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"SHORTAGES OF RESOURCES AND THE NEED FOR CONTROLS DURING WORLD WAR II"
11 September 1946

COLONEL NEIS:

It is hoped that this presentation will pay each of you a dividend in the form of an understanding of certain developments which occurred during World War II in respect to our National Resources and certain controls which were found necessary to facilitate our economic mobilization during that period.

The face value of your dividend check can be determined by you through "a before and after taking" method of examining your understanding of:

1. What do we mean when we talk of National Resources?
 - a. What do we include in our reference to Tangible Resources?
 - b. What do we include in our reference to Intangible Resources?
2. What are the most essential controls, i.e., tools or mechanisms by which our nation under its democratic form of government can most readily be converted from a peacetime to a wartime economy.
3. Can you readily list the essential factors of production over which it is necessary to provide some measure of control in the economic mobilization of this country.
4. What would you say was the fundamental issue, in the United States, underlying the problem of economic mobilization for war.

If you do not have the answers to these questions your dividend check will, I hope, provide you with a medium of evaluating your progress during the next thirty minutes.

For the purpose of our discussion we will consider the term "resources" in its broadest application to mean national resources.

In order to provide an understanding of our position in respect to national resources during World War II it is first necessary that we agree as to what we mean by the term.

In the interest of clarification in this discussion we will define national resources as including both the tangible and intangible resources of our nation.

Prior to and during World War II we considered our tangible national resources as consisting of the greatest reservoir of materials, production facilities, trained labor, power, fuel, transportation and capital possessed by any other nation.

In the intangible resource classification we considered the health, high standard of living, morale, individual initiative and inventive genius of our population.

We considered that the potential military strength of the United States resided in the efficient mobilization and successful use by our resourceful population of all of our enormous treasury of resources.

It was understood that the real problem facing our nation in preparing for a major war effort was definitely one of the mobilization of our national resources. This mobilization was considered to require an intense concentration and coordination of effort and a centralization of controls.

It was realized that the concentration and coordination of efforts were to be directed principally in the field of industry but also would extend to an ordering of the entire national economy. It was thought that certain key control mechanisms would provide the medium by which our peacetime economy could most readily be converted into a wartime economy.

CONTROL MECHANISMS

These key mechanisms were public opinion; price, profit and wage control; and priorities and allocations.

Within the framework of our Industrial Mobilization Plan, revised in 1939, provision was made for certain emergency agencies to be created and charged with the responsibility of developing and administering these controls.

PUBLIC OPINION

Every American thinks of his government as an institution existing for his benefit. He does not consider himself as existing for the benefit of government.

He holds to himself the privilege of buying for himself and family whatever he wants and can afford. He considers it his right to go and come as he wishes, to eat what he likes and to work at whatever occupation he chooses, all without bureaucratic direction.

He considers it to be his unquestioned right to own and use as he sees fit (within the bounds of safety, health and morality), his home, his automobile, his electric refrigerator and any other essentials or luxuries for which he has a desire and can pay.

Wartime controls over our economy means to the average American the temporary surrender of many of these privileges. He must be willing to curtail his travel to that which is necessary. He must get along with his old automobile, forego repairs on his home or forego building

a new one, wear last years clothing, observe rationing regulations on his food and fuel requirements.

In other words he must be willing to let government direct his life to a degree that is entirely foreign to his background, training and psychology.

How can our citizens be made to realize that the temporary surrender of certain of their privileges is essential in the economic mobilization of our country for war.

This can only be accomplished by placing before the public the facts as they exist, coordinating and disseminating all available information.

Public Opinion based on well coordinated and properly disseminated information, is under our democratic form of government the most powerful influence in converting to and supporting a war economy.

The Industrial Mobilization Plan provided for a Public Relations Administration which was designed to coordinate and disseminate information to the public.

The planned functions of the Public Relations Administration were actually carried out during World War II by the Office of War Information.

PRICE CONTROL

Under the provisions of the Industrial Mobilization Plan there was to be organized a Price Control Authority. The planned functions of this agency were to provide and administer controls on prices, profit and wages as might be required to prevent or minimize disruption of the national economic structure resulting from the impact of the rapid increase of demand on existing facilities and resources.

In recognition of the importance of this control provided under the Industrial Mobilization Plan there was created on 11 April 1941, the Office of Price Administration and Civilian Supply, later reorganized and known as the Office of Price Administration (OPA), whose functions were as follows:

1. To take all "lawful steps" necessary to prevent price rises and inflation due to the defense program.
2. To study civilian needs and determine what dislocation the defense program would have on availability of civilian goods, and to see that materials not necessary for national defense were equitably distributed.

3. To determine and publish maximum prices, fees and commissions which should be charged for services or commodities.

4. To inform the Office of Production Management, and later WPB, of civilian needs and their relative importance.

5. To advise upon existing legislation and recommend additional legislation to secure the proper execution of the responsibilities of the Office of Price Control and Civilian Supply.

6. To formulate programs to assure the most effective use of civilian goods and to encourage the use of substitutes for materials of limited supply.

Here we have the second of the three tools considered essential in converting a democratic nation from a peacetime economy to a wartime economy.

PRIORITIES

The third essential tool or mechanism required to convert a democratic nation from a peacetime to a wartime economy was under the Industrial Mobilization Plan considered to be a well defined priority and allocation system. This tool was to be used to establish and indicate the relative urgencies within or between procurement programs after considering all urgent and essential needs of the nation.

The Industrial Mobilization Plan provided that priorities and allocations would be administered by a super agency under which the various emergency control agencies would function. This super agency was to be known as the War Resources Administration.

It is interesting to note that on 25 May 1940 the Office of Emergency Management was formally established and subsequently many other control agencies were organized to be coordinated under this agency. Principal among these control agencies was the Office of Production Management, established 7 January 1941.

Within the Office of Production Management were five main divisions: Production, Purchases, Priorities, Research and Statistics, and Labor.

Through subsequent reorganizations most of the functions of the Office of Production Management were absorbed by the War Production Board.

Here within the War Production Board and its predecessor emergency agency we find recognition given to the third essential tool, priorities and allocations.

From the foregoing we see that the three important tools were provided for the purpose of converting our nation from a peacetime to a wartime economy, Public Opinion, Price Control and Priorities.

ARMY AND NAVY MUNITIONS BOARD - PRIORITY FUNCTION

The Industrial Mobilization Plan provided for the functioning of the Army and Navy Munitions Board. Its function in peacetime was to act as a planning and coordinating agency in the place of the War Resources Administration and to provide a foundation for the emergency super agency, which was to come into being on the outbreak of war. In wartime its function was to act as an umpire in respect to controversies arising within or between the Army and Navy in respect to facility or material allocations and to administer military priorities. The authority to administer military priorities was delegated to the Army and Navy Munitions Board by the War Production Board and its predecessor.

Under this delegation the Army and Navy Munitions Board in collaboration with the Joint Chiefs of Staff developed a priority schedule of military requirements. This schedule in its early application gave precedence to requirement of materiel which would fly, float or shoot. This yardstick of evaluation of relative urgency had some merit in the early stages of our war effort, for it permitted concentration on war materiel urgently needed to implement forces actually mobilized.

CIVILIAN REQUIREMENTS

As time elapsed and our initial military requirements were met, it was realized that our national economy could not indefinitely continue to live on its fat. In other words, maintenance, repair and operation requirements for our key industries and other essential civilian requirements must be given a relatively high priority position along with military requirements. For instance, tanks made in Detroit were of little combat value until transported to the theater of operations. It therefore became more and more evident that facilities engaged in war production, transportation, power plants, mining, agriculture, housing, clothing and other essential requirements for the support of our national economy must be accorded a position of relative urgency on the priority schedule.

As military requirements mounted to meet our obligation as "The Arsenal of Democracy" it became increasingly apparent that the evaluation of our capacity to meet any conceivable demand on our resources must be reviewed and certain control measures adopted to obtain the greatest effectiveness from our treasury of resources.

GROSS NATIONAL PRODUCT

As an indication of the mounting demands made on our resources let us review the following data compiled to indicate the industrial magnitude of a war effort during World War II.

In 1939, during the year the European war began our gross national product, that is, the value of goods and services produced was approximately 90 billion dollars. We constructed about 6 1/2 billion dollars worth of new facilities and exported 3 billion dollars worth of goods.

In 1940 our gross national product expanded to 100 billion dollars. Construction increased to about 6 3/4 billion dollars and exports to about 4 1/2 billions.

In 1941 the gross national product increased to about 130 billion dollars, construction increased to about 10 3/4 billions and exports to about 5 billions.

In 1942 as war production mounted, our gross national product expanded to 150 billions. Construction amounted to 13 1/2 billions and export increased to 8 billions.

In 1943 the gross national product increased to 180 billions. Construction dropped to 7 3/4 billions and exports increased to 12 1/2 billions.

In 1944 the gross national product expanded to 200 billions. Construction fell off to about 4 billions and exports increased to 14 billions.

ESSENTIAL PRODUCTION FACTORS

During the period of mounting production each of the essential factors of production, i.e., materials, facilities, labor, power, fuel, transportation and finance were reviewed to determine its adequacy or inadequacy to meet our mounting wartime requirements.

Let us consider certain of these essential production factors separately and cite the steps taken during World War II to provide effective controls in the interest of the war effort.

MATERIALS

First let us consider materials. Prior to World War II we had always considered that for a few exceptions such as rubber, tin, quinine, hemp and a limited number of more or less strategic materials, we had adequate national reserves to permit us to meet any conceivable demand.

As the war progressed and military production increased it began to be realized that our productive capacity of certain essential materials was inadequate to meet stated military requirements and at the same time provided minimum requirements for our essential civilian economy.

The War Production Board through an extensive list of so-called L and M orders provided for a high degree of conservation in the use of raw materials by allocation, standardization, limitation and prohibition.

Certain products were limited as to the quantities that could be produced. The production of other products was completely prohibited. In some instances materials, as an example copper, steel and aluminum, could only be used for a limited number of applications and allocated for those specific uses.

The use of the priority system to control the flow of materials was satisfactory until the war production programs had increased to the point where the demands for material were in excess of the supply. At this point priorities could serve only as an indication of the relative urgency of various programs and the control of the flow of the three most essential materials, steel, copper and aluminum was accomplished by the adoption of the Controlled Materials Plan.

CONTROLLED MATERIALS PLAN

This plan provided for the establishment of approximately fourteen claimant agencies who acted in behalf of claimants whose requirements were consolidated and submitted to the War Production Board for quarterly allocation of controlled materials.

For instance, Ordnance prime and subcontractors would file with the Ordnance Department their quarterly requirements of steel, copper and aluminum needed to produce under prime and subcontracts with the Ordnance Department. In turn the Ordnance Department would consolidate the controlled material requirements of its contractors and submit them to the Controlled Materials Officer of the Army. At this point the Army received and consolidated the controlled material requirements received from all of the technical services of the Army. The Army as claimant agency then filed its application with the War Production Board who consolidated the requirements of all claimants and tried to balance requirements against available supply.

As shortages of controlled materials developed it often happened that substantial cuts were made by WPB in the amount of materials allocated to the claimants. When this occurred it was often necessary for the chiefs of the technical services to decide which of their programs should receive their full allocations and which ones should receive less controlled materials than required for full production.

It can be said that the Controlled Materials Plan as in operation on V-J Day was an evolutionary and successful plan developed through a long period of trial and error and served most effectively in controlling production programs, giving full requirements to the most urgent and limiting less urgent programs.

It is believed that in the event of another war emergency the Controlled Materials Plan should be adopted at the earliest opportunity and that pending its adoption, a system of priorities designed to indicate relative urgencies of programs should be used.

FACILITIES

The Industrial Mobilization Plan provided for the allocation of facilities in the event of a war emergency.

In conformance with this plan nation-wide surveys of facilities were made and through the coordinating machinery of the Office of the Assistant Secretary of War certain key industrial plants were allocated to the technical services of the Army, to be used beginning on M-Day for the production of predetermined materiel.

It was assumed that on M-Day or shortly thereafter negotiated contracts would be signed with these allocated facilities and they would get into early production on the particular materiel which they were scheduled to produce.

The fact that we did not recognize a specific M-Day in World War II and the legal necessity during 1939, 40 and 41 (our period of preparedness) for placing contracts with successful low bidders, did much to nullify the large amount of procurement planning work that had been done in respect to facility allocations.

It may be said that the major controls in the hands of the government in respect to facilities was provided by the Controlled Materials Plan through which allocations of steel, copper and aluminum were made to facilities engaged in the production of munitions or other essential products. For instance since automobiles, electric refrigerators, vacuum cleaners and other similar products were not considered essential and since no controlled materials would be allocated for their manufacture, facilities so engaged were automatically forced to convert to the production of munitions or other essential products.

At this point it is considered worth noting that a very high percentage of the facilities originally allocated under the Facilities Allocation Program ultimately were engaged in the production of the materiel for which they were originally allocated.

LABOR

Certain labor controls added much to influence industries to convert to war production. Regional Labor Boards served to allocate labor to plants engaged in war production. These allocations were based on the relative urgency of the production programs to the war effort.

Since in most of the so-called labor areas there existed an extreme shortage of labor, any plant not engaged in some important aspect of war production could not expect labor to be allocated to it.

The mechanisms for labor control also included the requirement that the individual worker before being employed must pass through his local Labor Referral Board and present to his prospective new employer a Certificate of Availability indicating good and sufficient reasons why he had separated from his last job. This mechanism was designed to discourage individuals from moving to one job from another in an attempt to get manufacturers to bid up for his services. It also served to prohibit contractors from pirating each others labor forces.

Labor in all of its World War II aspects will be the subject of a later problem in this course. Consequently aside from the references here made to certain control measures in that field we will defer further consideration of the subject at this time.

POWER AND FUEL

Power and fuel are so closely related that we can consider them under this one heading.

There existed at the outbreak of World War II approximately sixty-eight regulatory bodies in this country concerned with providing controls of one sort or another over the production and distribution of electric power.

In the main electric power did not prove to be a major problem in the World War II production effort. Aside from certain "conservation in use", control measures which were adopted, relatively few war controls were necessary. Most of the power conservation problems were the result of fuel shortages.

Controls involved in respect to fuels were of major importance during World War II. Through the Solid Fuels Administration and the Petroleum Administration for War, both operating with other agencies of government, there were invoked certain rationing and licensing procedures through which available supplies of solid and liquid fuels were allocated in conformance with the relative urgency of individual requirements.

Shortages in solid fuels were the direct result of labor shortages at the mines. Shortages of petroleum developed from the unprecedented demands for direct military use.

TRANSPORTATION

In the field of transportation, as the war progressed, there developed an increasingly acute shortage.

The unprecedented load of freight moved, along with an all-time high in troop and passenger movements served to heavily overburden both rail and highway traffic.

As stated earlier in this presentation, in the early stages of the war effort major attention was given to the production of end products directly associated with combat. Either it must fly, float or shoot; otherwise any requirement was of secondary importance. This policy in a measure was responsible for lack of normal upkeep of our transportation facilities. Only after an extended period of time was it considered practical to provide MRO equipment for our transportation and certain other essential industries.

The combination of an all-time high in rail and highway traffic and lack of adequate upkeep tended to provide a serious threat to our economy.

Through controls initiated by the Office of Defense Transportation in the form of priorities applications, embargoes and licensing, together with certain allocations of MRO it was possible for the transportation systems of this country to accomplish a very creditable record.

SUMMARY

As compared with the war production and finance problems facing the other major world powers. The problem of war production in the United States usually was thought of as extremely simple. Actually, this opinion was incorrect.

Our fundamental problem is not necessarily solved by our tremendous reserves of national resources, our vast industrial structure and our gold hoard. It is not one of how much we should raise by taxes, or how much we shall borrow. These are merely technical details of a problem that is not easily solved.

We have in this country, with few exceptions, all the raw materials that we need to convert this nation into an "Arsenal of Democracy." We have a productive machine that potentially is without parallel in the world. We have a labor force that no other nation can equal in quantity, training, and expertness. Further, we have magnificent reserves. We have enough capital to expand our industrial equipment almost without limit. By lengthening hours and bringing in women and the youth of the country we probably can at least double our normal active labor force.

We have a standard of living that is so high that we could divert enormous amounts of productive capacity from the turning out of consumption goods to the making of military supplies without endangering the health of our citizens. And, finally, we have so many goods to export, and so much gold and foreign exchange, that paying for the relatively few things that we need from abroad could never possibly cause us any trouble.

Why, then, should there be a problem? With such resources and such reserves, why should we have any difficulty in developing our economy into a military machine superior to any in the world.

It will be difficult because we cannot use such a solution as one major power employs. We insist that our problem must be solved within the framework of a democracy. In peacetime we believe that our government should buy commodities, not commandeer them. We insist that our employers shall hire workers at a wage and hour scale fixed by private bargaining, not by an edict of the state. We want our workers free to

spend their wages for whatever they please and at prices fixed in the market place, not by governmental decree. And we hold it to be our right to eat and wear what we want and can afford, not what some bureaucrat tells us to eat and wear.

Can we solve our problem of war production and at the same time hold to such beliefs and convictions? Can we make our economy into a military machine comparable in efficiency and effectiveness to that of the other great powers without giving up something? That, in the final analysis, is the fundamental issue underlying the problem of controls in war production for the United States.

Gentlemen, we are ready for questions.

A STUDENT:

Colonel, I am a little confused on the Controlled Materials Plan. Now you spoke of having it in effect immediately in event of need. Is there any use of having it on a material that is not in short supply? In other words, would a priorities system take care of it if it would not go around?

COLONEL NEIS:

I think you recall that I suggested that we put into effect immediately a priority plan. Undoubtedly if we again become the arsenal of democracy, the requirements for steel, aluminum and copper will mount as it did in the past. Mr. Small indicated to you a few days ago that it would probably be a matter of several months before a Controlled Materials Plan could be well sold and industry well reoriented on it. The reason I suggested, that upon the outbreak of the war, we should take steps to introduce the Controlled Materials Plan is that I realize it would take probably six to eight months to get it into actual operation.

A STUDENT:

Sir, is it true that it has no value until the commodity or material itself, resource, is in short supply?

COLONEL NEIS:

No, I would not say that. It has a value because it controls the size of programs. It is possible that the military may want much more of everything than they need. The Controlled Materials Plan will be a great influence in causing the military to better evaluate requirement as to programs.

Admittedly since it is going to take a number of months to educate industry to operate it--we should get it into operation just as rapidly as possible and it will serve to determine or limit the size of programs better than anything I know of.

A STUDENT:

Before CMP there was a PRP. What was the essential difference? Why did the PRP break down?

COLONEL NEIS:

The PRP was the horizontal application of allocations. It gave very little consideration to items that were not directly in our military contract. For instance, bolts, nuts and screws were mentioned here the other day, fractional horse power motors and things of that general nature.

We would go to a jewelry manufacturer, for instance, and enter onto a contract to produce fuses. He would submit his application for copper, aluminum and steel to the War Production Board, and under the PRP program his application would go into the Consumer Goods Division, which would act as claimant agent for him.

We found very shortly that in the conferences with WPB we were resisting many allocations which WPB wanted to make for our own utilization. We would see a requirement for a hundred tons of copper, for instance, coming in for a jewelry manufacturer and we would say, "We don't want any jewelry; we want fuses." The PRP system was not adequate in providing the information needed. We thought that it would be better to provide a program such as the CMP where the allocations were made vertically right down the line. For instance, if an allocation was made to Chrysler. Chrysler authorized a certain amount of his allocation to go to Hercules who made motors and Hercules authorized a certain amount of his allocation to go to Northeast Starter Company; right down the line; Northeast Starter Company authorized a certain amount of its allocation to go to a New Departure Bearing Company. So we had a vertical application of allocations rather than a horizontal application such as the PRP plan provided.

A STUDENT:

You spoke of the increase from 90 billion dollars in output up to 200 billion dollars. Did you have any way to evaluate that other than in billion dollars? In other words, we had an increase in the cost of labor and prices, and not only that but we had an increase in cost of taking certain amount of ore and producing it into a finished product due to the technical nature of the product.

COLONEL NEIS:

It is true that the increase in cost of production was a very significant factor but I think it was small as compared with the over-all figure. To my knowledge, there is no record of the relative amount of end items produced but I think that we could take an over-all estimate of the purchasing power of the dollar--fluctuation of purchasing power of the dollar--between 1939 and 1944 and pretty well evaluate what you are trying to get at there.

40

A STUDENT:

Will you elaborate further on your statement regarding the disregard of spending money--that there is plenty of money--because that appears to me to be a very dangerous philosophy.

COLONEL NEIS:

But I wasn't responsible for it. (Laughter) Gentlemen, I don't want to minimize the importance of the financial aspect of this thing but our major objective was to get war material irrespective of cost. The philosophy that existed, was that if we could save one American life, we were willing to spend any amount of money to do it. Public opinion was very definitely on the side of getting your munitions out there where they could be used and looking at the expense aspect of it later.

Now I don't want to give the impression that money was thrown to the birds because it was not. A great many of us who came into this effort had a long business experience where every dollar spent had to produce results. It was quite a job for most of us to reconcile ourselves to talking in terms of millions. I would say that in the main the financial aspect of this war effort was given some consideration; probably not the consideration that our hindsight would indicate was warranted but our main objective, our main mission, was to get the munitions out there where they could be used.

Does that answer your question?

A STUDENT:

Yes, sir. However, I would like to make a comment that it is my understanding that normally a hundred or a hundred and thirty octane gasoline can be produced for about 15 cents a gallon in a limited quantity and that the price in 1944 was 96 cents a gallon which meant that the last five percent of production must have cost over two dollars or possibly three dollars a gallon which indicator should have indicated that possibly the requirements should be reviewed inasmuch as the expenditure to produce the last five percent meant a tremendous increase in manpower, plant facilities and even the basic commodity, oil, itself. Therefore, when the cost of any product becomes excessive over its normal cost, the requirements for that item should be very carefully reviewed.

COLONEL NEIS:

I quite agree with you but I think we have been, well, content to pay a high price per gallon for high octane gas to keep our planes in the air. If we had to spend 90 cents to get those planes up in the air where we could realize on the original investment, it would have been a smart thing to do, because had we not gotten those planes in the air the other fellow would have gotten his there and the results would have been disastrous. I think that public opinion in this country would have been right down on us like an avalanche if we had said,

13
RESTRICTED

"No, we can't put that plane in the air because the high octane gas is costing us 90 cents. We are goint to wait around. Let the Germans strafe us and bomb us until we can get gasoline that is lower priced." That type of psychology wouldn't have lasted ten minutes against public opinion as it existed at that time.

You must remember that there was hardly an American family that didn't have a son, brother or husband out there somewhere in the service and the fact that they were going to have to pay a little more to get him home safely was pretty much of a secondary consideration. There again you have public opinion with you and it would have been disastrous if anybody had stopped to count the pennies in the winning of the war.

A STUDENT:

I didn't mean to keep the planes on the ground. I am talking about that last five percent.

COLONEL NEIS:

Gentlemen, the statisticians who prepare a great many of these figures and accounts include a write off of plant facilities and costs and things of that nature. That probably is good practice in business but we didn't know when we built one of these high octane plants how long a period it was going to take to amortize them, whether we should write them off in five years or whether the war would last longer or whether we should write it off in two years.

War is a costly thing. It is not economical. You can't go in and count your pennies in any aspect of it. You must reconcile the public to the fact it is an uneconomic operation and the dollar aspect of the thing is minor as compared to the requirement of getting munitions out there where they can be used.

Now I quite agree with you, and I hope that the requirements group will take full cognizance of some of the errors made and the shortcomings and bring them out in their problems. Are you on the requirements study?

A STUDENT:

Yes, sir.

COLONEL NEIS:

That would be a very interesting aspect to bring up as a problem.

A STUDENT:

In connection with Colonel Howards' comment, I happen to have a little contact with hundred octane gasoline deals and there were, last

14
RESTRICTED

fall, three hundred thousand tons of high octane gas still left in the United Kingdom, which were U. S. equity in that pool, which leads me to a pet topic which is the scanning of overseas requirements on some of these items.

I agree with everything you said about keeping the aircraft in the air, but an examination of a 300 thousand ton U. S. reserve alone would seem to indicate that perhaps we might have overstrained a little on our estimate in that particular commodity.

COLONEL NEIS:

Probably.

A STUDENT:

We are trying to use it now before it deteriorates to the point where it won't be serviceable.

COLONEL NEIS:

High octane gasoline, like most surpluses we had stored in the European theater, we intended to deploy. We were going to transport a tremendous amount to the Asiatic theater. Great many shiploads of trucks were started for the East, from England and from France. We had no idea that the Japanese phase of the war was going to end so quickly after the Germans gave up. There is one thing we must bear in mind in computing requirements--you can't get it down to the point where the last bullet is going to shoot the last Jap. You have got to be reconciled to the fact, in developing requirements--and I hope you keep this in mind. You were either going to have more Japs when the war was over or you were going to have more bullets.

Now frankly we are subject to a tremendous amount of criticism. If the foresight of most of our people is as good as their hindsight, it would have been much easier to handle this war effort.

A STUDENT:

When we saw the end of the war with Germany coming--there first was given out an order that the shipments of aviation gas would stop on V-E Day, but we had no storage tanks in this country in which to put the gasoline that was in the pipeline. We had to continue those shipments to Europe until we could divert them or else we had to build additional tank storage as in this country. That was the cause of that tremendous stockpile that had been built up after the war.

COLONEL NEIS:

Gentlemen, I want to mention that shortly before the Battle of the Bulge we were going through a period of reconversion over here to the extent that it had most of us alarmed. The War Production Board

had gained the impression that the war was pretty well over, and that it was just a matter of three or four months before the shooting would stop in the European theater. Consequently, the military encountered a tremendous amount of resistance in maintaining an uninterrupted production program, and in getting the War Production Board to continue its allocations of materials to meet full scale military requirements.

Gentlemen, we have time for one more question.

A STUDENT:

Regarding the problem of aviation gasoline, during the last part of the war, first, the price of aviation gasoline was approximately 16 cents a gallon; second, 300 thousand gallons of aviation gasoline provided about 14 days' supply at the height of the war for about 20 major B-29 raids which would have taken place if the war had continued. That surplus in England would have been readily absorbed in the Pacific. Our aviation gasoline consumption dropped in the month of September 1945 to one fourth to what it had been in July 1945, with a pipeline full of tankers which had to be computed ahead at least two or three months which could not be diverted once it had left the United States.

COLONEL NEIS:

Thank you very much. That is an interesting comment. That all goes to emphasize the importance of this first problem you are going to be engaged in.

A STUDENT:

Colonel Neis, this is about one of the questions asked at the beginning. During the period of productive expansion, from 90 to 200 billion, I think you made the statement that 14 billion was exported; was that during that entire period?

COLONEL NEIS:

Oh, no. In one year, 1944.

A STUDENT:

Did that include lend-lease?

COLONEL NEIS:

Yes. It included lend-lease. I did not want to burden you with statistics but the copy of this presentation has listed, not only the national income, but also the amount of construction and export per year for the period 1939 through 1945.

Now, gentlemen, may I go back to the subject of requirements. Requirements, in my opinion, are the foundation upon which this course is built. A lack of consideration of the subject of requirements is just like trying to build a house without foundation. You must know first WHAT YOU WANT. Next, you must know HOW MUCH YOU WANT; next, WHEN YOU WANT THEM, and next, WHERE YOU ARE GOING TO GET THEM. These four factors constitute the basic foundation of requirements.

Thank you, gentlemen.