator SCHMITT. I agree with you. I do not have too much problem with that, but when you come down to specific decisions, on specific procurements, how do you make that decision?

Mr. ABRAHAMSON. I think that has to be done by each agency.

Mr. GULLER. Senator, with regards to that amount, and I am sure that every company meets its match once in a while, but it would seem to me that if there are so many ways that that decision may have been researched better by a preaward survey. As an example, in our particular field, anyone that just says they can make a cryogenic container, unless he has exhibited some experience in the field, could be hard put to pass a preaward survey. There are a number of techniques that only three or four companies, to my knowledge, in this country are doing that results in a qualified "LOX" container assembly.

Another company that has good intentions and capabilities, would have the facility and says that he could do it, should have to prove that statement.

I used to always criticize our Government people for coming out with a 17-man preaward team to a company like ours which had 4 people to talk to. It is kind of difficult to talk about the bid requirement if we do not have experience in that particular field, we might never convince them. There are many Government checkpoints, there is the preliminary award, postaward, and with everything else being monitored, contractors having problems should be recognized. I think the mechanisms are there, and unfortunately you have an instance where the surveillance system did not work.

Senator SCHMITT. There was one more mechanism, it was a common decision that awards go to small business. I had no problem with it at the time, but there were concerns.

Senator STEWART. I think you can point out many events in large sized projects that turned out to be just as much a problem.

Senator SCHMITT. I agree. I think I will leave it at this point, but if you have any further thoughts on this problem, of deciding on this 10 percent. It is a problem, but it is one that can get you or the Government in trouble.

Mr. DANIELS. As I indicated, some 3 percent goes to small business. We really have two recommendations, one that this 3.4 percent begin to grow at 1 percent a year in the R. & D. area.

We have a second recommendation, where we have an agency that has $100 million in R. & D. budget, that they be tabbed to put 1 percent of this into small business.

The procedure for small business set-aside would permit a small business set-aside to proceed with at least two qualified sources if found available.

Somewhere in NASA you may interject that you had two qualified sources, and you were wrong, but you are going to be wrong sometimes, and if you are going to go down this route, obviously you will have situations where you will be sorry you made the small business set-aside.

Senator SCHMITT. But you think on balance that is still a good type of procedure?

Mr. DANIELS. The reason I feel that way, because of the subject you really have to talk about mainly competition, and I think one of the reasons why the Government——

Senator STEWART. I was trying to talk about that a minute ago. I think there is some competition from public policy.

I think research money sets that policy, and you gentlemen are not getting enough of the research money to provide competition in some areas.

It is my understanding all business and industrial firms receive some 46 percent of the basic and applied research moneys expended by the Government.

Is that a correct figure?

Dr. SPRINGBORN. I believe I gave you basic research.

Mr. DANIELS. But if you take that and go to the whole field, it quickly drops back into 3½ percent.

Senator STEWART. That would sound about right.

I also wanted to ask you about procurement. How much of the procurement dollars are involved?

Mr. DANIELS. Roughly 20 percent of the procurement dollars.

Senator STEWART. Goes to small business?

Mr. DANIELS. Yes.

We are talking about the Government procurement dollars.

Let me expand on that.

It turns out that given a certain figure—well, we would like to look beyond and behind the numbers, because if you look closely, you will find that 80 percent of the contracts competed, and 20 percent of the dollars are there, and so if you try to put this in context of S. 5, you have a very small area of competing contracts, maybe 80 percent, and you then have a very, very large area, almost the rest of the field is what is called competitive negotiation, and then finally, you have the sole source procurement.

It is important to note the sole source is an area where you have no competition as to either price or the technology, but interestingly enough, this wide area of competitive negotiation is an area in which you often will spend $1 million even before the RFP is on the street, and so in this area of competitive negotiation, what you have is the pocket companies, that is companies that can afford to pay the price, who end up with these procurements, and worse than that, there is no competition as to price.

Once the contractor is selected, then you are stuck with that contractor both for that procurement and for subsequent procurements.

Mr. LOCKWOOD. There is not only the question of procurement, but something important that Senator Schmitt brought out and something that you did earlier, that is we have in the Congress a number of bills that are going to impact on the small business community, whether it is patents or tax policy, one of the problems we see in the legislative process, as well as rulemaking process is oftentimes impossible for a small innovative firm to be adequately represented by virtue of limitations on those firms in the process.

This is certainly true in the rulemaking process in my particular company.

We have 42 identifiable agencies in Government that directly interact with our business. I spent over 50 percent of my time dealing with Government, yet we have no Government contracts, and we have not ever sought one.

I might ask now that there are three copies of the Federal Register outlining three significant rulemaking processes, that I have to one way or another be involved in.

Now, this is all time that is being taken away from me, and as chief executive, chief engineer, and chief scientist in my particular business, this is an enormous drain, and in many, many cases the small businessman cannot get plugged into this process.

On the other hand, as you so ably mentioned, the president of Exxon has a lobbyist here, Lockheed Aircraft has a lobbyist.

Senator STEWART. I have seen not only the presidents of both of those companies, but in addition their lobbyists.

Mr. LOCKWOOD. And they must represent their interests, and they do it very well.

On the other hand, very often because there is no effective mechanism, and because the time burdens are such that small innovative businessmen cannot get plugged into the process, our needs are so often overlooked, but yet the end result is an impact that is unreasonably heavy and discriminatory against the small businessman's end of the spectrum where this has not been considered at all.

Senator STEWART. I appreciate your comments, because that is the concern I was addressing.

To give you some examples of what I mean by research and development, we have had some hearings on saving the small farmer in the Agriculture Committee. It is a very important and vital issue in this country.

During the entire time we had those hearings, we did not hear once about agricultural innovation.

Many of the people who came and testified were connected in one way or another with large-sized concerns. They did not talk about the technology that is available, such as the new kinds of tillage equipment and other things available. All of this type of information came from small companies. Some of those smaller firms obtained their first research money from the Government. They had begun to develop some innovative kinds of things, but if they had had what you are talking about—my ear and the ear of Government policymakers—imagine what could have been done.

Solar technologies is another example. Nobody said a word about the development of small-scale systems. But yet smaller companies are marketing energy-efficient products.

That tells the tale to me of what research and development money can do for those smaller companies and the country. I think you have something here that you probably should share with the Senators concerned with energy legislation.

Mr. GREEN. Senator, I know others would be interested, too. We are doing a demonstration in Utah and New Mexico on growing plants that grow oil, and this indeed is crude oil that comes from the milkweed species in Utah, and we are monitoring how many barrels per acre per year we can grow.

It is not really a new area, in fact this has been talked up around the world, and we are actually doing it.

Here is a tube of crude oil, the first we extracted from milkweed in Utah, and our goal is to monitor how many barrels.

Senator STEWART. I deeply appreciate your coming hear today. I want to say to you all that this is a beginning of a series of hearing, and hopefully, the development of a consensus in the Senate and in the House. You all have a lot of answers to a lot of the problems of this country of ours.

Somebody told me the other day that not since Harry Truman, have we had folks in Washington that have been concerned with small business people and the small business community. I would disagree with that.

There are a lot of people I serve with in the Senate that are very much concerned about the small business sector. A lot of us are new to this business, but we plan to stay with the program and the issue until we get some meaningful results.

Before closing, I want to mention that we will include in the hearing record a copy of the innovation report prepared by the Chief Counsel for Advocacy, Milton Stewart. Excerpts from various subcommittee reports prepared for the Advisory Committee on Industrial Innovation, which was established as part of the President's Domestic Policy Review, will be included as well.

Thanks to all of you.

We stand adjourned.

[Whereupon, the committee was adjourned at 12 noon.]

APPENDIX

II

96TH CONGRESS
1ST SESSION

S. 1860

To establish a Federal program to assist innovative small businesses by strengthening the role of such businesses in federally funded research and development and by fostering the formation and growth of such business.

IN THE SENATE OF THE UNITED STATES

OCTOBER 4 (legislative day, JUNE 21), 1979

Mr. NELSON (for himself, Mr. WEICKER, Mr. BAYH, Mr. DOLE, Mr. NUNN, Mr. CULVER, Mr. HUDDLESTON, Mr. BUMPERS, Mr. SASSER, Mr. STEWART, Mr. BAUCUS, Mr. LEVIN, Mr. HATCH, Mr. HAYAKAWA, Mr. DURKIN, Mr. JOHNSTON, Mr. LEAHY, Mr. PRESSLER, Mr. CHAFEE, and Mr. PACKWOOD) introduced the following bill; which was read twice and referred, by unanimous consent, to the Select Committee on Small Business solely to consider titles I, II, and IV, and if and when reported, the bill be referred to the Committee on the Judiciary solely to consider titles II and IV, and if and when reported, the bill be referred to the Committee on Finance solely to consider title III

A BILL

To establish a Federal program to assist innovative small businesses by strengthening the role of such businesses in federally funded research and development and by fostering the formation and growth of such business.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Small Business Innovation Act of 1979".

STATEMENT OF FINDINGS

SEC. 2. The Congress finds and declares that—

(1) technological innovation creates jobs, increases productivity, competition, and economic growth, and is a valuable counterforce to inflation and to the United States balance-of-payments deficit;

(2) small business is a principal source of the Nation's major innovations;

(3) small businesses receive less than 4 per centum of Federal funds for research and development;

(4) private technology expenditures in the United States are highly concentrated in certain fields and industries, as only six industries account for over 85 per centum of all industrial research and development spending and only thirty-one companies, many of them multinational companies, account for 60 per centum of total United States research and development;

(5) the tax structure of the Internal Revenue Code of 1954 provides insufficient support for the formation, growth, and long-term independent operation of small businesses; and

(6) it is in the national interest—

(A) to strengthen the ability of small businesses to be innovative;

(B) to increase private sector commercialization of innovations derived from Federal research and development;

(C) to increase the proportion of Federal research and development expenditures which go to small businesses;

(D) to assure small businesses of the opportunity to compete for Federal research and development contracts; and

(E) to stimulate technological innovation by all possible means.

TITLE I—RESEARCH AND DEVELOPMENT CONTRACTS

SMALL BUSINESS SET-ASIDE; SMALL BUSINESS INNOVATION RESEARCH PROGRAM

SEC. 101. The Small Business Act (15 U.S.C. 631 et seq.) is amended by inserting immediately after section 9 the following new section:

"SEC. 9A. (a) The Administration shall—

"(1) advise and assist Federal agencies in meeting the small business research and development set-asides required under subsection (b), and monitor the activities of Federal agencies in meeting such set-asides;

"(2) develop and maintain a source file and an information program to assure each qualified and inter-

ested small business concern the opportunity to participate in Federal agency small business innovation research (SBIR) programs;

"(3) coordinate the development of a schedule for release of SBIR solicitations with participating agencies, and prepare a master release schedule to preclude several Federal agencies from releasing such solicitations at one time and thereby limiting the opportunities of small business concerns to respond to some solicitations;

"(4) independently survey and monitor the operation of SBIR programs within participating Federal agencies; and

"(5) report annually to the Select Committee on Small Business of the Senate and the Committee on Small Business of the House of Representatives on the activities of Federal agencies in meeting the small business research and development set-asides required under subsection (b), the SBIR programs of the Federal agencies, and the information and monitoring efforts of the Administration related to the SBIR programs.

"(b) For fiscal year 1980, each Federal agency shall set-aside for award to small business concerns a percentage of the total dollar amount of its budget for prime research and

development contracts equal to the percentage of the total dollar amount of such contracts awarded to such concerns in fiscal year 1979 plus 1 percentage point. In fiscal year 1981 and in each succeeding fiscal year, each Federal agency shall increase the percentage of the total dollar amount of such contracts set-aside for small business concerns pursuant to this subsection by 1 percentage point, until such percentage set-aside for award to such concerns equals 10 per centum of the total dollar amount of such contracts. The set-asides required by this subsection apply to contracts for basic research and development and applied research and development.

"(c) Each Federal agency which has a research or research and development budget in excess of $100,000,000 for any fiscal year beginning with fiscal year 1980 shall establish an SBIR program which meets the requirements of this section and section 102 of the Small Business Innovation Act of 1979 and shall expend not less than 1 per centum of such budget for fiscal year 1980 and for each succeeding fiscal year with small business concerns specifically in connection with such Act. Contract awards under this subsection shall be considered as meeting the set-aside requirement of subsection (b). Contract awards to small business concerns for research or research and development which result from competitive or single source selections other than under an

SBIR program shall not be counted as meeting any portion of the percentage requirements of this section.

"(d) Each Federal agency required by subsection (c) to establish an SBIR program shall, in accordance with this Act and regulations issued under this Act—

"(1) determine categories of projects to be in its SBIR program;

"(2) issue SBIR solicitations in accordance with a schedule determined cooperatively with the Administration;

"(3) receive and evaluate proposals resulting from SBIR proposals;

"(4) select awardees for its SBIR contracts;

"(5) administer its own SBIR contracts (or delegate such administration to another agency);

"(6) make payments to SBIR contractors on the basis of progress toward or completion of the contract requirements; and

"(7) make quarterly reports on the SBIR program to the Administration.

"(e) Each Federal agency subject to the requirements of subsection (b) or (c) of this section shall report quarterly to the Administration the number of research and development contract awards to small business concerns under this section (for contracts over $10,000 in amount) and the dollar value

of all such contract awards, identifying SBIR awards and comparing the number and amount of all research and development contract awards with awards to concerns which are not small business concerns.

"(f) For purposes of this section—

"(1) the term 'contract' means any contract, grant, or cooperative agreement entered into between any Federal agency and any organization or person for the performance of experiments, developmental, or research work and includes the assignment of any such contract, the substitution as parties to any such contract, and the letting of any subcontract to any such contract;

"(2) the term 'small business innovation research program' or 'SBIR' means a program under which a portion of a Federal agency's research or research and development effort is reserved for award to small business concerns through a simplified, standardized acquisition process having a phase for determining, insofar as possible, the practicability of ideas proposed under the program, and a phase for the principal research effort to develop the proposed idea to the product production level, in order to promote greater utilization of small science and technology firms in United States Government research and development and conversion

of that research to technological innovation in the private sector or for technological innovation in products intended for Government use; and

"(3) the terms 'research' and 'research and development' have the meanings given to such terms by the Cost Accounting Standards Board.".

REGULATIONS FOR THE SBIR PROGRAM

SEC. 102. (a) The Administrator for Federal Procurement Policy, in conjunction with the Small Business Administration and the National Science Foundation, is authorized and directed to promulgate and issue appropriate regulations, in accordance with the provisions of this Act and within one hundred and twenty days of its enactment, for conduct by Federal agencies of small business innovation research programs established pursuant to section 9A of the Small Business Act. Such regulations shall—

(1) provide for simplified standardized and timely SBIR solicitations, proposals, and evaluation processes;

(2) require Federal agencies to coordinate SBIR solicitation release schedules with the Small Business Administration; and

(3) include uniform requirements for patent rights and rights in data that are commensurate with the intent of this Act.

(b) The National Science Foundation and the Small Business Administration shall provide the Administrator of the Office of Federal Procurement Policy with advice and assistance in the promulgation of regulations under this section.

RESEARCH AND DEVELOPMENT CONTRACT REGULATIONS

SEC. 103. (a) The Administrator for Federal Procurement Policy, in cooperation with the Small Business Administration, shall establish simplified regulations for all Federal agencies for the award of research and development contracts to small business concerns and procedures for insuring compliance with such regulations by all Federal agencies. In establishing such regulations, the Administrator shall consider means which will facilitate the participation of small business concerns in the research and development contracts of Federal agencies.

(b) The Administrator shall insure that regulations established pursuant to subsection (a) shall—

(1) provide for the elimination of provisions of Federal research and development contracts which require businesses to absorb expenses of performance of the contract, and require that a Federal agency, when awarding any such contract to a small business concern, negotiate fees for all services and expenses provided to the agency under such contract;

(2) prohibit each Federal agency and each office or component thereof from excluding any small business concern from competition for any research and development contract on the same terms and conditions as any other business concern;

(3) require each Federal agency to consider unsolicited research and development proposals from small business concerns and to promptly and fairly review such proposals based upon their merits;

(4) require each Federal agency to consider small business concerns on an equal basis with any other business concern in the award of sole source research and development contracts;

(5) require that, for purposes of determining expenses of a research and development contract, the independent research and development costs and the bid and proposal costs incurred by small business concerns shall be attributable to expenses of the contract in the fiscal year in which such expenses are incurred;

(6) require each Federal agency to evaluate the feasibility of dividing all proposed large scale research and development contracts into smaller segments in order to facilitate the participation of small business concerns in such contracts;

(7) require each Federal agency which lets research and development contracts to develop, in cooperation with the Small Business Administration, programs to—

(A) inform the staff and consultants of the agency of the need to provide fair and equal opportunity to small business concerns owned by women and minorities for participation in the research and development contracts of the agency; and

(B) require such staff and consultants to provide guidance and counseling to small business concerns to strengthen the ability of such firms to compete for and receive research and development contracts of the agency;

(8) require each Federal agency to include in the evaluation of personnel involved with the awarding of research and development contracts an appraisal of the achievements and attitudes of such personnel in carrying out the provisions of paragraph (7); and

(9) establish the responsibility of each Federal agency to identify and study the areas of agency procedures for the award of research and development contracts which discriminate against small business con-

cerns and to take such action as may be necessary to change or eliminate such discriminatory procedures.

DEFINITIONS

SEC. 104. For purposes of this title—

(1) the term "Federal agency" means an executive agency as defined in section 105 of title 5, United States Code, or a military department as defined in section 102 of such title;

(2) the term "contract" means any contract, grant, or cooperative agreement entered into between any Federal agency and any organization or person for the performance of experiments, developmental or research work and includes the assignment of any such contract, the substitution of parties to any such contract, and the letting of any subcontract to any such contract;

(3) the term "small business concern" has the same meaning as in section 3 of the Small Business Act;

(4) the term "small business innovation research program" or "SBIR" means a program under which a portion of a Federal agency's research or research and development effort is reserved for award to small business concerns through a simplified, standardized acquisition process having a phase for determining, insofar

as possible, the practicability of ideas proposed under the program, and a phase for the principal research effort to develop the proposed idea to the product production level, in order to promote greater utilization of small science and technology firms in United States Government research and development and conversion of that research to technological innovation in the private sector or for technological innovation in products intended for Government use; and

(5) the terms "research" and "research and development" have the meanings given to such terms by the Cost Accounting Standards Board.

TITLE II—PATENTS

Subtitle A—Patent Procedure for Small Business

AMENDMENT OF TITLE 35, UNITED STATES CODE, PATENTS

SEC. 201. (a) Title 35 of the United States Code is amended by adding after chapter 17, a new chapter as follows:

"CHAPTER 18.—PATENT RIGHTS IN INVENTIONS MADE WITH FEDERAL ASSISTANCE

"Sec.
"200. Policy and objective.
"201. Definitions.
"202. Disposition of rights.
"203. March-in rights.
"204. Return of Government investment.
"205. Preference for United States industry.
"206. Confidentiality.
"207. Uniform clauses.

"208. Domestic and foreign protection of federally owned inventions.
"209. Regulations governing Federal licensing.
"210. Restrictions on licensing of federally owned inventions.
"211. Precedence of chapter.
"212. Relationship to antitrust laws.

"§ 200. Policy and objective

"It is the policy and objective of the Congress to use the patent system to promote the utilization of inventions arising from federally supported research or development; to encourage maximum participation of small business firms in federally supported research and development efforts; to promote collaboration between commercial concerns and nonprofit organizations, including universities; to ensure that inventions made by nonprofit organizations and small business firms are used in a manner to promote free competition and enterprise; to promote the commercialization and public availability of inventions made in the United States by United States industry and labor; to ensure that the Government obtains sufficient rights in federally supported inventions to meet the needs of the Government and protect the public against nonuse or unreasonable use of inventions; and to minimize the costs of administering policies in this area.

"§ 201. Definitions

"As used in this chapter—

"(a) The term 'Federal agency' means any executive agency as defined in section 105 of title 5, United States Code, and the military departments as defined by section 102 of title 5, United States Code.

"(b) The term 'funding agreement' means any contract, grant, or cooperative agreement entered into between any Federal agency and any person for the performance of experimental, developmental, or research work funded in whole or in part by the Federal Government. Such term includes any assignment, substitution of parties, or subcontract of any type entered into for the performance of experimental, developmental, or research work under a funding agreement as herein defined.

"(c) The term 'contractor' means any person that is a party to funding agreement.

"(d) The term 'invention' means any invention or discovery which is or may be patentable or otherwise protectable under this title.

"(e) The term 'subject invention' means any invention of the contractor conceived or first actually reduced to practice in the performance of work under a funding agreement.

"(f) The term 'practical application' means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the

extent permitted by law or Government regulations available to the public on reasonable terms.

"(g) The term 'made' when used in relation to any invention means the conception or first actual reduction to practice of such invention.

"(h) The term 'small business firm' means a small business concern as defined at section 2 of Public Law 85–536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration.

"(i) The term 'nonprofit organization' means universities and other institutions of higher education or an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)).

"§ 202. Disposition of rights

"(a) Each nonprofit organization or small business firm may, within a reasonable time after disclosure as required by paragraph (c)(1) of this section, elect to retain title to any subject invention: *Provided, however,* That a funding agreement may provide otherwise (i) when the subject invention is made under a contract for the operation of a Government-owned research or production facility, or (ii) in exceptional

circumstances when it is determined by the agency that restriction or elimination of the right to retain title to any subject invention will better promote the policy and objectives of this chapter. The rights of the nonprofit organization or small business firm shall be subject to the provisions of paragraph (c) of this section and the other provisions of this chapter.

"(b)(1) Any determination under (ii) of paragraph (a) of this section shall be in writing and accompanied by a written statement of facts justifying the determination. A copy of each such determination and justification shall be sent to the Comptroller General of the United States within thirty days after the award of the applicable funding agreement. In the case of determinations applicable to funding agreements with small business firms, copies shall also be sent to the Chief Counsel for Advocacy of the Small Business Administration.

"(2) If the Comptroller General believes that any pattern of determinations by a Federal agency is contrary to the policy and objectives of this chapter or that an agency's policies or practices are otherwise not in conformance with this chapter, the Comptroller General shall so advise the head of the agency. The head of the agency shall advise the Comptroller General in writing within one hundred twenty days of what action, if any, the agency has taken or plans to take with respect to the matters raised by the Comptroller General.

"(3) At least once each year, the Comptroller General shall transmit a report to the Committees on the Judiciary of the Senate and House of Representatives on the manner in which this chapter is being implemented by the agencies and on such other aspects of Government patent policies and practices with respect to federally funded inventions as the Comptroller General believes appropriate.

"(c) Each funding agreement with a small business firm or nonprofit organization shall contain appropriate provisions to effectuate the following:

"(1) A requirement that the contractor disclose each subject invention to the Federal agency within a reasonable time after it is made and that the Federal Government may receive title to any subject invention not reported to it within such time.

"(2) A requirement that the contractor make an election to retain title to any subject invention within a reasonable time after disclosure and that the Federal Government may receive title to any subject invention in which the contractor does not elect to retain rights or fails to elect rights within such time.

"(3) A requirement that a contractor electing rights file patent applications within reasonable times and that the Federal Government may receive title to any subject inventions in the United States or other

countries in which the contractor has not filed patent applications on the subject invention within such times.

"(4) With respect to any invention in which the contractor elects rights, the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world, and may, if provided in the funding agreement, have additional rights to sublicense any foreign government pursuant to any existing or future treaty or agreement.

"(5) The right of the Federal agency to require periodic reporting on the utilization or efforts at obtaining utilization that are being made by the contractor or his licensees or assignees: *Provided*, That any such information may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under the Freedom of Information Act.

"(6) An obligation on the part of the contractor, in the event a United States patent application is filed by or on its behalf or by any assignee of the contractor, to include within the specification of such application and any patent issuing thereon, a statement specifying that the invention was made with Government

support and that the Government has certain rights in the invention.

"(7) In the case of a nonprofit organization, (a) a prohibition upon the assignment of rights to a subject invention in the United States without the approval of the Federal agency, except where such assignment is made to an organization which has as one of its primary functions the management of inventions and which is not, itself, engaged in or does not hold a substantial interest in other organizations engaged in the manufacture or sale of products or the use of processes that might utilize the invention or be in competition with embodiments of the invention (provided that such assignee shall be subject to the same provisions as the contractor) (b) a prohibition against the granting of exclusive licenses under United States patents or patent applications in a subject invention by the contractor to persons other than small business firms for a period in excess of the earlier of five years from first commercial sale or use of the invention or eight years from the date of the exclusive license excepting that time before regulatory agencies necessary to obtain premarket clearance unless, on a case-by-case basis, the Federal agency approves a longer exclusive license. If exclusive field of use licenses are granted, commercial sale

or use in one field of use shall not be deemed commercial sale or use as to other fields of use, and a first commercial sale or use with respect to a product of the invention shall not be deemed to end the exclusive period to different subsequent products covered by the invention; (c) a requirement that the contractor share royalties with the inventor; and (d) a requirement that the balance of any royalties or income earned by the contractor with respect to subject inventions, after payment of expenses (including payments to inventors) incidental to the administration of subject inventions, be utilized for the support of scientific research or education.

"(8) The requirements of sections 203, 204, and 205 of this chapter.

"(d) If a contractor does not elect to retain title to a subject invention in cases subject to this section, the Federal agency may consider and after consultation with the contractor grant requests for retention of rights by the inventor subject to the provisions of this Act and regulations promulgated hereunder.

"(e) In any case when a Federal employee is a coinventor of any invention made under a funding agreement with a nonprofit organization or small business firm, the Federal agency employing such coinventor is authorized to transfer or

assign whatever rights it may acquire in the subject invention from its employee to the contractor subject to the conditions set forth in this chapter.

"(f)(1) No funding agreement with a small business firm or nonprofit organization shall contain a provision allowing a Federal agency to require the licensing to third parties of inventions owned by the contractor that are not subject inventions unless such provision has been approved by the head of the agency and a written justification has been signed by the head of the agency. Any such provision shall clearly state whether licensing may be required in connection with the practice of a subject invention and/or specifically identified work objects. The head of the agency may not delegate the authority to approve provisions or sign justifications required by this subparagraph.

"(2) A Federal agency shall not require the licensing of third parties under any such provision unless the head of the agency determines that the use of the invention by others is necessary for the practice of a subject invention or for the use of a work object of the funding agreement and that such action is necessary to achieve the practical application of the subject invention or work object. Any such determination shall be on the record after an opportunity for a hearing. Any action commenced for the judicial review of such determina-

tion shall be brought within sixty days after notification of such decision.

"§ 203. March-in rights

"With respect to any subject invention in which a small business firm or nonprofit organization has acquired title under this chapter, the Federal agency under whose funding agreement the subject invention was made shall have the right, in accordance with such procedures as are provided in regulations promulgated hereunder to require the subject inventor, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the contractor, assignee, or exclusive licensee refuses such request, to grant such a license itself, if the Federal agency determines either—

"(a) that such action is necessary because the contractor or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use; or

"(b) that such action is necessary to alleviate health or safety needs which are not reasonably satisfied by the contractor, assignee, or their licensees; or

"(c) that such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the contractor, assignee, or licensees; or

"(d) that such action is necessary because the agreement required by section 205 has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of its agreement obtained pursuant to section 205.

"§ 204. Return of Government investment

"(a) If after the first United States patent application is filed on a subject invention, a nonprofit organization, a small business firm, or an organization to whom such invention was assigned for licensing purposes receives $70,000 in gross income for any one calendar year from the licensing of a subject invention or several related subject inventions, the United States shall be entitled to 15 per centum of all additional such income for that year other than any such additional income received under nonexclusive licenses (except where the nonexclusive licensee previously held an exclusive or partially exclusive license).

"(b) If after the first United States patent application is filed on a subject invention, a nonprofit organization, a small business firm, or an assignee of a subject invention of such an

organization or firm receives gross income of $1,000,000 on sales of its products embodying or manufactured by a process employing one or more subject inventions, the United States shall be entitled to a share, to be negotiated but not to exceed 5 per centum, of all additional gross income for that year accruing from such sales: *Provided, however,* that in no event shall the United States be entitled to an amount greater than that portion of the Federal funding under the funding agreement or agreements under which the subject invention or inventions was or were made that was expended on activities related to the making of the invention or inventions less any amounts received by the United States in accordance with paragraph (b) of this section 204. In cases when more than one subject invention is involved, no expenditure funded by the United States shall be counted more than once in determining the maximum amount to which the United States is entitled.

"(c) The Director of the Office of Federal Procurement Policy is authorized and directed to revise the dollar amounts in paragraphs (b) and (c) of this section 204 at least every three years in light of changes to the Consumer Price Index or other indices which the Director considers reasonable to use.

"(d) This section applies only to subject inventions upon which United States patents are granted and in effect.

"§ 205. Preference for United States industry

"Notwithstanding any other provision of this chapter, no small business firm or nonprofit organization which receives title to any subject invention and no assignee of any such nonprofit organization shall grant to any person the exclusive right to use or sell any subject invention in the United States unless such person agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by the Federal agency under whose funding agreement the invention was made upon a showing by the small business firm, nonprofit organization, or assignee either that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States, or that under the circumstances domestic manufacture is not commercially feasible.

"§ 206. Confidentiality

"Federal agencies are authorized to withhold from disclosure to the public information disclosing any invention in which the Federal Government owns or may own a right, title, or interest (including a nonexclusive license) for a reasonable time in order for a patent application to be filed. Furthermore, Federal agencies shall not be required to release copies of any document which is part of an application

for patent filed with the United States Patent and Trademark Office or with any foreign patent office.

"§ 207. Uniform clauses and regulations

"The Office of Federal Procurement Policy, after receiving recommendations of the Office of Science and Technology Policy, may issue regulations which may be made applicable to Federal agencies implementing the provisions of sections 202 through 205 of this chapter and the Office of Federal Procurement Policy shall establish standard funding agreement provisions required under this chapter.

"§ 208. Domestic and foreign protection of federally owned inventions

"Each Federal agency is authorized to—

"(1) apply for, obtain, and maintain patents or other forms of protection in the United States and in foreign countries on inventions in which the Federal Government owns a right, title, or interest;

"(2) grant nonexclusive, exclusive, or partially exclusive licenses under federally owned patent applications, patents, or other forms of protection obtained, royalty-free or for royalties or other consideration, and on such terms and conditions, including the grant to the licensee of the right of enforcement pursuant to the provisions of chapter 28 of this title as determined appropriate in the public interest;

"(3) undertake all other suitable and necessary steps to protect and administer rights to federally owned inventions on behalf of the Federal Government either directly or through contract; and

"(4) transfer custody and administration, in whole or in part, to another Federal agency, of the right, title, or interest in any federally owned invention.

"§ 209. Regulations governing Federal licensing

"The Administrator of General Services is authorized to promulgate regulations specifying the terms and conditions upon which any federally owned invention may be licensed on a nonexclusive, partially exclusive, or exclusive basis.

"§ 210. Restrictions on licensing of federally owned inventions

"(a) No Federal agency shall grant any license under a patent or patent application on a federally owned invention unless the person requesting the license has supplied the agency with a plan for development and/or marketing of the invention: *Provided,* That any plan may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under the Freedom of Information Act.

"(b) A Federal agency shall normally grant the right to use or sell any federally owned invention in the United States only to a licensee that agrees that any products embodying

the invention or produced through the use of the invention will be manufactured substantially in the United States.

"(c)(1) Each Federal agency may grant exclusive or partially exclusive licenses in any invention covered by a federally owned domestic patent or patent application only if, after public notice and opportunity for filing written objections, it is determined that—

"(A) the interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

"(B) the desired practical application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention;

"(C) exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

"(D) the proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical ap-

plication or otherwise promote the invention's utilization by the public.

"(2) A Federal agency shall not grant such exclusive or partially exclusive license under paragraph (1) of this subsection if it determines that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws.

"(3) First preference in the exclusive or partially exclusive licensing of federally owned inventions shall go to small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and as likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

"(d) After consideration of whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced, any Federal agency may grant exclusive or partially exclusive licenses in any invention covered by a foreign patent application or patent, after public notice and opportunity for filing written objections, except that a Federal agency shall not grant such exclusive or partially exclusive license if it determines that the grant of such

license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws.

"(e) The Federal agency shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

"(f) Any grant of a license shall contain such terms and conditions as the Federal agency determines appropriate for the protection of the interests of the Federal Government and the public, including provisions for the following:

"(1) periodic reporting on the utilization or efforts at obtaining utilization that are being made by the licensee with particular reference to the plan submitted: *Provided*, That any such information may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under the Freedom of Information Act;

"(2) the right of the Federal agency to terminate such license in whole or in part if it determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of the Federal

Agency that it has taken or can he expected to take within a reasonable time, effective steps to achieve practical application of the invention;

"(3) the right of the Federal agency to terminate such license in whole or in part if the licensee is in breach of an agreement obtained pursuant to paragraph (b) of this section; and

"(4) the right of the Federal agency to terminate the license in whole or in part if the agency determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee.

"§ 211. Precedence of chapter

"(a) This chapter shall take precedence over any other Act which would require a disposition of rights in subject inventions of small business firms or nonprofit organization contractors in a manner that is inconsistent with this chapter, including but not necessarily limited to the following:

"(1) section 10(a) of the Act of June 29, 1935, as added by title 1 of the Act of August 14, 1946 (7 U.S.C. 427i(a); 60 Stat. 1085);

"(2) section 205(a) of the Act of August 14, 1946 (7 U.S.C. 1624(a); 60 Stat. 1090);

"(3) section 501(c) of the Federal Coal Mine Health and Safety Act of 1969 (30 U.S.C. 951(c); 83 Stat. 742);

"(4) section 106(c) of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1935(c); 80 Stat. 721);

"(5) section 12 of the National Science Foundation Act of 1950 (42 U.S.C. 1871(a); 82 Stat. 360);

"(6) section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182; 68 Stat. 943);

"(7) section 305 of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457);

"(8) section 6 of the Coal Research Development Act of 1960 (30 U.S.C. 666; 74 Stat. 337);

"(9) section 4 of the Helium Act Amendments of 1960 (50 U.S.C. 167b; 74 Stat. 920);

"(10) section 32 of the Arms Control and Disarmament Act of 1961 (22 U.S.C. 2572; 75 Stat. 634);

"(11) subsection (c) of section 302 of the Appalachian Regional Development Act of 1965 (40 U.S.C. App. 302(e); 79 Stat. 5);

"(12) subsection (a)(2) of section 216 of title 38, United States Code;

"(13) section 9 of the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5901; 88 Stat. 1878);

"(14) section 3 of the Act of June 22, 1976 (42 U.S.C. 1959d, note; 90 Stat. 694);

"(15) subsection (d) of section 6 of the Saline Water Conversion Act of 1971 (42 U.S.C. 1959(d); 85 Stat. 161);

"(16) section 303 of the Water Resources Research Act of 1964 (42 U.S.C. 1961c–3; 78 Stat. 332);

"(17) section 5(d) of the Consumer Product Safety Act (15 U.S.C. 2054(d); 88 Stat. 1211);

"(18) section 3 of the Act of April 5, 1944 (30 U.S.C. 323; 58 Stat. 191);

"(19) section 8001 of the Solid Waste Disposal Act (42 U.S.C. 6981; 90 Stat. 2829);

"(20) section 306(d) of the Surface Mining and Reclamation Act of 1977 (30 U.S.C. 1226(d); 91 Stat. 455);

"(21) section 21(d) of the Federal Fire Prevention and Control Act of 1974 (15 U.S.C. 2218(d); 88 Stat. 1548);

"(22) section 6(b) of the Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978 (42 U.S.C. 5585(b); 92 Stat. 2516); and

"(23) section 12 of the Native Latex Commercialization and Economic Development Act of 1978 (7 U.S.C. 178(j); 92 Stat 2533).

The Act creating this chapter shall be construed to take precedence over any future Act unless that Act specifically cites this Act and provides that it shall take precedence over this Act.

"(b) Nothing in this chapter is intended to alter the effect of the laws cited in paragraph (a) of this section or any other laws with respect to the disposition of rights in inventions made in the performance of funding agreements with persons other than nonprofit organizations or small business firms.

"(c) Nothing in this chapter is intended to limit the authority of agencies to agree to the distribution of rights in inventions made in the performance of work under funding agreements with persons other than nonprofit organizations or small business firms in accordance with the Statement of Government Patent Policy issued by the President on August 23, 1971 (36 Fed. Reg. 16887), agency regulations, or other applicable regulations or to otherwise limit the authority of

agencies to agree to allow such persons to retain ownership of such inventions.

"§ 212. Relationship to Antitrust Laws

"Nothing in this chapter shall be deemed to convey to any person immunity from civil or criminal liability, or to create any defenses to actions, under any antitrust law.".

AMENDMENTS TO OTHER ACTS

SEC. 202. The following Acts are amended as follows:

(a) Section 156 of the Atomic Energy Act of 1954 (42 U.S.C. 2186; 68 Stat. 947) is amended by deleting the words "held by the Commission or".

(b) The National Aeronautics and Space Act of 1958 is amended by repealing paragraph (g) of section 305 (42 U.S.C. 2457(g); 72 Stat. 436).

(c) The Federal Nonnuclear Energy Research and Development Act of 1974 is amended by repealing paragraphs (g), (h), and (i) of section 9 (42 U.S.C. 5908 (g), (h), and (i); 88 Stat. 1889–1891).

EFFECTIVE DATE

SEC. 203. This title shall take effect one hundred and eighty days after the date of its enactment, except that the regulations referred to in section 201, or other implementing regulations, may be issued prior to that time.

Subtitle B—Reexamination of Patents

PRIOR ART CITATIONS AND REEXAMINATION

SEC. 210. (a) Title 35 of the United States Code is amended by adding after chapter 29 the following chapter:

"CHAPTER 30—PRIOR ART CITATIONS TO PATENT OFFICE AND REEXAMINATION OF PATENTS

"Sec.
"301. Rules established by Commissioner of Patents.
"302. Citation of art.
"303. Request for examination.
"304. Determination of issue by Commissioner of Patents.
"305. Reexamination ordered by Commissioner of Patents.
"306. Response or amendment by patent owner.
"307. Appeals.
"308. Certificate of patentability; unpatentability and claim cancellation.
"309. Reliance on art in court.
"310. Stay of court proceedings to permit Office review.
"311. Dismissal of complaint.

"§ 301. Rules established by Commissioner of Patents

"The Commissioner shall establish rules and regulations for the citation to the Office of prior art patents or publications, pertinent to the validity of patents, and for the reexamination of patents in the light of such prior art.

"§ 302. Citation of art

"Any person may, at any time within the period of enforceability of a patent, cite to the Office prior patents or publications which may have a bearing on the patentability of any claim of the patent: *Provided*, That the person citing such prior art identifies in writing the part(s) of the same considered pertinent and the manner of applying the same to at least one claim of the patent. The writing identifying and

applying the same shall become a part of the official file of the patent. The identity of the person citing the prior art will be excluded from such file upon his request to remain anonymous.

"§ 303. Request for examination

"Any person may, at any time within the period of enforceability of a patent, request reexamination of the patent as to the patentability of any claim thereof in the light of any prior art cited under the provisions of section 302 of this chapter, by filing in the Office a written request for such reexamination accompanied by a reexamination fee prescribed according to this title and by a statement of the relation of such prior art to the patentability of the claim or claims involved. Unless the requesting person is the patentee, the Commissioner shall promptly send a copy of such request and statement to the owner of the patent appearing from the records of the Office at the time of the filing of the request.

"§ 304. Determination of issue by Commissioner of Patents

"(a) Within ninety days following the filing of a request for reexamination under section 303 of this chapter, the Commissioner shall make a determination as to whether a substantial new question of patentability affecting any claim of the patent concerned, not previously considered in examination or reexamination of such claim, is raised by the con-

sideration, with or without any other prior art, of the prior art which has been cited in relation to the patent according to section 302 of this chapter. The Commissioner on his own initiative may make such a determination at any time.

"(b) A record of the Commissioner's determination under paragraph (a) of this section shall be made in the file of the patent, and a copy of it sent promptly to the owner of the patent.

"(c) A determination by the Commissioner pursuant to paragraph (a) of this section that such a new question of patentability is not so raised shall be final and nonappealable.

"§ 305. Reexamination ordered by Commissioner of Patents

"If, in a determination made pursuant to paragraph (a) of section 304, the Commissioner finds that a substantial new question of patentability affecting a claim or claims of the patent is raised by consideration of the patents and publications that have been cited in relation to the patent according to section 302 of this chapter, he shall order a reexamination of the patent for the resolution of the question, and shall proceed to resolve it as though the claim or claims involved were present in a pending application. The patent owner shall be given a reasonable period, not less than two months, after the filing of the reexamination order within which he may file a statement on such question for consideration in the

reexamination. The patentee shall serve a copy of such statement on any person who has requested examination according to section 303 of this chapter and such person shall have the right, within a period of two months from such service, to submit a reply to the patentees statement. Any reexamination proceeding under this section shall be conducted with special dispatch within the Office.

"§ 306. Response or amendment by patent owner

"The patent owner shall be provided an opportunity in any reexamination proceeding under this chapter to amend any claim of his patent in order to distinguish the claim from prior art cited according to section 302 of this chapter, or in response to a decision adverse to the patentability of the claim, but no amendment enlarging the scope of a claim shall be permitted in a reexamination proceeding under this chapter.

"§ 307. Appeals

"The owner of a patent involved in a reexamination proceeding under this chapter may appeal from a final decision in such proceeding adverse to the patentability of any claim, or amended claim, of the patent.

"§ 308. Certificate of patentability; unpatentability and claim cancellation

"When in a reexamination proceeding under this chapter the time for appeal has expired or any appeal proceeding

has terminated, the Commissioner shall issue and publish a certificate canceling any claim of the patent finally determined in such proceeding or on appeal therein to be unpatentable, confirming any claim of the patent so determined to be patentable, and incorporating in the patent any amended claim thereof so determined to be patentable.

"§ 309. Reliance on art in court

"(a) No patent or (printed) publication may be relied upon as evidence of nonpatentability in a civil action involving an issue of validity or infringement of a patent unless (a) the patent or publication was cited by or to the Office during prosecution of the application for the patent or was submitted for consideration by the Office in accordance with sections 302 and 303 of this chapter and was actually considered in accordance with section 304, or (b) the court, upon motion, concludes such submission and reconsideration to be unnecessary for its adjudication of the issue of validity or infringement.

"(b) The limitation provided by this section shall apply in any civil action in which a pleading presents a claim for infringement or for adjudication of the validity of a patent, upon the basis of the contents of the patent file as it existed on the date of the filing of such pleading, excepting that a party may rely upon a patent or publication cited later, and upon the final determination had on a request for reexamina-

tion in the light of such patent or publication if such patent or publication was cited and such request was filed in the Office within the period of a stay ordered by the court in accordance with section 310 of this chapter.

"§ 310. Stay of court proceedings to permit Office review

"(a) Any party to a civil action against whom a pleading presents a claim for infringement or for adjudication of the validity of a patent shall have the right, by motion brought before any responsive pleading, to secure a stay of all proceedings in the action by order of the court for a period, not less than four months, sufficient to enable such party to search for and cite patents or publications considered pertinent to the patent and to request reexamination of the patent in view of such prior art according to sections 302 and 303 of this chapter. If such party files a request for such reexamination in the Office and serves and files a copy of it in the action within the period of the stay provided by such order, the stay shall be extended by further order of the court until at least twenty days after the final determination of the request for reexamination.

"(b) The court, on motion and upon such terms as are just, may at any time stay the proceedings in a civil action in which the validity of a patent is in issue for a period sufficient to enable the moving party to cite to the Office newly discovered additional prior art in the nature of patents or (printed)

publications and to secure final determination of a request for reexamination of the patent in the light of such additional prior art, provided the court finds that such additional prior art, in fact, constitutes newly discovered evidence which by due diligence could not have been discovered in time to be cited to and considered by the Office within the period of a stay of such proceedings that was or could have been secured according to subsection (a) of this section.

"§ 311. Dismissal of complaint

"The party or parties whose complaint commencing a civil action presents a claim for infringement or for adjudication of the validity of a patent shall have the right, by notice served upon the other party or parties and filed in the action at any time within the period of a stay ordered by the court pursuant to section 310 of this chapter, to dismiss such complaint without prejudice and without costs to any party.".

TITLE III—AMENDMENTS TO THE INTERNAL REVENUE CODE OF 1954

SHORT TITLE; AMENDMENTS TO 1954 CODE

SEC. 301. (a) This title may be cited as the "Small Business Research and Development Tax Incentive Act of 1979".

(b) Except as otherwise expressly provided, whenever in this Act an amendment or repeal is expressed in terms of an amendment to, or repeal of, a section or other provision, the

reference shall be considered to be made to a section or other provision of the Internal Revenue Code of 1954.

RECOGNITION OF GAIN ON SALE OF SMALL BUSINESS STOCK

SEC. 302. (a)(1) Part III of subchapter O of chapter 1 (relating to nontaxable exchanges) is amended by adding at the end thereof the following new section:

"SEC. 1041. SALES OF SMALL BUSINESS STOCK.

"(a) NONRECOGNITION OF GAIN.—If small business stock is sold, gain (if any) from such sale shall, at the election of the taxpayer, be recognized only to the extent that the taxpayer's sale price exceeds the cost of small business stock purchased by the taxpayer within 18 months after the date of such sale.

"(b) DEFINITIONS; SPECIAL RULES.—For purposes of this section—

"(1) SMALL BUSINESS STOCK.—The term 'small business stock' means common or preferred stock issued by a small business concern.

"(2) SMALL BUSINESS CONCERN.—

"(A) IN GENERAL.—The term 'small business concern' means a domestic corporation or small business investment company (other than an electing small business corporation as defined in section 1371(b))—

"(i) which does not, for the taxable year in which such stock is issued, have passive investment income (as defined in section 1372(e)(5)(C)) in excess of the limitation set forth in section 1372(e)(5)(A), and

"(ii) the equity capital (within the meaning of the last sentence of section 1244(c)(2), as in effect on November 5, 1978) of which does not exceed $25,000,000.

"(B) CONTROLLED CORPORATIONS.—In the case of a corporation which is a member of a controlled group of corporations (as defined in section 1563(a)(1)), the equity capital of all members of the controlled group shall be treated, for purposes of paragraph (1)(A) of this subsection, as the equity capital of the issuing corporation.

"(3) STOCK ACQUIRED BY UNDERWRITER.—No acquisition of stock by an underwriter in the ordinary course of his trade or business as an underwriter, whether or not guaranteed, shall be treated as a purchase for purposes of subsection (a).

"(4) DEFINITION OF SMALL BUSINESS INVESTMENT COMPANY.—The term 'small business investment company' has the same meaning as when such

term is used in title III of the Small Business Investment Company Act of 1958 (15 U.S.C 681 et seq.), except that such term shall not include an electing small business corporation (as defined in section 1371(b)).

"(c) LIMITATION.—Subsection (a) shall only apply to gain attributable to sale of small business stock with respect to which the taxpayer's holding period is more than 12 months.

"(d) BASIS OF SMALL BUSINESS STOCK.—The basis of small business stock purchased by the taxpayer during the 18-month period shall be reduced by the amount of gain not recognized solely by reason of the application of subsection (a). If more than one share of small business stock is purchased, such reduction in basis shall be applied to each such share in chronological order of purchase. The amount of the reduction applicable to each share shall be determined by multiplying the maximum gain not to be recognized pursuant to subsection (a) by a fraction the numerator of which is the cost of such share and the denominator of which is the total cost of all such shares.

"(e) STATUTE OF LIMITATIONS.—If during a taxable year a taxpayer sells small business stock at a gain, then—

"(1) the statutory period for the assessment of any deficiency attributable to any part of such gain

shall not expire before the expiration of 3 years from the date the Secretary is notified by the taxpayer (in such manner as the Secretary may by regulations prescribe) of—

"(A) the taxpayer's cost of purchasing small business stock which the taxpayer claims results in nonrecognition of any part of such gain,

"(B) the taxpayer's intention not to purchase property within the period specified in paragraph (2), or

"(C) a failure to make such purchase within such period; and

"(2) such deficiency may be assessed before the expiration of such 3-year period notwithstanding the provisions of any other law or rule of law which would otherwise prevent such assessment.".

(2) Section 1223 of such Code is amended by redesignating paragraph (12) as paragraph (13) and by inserting a new paragraph (12) as follows:

"(12) In determining the period for which the taxpayer has held small business stock the acquisition of which resulted under section 1041 in the nonrecognition of any part of the gain realized on the sale of small business stock, there shall be included the period for which small business stock with respect to which

gain was not recognized had been held, and the period such replacement small business stock was held as of the date of such sale or exchange.".

(3) The table of sections for part III of subchapter O of chapter 1 of such Code is amended by adding at the end thereof the following new item:

"Sec. 1041. Sales of small business stock.".

(b) Section 1202 (relating to deduction for capital gains) is amended by redesignating subsection (c) as (d) and by adding after subsection (b) the following:

"(c) SMALL BUSINESS DEDUCTION.—

"(1) IN GENERAL.—If for any taxable year a taxpayer other than a corporation has a net small business capital gain, 80 percent of the amount of such gain shall be a deduction from gross income.

"(2) NET SMALL BUSINESS CAPITAL GAIN.—

"(A) IN GENERAL.—The term 'net small business capital gain' means the excess of—

"(i) an amount equal to the excess of (I) the gain from the sale or exchange of any small business stock held for more than 5 years, over (II) any loss from the sale or exchange of any small business stock held more than 1 year, over

"(ii) the net short-term capital loss from the sale or exchange of small business stock.

"(B) COORDINATION WITH SUBSECTION (a).—If a taxpayer has net small business capital gain for any taxable year, any gain or loss taken into account in computing such gain shall not be taken into account for purposes of computing net capital gain under subsection (a).

"(3) SMALL BUSINESS STOCK.—The term 'small business stock' means common or preferred stock issued by a qualified small business concern (within the meaning of section 172(j)).".

(c) The amendments made by this section shall apply with respect to stock acquired after December 31, 1979.

NET OPERATING LOSS CARRYOVERS

SEC. 303. (a) Subsection (b)(1) of section 172 (relating to net operating loss deduction) is amended by adding at the end thereof the following new subparagraph:

"(J) In the case of a qualified small business concern (as defined in subsection (j)), a net operating loss for any taxable year beginning after December 31, 1979, shall not be a net operating loss carryback to any taxable year preceding the year of such loss, but shall be a net operating loss car-

ryover to each of the 10 taxable years following the year of such loss.".

(b) Section 172 is amended by adding at the end thereof the following new subsection:

"(j) QUALIFIED SMALL BUSINESS CONCERN.—For purposes of this section, the term 'qualified small business concern' means a small business concern (within the meaning of section 1041(b)(2)) which during the 3 taxable years preceding the taxable year, or if the concern has not been in existence for 3 taxable years, during all taxable years of the concern (including the taxable year), had research and experimental expenditures (within the meaning of section 174)—

"(1) the average of which was 3 percent or more of gross revenues during such taxable years, or

"(2) which exceeded 6 percent or more of gross revenues during any one of such taxable years.".

(c)(1) Subparagraph (A) of section 172(b)(1) is amended by striking out "and (H)" and inserting "(H) and (J)".

(2) Subparagraph (B) of section 172(b)(1) is amended by striking out "and (F)" and inserting ", (F), and (J)".

(d) The amendments made by this section shall apply to taxable years beginning after December 31, 1979.

RESEARCH AND EXPERIMENTATION DEDUCTION

SEC. 304. (a) Section 174 (relating to research and experimental expenditures) is amended by redesignating subsection (e) as (f) and by inserting after subsection (d) the following new subsection:

"(e) QUALIFIED SMALL BUSINESS CONCERN.—Notwithstanding the provisions of subsection (b)(1)(C) or (c), a qualified small business concern (within the meaning of section 172(j)) may elect—

"(1) for purposes of subsection (a), to treat research and experimental expenditures for the acquisition or improvement of property which is subject to an allowance under section 167 or 611 and which constitutes research equipment as expenses not chargeable to capital account, and

"(2) for purposes of subsection (b), to treat research and experimental expenditures for any property subject to an allowance under section 167 or 611 as deferred expenses, except that in the case of a building or its structural components, the term '120 months' shall be substituted for '60 months' in paragraph (1) of such subsection.".

(b) The amendments made by this section shall apply to taxable years beginning after December 31, 1979, for expenditures made after such date.

EXCLUSION FOR AMOUNTS DEPOSITED IN RESERVE FOR RESEARCH AND DEVELOPMENT

SEC. 305. (a) Subpart B of part II of subchapter E of chapter 1 of the Internal Revenue Code of 1954 (relating to taxable year in which items of gross income included) is amended by adding at the end thereof the following new section:

"SEC. 459. RESERVE FOR RESEARCH AND DEVELOPMENT.

"(a) EXCLUSION OF CERTAIN DEPOSITS INTO RESERVE FOR RESEARCH AND DEVELOPMENT.—

"(1) IN GENERAL.—In the case of a small business concern engaged in a trade or business other than real estate, the gross income of the taxpayer shall not include the amount of any income received by the taxpayer during the taxable year which is deposited into a reserve for research and development.

"(2) LIMITATION ON EXCLUSION.—Paragraph (1) shall not apply to the amount of income which is deposited in a reserve for research and development during the taxable year to the extent that the amount of such income exceeds the least of the following amounts:

"(A) 10 percent of the gross revenues of the taxpayer for the taxable year from such trade or business,

"(B) $100,000, or

"(C) the amount of research and experimental expenditures which may be taken into account by the taxpayer for such year under section 174.

"(b) EXCLUSION FOR AMOUNTS USED FOR RESEARCH AND DEVELOPMENT.—In the case of any amount which is paid from a reserve for research and development and which is used by the taxpayer for research and experimental expenditures which may be taken into account by the taxpayer for such year under section 174, no deduction shall be allowable for such expenditures.

"(c) INCLUSION IN GROSS INCOME FOR AMOUNTS FROM RESERVE NOT USED FOR RESEARCH AND DEVELOPMENT.—In the case of any amount which is paid from a reserve for research and development for any purpose not described in subsection (b), the gross income of the taxpayer shall include, for the taxable year in which such amount is paid or otherwise made available to the taxpayer or any other person, an amount equal to 150 percent of the amount so paid or otherwise made available during the taxable year.

"(d) SPECIAL RULES.—

"(1) CONTRIBUTIONS TO RESERVE ONLY IN CASH.—A contribution to a reserve for research and development may be made only in cash, and any reserve for research and development to which a contri-

bution other than cash is made shall not be taken into account under this section.

"(2) TREATMENT OF RESERVE WHERE TAXPAYER CEASES TO BE A SMALL BUSINESS CONCERN.—

"(A) IN GENERAL.—In the case of a small business concern which ceases to be a small business concern (other than by reason of the acquisition of stock or assets of such concern by any other person), the reserve for research and development of such concern shall continue to be treated as such a reserve for a small business concern, except that no further contributions may be made to such reserve beginning with the taxable year in which such concern ceases to be a small business concern.

"(B) INCLUSION IN INCOME WHERE SMALL BUSINESS CONCERN ACQUIRED BY OTHER BUSINESS.—In the case of a small business concern which ceases to be a small business concern by reason of the acquisition of the stock or assets of such concern by any other person, 150 percent of the amount of the reserve for research and development of such concern as of the date of such ac-

quisition shall be immediately included in gross income as of such date.

"(e) SMALL BUSINESS CONCERN DEFINED.—For purposes of this section, the term 'small business concern' means any small business concern within the meaning of section 1041(b)(2).

"(f) RECORDS; REPORTS; REGULATIONS.—

"(1) RECORDS AND REPORTS.—Each taxpayer who maintains a reserve for research and development shall keep such records and make such reports as the Secretary shall by regulation prescribe.

"(2) REGULATIONS.—The Secretary shall prescribe such regulations as may be appropriate to carry out the purposes of this section.".

(b) The table of sections for such subpart B is amended by inserting after the item relating to section 458 the following new item:

"Sec. 459. Reserve for research and development.".

(c) The amendments made by this section shall apply to taxable years beginning after December 31, 1979.

RESTORATION OF PRIOR LAW FOR QUALIFIED STOCK OPTIONS

SEC. 306. (a)(1) So much of section 422(b) (relating to qualified stock option) as precedes paragraph (1) thereof is amended to read as follows:

"(b) QUALIFIED STOCK OPTIONS.—For purposes of this part, the term 'qualified stock option' means an option granted to an individual—

"(A) after December 31, 1963 (other than a restricted stock option granted pursuant to a contract described in section 424(c)(3)(A)), and before May 21, 1976 (or, if it meets the requirements of subsection (c)(7), granted to an individual after May 20, 1976, and before January 1, 1980), or

"(B) after December 31, 1979 (other than such a restricted stock option),

for any reason connected with his employment by a corporation, if granted by the employer corporation or its parent or subsidiary corporation, to purchase stock of any of such corporations, but only if—".

(2) Paragraph (7) of section 422(c) (relating to special rules) is amended by inserting "and before January 1, 1980" after "May 20, 1976" each place it appears.

(b) Paragraph (3) of such section 422(b) is amended by striking out "5" and inserting "10".

(c) The amendments made by this section shall apply to options granted after December 31, 1979, in taxable years ending after such date.

SUBCHAPTER S CORPORATIONS MAY INCLUDE 100 SHAREHOLDERS AND SUBCHAPTER C CORPORATIONS

SEC. 307. (a) Paragraph (1) of section 1371(a) of the Internal Revenue Code of 1954 (defining small business corporation) is amended by striking out "15 shareholders" and inserting in lieu thereof "100 shareholders".

(b) Paragraph (2) of section 1371(a) of such Code is amended—

(1) by striking out "and other than" after "estate" and inserting in lieu thereof a comma, and

(2) by inserting ", or a corporation which is a venture capital corporation described in subsection (f)" after "subsection (e)".

(c) Section 1371 of such Code is amended by adding at the end thereof the following:

"(f) VENTURE CAPITAL CORPORATION.—The term 'venture capital corporation' means any corporation—

"(1) which is engaged or proposes to engage primarily in the business of furnishing capital (other than short-term paper) to industry, financing promotional enterprises, purchasing securities of issuers for which no ready market is in existence, or reorganizing companies or similar activities; and

"(2) at least 60 percent of the net assets of which (exclusive of Government securities, short-term paper

and cash items) at cost consist of securities which were—

"(A) acquired directly from the issuer thereof in a transaction or transactions not involving the registration of the securities under the Securities Act of 1933 or pursuant to the exercise of options, warrants, or rights acquired in such transactions;

"(B) received in a reorganization or in an exchange offer in exchange for securities acquired pursuant to subparagraph (A) of this paragraph; or

"(C) distributed on or with respect to any securities referred to in subparagraph (A) or subparagraph (B) of this paragraph.".

(d) The amendments made by this section shall apply to taxable years beginning after December 31, 1979.

TITLE IV—REGULATORY FLEXIBILITY

SHORT TITLE

SEC. 401. This title may be cited as the "Regulatory Flexibility Act".

FINDINGS AND PURPOSES

SEC. 402. (a) The Congress finds that—

(1) in numerous instances compliance with Federal regulatory and reporting requirements imposes in-

equitable demands and burdens on individuals, small businesses, small organizations, and small governmental jurisdictions;

(2) regulatory efforts to protect the health, safety, and economic welfare of the Nation have in many instances imposed unnecessary and burdensome legal, accounting, and consulting costs upon individuals, small businesses, small organizations, and small governmental jurisdictions and are adversely affecting competition in the marketplace;

(3) the scope and volume of rules or regulations have created high entry barriers in many industries and have discouraged potential entrepreneurs from introducing beneficial products and processes;

(4) the practice of treating all regulated individuals, businesses, organizations, and governmental jurisdictions as equivalent has led to inefficient use of regulatory agency resources, enormous enforcement problems, and, in some cases, actions inconsistent with the legislative intent of health, safety, environmental, and economic welfare legislation;

(5) in many instances reasonable alternative rules or regulations could be adopted to minimize adverse economic effects on individuals, businesses, organiza-

"(B) an exemption from coverage of the proposed rule, or any part thereof, for such individuals, businesses, organizations, and governmental jurisdictions whose activities are of a nature which makes the inclusion of such individuals, businesses, organizations, and governmental jurisdictions of minimal value to the realization of the goals and purposes of the proposed rule;

"(C) the clarification, consolidation, or simplification of requirements of the proposed rule; or

"(D) other suitable means, including performance standards and differing timetables for compliance for such individuals, businesses, organizations, and governmental jurisdictions; and

"(7) with regard to any reporting or recordkeeping requirement which the agency anticipates requiring of ten or more members of the public pursuant to the proposed rule—

"(A) a statement of the purpose of the requirement, its form, its length, and the type of professional skills necessary for its completion;

"(B) an estimate of the number of persons who would be required to submit or maintain reports or records;

AGENCY RULEMAKING REQUIREMENTS

SEC. 403. (a) Section 553(b) of title 5, United States Code, is amended—

(1) by striking out the word "and" at the end of paragraph (2);

(2) by striking out the period at the end of paragraph (3) and inserting a semicolon; and

(3) by adding immediately after paragraph (3) the following:

"(4) the goals and purpose of the proposed rule;

"(5) the estimated number of individuals, businesses, organizations, and governmental jurisdictions to which the proposed rule would apply;

"(6) a statement that the agency seeks and shall consider alternative proposals to the proposed rule which would accomplish the goals and purposes of the proposed rule while substantially reducing the adverse economic impact of the rule on individuals, small businesses, small organizations, and small governmental jurisdictions affected by the rule through—

"(A) the establishment of differing compliance or reporting requirements that take into account the amount of resources available to individuals, businesses, organizations, and governmental jurisdictions;

When rules are required by statute to be made on the record after opportunity for an agency hearing, sections 556 and 557 of this title apply instead of this subsection.".

(c) Section 553 of such title is amended by adding at the end thereof the following new subsection:

"(f) For the purposes of this section, the term—

"(1) 'individual' does not include any individual who is affected by a rule primarily in his capacity as an officer or employee of a business, organization, or governmental jurisdiction;

"(2) 'small business' has the same meaning as the term 'small business concern' in section 3 of the Small Business Act (15 U.S.C. 632), and includes such additional businesses as the agency shall establish by rule;

"(3) 'small organization' includes unincorporated businesses, sheltered workshops, not-for-profit enterprises which are not dominant in their fields, and such other groups or enterprises as the agency shall establish by rule;

"(4) 'small governmental jurisdiction' includes—

"(A) governments of cities, counties, towns, villages, school districts, water districts, or special assessment districts, with a population of less than one hundred thousand; and

"(C) a statement of each proposed use of the information required to be recorded;

"(D) a statement of the method to be used to store such information, the length of time such information would be maintained, and the identity of the persons who would have access to such information; and

"(E) an estimate of the average amount of time necessary for each person to comply with the requirement.".

(b) Section 553(c) of such title is amended to read as follows:

"(c) After notice required by this section, the agency shall give interested persons an opportunity to participate in rulemaking through submission of alternative proposals, written data, views, or arguments with or without opportunity for oral presentation. After consideration of all relevant matter presented, the agency shall incorporate in the rule adopted a concise general statement of its basis and purpose. In addition, the agency shall publish a description of any alternative proposals to the proposed rule which were considered and a statement of the reasons for adopting the final rule rather than any alternative proposals which would have had a lesser adverse economic impact on individuals, small businesses, small organizations, or small governmental jurisdictions.

tions, and governmental jurisdictions subject to regulation without significant loss of regulatory efficiency;

(6) Government information collection has not adequately weighed the privacy rights of individuals and enterprises against the need of the Government for information because the design of the regulatory process has encouraged regulators to treat information as a free good; and

(7) deep public dissatisfaction with the regulatory process has stemmed in large part from a public perception that burdensome rules or regulations fail to correct key national problems.

(b) It is the purpose of this title to establish as a principle of regulatory issuance that regulatory and informational requirements fit the scale of the individuals, businesses, organizations, and governmental jurisdictions subject to a rule and that fewer and simpler requirements be made of individuals, small organizations, small businesses, and small governmental jurisdictions. To achieve such principle, agencies are empowered and encouraged to issue rules or regulations which apply differently to different segments of the regulated population and are required to solicit and consider alternative regulatory proposals from the public prior to the adoption of final rules.

"(B) other governmental jurisdictions which the agency shall establish by rule to be of limited means or resources based on factors such as location in rural or sparsely populated areas or limited revenues due to the population of such jurisdiction.".

DEFINITIONS

SEC. 404. Section 551(4) of title 5, United States Code, is amended by inserting "recordkeeping or reporting requirements estimated to apply to ten or more persons in any calendar year, and" immediately after "includes".

REVIEW OF REGULATIONS

SEC. 405. (a) Within one hundred and eighty days after enactment of this Act, each agency shall publish a plan for the review of the rules or regulations of that agency. The purpose of such review shall be to determine whether the rules or regulations of the agency are achieving, in an efficient and equitable manner, the goals of the legislation under which such rules or regulations were promulgated. Each plan for the review of agency rules or regulations shall include a statement of the criteria the agency will employ to select which rules or regulations shall be reviewed in accordance with the provisions of this section. Each agency shall periodically review its rules and regulations in accordance with the schedule and criteria set forth in its published plan.

(b) In selecting and evaluating rules or regulations, the agency shall consider factors such as—

(1) the continued need for the rule or regulation;

(2) the type and number of complaints or suggestions received concerning the rule or regulation;

(3) the burdens imposed on persons directly or indirectly affected by the rule or regulation, especially the burdens placed on individuals, small businesses, small organizations, and small governmental jurisdictions;

(4) the need to simplify or clarify language of the rule or regulation;

(5) the need to eliminate overlapping and duplicative rules or regulations;

(6) the need to resolve conflicts between the rules or regulations of the agency and the rules, regulations, or laws administered by other agencies; and

(7) the length of time since the rule or regulation has been evaluated or the degree to which technology, economic conditions, or other factors have changed in the area affected by the rule or regulation.

(c) Each year, each agency shall publish in the Federal Register a list of rules or regulations which it expects to issue during the following twelve months and a list of rules or regulations to be reviewed during the following twelve

months. Such publication shall be accompanied by a brief description of the rule or regulation, the need for such rule or regulation, and the legal basis for such rule or regulation.

Small Business & Innovation

A Report of an SBA Office of Advocacy Task Force

Office of the Chief Counsel for Advocacy
U.S. Small Business Administration

July 1979 FINAL VERSION
JULY 1979

SMALL BUSINESS AND INNOVATION

". . . there is a lot that can be done to channel research and development funds to the small business entities of America. We've done an analysis that shows the Government gets a much better return on its investment with a small business with eagerness and growth as a major commitment, a tiny bureaucracy where the superb leadership is very close to the actual working conditions, than we do with an equal amount of research and development money put into very large corporations which might consider research and development projects as one of the tiny portions of its total commitment."

-President Jimmy Carter

"Anything that won't sell, I don't want to invent. Its sale is proof of utility, and utility is success."

-Thomas Alva Edison

Prepared by:

Office of the Chief Counsel
for Advocacy
U.S. Small Business Administration

FOREWORD

P.L. 94-305 charges the Chief Counsel for Advocacy with the responsibilities to: examine the role of small business in the American economy and the contribution which small business can make in . . . stimulating innovation (Section 202(1)); develop proposals for changes in policies and activities of any agency of the Federal Government which will better fulfill the purposes of the Small Business Act and communicate such proposals to the appropriate Federal agencies (Sec. 203(3)); and, recommend specific measures for creating an environment in which all businesses will have an opportunity to compete effectively and expand to their full potential, and to ascertain the common reasons, if any, for small business successes and failures (Sec. 202(9)).

The Chief Counsel is authorized to hold hearings with the approval of the SBA Administrator. From time to time, he may prepare and publish such reports as he deems appropriate to carry out the functions of his office.

Pursuant to this authority, and with the approval of the Administrator, Honorable A. Vernon Weaver, hearings were held on January 4th and 5th and February 22nd and 23rd of this year in Washington, D.C., on the subject of Innovation and Small Business. This report and the draft copy of the "Small Business Innovation Act" are the products of those hearings.

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INTRODUCTION

This is a report of an unusual consensus among three citizen study groups on a matter of national urgency. The three groups were named for similar, but slightly different purposes.

First, the Commerce Department named fourteen leading citizens to a "work group" on "Job Creation through the Success of Small, Innovative Businesses." (JC-WG, hereafter).

Second, as part of a Domestic Policy Review of industrial innovation the Commerce Department included six small business people on advisory subgroups. They filed joint views on small business in industrial innovation, in effect becoming an additional subgroup of the Review. (INN-SBTF, hereafter).

And finally, we named twenty executives of small science-based firms and seven venture capital managers to serve as a "task force" on how to strengthen innovative small businesses themselves.

What is remarkable is that these forty-seven citizen leaders whose backgrounds, skills and outlooks are richly diverse arrived at roughly the same set of conclusions. Whether their purpose was creating jobs, shoring-up our sagging industrial innovation rate or expanding small science-based business--where they dealt with the same Federal policies, they reflect substantial consensus.

"Consensus" here does not mean that the views of the three groups are identical or that they cover exactly the same ground. Nor does consensus mean that any individual member of any of the groups would necessarily put his own views in precisely the terms used in the group's report. Every member of each group does not necessarily subscribe to every recommendation, although, of course, by his signature each member concurs generally in the group's consensus.

All three groups seem generally to agree that:

1. The critical need is for an entrepreneurial environment far more favorable to innovation and risk-taking than we have had for the past ten years;

2. Primary reliance for innovation can and should be placed on the private sector;

3. The unsatisfactory environment for innovation and risk-taking results from the cumulative impact of a number of Federal policies;

4. Small business is the most underutilized participant in the Nation's innovation process;

5. There is a compelling national stake in closing the gap between small business' potential contribution to innovation and its present utilization;

6. General Federal policy changes, important as they are, will not help small business enough: the changes needed must be specifically targeted to it;

7. Two typical yet central deficiencies cited among many are: (a) inadequate Federal targeting of Federal R&D procurement to small business; and (b) inadequate incentive for converting Federal R&D results to market sector civil technology innovation.

8. To meet those deficiencies a gradual build up to a 10% set-aside for small business research and development procurement is recommended. That would almost triple small business' share in a few years. Transfer to the private sector would be further stimulated by using 1% to follow a model program developed by the National Science Foundation.

9. Those Federal policy changes necessary for creating a favorable environment are practicable and achievable in the near term.

The SBA Advocacy Task Force met for four days. It was the judgment of the group that documentation and argumentation in support of its viewpoint was generally

SECTION 1. PURPOSE: TO ESTABLISH a Federal program to bolster innovative small businesses by strengthening their role in Federally funded research and development and by fostering their formation and growth in the economy.

This Act may be cited as the "Small Business Innovation Act of 1979."

SECTION 2: FINDINGS: THE CONGRESS hereby finds that

1. Technological innovation is a most important contributor to job creation, increased productivity, competition and economic growth in the United States as well as a valuable counterforce to inflation and our balance of payments deficit;

2. Small business is a principal source of major innovations in the Nation when compared with large business, universities and government laboratories;

3. Yet the vast majority of Federally funded research and development is conducted in large business, in universities and in government laboratories with small business receiving less than four percent of these funds;

4. While private U.S. technology expenditures are highly concentrated with just six industries accounting for over 85 percent of all industrial research and development spending and just 31 companies, many of them multi-national, accounting for 60 percent of total U.S. R&D;

5. Moreover, the Internal Revenue Code, in its present form insufficiently supports the formation, growth and long-term independent operation of innovative small businesses; THEREFORE

6. It is in the national interest to strengthen the ability of small businesses to be innovative, to increase private sector commercialization of innovations derived from Federal research and development, to increase the proportion of Federal research and development expenditures which go to small firms, to assure small firms of the opportunity to compete for Federal research and development contracts and to stimulate technological innovation by all possible means.

A Report of the SBA Advocacy Task Force:

"Small Business Innovation Act of 1979"

A Legislative Proposal

available. (It had before it the Report of the Commerce Work Group on Job Creation (Appendix II) and knew that the second report (Appendix I) was in preparation.) It therefore concluded that it could best spend its time concentrating on the content of a specific legislative proposal.

What follows then is the text of proposed legislation. It is cast in layman's language and is not in the Congressionally approved form. Its purpose is to reflect recommendations rather than actual statutory language. (Versions of two parts of it have already been introduced in the U.S. Senate: S. 3496 pending before the Senate Judiciary Committee and S. 1074 before the Senate Small Business Committee.) It is followed by a schematic comparison of the recommendations of all three groups. The full texts of the reports of the Commerce Work Group of Job Creation and the Commerce Innovation Small Business Task Force are attached as appendices.

To students of the innovation process many of the recommendations will have a familiar ring. They have figured in other citizen group studies extending from the Charpie Commerce Department report almost twelve years ago, to the SBA Casey report of two years ago.

These forty-seven men and women have given generously of their time and talents. They have done so in the hope that they can communicate to their country's leaders the sense of urgency which they feel about this subject. It is rare that a single general prescription--enhancing the environment for small business technology innovation--appears to contribute to so many high priority Federal goals: stabilizing inflation through new products and new processes; speeding the replacement of non-renewable energy and material resources; strengthening domestic producers' competitive ability and the balance of payments; enlarging the most job productive part of our economy; and enhancing our ability to control undesirable consequences of our industry.

If these forty-seven citizens are right--and we believe they are--our country will gain much or lose much, depending on how quickly it accepts the advice they have given it.

Milton D. Stewart
Chief Counsel for Advocacy
May 23, 1979

SECTION 3: RESEARCH AND DEVELOPMENT PROCUREMENT SET-ASIDES FOR SMALL BUSINESS: EACH FEDERAL Department or Agency shall target an increase by set-aside for small business of prime research and development contracts of at least one percent (1%) per year of its total research and development budget, beginning in fiscal year 1980, from fiscal year 1979 levels, until small business is receiving a prime contract dollar volume equal to at least ten percent (10%) of that Department's or Agency's total research and development budget.

SECTION 4: SMALL BUSINESS INNOVATION RESEARCH PROGRAMS: EACH DEPARTMENT or Agency with a research and development budget of $100 million or more will initiate a small business innovation research competitive solicitation program modeled after the National Science Foundation's Small Business Innovation research program, but introducing their own topics, making their own solicitation, evaluations and awards, the latter from their own budget. Funding of this program will be at a level equal to at least one percent (1%) of each agency's research and development budget, starting in fiscal year 1980. Each agency program shall be designed to be a direct attempt to stimulate technological innovation in the private sector from Federally funded research and development in agency program objectives.

SECTION 5: PATENTS AND INVENTIONS: (a) SMALL BUSINESSES should be allowed to retain patent rights on inventions made under Federally-supported research according to the following provisions:

1. Each small business shall have a reasonable amount of time to elect to retain title to subject inventions. The Federal agency may retain title if the invention is made under a contract for operation of a government owned research or production facility, or in exceptional circumstances when it is determined that restriction or elimination of the right of the contractor to retain title to a subject invention would better promote the policy and objectives of this bill.

2. Whenever the funding agency determines that it should retain title to a subject invention a copy of this decision shall be sent to the Comptroller General. The Comptroller General will then review this decision and inform the head of the agency of his determination as to whether or not this retention of title is justified. The Comptroller General will also submit an annual report to the House and Senate Committees on the Judiciary on agency implementation of this bill.

3. Each funding agreement shall contain provisions to: (1) insure the right of the Federal Government to receive title to any subject invention not reported to it within a reasonable time; (2) insure the government's right to receive title to inventions when the inventor does not intend to file for patent rights; (3) guarantee that the agency shall have a nonexclusive, nontransferable paid-up license to use the invention; and (4) insure the right of the funding agency to require periodic reports on the utilization or efforts at obtaining utilization of the subject invention.

4. The Federal agency has the right to require the subject inventor of his assignee to grant additional licenses if the agency feels that sufficient steps are not being taken to achieve commercialization. Additional licensing may also be required to alleviate health and safety needs, or under provisions for public use as specified by Federal regulations.

5. If the patent holder receives $250,000 in after-tax profits from licensing any subject invention during a ten-year period, or receives in excess of $2,000,000 on the sale of products embodying or manufactured by a process employing the subject invention within the ten-year period, then the government shall be entitled to collect up to 50 percent (50%) of all net income above these figures until such time as the amount of government research money has been repaid.

6. Any title holder to a subject invention or his assignee shall not grant to any person the exclusive right to use or sell any subject invention in the United States unless that person agrees that any products embodying the subject invention or produced through its use shall be manufactured substantially within the U.S. unless this provision is waived by the funding agency.

7. Federal agencies are authorized to grant exclusive, partially exclusive, or non-exclusive licenses on government owned patents to achieve commercialization.

8. After public notification of the government patents available for licensing the agency will then require that potential licensees submit plans outlining how the invention will be developed and marketed. If the agency determines that the granting of an exclusive or partially exclusive license will not lessen competition it will give first preference in its licensing to qualified small businesses.

9. All contractors not covered under this proposal will continue to operate under the existing agency programs.

(b) The Patent Office shall develop a practical, effective and low-cost per use computer-based search and retrieval system for its own use and public access with particular concern for its usefulness to small business firms. The system shall include appropriate classifications for and require the submission of supplemental information to make accessing easier, more complete and to provide more information concerning a patent's use and potential application.

(c) The Patent Office and the Small Business Administration shall jointly and urgently conduct a study of the feasibility of devising a modified version of the patent law and regulations for use by small businesses, and individual inventors. The goal of such a modified version shall be to reduce the time and cost of securing and defending the patent rights of small businesses and individual inventors to reduce the present inequity resulting from the greater ability of large business to make effective use of the patent laws and regulations.

(d) The Patent Office shall conduct a study regarding the feasibility of initiating a compulsory licensing requirement for patents which are not being adequately exploited and shall report back its findings to the Congress within one year.

SECTION 6: REGULATIONS, POLICIES AND PROCEDURES. (a) Procurement: The Office of Federal Procurement Policy in cooperation with the Small Business Administration shall develop and issue a simplified set of regulations for research and development awards to small business designed from the users' point of view.

1. Cost-sharing requirements for research and development awards to small business shall be eliminated and negotiated fees shall be allowed on all such contracts;

2. No Federal agency or organizational unit within an agency shall exclude small business from a fair and equitable opportunity to compete on a merit basis on the same terms as other participants;

3. Every Federal agency shall seek unsolicited proposals from small business and shall give such proposals a fair and prompt review based upon their

merit, and small business should have equal opportunity to receive sole source awards;

4. Independent research and development (IR&D) and bid and proposal (B&P) costs of small business firms shall be considered as expenses for the fiscal year in which they occur instead of being averaged-back over the past two years;

5. The Departments of Defense and Energy and the National Aeronautics and Space Administration shall take additional steps to conduct regular break-out reviews of all proposed large scale systems contracts for research and development, and to seek means of making more of this effort available to small business.

6. All Federal agencies involved with research and development funding will develop, with the Small Business Administration, specific programs to inform their staffs and consultants of the need to provide a fair and equal opportunity to small women-owned and minority business firms to be considered for Federally funded research and development; and of the requirement to guide, counsel and assist small firms to strengthen their capability to compete and insure that they receive a fair share of all Federal research and development contracts as described in the Small Business Act. Evaluations of procurement personnel performance shall include appraisals of achievement and attitude in expanding small and minority business participation;

7. All Federal agencies have a responsibility to identify and study those problems of their procurement system that, in effect, discriminate against small business and a responsibility to make changes or eliminate these practices to the extent possible through administrative action.

(b) Regulatory Flexibility:

1. All Federal agencies which issue regulations affecting small business shall, insofar as practicable, issue them so as to relate regulatory burdens to the relative size of the firms regulated.

2. In cases where government regulations provide for an agency to make a decision involving a matter initiated by a small business within a certain time period and that decision is not forthcoming by said deadline, it shall be assumed with legal force that the decision is affirmative, i.e., that permission, if not denied within a specified period, is granted an extension, if not denied within a specified period, is approved.

3. Offerings of less than $2 million involving one hundred or less investors shall be exempt from SEC registration requirements.

SECTION 7: CAPITAL FORMATION AND INVESTMENT: (a) In recognition of the risks of small-scale research and development, the potential economic benefit of research and development and the potential importance of small science and technology based firms to the Nation, for any small business which maintains an average investment over three-years of three percent or, in a single year spends six percent of gross revenue in research and development as defined by GAAP over the relevant period:

1. Investors in such firms may defer paying the tax on gains on equity investments provided they are reinvested in another small business (which maintains the same three or six percent R&D investment rate within two years);

2. Gains from capital investment in such firms, if held for a minimum of five years, shall be taxed at half of whatever rate would be applied by the IRS without this provision.

3. Losses from investment in such firms may be carried forward for ten years instead of five years due to the length of time often required for research and development to result in profitable new products, processes or services;

4. The period of exercising stock options in such firms is extended from a maximum of five to a maximum of ten years;

5. Start-up losses from such firms which would otherwise be barred may flow through to individual funding investors for tax purposes under Section 1244 of the Internal Revenue Code.

6. The Qualified Stock Option Plan for key employees is restored for these firms.

7. The Department of Labor and the Internal Revenue Service should devise regulations jointly that encourage, stimulate and otherwise provide incentive for, and eliminate obstacles to, increasing significantly the amount of pension fund assets that are invested in small businesses so as to maximize their capacity to be innovative. The Internal Revenue Service also should establish regulations and reporting procedures that improve the ability of small businesses to retain money and thus enables them to cope better with cash flow pressures.

(b) For tax purposes, specialized equipment and instrumentation for research, development or testing may be written off at any time and specialized research, development or testing facilities may be depreciated over a minimum of five years by such small business firms;

(c) Small business concerns may establish and maintain a "Reserve for Research and Development" for tax purposes in profitable years to use in periods of business stress up to the level of ten percent of gross revenues of $1 million, to the extent that contributions to the reserve are equalled by at least that amount of expenditure in that year for research and development.

1. Contributions to the "Research and Development Reserve" shall be considered as income when removed from the reserve unless used for research and development purposes.

2. When a firm ceases to be a small business, it may utilize any existing reserve for the same purpose but may not replenish it;

3. If a small business is acquired by a large firm, any existing reserve shall be considered taxable income.

(d) Subchapter S companies should be allowed to include up to 100 investors and corporations should be allowed to be stockholders of Subchapter S companies.

SECTION 8: IMPROVING SMALL BUSINESS EXPORT PERFORMANCE: THE CREATION of Small Business Export Trade Corporations should be encouraged by a double deduction for these corporations of up to $100,000 of annual expenses associated with the exporting activities of each client, with a loss carryforward of ten years. In addition, small businesses should be allowed a double deduction of special expenses of serving export markets up to $100,000 annually. Also, export procedures for technical products should be simplified.

SECTION 9: GOVERNMENT COMPETITION WITH AND DUPLICATION OF SMALL BUSINESS ENTREPRENEURIAL ACTIVITY: FEDERAL AGENCIES should be prohibited from engaging in and supporting research and development projects that are competitive with or duplicatory of private sector technological developments, or in other ways might prevent the establishment by small business of exclusive technological or intellectual properties in a new area of non-defense technological advancement.

SECTION 10: DEFINITIONS: As used in this Act -

(a) The Term "Federal agency" means an "executive agency" as defined in 5USC and in the military departments as defined by 5 USC 102.

(b) The term "contract" means any contract, grant, or cooperative agreement entered into between any Federal agency or any organization of person for the performance of experiments, developmental or research work funded in whole or in part by the Federal government. Such term includes any assignment, substitution of parties, or subcontract of any type entered into for the performance of experimental, developmental, or research work under the contract.

(c) The term "invention" means any invention or discovery and includes any art, method, process, machine, manufacture, design or composition of matter, or any new and useful improvement thereof, or any variety of plant, which is or may be patentable or otherwise protectable under the laws of the United States.

(d) The term "small business" firm means a concern as defined by Section 2 of Public Law 85-536 (15USC 632) and implementing regulations of the Administrator of the Small Business Administration.

(e) The term "research and development" when considered for tax purposes, means any activity defined as "research and development" according to Generally Accepted Accounting Principles.

(f) The term "research and development" when considered for Federal budget purposes, i.e., "research and development expenditures", means any activity defined as "research and development" according to the National Science Foundation.

COMPARISON TABLE

SBA ADVOCACY
TASK FORCE BILL

COMMERCE JOB CREATION
WORK GROUP (JC-WG)

COMMERCE INNOVATION
SMALL BUSINESS TASK FORCE (INN-SBTF)

TAX RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 7(a)(2)	We recommend that the capital gains tax rate be reduced to 25 percent (the pre-1969 rate) on the capital gains realized from the sales of stock of small businesses (less than 500 employees at date of purchase) whenever such stocks have been held for more than three years, with a rate of 10 percent for the capital gains of investors in the smallest businesses (less than 100 employees at date of purchase). The reduced rates would not apply to capital gains realized from the sale of real estate. (JC-WG) Reduce the federal tax on gains from capital investments in small science and technology firms to a level of fifty percent of the otherwise applicable capital gains rate, if the investment is held for a minimum of five years. (INN-SBTF)
Section 7(a)(2)	We recommend deferral of capital gains taxes on the sales of stock if the proceeds are reinvested within one year in small businesses, except those whose principal activities are real estate transactions. (JC-WG) Allow investors in small science and technology based firms to defer paying capital gains taxes on equity investments, provided the gains are reinvested in other small science and technology based firms within two years. (INN-SBTF)
Section 7(a)(3)	We recommend that the threshold for application of the full corporate tax rate of 46% be raised for small businesses from $100,000 to $200,000 of annual net income; and for annual net income below $200,000 a progressive rate schedule beginning at 10% on the first $50,000, and increasing in 10% increments to $200,000 on each additional $50,000. In addition we recommend that the carry-forward provisions for start-up losses of small businesses be extended from five to ten years. (JC-WG)

TAX RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 7(a)(3) (cont'd)	Allow small science and technology firms to carry forward losses for a period of ten years instead of five years. (INN-SBTF)
Section 7(a)(6)	We recommend restoration of the Qualified Stock Option Plan for Key Employees of small businesses. (JC-WG) Restore the Qualified Stock Option Plan for Key Employees in small science and technology firms, and establish the period for exercising stock options at ten years. (INN-SBTF)
Section 8	We recommend that the creation of Small Business Export Trade Corporations be encouraged by a double deduction for these corporations of up to $100,000 of annual expenses associated with the exporting activities of each client, with a loss carry-forward of ten years. In addition, we recommend that small businesses be allowed a double deduction of special expenses of serving export markets up to $100,000 annually. (JC-WG) Permit small businesses to take double deductions of expenses directly related to export market development. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	We recommend that small businesses be allowed to deduct twice their payments for regulatory advisory services related to compliance with federal, state, and local regulation. (JC-WG)
No parallel section in Advocacy Task	Provide for a twenty-five percent tax credit for research and development related expenditures by small businesses (as currently allowed in Canada). (INN-SBTF)

TAX RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
No parallel section in Advocacy Task Force Bill	Revise the corporate income tax rate to provide greater retention of earnings during the initial start-up and growth phases for small science and technology firms. (INN-SBTF)
Section 7(d), Section 7(a)(5), and Section 7(b)	A new class of equity security be created for start-up innovative businesses that would couple the benefits of limited partnerships with the benefits of Sub-chapter "S" Corporations. This new equity class would possess the following features: -- limited liability protection, -- include up to one hundred investors, -- allow incorporated investors, -- allow the use of cash basis accounting for tax determinations, -- allow operating losses and investment tax credits to flow through to individual funding investors in the year occurred, -- allow specialized equipment and instrumentation for research, development or testing to be expensed in the year purchased. This new class of stock and its benefits should be available to small businesses that spend in excess of five percent of their gross sales revenues and development as determined by Generally Accepted Accounting Principals.(GAAP) (INN-SBTF) (Note: As referred to hereinafter INN-SBTF Recommendation 1)

TAX RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
No parallel section in Advocacy Task Force Bill	Treat license royalties as capital gains instead of ordinary income. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	Eliminate the existing tax liabilities for overseas joint ventures in which the small business investment consists of a contribution of know how and technical information. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	We recommend that private sector individual or corporate owners of technology be rewarded, through appropriate changes in the tax code, for selling, leasing, or licensing their technology to small business firms in the United States. In addition, we recommend the establishment of a voluntary national policy to encourage companies to make their technologies available for uses by others. (JC-WG)
COLUMN NOTE: These two sections of Task Force Bill have no direct paralles in JC-WG or INN-SBTF Reports.	For tax purposes, specialized equipment and instrumentation for research, development or testing may be written off at any time and specialized research, development or testing facilities may be depreciated over a minimum of five years by such small business firms. (ADVOCACY TASK FORCE BILL - Section 7b) The period of exercising stock options in small business science and technology based firms is extended from a maximum of five to a maximum of ten years. (ADVOCACY TASK FORCE BILL - Section 7(a)(5))

RESEARCH AND DEVELOPMENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 3	We recommend that each federal agency receiving R&D funds by appropriation from the Congress be required to allocate at least 10 percent of all such funds (excluding those for basic research) to small businesses and that this objective be achieved in annual one percent increments beginning in FY 1980. (JC-WG) Each federal agency should be directed to allocate at least ten percent of its R&D budgets to small business and increase current levels by one percent of its budget each year until the ten percent minimum is established, starting in 1980. (INN-SBTF) This increase should be heavily directed towards basic research at universities and applied research and development in the private sector, with strong incentives for commercialization. (INN-SBTF)
Section 7(c)	We recommend that small business firms be allowed to establish and maintain a reserve for R&D for use in times of financial stress. (JC-WG) Allow small business concerns to establish and retain a "reserve for research and development in profitable years to be used in periods of business stress, with the maximum level of this reserve being ten percent of gross revenues. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	We recommend that each federal agency allocate five percent of its R&D funds for technology transfer. These funds should be used to establish well defined and organized programs of technology transfer in which there are incentives to individual researchers to contribute their time and skills to the identification of commercial applications. Such incentives should be related to the benefits realized from technology transfer. (JC-WG)

RESEARCH AND DEVELOPMENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
No parallel section in Advocacy Task Force Bill	The decline in R&D expenditures as a percentage of Gross National Product must be arrested and redirected upwards towards the goal of three precent by 1985. (INN-SBTF)
Section 4	Each year, starting in 1980, each agency with a budget of over $100 million for R&D should allocate at least one percent of its R&D budget to the small business program using the same format as that of the National Science Foundation but with their own research topics, and review and awards procedures. This program should be coordinated by an Inter-Agency Small Business R&D Committee chaired by the Small Business Administration. (INN-SBTF) We recommend that private sector individual or corporate owners of technology be rewarded, through appropriate changes in the tax code, for selling, leasing, or licensing their technology to small business firms in the United States. In addition, we recommend the establishment of a voluntary national policy to encourage companies to make their technologies available for noncompetitive uses by others. The Work Group believes the National Science Foundation's program called "Small Business Innovation Applied to National Needs" has great potential for increasing technological innovation in the private sector and is worthy of emulation or even adoption by other federal agencies. (JC-WG)

RESEARCH AND DEVELOPMENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 9	A clear federal policy should be established and enforced to prohibit federal funds from being used to finance projects that are competitive with or duplicatory of private sector technological developments, or in any other ways might prevent the establishment by small business of exclusive technological or intellectual properties in new areas of non-defense technological advancement. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	There should be decreased emphasis on applied research in universities, federal laboratories and non-profit institutions, particularly where such applied work might pre-empt private initiative or is duplicatory or competitive with private sector activities. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	We recommend that private sector individual or corporate owners of technology be rewarded, through appropriate changes in the tax code, for selling, leasing or licensing their technology to small business firms in the United States. In addition, we recommend the establishment of a voluntary national policy to encourage companies to make their technologies available for uses by others. (JC-WG)
No parallel section in Advocacy Task Force Bill	We recommend that there be some re-direction of federally-supported agricultural research to the development of technology for improving the efficiency of small family farms and food processors and for making food production, transportation, and preservation less capital and fossil-fuel intensive. (JC-WG)
Section 7(a)(5) Depreciation Allowance	Provide for a twenty-five percent tax credit for research and development related expenditures by small businesses (as currently allowed in Canada). (INN-SBTF)

REGULATORY PROCEDURES

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
No parallel section in Advocacy Task Force Bill	A thorough revision of the regulations and operating procedures of OSHA as they relate to small innovative business to include: -- A general exemption from OSHA, except where the accident history of a particular industry or firm is substantially greater than average, and in such cases, the burden should be upon OSHA to justify action; and -- The prohibition of first instance citations except in extreme cases. (INN-SBTF)
Section 6(b)1	In all regulatory activities, the burden should be placed upon each regulatory agency to establish a cause of concern before requiring regulatory compliance by a small business. Minimum levels of impact should be statutorily defined thereby exempting small businesses in all but extreme and justifiable cases. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	Substantial strengthening of the Regulatory Council to include: -- participation by the Small Business Administration; -- requiring all regulatory agencies to balance the risks of a hazard against the economic costs, with thorough consideration of specific impacts of proposed regulations upon small business creative processes; -- the use of "performance standards" and not "method standards" in those cases where regulatory standards are clearly justified. (JC-WG)

REGULATORY PROCEDURES

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
No parallel section in Advocacy Task Force Bill (cont'd)	-- wherever possible, return to reliance upon standards associations with federally mandated standards being the last resort, and -- improved congressional oversight of the regulatory process as it relates to small innovative businesses. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	Provide product liability and recall insurance at reasonable costs for small businesses, with exemptions from recalls except in the most extreme cases; and the establishment of statutory limits of liability for product failures similar to Workman's Compensation Insurance. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	We recommend that small businesses be allowed to deduct twice their payments for regulatory advisory services related to compliance with federal, state, and local regulation. (INN-SBTF)
COLUMN NOTE: These two sections of Task Force Bill have no direct paralles in JC-WG or INN-SBTF Reports.	All federal agencies which issue regulations affecting small business shall, insofar as practicable, issue them so as to relate regulatory burdens to the relative size of the firms regulated. (ADVOCACY TASK FORCE BILL - Section 6(b)) In cases where government regulations provide for an agency to make a decision involving a matter initiated by a small business within a certain time period and that decision is not forthcoming by said deadline, it shall be assumed with legal force that the decision is affirmative i.e., that permission, if not denied within a specified period, is granted and an extension, if not denied within a specified period, is approved. (ADVOCACY TASK FORCE BILL - Section 6(b)(2))

CAPITAL AND INVESTMENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 6(a)7	Modify ERISA to allow up to five percent of pension fund portfolios to be invested in small businesses. (INN-SBTF) We recommend (1) that ERISA's prudent man standard be restated so that it is clearly applicable to the total portfolio of pension fund investments rather than individual investments, and (2) that pension fund managers explicitly be permitted to invest up to five percent of pension fund assets in small firms. (JC-WG)
No parallel section in Advocacy Task Force Bill	Encourage state investment pools to invest a larger percentage of their holdings in small innovative businesses. (INN-SBTF)
Section 6(b)3	Exempt from SEC registration offerings of equity securities for innovative businesses outlined in Recommendation #1 of less than two million dollars. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	Change the charter of the Securities and Exchange Commission to specify the encouragement of the flow of capital into small innovative enterprises as well as to protect the public investor. (INN-SBTF)

PROCUREMENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 6 (a) 1	Cost sharing requirements for research and development awards for small business shall be eliminated and negotiated fees shall be allowed on all contracts. (INN - SBTF)
Section 6 (a) (2)	No federal agency shall exclude small business from a fair and equitable opportunity to compete on a merit basis on the same terms as other participants. (INN - SBTF)
Section 6 (a) 4	No agency shall restrict opportunities for small businesses to submit unsolicited proposals and shall give such proposals a fair review based upon their merit. Each agency shall provide small firms opportunities to receive sole source awards. (INN - SBTF)
No parallel section in Advocacy Task Force Bill	A separate set of simplified Federal Acquisition Regulations should be developed to apply to small business firms. (INN - SBTF)
No parallel section in Advocacy Task Force Bill	All proposals submitted by small business must be awarded or declined within four months of submission. (INN - SBTF)
No parallel section in Advocacy Task Force Bill	Proposal evaluations shall consider total costs relative to the work proposed, and not consider overhead or indirect cost rates due to variations in institutional and company accounting practices. (INN - SBTF)
No parallel section in Advocacy Task Force Bill	Fee negotiations shall take into consideration the level of interest rates and shall be higher in times of high interest rates than in times of low interest rates. All debt service costs shall be allowable costs for small business and procedures should be instituted for prompt payments to small businesses, with late payment penalties. (INN - SBTF)

PROCUREMENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 6 (a) 7	Every federal agency should study policies and procedures that discriminate against small businesses, and to institute changes that will equalize opportunity without harming the public interest. (INN - STBF)
COLUMN NOTE: These two sections of Task Force Bill have no direct parallels in JC - WG or INN - SBTF Reports.	The Departments of Defense and Energy and the National Aeronautics and Space Administration shall take additional steps to conduct regular break-out reviews of all proposed large scale systems contracts for research and development. and to seek means of making more of this effort available to small business. (ADVOCACY TASK FORCE BILL - Section 6 (a) (5)) All Federal agencies involved with research and development funding will develop, with the Small Business Administration, specific programs to inform their staffs and consultants of the need to provide a fair and equal opportunity to small women-owned and minority business firms to be considered for Federally funded research and development; and of the requirement to guide, counsel, and assist small firms to strengthen their capability to compete and insure that they receive a fair share of all Federal research and development contracts as described in the Small Business Act. Evaluations of procurement personnel performance shall include appraisals of achievement and attitude in expanding small and minority business participation. (ADVOCACY TASK FORCE BILL Section 6 (a) (6))

PATENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 5 (b)	The Patent and Trademark Office should develop a practical and effective computer based search and retrieval system for its own use and public access, with particular concern for its usefulness for small business firms. (INN - SBTF)
Section 5 (c)	A new mandatory re-examination procedure should be instituted in the Patent and Trademark Office whereby a litigant who raises a defense of invalidity of a patent based on new found heretofore unconsidered art should first test the assertion of invalidity in the patent office where the most expert opinions exist at a much reduced costs. (INN - SBTF)
No parallel section in Advocacy Task Force Bill	The budget of the patent office should be increased sufficiently to allow for more thorough searching of prior art using the most modern search technology. (INN - SBTF)
Section 5 (c)	The patent laws should be amended to recognize that the reliability of patents is a keystone in the commitment of funds to carry out commercialization of patented inventions, and incontestibility should be mandated after a period of time so as to result in absolute reliability, except in cases of fraud.(INN - SBTF)
Section 5 (a)(1)(9)	Legislation should be passed to give small businesses title to inventions made under government contracts, with the provision that commercialization be undertaken in a reasonable time. If such commercialization is not undertaken title should revert to the government and the government should license small businesses. As an alternative, small business should be able to obtain title to inventions developed under government awards if they invest an amount of capital at least

PATENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 5(a)(1)-(9) (cont'd)	equal to the amount of the R&D award under which the invention occurred. Likewise, with inventions made in national laboratories, the government should preferentially license small business concerns. (INN-SBTF)
Section 5(d)	Small businesses should be able to obtain (with appropriate restrictions) compulsory licenses through suitable proceedings in cases where uncommercialized patents block entry into new markets. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	The Justice Department should be required to undertake competitive impact studies for taking anti-trust action against small business when a small business is attempting to exploit the full property rights afforded by its patent. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	Treat license royalties as capital gains instead of ordinary income. (INN-SBTF)

EXPORT AND TRADE RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
No parallel section in Advocacy Task Force Bill	Eliminate the existing tax liabilities for overseas joint ventures in which the small business investment consists of a contribution of know how and technical information. (INN-SBTF)
Section 8	We recommend that the creation of Small Business Export Trade Corporations be encouraged by a double deduction for these corporations of up to $100,000 of annual expenses associated with the exporting activities of each client, with a loss carry-forward of ten years. In addition, we recommend that small businesses be allowed a double deduction of special expenses of serving export markets up to $100,000 annually. (JC-WG) Permit small businesses to take double deductions of expenses directly related to export market development. (INN-SBTF)

DISSENTING OPINIONS

As noted earlier, the SBA Advocacy Task Force Bill is the product of a nearly unanimous consensus of opinion. However, some individual members of the Task Force did express reservations about various sections of the bill. The following are excerpts from their comments on the bill.

"Section 9 (Government Competition with and Duplication of Small Business Entrepreneurial Activity) is rather broad. Conceivably, a venture could be privately funded on the west coast, and unbeknownst to either the government or west coast venture, there might be an east coast university project being funded by the government with the aim of solving the same problem. Furthermore, the relative success for either project might be uncertain, and the two efforts may be using different technological approaches. In this instance, I would not be in favor of automatically forcing termination of the government sponsored research."

"I do feel strongly that the tax provisions are too complicated and in some cases conflicting. . . . I would prefer to see us go for something fairly simple such as (1) restoration of the stock option, and (2) relief in the area of graduated corporate taxes for the benefit of small businesses."

"It is my feeling that far too much emphasis has been placed on technical aspects of patent reform and special small business concessions. In my view, this area is a quagmire which could swallow the rest of the legislation, while adoption of these provisions is (at best) of secondary importance."

"Section 5(a)(5) seems to me to be unwieldy, virtually impossible to administer, and an accounting nightmare. I suggest that a substitute proposition might be for GSA to make a one time determination after (X) years if repayment of original funding should be required. A concept basically similar to a contract subject to renegotiation."

"In Section 7(a)(1) (deferment of equity investments) I would like to attach some limitations to the roll-over provisions. First, I think it should apply only to individuals, not corporations. Second, I think there should be ceilings, i.e., the roll-over amount for any single investment should be limited to $100,000 or three times the amount of the original investment, whichever figure is greater. Beyond that, ordinary capital gains rates can apply."

"Section 5(a)8 - strike if possible."

"I am troubled by the glaring de-emphasis that (capital formation) has received. Access to capital-specifically, a proper mix of debt and equity capital that is consistent with a given firm's cash-flow generating capability - is the single most critical factor concerning the formation and development of technology based, small businesses. . . . I believe that the "bill" devoted too much attention to the patents issue without considering the fact that patents will remain as patents and not products unless technical entrepreneurs and small companies have sufficient access to start-up and expansion capital."

"Just a pro forma comment on the definition of 'small business'. I feel that it should be limited to companies with 100 employees or less."

"You may recall that (I) questioned the validity and objected to the priority given by our Advisory Committee to the reduction of the capital gains tax as a means for stimulating innovation."

In Section 5(a)(5) "with respect to $2 million of gross revenues and products employing patented items, some recognitions should be made of the value of the patented items in relation to the whole. For instance, the invention may be a $20 value, which is part of a $300,000 jet aircraft engine, and the $2 million test should certainly relate more closely to the quantity of $20 parts sold than to the quantity of aircraft engines incorporating the part sold."

"Also, I repeat my reservations about the elitism implicit in the use of the term 'innovative small businesses.' All small businesses should be deemed to have innovative potential - i.e., ability to improve productivity and create more jobs."

"Government should respect proprietary information submitted as part of proposals for contracts and unless information can be shown to be in the public domain, shall not divulge or use such information except for the evaluation of the submitted proposal. Under no circumstances shall this information be used as the basis of another RFP."

"Government shall not take proprietary ideas 'in house' after initial funding unless the contractors performance shall be deemed poor."

"In Section 7(d) - cannot agree that companies should be allowed to include up to 100 investors. Too many."

BIOGRAPHIES

MEMBERS OF
SBA ADVOCACY TASK FORCE

Milton Bevington:

B.S. in Chemical Engineering, M.I.T., MBA - Harvard Business School. President and CEO of Servidyne, Inc.; former Executive Vice President of The Trane Co.

SERVIDYNE:

Founded in Atlanta in 1966. Supplies total energy management services to industrial, commercial, and institutional services. Clients are nationwide and in over 20 foreign countries. Headquartered in Atlanta, the company has 13 offices located throughout the country.

N. Paul Bosted:

M.S. in Physics, Sr. Fellow - Mellon Institute, Pittsburgh, Pa. Nine years - International Rectifier Corp., as President. Five years as an International Technical Consultant. Joined Sun Systems in 1976. Serves as President Expert in the field of electronics.

SUN SYSTEMS:

Founded in 1971, specializes in sophisticated digital electronic instruments for government installations, NASA and several Nuclear Energy plants. Clients include GE, International Harvester, Westinghouse. Presently have 12 employees. Size of business - $500,000 gross.

William Chandler:

Oregon State University, American Graduate School of International Management. Founder and President of Bay Venture Management, San Francisco, Calif. Formerly associated with Federal Reserve Bank, Raytheon, Veriflo Corp., and Western Growth Fund.

BAY VENTURE MANAGEMENT:

Organized in late 1975 as a venture development firm dealing with start-up companies in the bay area.

Dan Cronin:

B.A. Harvard, Economics, Cum Laude, 1950, Advanced Management Course, Harvard. Vice President, Small Business Association of New England. Formerly salesman, manager and then President of small hospital supply co., which merged in 1968 with a large company with 150 employees and 5 million in business. In 1974 served as Assistant to the then Secretary of Commerce, Elliot Richardson, 1977 joined Ampersand Associates, a venture capital firm. Also served on SBA Regional Advisory Council.

AMPERSAND ASSOCIATES:

Venture Capital firm with investments ranging from 1-1/2 million to 100 million. One client is #2 in the electronic cash register business.

Alfred C. W. Daniels:

E.E. Graduate of Arizona State University, Harvard Law School, also served as an Assistant Dean at Harvard. Vice President, New England, HH Aerospace Design Co., Inc. An officer and rated airline transport pilot, he has served in both command and staff R&D positions in the U.S. Air Force where he also earned four Air Medals with 200 missions in Viet Nam. Received the 1,000 Hour Sabreliner Flight Award. President, Black Corporation Presidents of New England, Inc., and a member of the Board of Directors, Smaller Business Association of New England, Inc.

HH AEROSPACE DESIGN CO., INC.:

A consulting firm established in 1974, incorporated in the State of New York. A 100% minority-owned corporation, serving the Eastern Seaboard. HHA's capabilities include R&D studies, economic analysis, design and engineering services in aerospace, electronics and transportation planning, including surface systems, tests and evaluation.

Dr. Orrie Friedman:

Ph.D. Chemistry - McGill University, 1944. Former Professor of Chemistry - Brandeis University. Left to organize Collaborative Research, Inc., in 1962. Has served as President & Science Director since its inception. His contributions to bio-medical research are included in over 90 science publications. Well known for basic discoveries in cancer chemotherapy. Served on a number of Advisory Ctes at NIH. Member, Office and Director of several corporate, philanthropist and professional organizations.

COLLABORATIVE RESEARCH, INC.:

A high technology company with interests primarily in bio-medics and research and development. Organized in 1962 to undertake sponsored research, the company consists of two closely integrated operating divisions: Research and Pharmacutical Products, and a central Research Division. Company has expertise in a number of areas as the cutting edge of new cell and molecular biological technology.

Edward Gaffney:

Michigan Technology University, Mechanical Engineering. Developed and patented the cushion lift chair. Awarded U.S. Small Business Person of the Year in 1978, and Small Business Man of Wisconsin in 1977. President and Founder of Ortho-Kinetics. Currently Vice President of Independent Business Association of Wisconsin. Member of Wisconsin Legislative Council, Subcommittee on Small Business.

ORTHO-KINETICS:

Founded in 1963, small high technology based firm, specializing in research and development and manufacture of the cushion lift seat and childrens care seats. Currently employs 50 people.

Clyde R. Goodheart:

B.S. in Biology, Northwestern University, MD - Northwestern Medical School, MS - Northwestern Graduate School. Three years at California Institute of Technology in Post-Doctoral Fellowship. Assistant Professor and Associate Professor, Department of Pediatrics, University of Southern California Medical School, Children's Hospital of Los Angeles. Well known for his work in cancer research, Dr. Goodheart has been involved in bio-medical studies and has written many scientific articles.

BIO LABS, INC.:

Founded in July, 1970 by Dr. Clyde R. Goodheart, it serves government and industry through contract research, product development programs, quality control testing, industrial microbiology. Current research areas include tissue culture work, immunology, biochemical and biophysical work with viruses.

Sidney Green:

B.S. University of Missouri in Mechanical Engineering, M.S. University of Pittsburgh, attended University of Pennsylvania Graduate School & received the degree of Engineer in Engineering Mechanics from Stanford University Formerly with Westinghouse Electric Company Research Labs, General Motors Defense Research Labs, & GM Technical Center. President & Chief Executive Officer of Terra Tek, he is active on many government committees & professional societies. Published over 40 open literature papers and reports, holds several patents.

TERRA TEK:

Founded in 1970 as a for-profit company, a springoff venture pursuing application of ideas primarily initiated at the University of Utah. Recognized as a leader in problem-solving applications involving rock mechanics, the geosciences and associated technology, and for its practical application of material sciences. Main lines of business include R&D, manufacture of sophisticated servocontrolled computer interfaced test systems, full-scale testing of drilling, mining and exploitation of new ventures.

Harold Guller:

Washington University School of Engineering. President and Chairman of the Board of Essex Cryogenics Industries, Inc., and President of its wholly owned subsidiaries: Essex Cryogenics of Missouri, Inc., Higgs Screw Products, Propellex Corp., and Essex Precision Controls, Inc. Serves as Chairman of the St. Louis District Advisory Council of the Small Business Administration. Member of various local and regional advisory and technical committees and several civic organizations.

ESSEX CRYOGENICS INDUSTRIES, INC.

Designs and produces hydraulic, pneumatic fuel, electronic and electromechanical components and subsystems for aircraft applications. Selected as the Small Business Prime Contractor of 1971 for Region VII, Small Business Subcontractor of 1972 for Region VII; Small Business Subcontractor of 1973 for Region VII and National Small Business Subcontractor of the Year 1973.

Dr. Eugene Haddad:

B.S. Engineering Physics, Alabama Polytechnic Institute of Technology, M.S. in Physics, University of California, Ph.D., University of Utah. Formerly staff member of Los Alamos Scientific Laboratory and AEC Research Division. 1966-1967 Visiting Professor of Physics, Catholic University. 1968-1969 Assistant to Deputy Director of Science and Technology, U.S. Defense Atomic Support Agency. 1969-1975 Executive Vice President, Columbia Scientific Industries Corp., Austin, Texas. Since 1976, President, Chief Executive Officer and Director of Columbia Scientific Industries Corp. Member of several professional and honorary societies. Has published numerous papers in scientific journals.

COLUMBIA SCIENTIFIC CORPORATION:

The main thrust of the company is in the design and manufacture of high quality environmental and safety equipment. The company also conducts research for federal, state and local governments, as well as the private sector. Located in Austin, Texas, the company employs 85 people and has an annual sales volume of approximately $4.5 million.

Roger Hill:

B.S. Physics, Brown University, M.S. Elec. Engr., Northwestern University, Doctorate studies at Northwestern University. Small Business person of the Year in State of Wisconsin, 1978. Member of Independent Business Association of Wisconsin, Special Committee on Small Business of Wisconsin Legislative Council, First National Bank Board of Directors, International Trade Subcommittee of the Chamber of Commerce of the U.S., Institute of Elec. & Electronic Engrs.

GETTYS MANUFACTURING CO.:

Founded in 1959 by Roger Gettys Hill, as a three-person engineering and consulting firm and later dynamically expanded into an international, multi-million dollar enterprise with subsidiaries in England, Germany and Italy. Today, Gettys and its licensee supply over 50% of the world DC servo drive market. In 1965 introduced world's first all-electronic three-dimensional tracer.

Robert Hillas:

B.A. Dartmouth, MBA - Stanford University. Seven years as a Venture Capital Investment Specialist with E.M. Warburg, Pincus and Company. Serves on two Boards of Directors and one Advisory Committee of Investee Companies.

E. M. WARBURG, PINCUS, & CO.:

Specialists in financial services. One of the larger private venture capital pools in the country. Deal with start-up money particularly in large publicly held companies.

Patrick Iannotta

Majored in Economics, Queens College, Member, Treasury Advisory Council; New York State Governors High Technology Task Force; President of Ecolotrol for past ten years.

ECOLOTROL, INC.:

Founded in 1969, developed a standardized treatment system for industrial waste water and municipal sewage. Number of plants in design & construction throughout the world. Currently commercializing sophisticated instruments and control devices in the energy area. Ecolotrol holds several patents.

Charles G. James:

B.S. in Business Administration - Bowling Green State University. Treasurer and member of Board of Directors, The Sea Pines Company, Hilton Head, South Carolina. Staff person, Laurance S. Rockefeller, New York. Group Vice President of Heizer Corporation, Chicago, Illinois, a venture capital firm, currently with Battelle Memorial Institute, Columbus, Ohio, as President of Scientific Advances, Inc., a wholly-owned subsidiary of Batelle.

SCIENTIFIC ADVANCES INC.:

Provides financial, management, and technical support for companies or projects originating within or without Battelle; a whollyowned subsidiary of Battelle Memorial Institute, Columbus, Ohio. SAI was conceived as a source for short run production, marketing and eventual disposition of unique Battelle developed products, SAI has shifted to the formation and growth of new ventures to introduce innovative technology.

Paul Kelley:

Harvard, MBA, Northeastern University. Is a doctoral candidate at Boston University. Is responsible for implementing the Massachusetts Technology Development Corporation Revolving Loan Fund program. Has been personally involved in several turn-around situations and technology-based start-ups. He was instrumental in putting together the financial packages for over 40 successful start-up, technology-based companies. President of SUN Community Development Corp. and is the Senior Lecturer in the Venture Development Program st Boston State College.

MASSACHUSETTS TECHNOLOGY DEVELOPMENT CORPORATION:

A public-purpose development finance mechanism established by an act of the Massachusetts State Legislature in July 1978. Has the dual capability to provide management and direct financial assistance to early-stage, technology-based small businesses in Massachusetts. The MTDC can provide seed capital to commercialize new technologies which will foster primary job creation and increase tax revenues and exports.

Gilbert V. Levin:

B.E., The Johns Hopkins University, 1947, M.S., 1948, Ph.D., 1963, Environmental Engineering. President and Founder, Chairman of the Board of Directors, Biospherics Inc., Rockville, Md. Formerly Director, Life Systems Division. Member, Board of Directors, Hazelton Labs, Inc., Falls Church, Va. Holds more than 33 patents in biological treatment of wastewater and in microbiology. Member of several honorary science associations & author of approximately 100 technical publications.

BIOSPHERICS INCORPORATED:

Organized into three major operating divisions: The Environmental Instrumentation Division which develops, manufactures, and markets sophisticated innovative instruments in the fields of pollution control and health; the Laboratory Division which performs contract research and development on environmental and health problems, develops Biospherics proprietary products in these areas and offers commercial analytical services in chemistry, biochemistry, microbiology, pesticides, and toxic substances; the Science Writing Division which writes, edits, produces and disseminates information in these areas of interest.

Harold K. Lonsdale:

B.S. Chemistry, Rutgers University, 1953. Ph.D in Physical Chemistry, Pennsylvania State University, 1957. Formerly, Nuclear Research Officer, U.S. Air Force, staff member, Research and Development Laboratory, General Atomic Co., Principal Scientist, ALZA Corp., and Visiting scientist, Max Planck Institute of Biophysics, Frankfurt, West Germany, and the Weizmann Institute of Science, Rehovot, Israel. Since 1974, President of Bend Research Inc., Bend, Oregon. Member of the American Chemical Society, Editorial Board of Desalination Journal and Editor of the Journal of Membrance Science. Adjunct Professor, Oregon State University. Author of many publications.

BEND RESEARCH, INC:

Is a young firm engaged in contract research and development for industry and government. Their field of expertise is membrance science and technology.

David T. Morgenthaler:

Massachusetts Institute of Technology, B.S., M.S. (mechanical engineering), Licensed Professional Engineer. Presently, Senior Partner, Morgenthaler Associates since 1969. Formerly with Foseco, Inc., as President and Vice President of Delavan Manufacturing Co. Chairman, National Venture Capital Association. Holds directorships with numerous companies throughout the country and member of several civic and regional organizations.

MORGENTHALER ASSOCIATES:

A private venture capital firm founded in 1968 by David Morgenthaler. The company's objective is to obtain substantial long term gains by investing in companies which offer some kind of proprietary product or service. It invests throughout North America and is interested in all types of business. The firm's normal investment size ranges from $100,000 to $300,000 in a given investment.

George W. Murphy:

B.S., Fordham, 1960. From 1958 to 1970 employed by IBM in various marketing and management positions. Since 1970 President and Chief Executive Officer of Educational Computer Corporation.

EDUCATIONAL COMPUTER CORPORATION:

Is the industry leader in research, development, and production of low cost computer controlled simulation devices that are used in advanced training programs. ECC blends computer technology with modern task oriented instructional methods to produce fully integrated technical training programs.

Dr. Arthur S. Obeymayer:

B.A. with High Honors, Swarthmore College, 1952. Ph.D. in Chemistry, M.I.T., 1956. Recipient of NST fellowships. President and founder of Moleculon Research Corporation. Founder and first Chairman of the Research Management Association. Currently, Vice President of the American Association of Small Research Companies. Has served in various capacities in the Association of Technical Professionals, Boston Industrial Mission, Federation of American Scientists and the Small Business Association of New England. Is frequently called upon by the Federal and Massachusetts state governments to serve in an advisory capacity.

MOLECULON RESEARCH CORPORATION:

Specializes in research, development and consulting in chemistry and allied fields. These services range from feasibility studies and product development to problem solving, chemical engineering investigations, and process development. Moleculon makes Poroplastic R film and powder. Product applications include controlled release materials, dermatological preparations, membrane separations for hydro-metallurgy and impurity removal from waste water, and color change monitoring of toxic vapors.

Dr. Judith H. Obeymeyer:

B.S., mathematics, Carnegie - Mellon University, 1956. Ph.D. in Mathematics, Harvard University, 1963. Assistant Professor, 1960-1966 Wellesley College. In 1978 taught mathematics at the University of Massachusetts. Recipient of four NSF Fellowships. Since 1968 Trustee and Manager of Technology Really Trust. Has served in a number of capacities with Moleculon Research Corporation for the last fifteen years. Has served as officer and on the board of numerous civic and charitable organizations and is a member of several honorary and professional societies.

MOLECULON RESERACH CORPORATION:

Specializes in research, development and consulting in chemistry and allied fields. These services range from feasibility studies and product development to problem solving, chemical engineering investigations, and process development. Moleculon makes Poroplastic R film and powder. Product applications include controlled release materials, dermatological preparations, membrane separations for hydro-metallurgy and impurity removal from waste water, and color change monitoring of toxic vapors.

Tom Perkins:

Degree in Electrical Engineering, Massachusetts Institute of Technology, M.B.A., Harvard Graduate School of Business Administration. Venture Capitalist with Kleiner, Perkins, Caufield, & Byers, San Francisco. Director, National Venture Capital Association, past President, Western Association of Venture Capitalists. Co-founder of Optics Technology and founded University Laboratories which became the leading producer of inexpensive gas lasers.

KLEINER, PERKINS, CAUFIELD & BYERS:

An active venture capital partnership with a capitalization of $15 million. Investments typically range from a minimum of $200,000 to a maximum of $1 million. They seek opportunities with the potential to achieve significant shares of high growth markets. Examples: computers & computer peripherals, office equipment, medical products and instruments, microbiology, genetic engineering, telecommunications, semiconductors, laser & optics, and pollution control.

Harry D. Richardson:

SCMP - Harvard University, 1976; MS - Engineering, University of Alabama, 1950; BS - Mechanical-Electrical Engineering, Louisiana Polytechnic Institute, 1941. Chairman and President of Nuclear Systems, Inc. since 1971. Currently consulting Professor to Louisiana State University. Member of the Board of Directors of several companies and member of numerous professional societies.

NUCLEAR SYSTEMS, INC.:

Is a small technology company. Primarily it is engaged in (1) developing, manufacturing, and marketing equipment using radioisotopes, (2) environmental and quality control testing electronic components, and (3) developing, manufacturing, and marketing products for management and conservation of energy in homes and small commerical buildings. In 1979, the sales volume is estimated to exceed $6 million. There are 250 employees located in six U.S. locations and one manufacturing plant in Mexico. NSI is a public company with nearly 500 stockholders.

Walter D. Syniuta:

Sc.D - M.I.T., Mechanical Engineering, M.Sc, Queens University, B.Sc, Queens University. President, Advanced Mechanical Technology, Inc. Formerly with Scientific Energy Systems Corp., Assistant & Associate Professor of Mechanical Engineering, M.I.T., Engineering Consultant, Development Engineer & Vibration Engineer. Member of various professional societies & author of several publications relating to his expertise in the field of electron microscopy.

ADVANCED MECHANICAL TECHNOLOGY, INC.:

A Massachusetts corporation engaged in R & D, and manufacturing of instrumentation. Engaged in R&D in the field of energy conversion systems, with current development programs in gas-fired hot water heaters, gas-fired residential space heating, waste-heat recovery systems, a novel heat-actuated heat-pump based on the Stirling cycle, use of ceramics in heat engines, and heat engine combustion research. AMTI is currently engaged in several commercial engineering projects.

Bruno O. Weinschel:

Dr. Engineering degree from the Technische Hochschule, Munich, Germany. Since 1952, President of the Weinschel Engineering Co., Inc. He is known for his work in the state of the art of insertion-loss microwave measurement. Serves as Director of the Precision Measurements Association. A Fellow in the Institution of Electrical Engineers. Editorial review boards of The Microwave Journal and Microwave Systems News. Author or co-author of forty journal articles and inventor or co-inventor of twenty patents.

WEINSCHEL ENGINEERING COMPANY, INC.:

A leader in the design and manufacture of high quality instruments and components for use throughout the microwave industry. Known worldwide for their precision and quality. Contributor to the advancement of microwave technology. Complete in-house, totally integrated engineering, machining and assembly, with inspection and test procedures in Gaithersburg, Md.

Robert F. Zicarelli:

B.S. and MBA - Northwestern University. Has been with Northwest Growth Fund, Inc. for 18 years, having joined NWGF as Vice President and Director in 1961. His investments in venture capital experiences span 30 years. A member of the Board of Governors of National Association of Small Business Investment Co.'s. (NASBIC) and Board of Directors, National Venture Capital Association. Past President of Regional SBIC Association and member of SBA National Advisory Council.

NORTHWEST GROWTH FUND:

Founded in 1961, it is an SBIC headquartered in Minneapolis with offices in Denver and Portand. It is a wholly-owned subsidiary of Northwest Ban Corporation. It has assets in excess of $40 million and investments in more than 50 small businesses, employing over 15,000 people. NWGF has invested in a broad range of apparel and personal products, electronics, basic manufacturing, communications, industrial and consumer services. One of the largest SBIC's in the country actively dedicated to venture capital funding.

BIOGRAPHIES

MEMBERS OF COMMERCE INNOVATION
SMALL BUSINESS "TASK FORCE"

Mr. Wayne Coloney:

Texas A&M, Summa Cum Laude Graduate - Georgia Institute of Technology, 1950. Serves as Chairman of the Board & Chief Executive Officer of the Wayne H. Coloney Co., Tallahassee, Florida. Formerly associated with Barrett, Daffin & Coloney, and J.E. Greiner & Co., Tampa. A professional engineer certified in Florida, Georgia, Alabama, and North Carolina. Member of American Society of Civil Engineers, National Society of Professional Engineers and numerous other organizations, both professional & philanthropic. Listed in Who's Who in the World and in the South and Southwest. Mr. Coloney holds several patents and has published articles related to his extensive interest in knowledge of land planning, transportation facilities, drainage and air pollution and historical renovation.

WAYNE H. COLONEY COMPANY:

Founded in 1970 as a broad-based engineering firm dealing with structural, mechanical and legal engineering in the areas of land planning, pollution control and design. Grew from three employees in 1970 to presently 200. Awarded in 1972 - Pollution Control Citation, 1975, SBA Regional Prime Contractor of the Year, placed in top 500 design firms chosen by McGraw-Hill magazine.

Eugene M. Lang:

B.A. from Swarthmore College, M.S. from Columbia University, mechanical engineering studies at Brooklyn Polytechnic Institute. Currently, President of REFAC Technology Development Corporation of New York City. Chairman of Scriptomatic, Inc., Philadelphia, Pa., Chairman of J.D.S., Inc., a West Palm Beach, Florida real estate company, Chairman, Electronic Research Associates Inc., Moonachie, New Jersey, a manufacturer of power supplies and loudspeakers. Chairman of REFAC

Electronics Corp., Barkhamsted, Conn., manufacturer of microminiature display devices and switches. Serves on Department of Commerce, Advisory Committee on Science and Innovation.

REFAC TECHNOLOGY DEVELOPMENT CORPORATION:

Since 1952, this company's principal business has been international technology transfer -- the creation of manufacturing licenses and joint ventures as a means for client manufacturers to enter export markets. Most REFAC clients are smaller companies that have specialized industrial products or manufacturing processes.

George Lockwood:

B.S. in Civil Engineering, Northwestern University M.B.A.- Harvard University, Currently President & Founder of Monterey Abalone Farm, Founder of Monterey Kelp Corporation which was acquired by Merck & Co., Inc. Formerly with Global Marine, a pioneer firm in off-shore oil well drilling. Mr. Lockwood holds several patents in his varied background including electronics & electronics manufacturing, oceanography & oceanography engineering, civil engineering, heavy construction & chemical processes.

MONTEREY ABALONE FARM:

Founded in 1972, specializes in domesticating the abalone species of the marine snail in California. In the first part of its history the company did extensive research in biological, environmental & nutritional factors relative to commercialization. Currently undergoing a major expansion of its operations.

Duane D. Pearsall:

B.S. from University of Denver, Commercial Engineering. General Motors Institute. Founder and President of the Small Business Development Corporation. Previously founded and was President of the Pearsall Company (1955-1966) and of Statitrol Corporation (1964-1977). Member of several professional societies. Member of Executive Committee and Board of Directors of Denver Chamber of Commerce and Council of Small Business of the Chamber of Commerce of the U.S., Regional Vice Chairman for Small Business, N.W. Region. Serves on S.B.A. Colorado District Advisory Council and M.F.I.B. Action Council Committee. Has published several technical papers. Colorado Small Business Person of the Year - 1976. National Small Business Person of the Year - 1976. Outstanding Citizen Award Mile High Sertoma Club - 1978. Serves on the Board of Directors of several companies and organizations.

SMALL BUSINESS DEVELOPMENT CORPORATION:

This was formed to support three activities - as consultant to small businesses, as an investor in small business and to organize a stronger voice for small business in Federal legislation.

Eric P. Schellin:

A.B. Columbia University, J.D., George Washington University. Lecturer, Patent, Trademark & Copyright Law, Georgetwon University, 1974-present. Executive Vice President of the National Patent Council, Inc., Chairman of the Board of Trustees of the National Small Business Assoc., 1979. President, Erdo Co., Member of various legal & scientific associations and the bar of V.A., D.C., Supreme Court and Court of Customs and Patent Appeals.

Robert C. Springborn:

B.S. University of Illinois, 1954, Ph.d. Organic chemistry Cornell University, 1954. Since 1972 Chairman and President of Springborn Laboratories, Inc. Formerly, Chairman and President of General Economic Corporation; Vice President, Chemical Group and General Manager of New Ventures Division, W.R. Grace; General Manager, Food and Chemicals Division, Ionics, Inc.; and Vice President, Technical Director, Ohio Rubber Division of Eagle-Picher Industries, Inc. Hold several patents in the field of high polymers. Several papers on entrepreneurship. Member of numerous professional, civic honorary societies. Chairman of the Coalition of Small Technical Businesses.

SPRINGBORN LABORATORIES, INC.:

Is an internationally oriented, employee-owned company. Serving the chemical and allied products industry with special expertise in high polymers offices in the U.S., Europe and Asia.

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