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PRODUCTION PROBLEMS IN THE BUREAU OF SHIPS--WORLD WAR II

4 March 1948

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GENERAL McKINLEY: Gentlemen, during the production phase of the course we have had lectures by Admiral Noble and Admiral Ruddock on the production of naval guns and ordnance which give offensive power to the ships. Today we shall hear from Admiral Mills on the subject of production problems in the building of the ships themselves.

Our speaker is an old friend of the College. He performed routine duties as a line officer in the Navy for a number of years and then specialized in engineering and ship design. In the years just before World War II he was largely responsible for the various types of combat ships which made up the wartime fleets. During most of the war years he was Deputy Chief, and since 1946 he has been Chief of the Bureau of Ships.

I take great pleasure indeed in welcoming back our old friend Admiral Mills.

ADMIRAL MILLS: General McKinley and gentlemen of this College: It is a very real pleasure for me to meet with you today to discuss some of the production problems which confronted the Bureau of Ships during World War II and to outline for you how these problems, as seen in retrospect, are affecting current thinking and planning in the bureau with respect to possible future emergencies.

Last year in a similar presentation, I endeavored to illustrate the difficulties which were encountered in obtaining adequate amounts of basic materials, in processing these materials into the thousands of components which go into the construction of modern men-of-war and in scheduling the flow of these components to the shipbuilding yards to assure the orderly and expeditious completion of the vessels themselves. All of this had to be accomplished in accordance with a priority grouping of ship types which was subject to frequent rearrangements as the military situation changed in the various theaters of operation. I dwelt also at some length on the tremendous expansion of plant facilities and industrial manpower that was necessary in the shipbuilding and allied or component industries in order to make possible the construction and maintenance of the vast tonnage of combatant and auxiliary ships and landing craft which comprised our Navy at the end of the war.

These were basic problems, common in principle to the production of the weapons and equipment of all the Armed Services and inherent in the impact of the insatiable demands of a global war on our national resources--

of permanent construction. Others have been sold to commercial interests under agreements which require the purchaser to maintain the plant and equipment in good condition and which permit the Government to recapture the yard if such action is deemed to be necessary for reasons of national security. Such a program should assure us of a reasonable reserve of shipbuilding facilities to meet the early demands for expansion of the industry in the event of a future emergency. The expense of the program is relatively small, only a very small fraction of what it would cost to build new yards.

Unfortunately, the problem of preserving the "know-how" of the industry as represented in its management organizations and skilled labor is one vastly more difficult of solution. The present dearth of shipbuilding in this country has already resulted in a serious depletion of these national assets. Of far-reaching significance is the fact that this lack of activity deters young men from choosing the industry as a career and few replacements are being trained to fill the vacancies left by the older men as they leave. Unless this trend can be corrected, there is danger that much of the specialized knowledge and skills will be lost.

To the Navy as a whole, and particularly to the Bureau of Ships because of the nature of its responsibilities, the preservation of shipbuilding "know-how" is one of the knottiest of current problems. A naval-building program of a size adequate in itself to accomplish this is out of the question at the present time. Our Navy today is by far the largest in the world. Moreover, it is comprised almost entirely of new vessels embodying the most modern of accomplished developments in design. It is my opinion that for a number of years to come the preservation of competent shipbuilding personnel in this country must depend in very great measure upon a continuing program of merchant ship construction.

Such a program has been advocated by the President's Advisory Committee on the Merchant Marine in its recent report. This report points out that there are critical shortages of certain types of ships in our present merchant fleet; ships which, in addition to their importance to the Nation in time of emergency, have a vital role to play in our peacetime economy. The Committee concludes that the orderly construction of these ships gives the best hope of maintaining our shipbuilding industry at a level of activity commensurate with its importance to our national security. To this view, I heartily subscribe. Further, I recommend that this group closely study the report of the President's Advisory Committee on the Merchant Marine, if it has not already done so. It was published in November 1947.

Because the standards of living in this country are the highest in the world, the wages of our merchant seamen and the domestic costs of building merchant vessels are both higher than those of other nations. This places United States steamship operators at an economic disadvantage on the routes in which they compete with foreign flag operators. Under certain conditions the Government is empowered to pay subsidies which are designed to

design and construction of other landing craft such as LST's and LCT's could be applied directly.

Instead of having to start from scratch at the outbreak of war to develop the designs of the combatant and the merchant vessels required by our military effort, as was unfortunately too much the case in World War I, it was possible, when the probability of our becoming involved in World War II became apparent, for us to expand our building program immediately from plans already in use and on the basis of ships of proved performance.

To be sure, as the war progressed combat and service experience dictated modifications in some features of the designs. For example, the ships built before the outbreak of war were found to be deficient in anti-aircraft armament. Flammable materials such as linoleum, rugs, overstuffed furniture, curtains, and wooden paneling were stripped from all ships because of the fire hazard they presented. Airports in the shell below the main deck were blanked off to reduce the danger of flooding in case of damage. Most of the changes, however, were superficial in nature.

Then too, the tremendous progress made in technical and scientific fields through the mobilization of our scientists and research organizations to the problems of all-out war provided us constantly with new means for increasing the military effectiveness of our ships and thus contributed immeasurably to our success.

Important as were these changes and the results of our wartime technological progress, there is significant importance in the fact that through the naval building program in prewar years and the merchant shipbuilding program which resulted from the Merchant Marine Act of 1936, we had developed ships of basically sound design and were able to apply the lessons of combat and the fruits of our technological research to these same ships without revolutionary alterations.

Our wartime fleet, ship for ship and type for type, I am convinced was the finest in the world. In this, the records of the war will bear me out.

That this should be so is not merely a fortunate quirk of circumstance. The Navy's prewar building program was not formulated on the policy of building ships in quantity, but rather on the premise that we must develop ships of the highest attainable naval efficiency.

Under the limitations imposed during prewar years by international agreements on naval tonnage and on the size of individual ships, every effort was made to reduce hull, machinery, and equipment weights in order that the maximum offensive power, defensive strength, and seakeeping qualities might be built into the prescribed displacement of each vessel. Innovations in methods of hull construction and in machinery design were tried wherever they gave promise of assisting towards this end. Looking back in

components, equipments, machinery, and structural factors which make up our naval vessels. This program is mutually supported by the programs of the other Naval Bureaus and of the Office of Naval Research. Coordination with the other Armed Services is, of course, accomplished by direct contact and by working with and through the Research and Development Board.

As an indispensable adjunct to its research and to assure the constant readiness of plans for vessels of the most advanced type, the bureau has laid out a prototype ship construction program in which the results of research are being fashioned to navsl use and tested under service conditions. Through this building of prototype vessels, the shipyards and component manufacturing industries may keep abreast of the most modern naval construction practices and from actual experience solve the detailed problems of manufacture as they arise.

Just what the naval vessels of the future will be like is a matter for conjecture. But it would be a mistake to think of them solely in terms of the types which exist today. As the galleon replaced the trireme and was in turn replaced by the ship-of-the-line, as sail was replaced by steam and wood by steel so is it certain that in the years to come even more startling changes will be realized. It is no secret that the use of atomic energy for propulsive power has been under study for some time in the Bureau of Ships. In more immediate prospect is the adaptation to marine uses of the gas turbine. Within recent months, as you doubtless know, a V-2 rocket was successfully fired from a naval aircraft carrier, and guided missiles have been launched from a submarine. These are but a few portents of what the future may bring.

There is a vast and exciting frontier of new developments which lie ahead of us. It is our goal insofar as they may be applied to ships to pioneer these developments. As the plans of the ships we are now designing take shape on the drafting tables, we are endeavoring to anticipate some of the changes of the future and to incorporate in these ships the reserves of space, power and stability which proved so invaluable in our ships of wartime design.

Perhaps some of you are wondering why in a talk about production problems I should devote so much time to discussing research, development, and design. Actually, these are a very vital part of production problems. They must precede actual construction and the merit of the final product depends entirely upon the thoroughness with which these phases are carried out. Moreover, they are tremendously time consuming and, if we are to be able to swing the potential industry capacity of the country into all-out production of effective instruments of war without delay at the onset of an emergency, we must have available fully developed working plans of the most advanced weapons we can devise.

Force, the Maritime Commission, and our civilian economy a decision is made as to the actual capacity allocations.

As the definite allotment of industrial plants is made known by the Munitions Board each of the responsible sections of the bureau checks the capacity assigned to it against its estimated requirements. This is a continuing process because both requirements and the necessary facilities to meet these requirements are subject to constant review and adjustment. Where it is determined that the potential capacity allocated is inadequate, plans are prepared for the expansion of existing facilities or for the creation of new facilities.

The Bureau of Ships is maintaining the closest possible liaison with the manufacturers of which the facilities have been allocated to its use in time of emergency. Through representatives in the field, through the Material Inspection Service of the Navy and by the interchange of visits between the bureau and the various plants a two-way flow of pertinent information is being maintained. By means of this exchange, the bureau is assured of up-to-date knowledge of the capabilities and capacity of the plants, while the manufacturers in turn are kept informed at all times of what is to be expected of them and are able to make their plans accordingly.

In recent months, there have appeared in public print predictions that a future war would end within a matter of hours or days after it started. If this concept is to be accepted, it would appear there is little to be gained from planning for industrial mobilization. Speaking before the Society of Naval Architects and Marine Engineers in New York last November, the Commander of the Atlantic Fleet, Admiral Blandy, took issue with this theory. I should like to quote briefly from his remarks. Referring to our war against Japan, Admiral Blandy said:

"Japan's situation at the end of the war could not possibly improve; it could only get worse. I emphasize this point because I do not believe that the destruction of cities by atomic bombs at the beginning of a war when the country receiving such attack still possesses effective offensive forces will insure a surrender. A virile nation strongly armed and battling for a vital issue, is not going to quit while it can fight back. And it can fight back until its offensive forces are defeated or its existing weapons or ammunition are destroyed or spent without hope of replacement. Those original stocks of weapons and ammunition including atomic bombs are not going to be stored within such obvious targets as large industrial or commercial areas."

"In short, I think the theory that a war can be won against a powerful enemy in 24 hours by atomic bombing is completely fallacious. But, of course, if the warring countries can reach each other with such weapons at the outbreak of war, terrific damage can be quickly inflicted, perhaps by

wanting to make it easier for these businessmen who are out--if you would believe some of the statements made in the Halls of Congress--to try to take advantage of the poor unsuspecting Government. Actually, you and I know that is nonsense. But our trouble is that we put on a restrictive clause for this, a protective clause for that, and another clause providing for something else; those clauses build up and are rarely ever taken out.

We are trying now to streamline our contracts. That requires concerted action among all the procurement agencies--not just the Armed Services, but everybody in the Government. That is one of the reasons why it is a difficult thing to accomplish.

I believe very sincerely what I told you. I can state almost without hesitation, based on remarks that have been made to me by a number of civilians with whom I have dealt, that the attitude of business is, "I never would have signed that contract had I not known the bureau or service with which I was dealing and the men who were administering those contracts." I do not think it makes much difference what we have in the contracts as long as we build up and treasure that reputation for fair administration. What I mean by that is that if a man appears to be overtime on a contract for delivery of equipment, do not just take somebody's word that he is overtime; and if the contract says that he shall pay so much for each day that he is over, do not start to exact that pound of flesh without knowing what the conditions are. Instead, discuss it with him, find out if he has a good reason and whether, if he had been on time, you could have used the equipment then. Use your ingenuity, if necessary, to find out what excuses you can make stick for the gentleman. In most cases I think you can find excuses that will stick and still be fair to the Government.

Our worst fault in the administration of contracts is that we let it become a routine piece of "red tape." That is what burns up the contractors with whom we deal.

QUESTION: Sir, you said that the present plans for the next emergency aim to get full production within two years. Have there been any technological developments since 1944 which will assist more rapid production?

ADMIRAL MILLS: There have been developments that will assist that production, but there have been no developments to date that I know of that will give you any reasonable amount of hope that production can be speeded up to that extend.

We had to do the job in the last emergency building up completely from scratch. The point I am trying to emphasize is that we have many facilities now that are assets to this country--and the same thing is true of England--that we ought to guard as national assets so that we will not have to build up from scratch in order to get this increased amount of production.

barges, for plain storage and for certain kinds of dry docks, concrete is excellent; but not for operating ships that have to go to sea and not for ships that have to go into combat. All I can say is definitely negative.

QUESTION: The Germans continued their ship production under heavy bombardment. What did we learn there that we can apply to future production?

ADMIRAL MILLS: The main thing we learned is dispersal. You can create components from a number of sources, so that the destruction of one or two of those sources will not prevent the assembly of components. And you can bring those components together in several places for assembly. That, to me, is the only effective means you can use when you have to build an animal as big as a ship. You must be near the water. You cannot build it inland, you cannot build it in a cave in the mountains and get it back out to sea. The fact that a ship, when she grounds, unless she is grounded lightly, is a terrific job to remove is just an evidence of the fact that you must have enough water under her to float her. And you cannot get this construction by hiding it away somewhere and then bringing it out when it is finished, except in small assemblies.

Briefly, the answer to your question is dispersal. That is the only cure I know of--and that really isn't a cure; it just alleviates the situation.

QUESTION: Sir, we know the Communists are trying to get into the transportation field, both in the operation of ships and in the longshoreman's union. Is there any evidence that they are trying to get into shipbuilding?

ADMIRAL MILLS: What do you think? My answer is that they are not only trying to get into shipbuilding and into transportation facilities, but they are trying to get into every walk of life. That is the reason we must be everlastingly on our guard.

GENERAL McKINLEY: Admiral, you have been very generous with regard to time. We certainly wish to express our keen appreciation for this wonderful morning you have given us.

ADMIRAL MILLS: Thank you, sir. It was my pleasure.

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