MAINTAINING READINESS FOR DEFENSE PRODUCTION

25 February 1952

1261

CONTENTS

Page

INTRODUCTION--Captain C. C. Marcy, USN, Chief of the Production Branch, ICAF..... 1

SPEAKER--Mr. John F. Gordon, Vice-President, General Motors Corporation..... 1

GENERAL DISCUSSION..... 8

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Mr. John F. Gordon, Vice-President, General Motors Corporation, was born 15 May 1900 in Akron, Ohio. He was graduated from the U. S. Naval Academy in Annapolis, in June 1922 and received an engineering degree from the University of Michigan in 1923. Mr Gordon has been with General Motors Corporation since 1923 and has held positions in engine design and development with the Cadillac Motor Car Division in Detroit and in design and development of aircraft engines with the Allison Division in Indianapolis. In 1946 he became Vice-President of the General Motors Corporation and General Manager of Cadillac Motor Car Division. In July 1950 he was assigned as Vice-President in charge of engineering in the Central Office and in January 1951 he became Vice-President in charge of Body and Assembly Divisions, the position he now holds. Mr. Gordon is a member of the Society of Automotive Engineers, Engineering Society of Detroit, and the American Ordnance Association.

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CAPTAIN MARCY: Gentlemen, the great industrial capacity of the United States has long been recognized as perhaps our greatest military and economic source of power. World Wars I and II have given ample demonstration of this fact, provided time is available to divert industry from its normal peacetime pursuits to a war effort. Perhaps the most challenging problem that faces the country today is the fact that the present international situation may not give us the time that we have always had in the past for this diversion.

This central problem of economic and industrial mobilization has occupied the study and time of leaders of the Government, industry, and the military. We are fortunate this morning in having a distinguished industrialist, who has devoted considerable study to this problem, as our guest speaker--Mr. John F. Gordon, Vice-President of General Motors Corporation.

Mr. Gordon, it is a pleasure to welcome you to the Industrial College to discuss this problem with us.

MR. GORDON: Captain Marcy, General Holman, officers and students of the Industrial College of the Armed Forces: I really appreciate the honor and the opportunity of speaking to you this morning on the subject of "Maintaining Readiness for Defense Production," because any contribution that industry may make toward the establishment of such a program would certainly be lasting in value to the Nation and to industry. Although my business connection has been with General Motors for many, many years, I would like to review for just a moment the extent of my own activities in defense production during the last 12 years as an indication of interest in the subject.

During most of 1940 and all of 1941 and 1942, I was employed by the Allison Division of General Motors at Indianapolis on the design, development, and production of Allison aircraft engines. In 1943 I transferred to the Cadillac Motor Car Division as chief engineer on the light tank program, which involved the M-5, the M-8, the M-19, and the M-24 light tanks and gun motor carriages, with participation in other programs involving landing vehicles, snowmobiles, tank-recovery vehicles, personnel carriers, and self-propelled artillery.

The four years following the war were devoted to automobile production at Cadillac but those years were also punctuated with several Phase I and Phase II studies on ordnance equipment, leading up to re-establishment of Cadillac as the producer of the Light Tank T-41-E1 in 1950 and 1951.

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Much of my time during the last two years has been devoted to contract negotiations and related activities on the current preparation for production of the F-84 Thunderjet at Kansas City, the T-48 medium tanks at Grand Blanc, Michigan, the T-41 range finder at Detroit, and the Grumman designed S2F1 at a new plant which we are just getting under way at Arlington, Texas. So, as you gentlemen can readily see, the record is one of almost continuous participation in defense production for our armed services spanning a period of well over 10 years.

The scope of this lecture has been outlined as follows: "How can American industry achieve and maintain the optimum state of readiness for all-out war production for a protracted, but indefinite, period--concurrently with achieving and maintaining optimum civilian production under the free enterprise system? What steps can industry, unassisted, take toward this objective? What assistance is required from government? How do present governmental policies either assist or hinder the attainment of this objective and what corrective measures are indicated?"

Let us examine the problem in its natural historical relation, which entails the transition from a period of commercial goods production into a period of combined military and commercial goods production.

There can be very little doubt of the fact that the American free enterprise system provides sufficient incentive to encourage the production of civilian goods at a rate beyond our national rate of consumption. The exportation of goods and services for the years of 1948, 1949, and 1950 exceeded the imports into the United States by some 15 billion dollars. They are currently estimated at the rate of 6.5 billion dollars per year by the Council of Economic Advisers.

The value of gross national product per year in constant dollars has increased by more than 20 percent in the last five years, which exceeds the rate of population growth in this country by a substantial margin and demonstrates the ability of our economic system to increase the standard of living of the people during a time of relative freedom from war. In such periods, this nation has sufficient capacity to cover the requirements for consumer goods and furnish a certain quantity for export into other areas.

But how about the productive capacity of the country for military defense items in the next emergency? What are the actual needs from that standpoint? We can only really study the facts on the established historical basis of some six or seven years ago, when this country was engaged in global warfare and had approximately 14 million men in the armed services.

With perhaps some minor variations or exceptions, it can be said that military production capacity was sufficiently great at that time to furnish our services with an overwhelming superiority in numbers

of ships, airplanes, guns, tanks, ammunition, and supplies to use against the enemies that were arrayed against us.

Although it is very difficult to obtain specific information as to what manufacturing capacity is really needed for such a gigantic task, the report of the Civil Production Administration dated November 1945 indicated ownership by the U. S. Government at that time of 1,691 new plants and 969 expansion facilities within existing plants. In August 1945 the Reconstruction Finance Corporation proposed the disposition of the following aircraft facilities as surplus: 50 aircraft plants, containing approximately 65 million square feet of floor space; 114 aircraft parts plants, containing approximately 25 million square feet of floor space; 69 aircraft engine and aircraft engine parts plants, containing approximately 40 million square feet of floor space; and 16 aircraft modification plants, containing approximately 8 million square feet of floor space.

This collection of plants, listed for disposal as surplus, involves much more floor space than the entire General Motors Corporation has in use today. Yet this particular group of aircraft and aircraft engine parts plants represented only a portion of the hundreds and hundreds of facilities offered for sale or lease, covering the whole gamut of production requirements from alcohol to zinc, from bicycles to balloons, from iron mines to metal reclamation plants.

Right at the present time industry knows that it is being asked to establish facilities for needed defense materials at certain rates to meet an emergency requirement with emergency capacities. These emergency measures approximate the same approach to the need used during the last war and which resulted in the construction and subsequent disposal of most of the plants that I just mentioned. In my opinion these emergency measures are exorbitant in cost, and they may be inadequate in result, because the supply contracts applicable to these facilities will not utilize the capacity effectively, nor for an extended period of time, unless there is further war development or active hostilities in countries other than in Korea.

Let us hope that the production of military material in the quantity required for a full-fledged war will not immediately be required. However, few people doubt the wisdom of establishing and keeping our national defense establishment at full strength for an indefinite period ahead. Consequently, for the purpose of developing and implementing an adequate defense program at the least possible cost, we should develop an industrial defense plan and maintain it from now on. Perhaps an insufficient percentage of the public appreciates or accepts the fact that properly prepared and utilized industrial production is one of the most decisive factors in any international conflict in this mechanical age. The feverish preparations of the Nazi government prior to World War II indicated their understanding of the need for industrial

power and preparedness. The dictator in force at that time placed absolute control of the resources and productive capacity in the hands of a few individuals, who did what they pleased to accomplish their ends without political or human considerations.

The industrial force generated in Germany could have conquered Europe and a large part of the world by commercial rather than military warfare had the program been directed by men with more intelligence and understanding. This experience is cited in an attempt to establish the fact that well-managed and disciplined industry can direct its effort toward war or peace and can be effective in domination through either channel.

Such industrial preparedness cannot be had at "no cost," but, it can be provided by a dominant industrial nation without loss of that position of dominance and without undue hardship on its people. Such preparedness is certainly invaluable when the ability to defend ourselves has to be considered a necessity.

Since we find military production to be essential to the preservation of our Nation, why not start a rearrangement of our industrial forces in the most effective manner so as to provide a dominant military force when that force is needed? Such a force would consist very largely of military products, with great capacity to produce more of the same, backed up by technical development groups capable of perfecting advanced types of weapons and other small groups of highly trained productive manpower and supervision.

If the industry defense program is to be adequate for an indefinite period, it must be developed on the basis of an integration of the productive capacity for military material with the productive capacity for civilian material, or contemplate repetition of a period of shifting from one type of material to the other in varying quantities as the international situation is altered. It is difficult to envision the probability that this Nation will always have either the time or the money for the acquisition, construction, or disposal of the necessary facilities to do the job. Under normal commercial conditions we can be certain that idle floor space, idle machine capacity, manpower, or technical excellence will never be available without forcing the country into periods of subnormal production of consumer goods. The present period exemplifies the fact that any acceleration of the rate of production of military equipment results in cutbacks on commercial goods, increases the shortages of such goods due to reduced production, and results in reduced employment and reduced production right at the time when the Nation demands the maximum productivity and employment.

It is not anticipated that the accelerated rate of military equipment manufacturing is to continue indefinitely, provided there is no war. The time factor is unknown. Are we again going to destroy or

disperse our facilities as we have previously done in our haste to return to commercial production? The pressure to do so could be accentuated by the demands of taxpayers to reduce military expenditures for a war which has not started. Also the accumulation of an oversupply of military equipment resulting from an accelerated rate of production can easily generate a false feeling of security in the minds of the general public if there is failure to make adequate allowance for the necessity of continuous technical improvement in the products of the armed services.

While speaking to the members of the American Ordnance Association in Cincinnati on 4 October 1951, Mr. C. E. Wilson, President of General Motors, spoke as follows:

"I am proposing that manufacturers who are expected to assume responsibility for the production of the larger and highly technical military items be prepared to operate dual-purpose plants, which can be used in three ways: for combined production, for total war production, or for total civilian production. New plants now being constructed as part of the defense and essential civilian program should be constructed with this objective; and existing facilities, as they are partly changed to defense production, should be organized so that they are flexible for these same three purposes. Definite agreements and understandings should be worked out by the Government through its defense agencies with these manufacturers for preserving the possibility of this type of dual operation for at least 10 years and for renewing such agreements for several generations if necessary.

"It would appear to be time for this country to: (1) Decide that we need a permanent national defense program; (2) Recognize that manufacturing industry is one of the major elements in such a program and must be kept prepared at all times to produce military equipment to the latest specifications and designs and on short notice in adequate quantities to meet full war requirements; (3) Provide legislation such as may be required to permit long-time contracts between the Defense Departments and industrial concerns for the custody and maintenance of such special or excess manufacturing facilities as may be required for war production, and which also will permit to the extent possible utilization of dual-purpose plants and facilities at all times in the interest of maximum production and stable employment."

Since that time the dual-purpose plant has received so much favorable comment that many manufacturers have seized upon the opportunity to publicize their own efforts as representatives of the most desirable type of operation. This is a shallow and inadequate approach to the required action for a permanent and effective industrial defense program.

Mr. Wilson said that his suggestion "could be the nucleus of an industry preparedness plan that will be practical, workable, and sound

to all concerned." Only the nucleus of a plan has been claimed. The complete plan demands new conceptions on the part of government and industry covering their mutual interests in a defense program.

The plan must comprehend the restrictions and drawbacks existing in the present method of military equipment procurement, so that some of these fundamental obstacles can be eliminated. I refer specifically to the false concept fostered in the minds of the general public for many years that any industrial organization which seeks military equipment manufacturing does so only from the most selfish interest in profit alone; also to that distorted idea that neither government officials, members of our defense establishment, nor industrial personnel can be trusted to do business under the practices which are normal to private industry and trade. Business between the Government and industry is now surrounded by a multitude of conditions which are not only distasteful to the average citizen, but are wasteful of time and money.

Since a good defense program should provide for maintenance of commercial production at the maximum level possible at all times, we must be able to meet our normal defense material requirements without dislocation of our normal commercial production; we must be able to expand that defense material production to a considerable degree without totally eliminating commercial production. Only in the case of total war can production of consumer goods be eliminated. Even then, not all such goods production can be stopped nor can any stoppage be for an indefinite period. Obviously, these requirements necessitate a certain amount of "turn-around" areas, in addition to the established maintenance of facilities allocated specifically to military production in a dual-purpose plant.

As a simple explanation of what might be considered an ideal arrangement, I would like to speak about the new plant which General Motors is arranging to build at Arlington, Texas, for simultaneous assembly of S2F1 airplanes and Buick-Oldsmobile-Pontiac automobiles. The ground floor area in this building will total approximately one million square feet, of which approximately 400,000 square feet will be used in the aircraft-manufacturing operations, with the remainder allotted to the assembly of automobiles. A large portion of the facility is usable for both commercial and defense purposes, such as offices, drafting rooms, power plants, receiving and shipping facilities, railroad sidings, parking areas, hospital, library, tool rooms, and maintenance areas.

This plant can remain in production on both airplanes and automobiles at varying ratios. It can increase the production of one and decrease the other in a minimum length of time, or go to maximum capacity on either item in approximately the time required to establish the flow of the needed material.

A portion of the floor area of the plant is not required for maximum capacity production on automobile assembly, but the idle portion as a percentage of the total will be relatively small and the initial cost, plus the maintenance over a long period of years, will be far less in our opinion that would have been spent had the facilities been authorized for present emergency production alone.

It is also possible that the time required to meet an emergency might well be more important than the cost if we recognize the fact that the time it takes to go to war depends more on the production of equipment than it does on the training of the soldier.

In the past the technical development of military equipment has been the responsibility of arsenals or small organizations having limited or negligible productive facilities at their disposal. This procedure is no longer adequate. Industry knows that our total industrial strength must be mobilized quickly in case of war or imminent threat of war, and consequently it must have a continuously active part in any adequate defense plan preceding the time of emergency. The development of such an industrial defense plan cannot be carried out solely by personnel of the Defense Department, by committees, or by business representatives appointed to government offices. Our working industry must carry out the plan and must have a major part in developing the plan, together with the policies and the legislation necessary to its establishment. But industry is also incapable of carrying that load alone. It needs the active interest and cooperation of labor and government in working out the problems involved--whether those problems encompass new types of contracts, extending over decades, whether they involve continuous engineering and development and test without active supply of units or whether they merely involve recognition of the requirement for maintenance of idle investment in stand-by facilities as a military requirement and a part of the industrial defense plan.

There are, without doubt, many difficult problems connected with the plans that have not been anticipated or mentioned. On the other hand, there are many elements in the present situation that indicate the inadequacy of our present planning insofar as industry is concerned, and which still fails to produce the necessary military item as soon as it is desired and needed.

A very recent study on the requirements in the preproduction preparation for the manufacturing of the F-84-F at Kansas City indicated the need for 8,475,105 man-hours of work before the first airplane can be completed. The lead time required is two years. There must be a better plan which could be evolved on an exploratory basis by mutual cooperation between the Government and business. There are units of industry which have gained enough experience in the last 10 years under the present plan that would likely be willing to cooperate in such an effort if Congress and our defense agencies are interested and willing to undertake their respective shares of the problem. Thank you!

QUESTION: I was very much interested in your idea of handing over to industry the whole bill of goods, so to speak, on the capacity and types of items and the quantities needed at a particular time during a war. Doesn't that also visualize an organization in industry? I would like to have your concept of how industry itself should be organized to do the planning, designate the plants, and so forth, and do the work.

MR. GORDON: I agree with you that it is quite a problem. I might say that at the end of World War II we recommended to the Government continuous operation of certain facilities that we had operated during the war, on such a basis that we could keep our staff and keep the operation going. That was particularly true of the tank program. We were very much interested in that, because during the war we had the responsibility for designing and producing not only the light tank, but all of the other vehicles which had components common to the light tank. We felt that there was a necessity for such a program. In other words, we didn't agree that we were going into a time of peace forever. We were not quite able to do that, because of the requirement for cutting down the financial needs of the program. Nevertheless, we did continue working with Ordnance the entire period of time after the war with the idea that we were going to get back into the business.

What we were able to do was to establish a product study group in the corporation that devoted full time to the design and development of ordnance equipment. We have been in a continuing program of designing, developing, testing, and producing ordnance equipment for the Government that has no direct relationship to our commercial business at all.

We feel that it does require a new concept, in other words, a realization that defense production is an integral part of our business. It is not something to be turned on or off in the future. The security of the country, in my opinion, requires better realization by industry of its obligations in the national defense program.

QUESTION: How effective do you think the industry advisory committees are in this situation of maintaining readiness for defense production?

MR. GORDON: I think what is needed actually is not so much advice on the program as doing the program. An advisory committee is not going to do the program.

As I mentioned previously, I feel that the program has to be handled by working industry as a part of its job, just as it handles all the other factors involved in the production of commercial equipment. In other words, I think that the continuous development which is going on in metallurgy, in processing, in machining, and equipment, in heat-treating, material development, and so forth, should be applicable to defense items just as rapidly as it is applicable to commercial items.

They will never be on that basis unless industry is an integral part of the program between emergencies rather than just during an emergency.

I might say this: Any large industrial organization is bound to be equipped with personnel who are capable of handling all the different types of metal fabrication. Whether it is forging, or casting, or machining, or assembling, essentially the same processes they are using for their commercial items are applicable to military items. To the man in the plant, once a part is reduced to a drawing to which he can apply dimensions and material specifications such as heat-treating, surface hardening, and tolerances, it makes no difference whether the part goes in an airplane, a tank, an automobile, or a machine for making shoes. It is a piece to be produced; and certain types of operations are required to produce that piece regardless of its end use.

If we can integrate--and I feel quite sure that we can--the production, design, and development of these individual pieces into our normal system, I see no reason why they can't be handled exactly the same as commercial goods are handled. We have done it repeatedly in shifting from commercial production to military production. Our proposal is to have it maintained on that basis all the time rather than shifting from one to the other and assuming each time that we can dispose of facilities, that we can scatter our people, that we can put our plants out of commission, and then put them back into the same program.

QUESTION: Would you discuss some of the factors leading to the location of your new Texas plant--that is, site selection? Second, in a case where the Government is going to put new facilities, and they are to be contractor-operated, do you feel that the contractor should hire the architect-engineer and do the construction himself, or do you think that the Government should hire the architect-engineer and do the construction himself, or do you think that the Government should hire the architect-engineer and merely let him consult with the contractor as to what he wants to place there?

MR. GORDON: Well, that is really quite a few different questions. First, as to the site selection for the plant in Texas, a part of the site selection was ours and a part was the Navy Department's. The Navy Department was interested in having increased production of aircraft designed by Grumman. Our original proposal was a dual purpose plant in New Jersey, but they preferred to have the added production at a point that was a greater geographical distance from other Grumman production.

Due to the fact that this plant will be a dual-purpose facility for the making of automobiles as well as airplanes, our usual procedure would locate the the plant in a geographical spot which is commercially favorable for the distribution of those automobiles. In other words, the general plan of operation is to build the automobiles where they are sold rather than to build them in one location and then ship them to where they are sold. It is very much more economical to build the

parts and assemble the automobiles in the distribution area rather than to build them all in one location and ship them as complete cars. Inasmuch as this is a dual-purpose operation, both the commercial characteristics and the military characteristics apply to its location. I might add that this plant is very close to the new International Airport between Fort Worth and Dallas, making it unnecessary to establish new airfield facilities for test-flying of the aircraft. I think that covers the site part of the question.

As to the design of the plant, I feel that anybody who is going to operate the plant certainly should have enough information at hand to determine the type of plant, the size of plant, and the structure that is required to do the job. In this particular plant, the design is based on its dual-purpose function. All the bulky equipment which is involved in processing automobiles is placed on the second floor, so that it is an entirely free first-floor operation. It is not expected that we will have to move or tear out that automotive equipment to go to the full estimated production of aircraft in the plant. The equipment on the first floor will be set up in such a way that it can be moved and rearranged relatively easily, so that as the requirements change for the manufacture of airplanes and automobiles, the rearrangement will be in furtherance of the concept of dual-purpose operation.

QUESTION: You commented at length and very well on the so-called Wilson Plan of dual-purpose factories, designed to reduce the long lead time necessary to get facilities together. Is it not true that about the same length of time is required to gather together the machine tools necessary to equip that plant? What are your thoughts on getting these tools together, so that you would have them ready to go when you had your plant ready?

MR. GORDON: Well, I might say that we have had considerable experience in the automobile business in introducing new models. We do it pretty frequently. Many, many times we will make a complete change in the design of an automobile at the time we introduce a new model, and yet we can do that without shutting down our plants from actual production for a period longer than a few weeks.

We can do it because we have groups of people who are working on the machinery, on the processing, on the subcontracting structure, on the material procurement, and everything else needed for the new model concurrently with the production of current model automobiles. When the time comes to shut down the plant to make the model change, we have on hand all the tools and all the equipment required for the new parts. We think the same planning procedure is applicable to the production of aircraft or anything else.

As it is now, of course, we lose by shutting down the work of actual production between emergencies. We lose all the time that it

takes to get into actual production again. We don't think that is either economical or the correct way of doing anything--to throw all these people out of work while we are getting ready to make something else. Our normal procedure in almost all manufacturing is to carry on with normal production while making provisions for changes in the product, even though that involves an entirely new design. It couldn't be otherwise.

QUESTION: I notice with interest the machine-tool problems on the tanks that you had at your Cadillac plant. The industry was so far short in the capacity needed to produce machine tools that you took them from the junk piles and rebuilt those tools. I am interested in some specific guide on how we can prepare the machine-tool industry so that it won't have these cycles that it seems to go through in its industry.

MR. GORDON: I might say that on the Cadillac tank T-41-E1, when the emergency came up and we were asked to build that tank, I went over to the arsenal and talked with its representatives. They said: "We will be in a position in 30 days to give you the drawings for making the tank." Mind you, we had never seen the tank; never had even seen a mock-up of it. Because they would be in position to give us the drawings on the tank within 30 days, there was anticipation of getting the program going almost immediately.

I said: "Do you realize the fact that we have no facilities and no place to do this? We have no organization to do it. We have no machines. We have no tools. We have had no study of the processing requirements to build this tank. We have to start out first of all to find or build a plant. We have to recruit the organization to do the job. Then we have to get the machinery, to establish the subcontractors, and do all of the other things needed. Drawings are fine, but we have an awful lot of work to do before we can even use the drawings on the job."

That is exactly what we had to do. If we had been a part of that program prior to getting our letter on the job, we would have had a great deal of that work done. Our processing people would have studied the operation. We would have had the actual engineering and designing done and all the machines on hand when the letter came.

Our normal procedure is to carry out all the phases of the program concurrently and not wait until we get the complete vehicle designed and then say: "Now we are going to start to produce this thing." By the time we get to the point where we release it for production, we have already done all the work that is required to establish the subcontractors, to get our materials lined up, and get our machines and tooling ready. There is no other way to do it that would be satisfactory from the time and quality standpoint.

On that particular vehicle, I might mention, inasmuch as it was designed by a group that had no real productive capacity, we had to start in almost immediately with a complete redesign of the vehicle and adapt it to the commercial processes and equipment that we could get. For example, one of the things we knew would be impossible to get would be armor castings, and we had to redesign it for forgings. We had to make more than 5,000 changes the first few months that we had the drawings in our control.

QUESTION: In furtherance of this dual-capacity idea, would you say that there would be an opportunity to change the characteristics and components of civilian-type items if you had a look-see at the military characteristics of a transport vehicle or combat vehicle, primarily a transport vehicle? Would commercial industry change any of its ideas as to the construction, so that it would have components that would fit readily into the military vehicles and have the characteristics that are necessary for military use?

MR. GORDON: Yes. We have done that. We had many cases of that during the war. For example, the new light tank engine was an adaptation of the Cadillac engine. That was also true of the M-24 and the M-19, quite a few of the LST's, and so forth. There were many cases of Ordnance's adaptation of passenger car units.

We think it would be possible to do that, to quite an extent at least, if it were the ideal thing to do. Actually I don't think that it is the ideal thing to do, because I think it complicates the services procurement problems entirely too much. I think that most of the equipment, such as engines, transmissions, and so forth, that are used in these vehicles should be specifically designed with that service in mind.

That is very heavy-duty service as compared with anything we have in the commercial world. Of course, having been an engineer all my life, I am very strong for designing a component for its end use rather than taking something designed for some other use and trying to make it adaptable to another similar use. I think you are much better off if you go at it the new-design way.

QUESTION: It takes a long time and a lot of effort to disseminate and implement any controlled materials plan. Would you please comment on the feasibility of continuing or discontinuing the present Controlled Materials Plan when critical materials are no longer tight?

MR. GORDON: When critical materials are no longer tight is a very important qualification. Well, maybe I am a little bit biased, but I think we are suffering from an overcontrol of materials at the present time. Just recently I have had the opportunity of talking with quite

a few people in the steel business; I find that they share that view rather strongly--that we are suffering from overcontrol at the present time.

As far as continuing it after the emergency conditions, I would be wholeheartedly opposed to that. I think it is contrary to the concept on which this country was organized and has grown to its present stature.

QUESTION: To what extent has industry as a whole accepted your concept or General Motors' concept of industry's role in defense planning?

MR. GORDON: To a considerably less extent than we would like to see. I might say that there are some people who have been specifically opposed to it. I think our concept of these things really stems back to this fact: General Motors is very large. We actually have under our control better than 10 percent of the total metal-fabricating capacity in the United States. At the present time we are operating about 105 plants.

We took the position during the war and during the present emergency that if we had over 10 percent of the metal-fabricating capacity in the United States, then the least that we could assume as our part of the national defense program would be the equivalent of 10 percent of the requirements of the armed services for anything made of metal.

As a result of that, we are involved in a large number of operations. Practically every division in the corporation is involved in something connected with the defense effort. I will give you a few of them. Cadillac is involved in the light tank and tank transmission programs. Buick is involved in the J-65 jet engine and also in the tank transmission program. Pontiac is making the T-46 cargo carrier and the Bofors gun for the T-141, and rockets. Oldsmobile is making rockets and 90-mm guns and is involved in quite a lot in the way of forgings. Chevrolet has the 105-mm shell manufacturing. A. C. Spark Plug has the Sky Sweep and aircraft navigational computers. Fisher Body has the T-48 tank, the Bullard vertical lathe, and a large portion of the F-84-F airplane on subcontract. Buick-Oldsmobile-Pontiac assembly division has the F-84-F at Kansas City and the S2F1 in Texas. Then, of course, we are involved in aircraft engines already--the J-33, the J-35, and others. Our Diesel divisions are involved in power plants. Ternstedt division is in range finders and other instruments. I could go on almost indefinitely with a list of equipment in which we are involved in General Motors. Our anticipated production of defense items during this current year should run in value over two billion dollars, with a production rate during the forth quarter running around 600 million dollars per quarter.

I think naturally we are in a position to understand and realize what defense requirements are as a part of the over-all defense program and what part industry must assume in order to take its actual share.

QUESTION: I admire your condemnation of the prevalent attitude that industry and the military can't be trusted to get together. Along that line, I would like to have your reaction to the impact of the tremendous number of questionnaires and reports required by government agencies of your company and of industry generally.

MR. GORDON: Well, since we have the limitation of the Bureau of the Budget approving all of them, we haven't been as much bothered as we used to be. That really cut down on the number of questionnaires.

They don't bother us as much as you might anticipate, largely because we have an organization which is capable of handling that type of thing. They are much more bothersome to the smaller business on the subcontractor side than they are to the large contractor.

QUESTION: One of our manpower problems in determining the feasibility of military mobilization plans is the nature of American industry. We have no way of knowing for sure what the component parts problems are and what the production facilities problems are. I was wondering if you think it is feasible to get a more accurate computation of those requirements that industry can use.

MR. GORDON: That is a very big problem. I would rather have somebody talk about that who has given more time and study to it than I have. I have looked into it, but I have felt that personally I don't know how it can be handled adequately at the present time.

One of the main factors that makes for difficulty is that, in many of these pieces we are talking about we have the projected requirements for an article that is still pretty indefinite as to design, as to materials usage, and everything along that line. I am very glad to have it so. In other words, I wouldn't want to be in a position from the technical standpoint, where we have complete information now on what we are going to be expected to make two or three years from now. If we ever get into that position, I am sure it would be obsolete before it ever reaches production. There is apt to be considerable difference between the actual requirements two or three years hence and what we think, at the present time, will be the requirements then.

QUESTION: In what you propose as the best thing to do, in the way of making industry an integral part of the defense planning, are you thinking of what happened in Germany, where they really got the cooperation of industry in the production of military end items all the way through?

MR. GORDON: Yes. Except that I think it was by coercion rather than cooperation. I think a much better comparison would be the Rolls-Royce relations with the British Government. I think we will have to admit that it has worked quite well in technical excellence and in

rapid development in the program they have sponsored and actually achieved over there. What gripes me is to see this country thinking that on the J-65 program we had to go to Britain for jet engine design. I don't like that.

QUESTION: I can see where you could use this dual-plant approach for the development of new facilities for some new type of fighter, or that where you are proposing a guided missile program you might use that type of facility. But wouldn't we have to adapt pretty much the existing facilities that we have now if we got into an all-out war production? And, if so, what should we do now with the existing facilities? Won't it take too long to convert what we have existing now to stand-by plants?

MR. GORDON: It will if the conversion that you refer to is required. We have that problem with the F-84 program at Kansas City. We contemplate that it will require conversion of only a portion of the old North American plant into F-84-F manufacture.

Conversion involves a lot of problems other than just machines and equipment. One of the biggest problems of conversion is the personnel that are involved--having adequate personnel available and trained to do the job. We are not in favor of complete conversion as such. We are in favor, let us say, of partial conversion of an existing facility into the dual-purpose program. But even then we do get into the requirement of shifting personnel from other plants into that area, as we had to do in Kansas City. The people that we had at Kansas City building automobiles did not have the aircraft experience that was necessary; so we had to get into a major shift of personnel to get the right people into the plant to do this job.

We would very much prefer never to convert back that portion that we have converted over to aircraft manufacture, but to keep the plant and facilities, the space and the equipment, and everything else in Kansas City either running on a pilot line basis or keep it in a stand-by position; then if the requirements should change, either up or down, we would be in a position to do the job needed in that location.

QUESTION: So far as production is concerned, don't you think you should have the personnel trained in these plants to do these things, so that when war comes, you won't have to shift these people around?

MR. GORDON: Yes. What we would like to do over a period of time is to train all the personnel in all our plants to do more than one job. We would like to expand their skill, their ability, so that we wouldn't have to shift these people around.

It goes beyond the production planning in the plant. It goes right down to the level of the working people. We think all these

people should be skilled in more than one job. We think that it would underwrite their future job security very much better than the present plan.

QUESTION: Do I understand that your suggestion is that these dual-purpose plants be kept going on some level of defense production for an extended period of time?

MR. GORDON: We think that would be the ideal condition, although it is not absolutely necessary. We do think there should be a certain area there which would be sufficiently large to permit the storage of equipment which is required to do defense work, so that it will be easily available.

QUESTION: If the situation ever comes up, as it may, where the Government is in a position to give you such a contract, what happens then to the maintenance force for that portion of the plant?

MR. GORDON: I would say that if the Government is in a position to give us a defense contract, our position is that the defense contract should be continued over a period of time and not terminated after short duration.

For example, in the Arlington plant, in which we are taking on the S2F1, we actually went ahead and accepted a letter agreement on the plant that only covered 15 airplanes. The lead time requirements for the plant construction were such that the Navy's appropriations cannot cover beyond that point. But we feel that coverage is bound to come, so we are actually taking on the responsibility for building the plant and providing all the equipment; the only insurance we have is this letter contract covering 15 airplanes.

We don't think industry should be forced into that kind of position. If we didn't have a considerably greater interest in the Government's policies and programs than some people say we have, we never would have agreed to build that plant.

QUESTION: I was very much interested in your comments on the production of the T-41 light tank. As you well know, the requirements are not established for that tank, and they won't be until the tank is accepted as an end item for production and the production money is made available. Did you mean to infer that General Motors would have been willing to come in without a contractual agreement of any sort in the early days of that tank?

MR GORDON: No. But I might say that I think the Government should contact industry and let it be in on the development of that tank before there is a production requirement.

QUESTION: You spoke of Rolls-Royce producing military end items for sale in the international markets. What is our industry doing along that line?

MR. GORDON: I think we can hardly blame industry for what is the national attitude. We have never been munitions makers in the United States. I think the people of the United States are essentially against war and I think they are essentially against war production, except as it relates to the defense of the country. I think there would be a terrific public opinion against any industry in this country which set itself up on the basis of making and selling munitions to foreign countries. Maybe I am wrong but I can't quite envision that possibility. I think you would have to look far before you could find an industry in this country that would look at it from that basis. The whole spirit of this country is essentially against it.

CAPTAIN MARCY: On behalf of the entire college, I thank you for an excellent lecture and a very stimulating discussion.

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