

INVESTIGATION OF THE NATIONAL
DEFENSE PROGRAM

ADDITIONAL REPORT
OF THE
SPECIAL COMMITTEE INVESTIGATING THE
NATIONAL DEFENSE PROGRAM

PURSUANT TO

S. Res. 71

(77th Congress, and S. Res. 6, 78th Congress)

RESOLUTIONS AUTHORIZING AND DIRECTING
AN INVESTIGATION OF THE NATIONAL
DEFENSE PROGRAM

(Submitted under authority of the order of the
Senate of July 7, 1943)

AIRCRAFT



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**SPECIAL COMMITTEE TO INVESTIGATE THE NATIONAL DEFENSE
PROGRAM**

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Mr. WALLGREN, from the Special Committee to Investigate the National Defense Program, submitted the following

ADDITIONAL REPORT

[Pursuant to S. Res. 71, 77th Cong., and S. Res. 6, 78th Cong.]

AIRCRAFT

The airplane has proved to be the most important single weapon in the present war. The possession of large numbers of planes was of incalculable assistance to Germany in conquering France and Poland. Air superiority enabled Germany to conquer Crete despite the naval superiority of the British, and the lack of such air superiority cost Germany North Africa and ultimately will cost it the war.

We have succeeded in building an air industry in the United States which our foes cannot hope to equal. England has a splendid aircraft industry, and Russia, about which little is known, is producing large numbers of planes. The German aircraft industry has suffered heavily from the bombing of Germany and is limited as to certain vital supplies both for the construction and the operation of planes. The Japanese aircraft industry never had a capacity comparable to ours. To reach a production remotely comparable with our own it would be necessary for Japan to expand her industrial resources from the ores to the finished products. She would have to create facilities for mining ores, for smelting and refining, for rolling, casting, forging and extruding, for milling and machining, and, finally, for the assembly of planes. This is impossible for Japan because she cannot produce the machine tools with which to undertake so vast a program. Consequently, we can be certain that we will be able to oppose Japan with incomparably superior air power. Our difficulties will be those of obtaining bases from which to operate against the Japanese and in overcoming the tremendous advantage which they have gained by acquiring numerous such bases in the islands of the Pacific.

During the calendar year 1942 approximately 48,000 airplanes were produced in the United States. During the 12 months ending June 30, 1943, we have produced 64,000 planes. The present enormous rate of production will be vastly increased. Moreover, there will be a greater proportion of the best and most useful planes.

The planes already produced and those to be produced within the next year will largely determine the result of the war. The advantages already obtained are known, but are proportionately very much smaller than those which we may reasonably expect. There is, and of necessity must be, an extended time lag between the production of a plane at the factory and the actual use of the plane at the front.

Our airplanes are being subjected to constant modifications, in some instances several hundred different modifications for a single type of plane. Some modifications are slight and not difficult to make, and some are of such major importance as almost to require the reconstruction of the plane. Some of the modifications are made at the aircraft plants. Others are made in modification centers under the direction of the Army and Navy and several industrial concerns. In some instances additional modifications are incorporated abroad before the planes are put into actual combat. The completion of such modifications sometimes requires many weeks.

On first examination it seems most uneconomical to produce an airplane and then later to modify it to make it suitable for use at the front. The reason for this practice is that an attempt to introduce too suddenly extensive modifications into a large aircraft plant results in a great decrease in the number of planes produced by the plant. For that reason, it is better to make the modifications in special modification centers until such time as the aircraft plant has had an opportunity to make orderly plans to incorporate the modifications into its production lines.

Sometimes the delivery of planes has been further delayed by the inability to obtain all the necessary instruments and equipment for use at particular fighting fronts for which the planes are destined. For instance, planes have to be "winterized" for use in cold climates and "summerized" for use in hot climates. The committee has been assured that there is very much less such difficulty today than existed previously.

The establishment of these modification centers presented a major task. Mistakes were made and delays were incurred in many instances, but, as experience has increased, improvements have been made. Modifications still require considerable time, and every attention should be given to reducing that time. The committee expects to check a number of the modification centers at a later time to ascertain the extent of the progress which has been made.

After the modification has been completed there is a further time lag necessary to permit the flying or shipping of the planes to the fronts and necessary to permit the crews to become familiar with the planes and with the circumstances under which they will have to operate them at the fronts. Also, repair parts, gasoline and oil, and other supplies have to be shipped abroad and servicing depots established.

Consequently, it is apparent that we have an enormous and continuous flow consisting at all times of many thousands of planes between the aircraft plants and the fighting fronts. These factors

are the principal reasons for the great disparity between the number of planes produced and the number actually in operation at the fronts. This means that our enemies have not yet felt the full weight of our airpower and that coming months will bring an ever-increasing flood of destruction.

It is only natural that in so vast a program there have been many mistakes. Perfection must not be expected in war, where it is better to use wasteful methods than to risk having too little. All that can fairly be asked is that reasonable care should be taken and common sense exercised to keep waste and mistakes at a minimum.

Particular attention is called to these observations so as to prevent the action of the committee, in referring in this report to mistakes and difficulties, from being misconstrued as a condemnation by the committee of a program which as a whole has been unequalled anywhere else in the world. However, we should not judge our efficiency simply by comparison with what others have done, but should also take into consideration what could have been accomplished by full and efficient use of the Nation's vast industrial and technical resources. In a great many instances we could have done much better than we have.

The committee in a previous aircraft report called attention to the large number of different types of planes that are being produced. The efficiency of many of these has never been proved on the fighting front. Others are relatively obsolete. The excuse given by the Army and Navy was that they believed it necessary to allow the established companies to produce whatever they said they could produce in order to get quantity production as soon as possible. The excuse for continuing production is that delays would be incurred if an attempt were made to switch to the production of one of the tested superior models. The committee believes that a great mistake was made in adopting such a policy and that, wherever possible, changes should still be made to reduce the number of models and to concentrate production on proven models. The success of the General Motors Eastern Aircraft Division in transforming its Linden automobile plant into a producer of Grumman fighters indicates that even greater changes can be accomplished with facility.

Since the committee's last report progress along these lines has been made, and at the committee's private hearings, both the Army and Navy assured the committee that they were going to abandon certain models and concentrate production on the models which have proved their worth. Such a policy will greatly simplify and facilitate the training of crews and the establishment and maintenance of repair depots.

Experimentation should continue for the purpose of developing and proving new models, but we should not attempt mass production of an entirely new model incorporating a whole series of major improvements until after it has been tested and proved.

The committee has made inspection tours of most of the aircraft plants and has talked with representatives of both management and labor with respect to them. It has also held numerous private hearings at which it received testimony from officials of the Army, Navy, and other war agencies having to do with the production of aircraft. The officials who appeared are commended for their full and frank discussion of their problems, including the difficulties which they have encountered. This was particularly true in the case of Rear Admiral

Ralph E. Davison, Assistant Chief of the Bureau of Aeronautics of the Navy, whose frankness and candor was in sharp contrast to that of some of the Navy officers who have testified before the committee on other matters.

Both the Army and the Navy testified that in general they expect to have trained crews available in sufficient numbers to man the planes which will be produced in accordance with their programs. In some categories, particularly 4-engine bombers, the crews for which require exceptional and lengthy training, a certain amount of difficulty may be encountered. But it is believed that even there it will be possible to provide sufficient trained crews.

The committee has been assured that aluminum sheet will be available in sufficient quantities. As previously reported by the committee, the most critical items are extrusions, forgings, and castings—particularly extrusions. Mr. Charles E. Wilson, Aircraft Production Board Chairman, War Production Board, has been giving special attention to these matters. With the cooperation of the Army additional extrusion capacity has been created, and in many instances softer alloys, with consequent greater capacity of extrusion per press, and rolled forms have been substituted. Efforts along this line will be continued.

To manufacture the required additional extrusion presses, it was necessary to set back the dates on which certain machinery for steel rolling mills would be furnished. This has resulted in a delay in the expected production of steel plate, particularly at the Henry J. Kaiser mill at Fontana, Calif., and at the Provo, Utah, and Homestead, Pa. mills of the Carnegie-Illinois Steel Corporation.

The use to capacity of existing facilities to machine aluminum necessarily places a strain upon such equipment, and care should be taken to provide soon enough for repair and replacement parts.

The airplane plants have also experienced difficulty in obtaining and keeping a sufficient number of skilled supervisors to take care of their ever-expanding production. In some cases, such persons have been drafted for the armed services. This has been as much due to the failure of the aircraft plants to devise the proper method of classifying their employees and to provide the draft boards sufficiently in advance with adequate and fair information on which they could reasonably base deferments, as it has been due to an unwillingness on the part of the draft boards to recognize the importance of the work.

In some instances, there have also been difficulties due to the inability of the aircraft plants under existing regulations to make the changes in wages necessary to make them proportionate to the value of the work done and the responsibility undertaken. This was particularly true of the Lockheed Aircraft Corporation, where increases in the hourly wage rates paid and the inability to obtain permission to make proportionate increases in the wages paid supervisors and foremen frequently resulted in responsible men receiving salaries less than subordinates two or three grades below them.

Difficulties also have been incurred, particularly in the case of the Boeing Aircraft Corporation plant at Seattle, Wash., because other war industries in the area, such as the shipyards, have paid higher wage rates. This has attracted trained aircraft employees to work for which in many instances they had to receive additional training, and it has made it very difficult both for the management and for the

leaders of labor in the aircraft plants. Special studies of this situation are being made, and the committee recommends that they be expedited so that an equitable adjustment of the problems can be obtained promptly.

In other instances, there has been enormous waste of manpower and increased dollar cost because workers were hired by aircraft plants in huge numbers before there was anything for them to do. The reasons for this varied. Sometimes, as in the case of the Columbus plant of the Curtiss-Wright Corporation, it was due to the inability to produce a plane which would meet the requirements of the service involved; sometimes it was due to the necessity of incorporating modifications required by the commanders at the fighting front; sometimes it was due to an inability to make the engines and parts that were needed; and sometimes it was due to faulty plans which the management had made for starting and organizing production. In all cases, it resulted in enforced idleness which led the workers to suspect sabotage and which materially decreased their efficiency as workers.

In the plants where planes with good fighting records were being produced, the workers were more efficient than in those plants which were not producing planes or which were producing planes of an inferior type. This waste of manpower has been decreased as a better flow of materials has been obtained and will decrease further as the Army and Navy eliminate the production of inferior planes or planes with chronic production difficulties.

Mr. Charles E. Wilson of War Production Board was appointed on September 22, 1942, to force the elimination of many of the troubles from which the aircraft plants were suffering. He has succeeded in obtaining the cooperation of the Army and Navy and is doing a very good job along these lines.

Five months before Mr. Wilson was appointed to the War Production Board, the committee recommended that such an organization be set up. On April 6, 1942, the committee recommended:

A. That the War Production Board set up a section charged with over-all planning for aircraft production, such section to be headed by a trained aircraft production executive drafted from the industry. The subcommittee has been told that the War Production Board still does not have a single top-notch aircraft production man in its organization.

B. That instead of wasting its energies on a generalized plea for all-out production, which has confused management, labor, and the public, the War Production Board concentrate its efforts on breaking those bottlenecks which are, in the aircraft industry to the subcommittee's certain knowledge, and probably in other fields, really holding up peak production.

ARMY AIRCRAFT

Four-engine Army bombers.

There are matters with respect to four-engine bombers and improvements thereon which the committee has studied but to which it cannot refer in a public report for reasons of security.

The performance of both the Boeing B-17, popularly known as the Flying Fortress, and the Consolidated B-24, popularly known as the Liberator, is well known. Production of those planes by both Boeing Aircraft and Consolidated Aircraft has been excellent. The Douglas Aircraft and the Vega Aircraft Cos. have also turned in good records in producing the Boeing B-17.

The Ford Motor Co. was relatively very much slower than had been expected in getting into production on the Consolidated B-24. On numerous occasions the committee checked the progress being made by the Ford Motor Co., not only with company officials but with Army and War Production Board officials, and insisted that additional action be taken to expedite production. The building of as huge and complicated a device as a B-24 airplane in large numbers presented many problems, and some delay had to be expected. The production line was set up similar to an automobile assembly line, despite the warnings of many experienced aircraftmen. From the standpoint of the time factor to reach reasonable production goals, this was probably a mistake, because the Ford Motor Co. had not had extensive prior experience in the airplane field and because, even in the automobile field, the assembly line technique was developed and applied over the years without an attempt to improvise it overnight in one single step.

This resulted in slower progress at the beginning, but should result in increased production at a later date, providing there are not too many modifications and changes. It is probable also that the Ford Motor Co. did not take full advantage of the opportunities to send production engineers, layout men and production supervisors, as distinct from designing engineers, to the Consolidated plant at San Diego to find out how the specific work to be done by them was being accomplished at San Diego.

The production problems of the Ford Motor Co. were further complicated by the changes in its contracts and schedules. Originally, it was expected only to produce knock-down subassemblies for final assembly by Consolidated and Douglas at Fort Worth, Tex., and Tulsa, Okla., respectively. This was changed, at the suggestion of the Ford Motor Co., to provide for final assembly of part of the planes by the Ford Motor Co. Still later the entire program was substantially increased.

The Ford Motor Co. was also hampered by the fact that several hundred modifications were ordered to be installed in the plane and that there necessarily was a time lag between the time when such modifications were being discussed and developed by the Army and Consolidated Co. and the time when the actual detailed blueprint specifications reached the Ford Motor Co.

Additional difficulty was encountered because the plant was located before the scarcity of gasoline and tires made it difficult to obtain workmen in competition with other more centrally located plants.

These difficulties made it impossible for the Ford Motor Co. to program its work so as to obtain maximum efficiency from the workers employed, and necessarily resulted in a considerable amount of waste and confusion.

The Ford Motor Co. was not able to furnish parts which it had contracted to furnish for assembly by the Douglas Aircraft and Consolidated Aircraft Companies at plants specially built in Tulsa, Okla., and Fort Worth, Tex., respectively. As a result, the Army was compelled to switch the Tulsa plant to other work, and the Consolidated plant at Fort Worth has proceeded far behind schedule.

Until recent months, the Ford Motor Co. had not produced at Willow Run a plane which was capable of use at the front. The planes produced were used for training. The reason for this was

that in order to get the plant into production and to permit the company to obtain the experience therefrom that would enable the plant to operate efficiently, the Army Air Forces temporarily "froze" the model and permitted production without the incorporation of modifications considered essential for use at the fighting fronts.

The committee has been informed, however, that recently great progress has been made by the Ford Motor Co. at the Willow Run plant, and that it is now producing in substantial numbers planes which, with the average amount of modification, can be used effectively at the fighting fronts. This has been achieved, in part at least, by the subcontracting to other plants of the Ford Motor Co. of portions of the work which originally had been expected to be done at the Willow Run plant. A few parts are also being made or assembled by other firms in the Detroit area. The committee hopes that progress will continue to be made.

Two-engine Army bombers.

The B-25, produced by the North American Co., popularly known as the Mitchell, has proved to be a valuable plane, and the rate of production is very substantial.

The B-26, produced by the Glenn L. Martin Co., popularly known as the Marauder, has had many difficulties. It has high performance both in speed and in load-carrying capacity, and, according to most reports, is an exceptionally fine plane in the air. However, the plane is unsafe when operated by any pilots except those specially trained for its operation, because of unusual difficulties in landing and take-off. It has had a higher accident rate than the B-25, produced by the North American Co., the Army's other plane of comparable size and performance. As a fighting airplane, most pilots who know it like it, and improvements have been made on it. It has accomplished many important missions. However, the difficulties with the plane and the high cost of production and maintenance are such that the Army plans to taper off its production and to use the Martin facilities in Baltimore, Md., and Omaha, Nebr., to produce other types of planes.

In the two-engine light bomber class, the Army has the Douglas A-20, popularly known as the Havoc, the Douglas A-26, and the Martin A-30.

The Douglas Havoc is one of the best-liked planes that has been built in this country. It has performed a large number of tasks, including night fighting, low-level bombing, and strafing. Production has been very substantial. The Douglas A-26 is an improved version of the Havoc.

The Martin A-30 is a less satisfactory but usable plane which has been in production since early in the program. It was originally built for the British and French.

One-engine dive and attack bombers.

The Army has the Douglas A-24, popularly known as the Dauntless, the Curtiss A-25, the Army's version of the Helldiver, the Vultee A-35, popularly known as the Vengeance, and the North American A-36.

The Army has concluded that it will have little need for additional dive bombers for the reason that dive bombers cannot be operated unless there is a clear air superiority and then, only when the ground forces are not adequately equipped with antiaircraft equipment.

The Douglas A-24 is an Army version of the Douglas SBD dive bomber, which was built for the Navy in Santa Monica prior to 1941. These two Douglas planes, one for the Army and one for the Navy, have carried the brunt of the dive-bombing work which has been accomplished by our armed forces to date.

The Curtiss A-25 is the Army's version of the Navy's SB-2C Helldiver manufactured by Curtiss at Columbus, Ohio. The Curtiss A-25 is manufactured at St. Louis, Mo., and the program will be greatly reduced both because of the Army's opinion that the dive bomber is not valuable for most Army purposes and because of the inability of the company to date to produce useable planes. This matter is described in much greater detail in the section devoted to the Curtiss-Wright Corporation.

The Vultee A-35 is a plane which was previously manufactured for the British by Vultee and Northrop. Although a large number are on the program, it is planned to reduce substantially the number to be produced and to substitute another plane.

The North American A-36 is the P-51, or Mustang, equipped with bomb racks. When it became apparent that the Rolls-Royce engine should be substituted in the Mustang for the Allison engine in order to enable the P-51 to function as a first-class pursuit plane, slight changes were made on the P-51's which were being produced with the Allison engine, and it was designated as an attack-bomber until such time as the Rolls-Royce engine could be run into the production line. The Army has informed the committee that as an attack bomber at low levels this particular plane, equipped with the Allison engine, has done excellent work so that both versions of the plane have been valuable.

Army two-engine fighters.

The Lockheed P-38, popularly known as the Lightning, had many difficulties at its inception, but those difficulties have been overcome and a large number of the Lockheeds have been used on various fighting fronts with spectacular success. It has proved to be a very fine plane.

The Northrop P-61 is another two-engine fighter produced for the Army, but progress has been very slow and the plane is far behind schedule. It was intended for use as a night fighter.

Army one-engine fighters.

The Army concentrated on the Curtiss P-40, popularly known as the Warhawk and the Bell P-39, popularly known as the Airacobra. The Curtiss P-40 plane is discussed in more detail in the section relating to the Curtiss-Wright Corporation. The Bell Airacobra has performed very good service in Russia, which has expressed a definite preference for it over the Curtiss P-40. An improved version of the Bell P-39 is under construction. Both planes are limited to use in low altitudes and were designed for use with large land armies locked in combat.

The North American P-51, popularly known as the Mustang, is superior to either the Bell Airacobra or the Curtiss P-40. Equipped with an Allison engine, it is a good low-altitude reconnaissance fighter and fighter bomber. Equipped with the Rolls-Royce two-stage engine, it is a good medium-altitude pursuit plane. It has been characterized by both the British and the Army Air Forces as the

most aerodynamically perfect pursuit plane in existence. Although this plane was a more recent plane than the Curtiss P-40, it was in production in 1941. In the opinion of the committee, it would have been preferable to increase the production of Mustangs and decrease the production of Curtiss Warhawks.

The Republic P-47, known as the Thunderbolt, is a good fighting plane, especially at high altitudes. The Army was slow to recognize the value of this plane, because of the Army's primary interest in low-altitude planes, such as the Curtiss P-40. After belated recognition was obtained, difficulties were experienced in perfecting it for production, which have now been overcome. It has been used in the past several months in England against German fighters, and the committee is informed that its performance is good.

NAVAL AIRCRAFT

Navy dive bombers.

As previously indicated, the Army has concluded that additional dive bombers will not be needed by the Army. The success of Battleship X against an attack by dive bombers, although not conclusive, indicates that dive bombers have very definite limitations even for Navy uses. Skip-bombing may prove to be more satisfactory than dive bombing, but the Navy is still of the opinion that it should proceed with the dive-bomber program.

This is a question of military tactics on which the decision of the Navy should be final. On the statements of the Navy and Army officials with respect to the dive bomber, it appears clear that great caution should be taken by the Navy to make sure that the program for the construction of dive bombers is not greater than that justified by the Navy's own interpretation of its technical value. At present such program calls for the production of many thousands of planes, a figure which is justified by including heavy allowances for attrition and training. The committee believes that the Navy should re-examine its dive-bomber program and make certain that it is no larger than necessary.

The Douglas SBD, popularly known as the Dauntless, has to date been the only dive bomber which has been successfully used in large quantities by the Navy. An improved version of the Douglas SBD is being built. It will be known as the Douglas SB2D. The Navy reports that it is expected to be a splendid plane of high performance.

The unfortunate experience of the Navy with the Curtiss SB2C, popularly referred to as the Hell Diver, is discussed in detail in the section relating to the Curtiss-Wright Corporation. If the Navy really had use for the number of Hell Divers for which it contracted, it has suffered a strategic loss as well as a loss of many millions of dollars.

Similarly, the Brewster Aeronautical Corporation, which was to produce the Brewster SB2A dive bomber, turned in a miserable performance. The bomber is a variation of one originally produced for the British, and very few have been acquired for the Navy. The Henry J. Kaiser Co. has taken over the management of the Brewster Aeronautical Corporation, and the Navy reports that it already has made substantial improvements. The production of dive bombers is being continued temporarily in order to use materials which have already been processed and in order to permit an orderly transfer to

