INTRODUCTION TO PRODUCTION

3 January 1955

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INDUSTRIAL COLLEGE OF THE ARMED FORCES

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CAPTAIN McCAFFREE: General Niblo, Ladies and Gentlemen: We of the Production Branch hope that you have all had a most enjoyable holiday. We also hope that you will have a happy and prosperous New Year, and may your next duty assignments be also to your liking and choosing.

During the next eight weeks of the course we are going to examine the most important aspects of Procurement and Production. This talk will cover some of the salient points of Production. The Procurement Orientation will be presented to you by Colonel Kearney this coming Friday. From then until 18 February the two Units will run concurrently.

Chart 1, page 2.--When Colonel Goldsmith introduced Requirements, he showed you this chart denoting the relationships between certain units of this course. I present it to you again for emphasis.

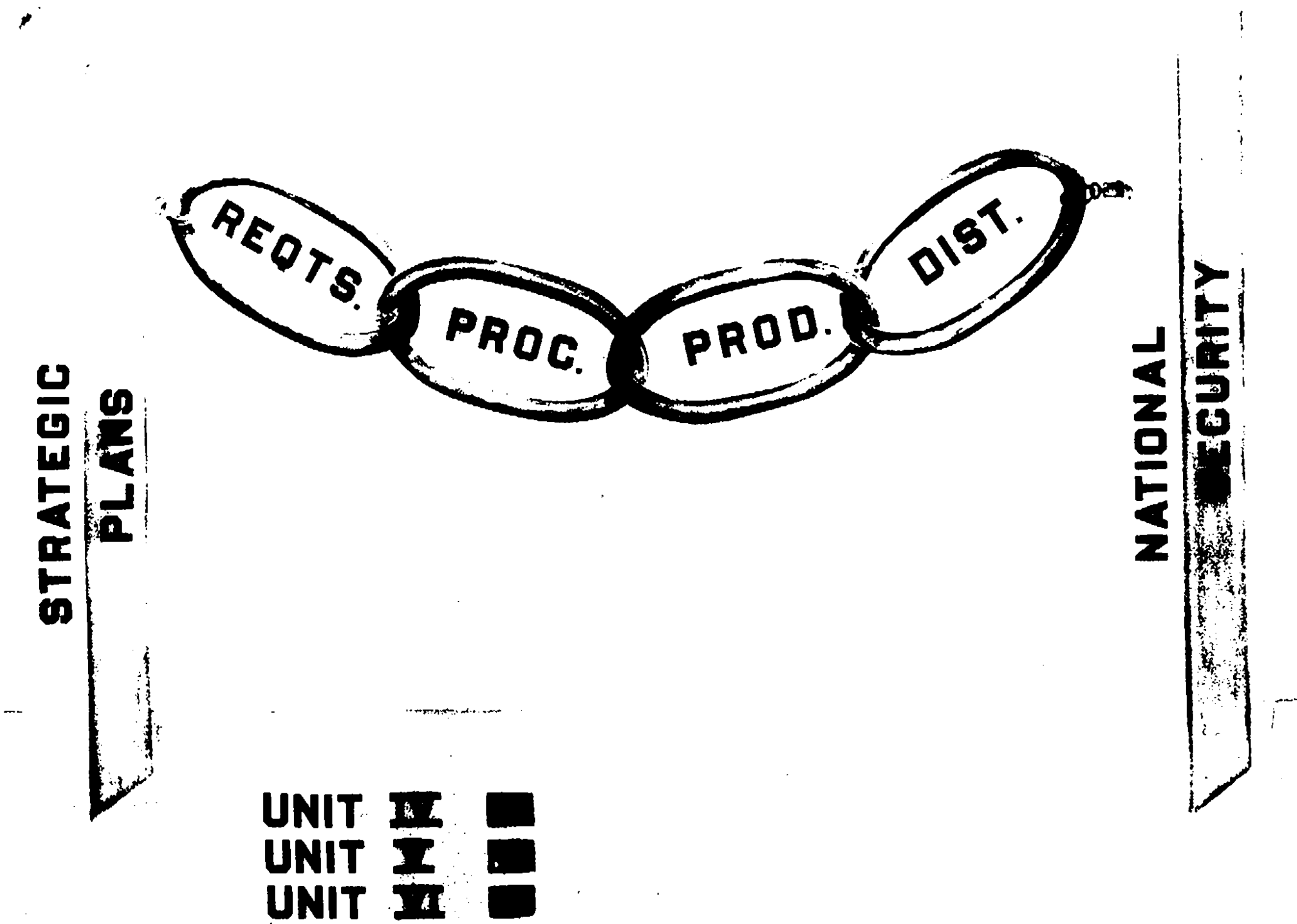
Procurement and Production are truly the mid-links between Strategic Plans, which support our National objectives, and National Security, the primary mission of the Armed Forces.

Success in industrial mobilization will depend to a great extent upon the mutual understanding and appreciation by our industrial and military leaders of the problems which each faces. As our future leaders, you, the members of this audience, will each have his part to play. And, in preparation for that responsibility, you will hear many, many times in this Unit the expression "The industry-military team." Remember it well! For without a continuous consciousness of the necessity for the cooperation exemplified by that expression, we as a Nation cannot do our best in mobilization.

It is only a step to translate that term into "The civilian-military team." We have just that in the Production Branch, and I hope you will understand and appreciate my pride in introducing this team to you. We hope and plan on presenting to you a course of which we will be proud and which you will feel is a constructive and tangible asset to your careers. The team is:

CHART 1

THE LOGISTIC CHAIN



Mrs. Gertrude Caretti, our Secretary.

Mr. Alden Baum, who will conduct the Iron and Steel area.

Mr. Lowell Henkel, who will monitor the Copper and Aluminum area.

Captain Joseph Swain, USN, who will supervise the Electronics area.

Colonel Lloyd Walker, USAF, who will handle Aircraft.

Lieutenant Colonel Harold Benedict, USA, who will preside over the Automotive area.

Colonel Victor Searle, USA, the Plastics and Petro-Chemicals area.

Colonel Charles Duff, USA, who will conduct the Guided Missles area.

Any resemblance between these members and those with whom you have associated previously in the course merely exemplifies the inherent flexibility of the faculty here at the College. It is my belief that this group of men will present to you the Production Unit in a manner and of such completeness as to justify that time-honored Naval phrase "Well done." You will be the judges.

To those of you who have read the published scope of this talk, I feel it is only fair to point out that any resemblance to my subsequent remarks is strictly coincidental. In fact, I have tried to avoid giving you the "capsule treatment" of the coming Production Unit.

First, let me explain the term "Production" as it was and as it is. When I was a student here, we defined Production as: "How to build the stuff we have no requirements for--in the quantities we can't determine--in time to dispose of it as surplus--just before we find out we need it." But I like the new definition better now :

Production means simply the creation of the finished item, built in quantity to definite specifications.

Although the definition is simple, the process is not. There are many problems involved in fitting the product desired to the processes and techniques of modern production methods, and also making the production line pay. The problems involved in this very complex industrial production process make up the inherent lead-time factor.

In this Unit we will develop a realistic approach to the general problems of mobilizing our industrial resources. We will evaluate the critical weaknesses of our productive complex and study the reasons for and the effect of Government controls upon industry. And we will cover them from both the partial and full mobilization viewpoints, with greater emphasis on the latter.

Full consideration in our planning for this Unit has been given to the questions you have asked in previous Units. Paramount among these questions has been: "What consideration has been given to loss or damage resulting from attack with thermonuclear weapons on our industrial complex and population centers?" A very timely question, too.

It is a new planning problem for which we have few if any experience factors to guide us. It is a problem that is going to get more difficult the deeper we get into it, too. You might file away in your minds a few questions to ask industry on our field trips as to what they are doing about it. However, there will be lecturers in this Unit who will give you the high-level planning aspects and the overall picture. Before moving on, though, let's take a closer look at the problem.

Approximately 71 percent of our industrial capacity and 54 percent of our industrial workers are located in only 50 large or prime target cities. Hence, to the other problems we have habitually considered in planning for war production must now be added the consideration of assuring continuity of industry under attack conditions.

The plans to meet this contingency can be logically divided into two principal programs--Industrial Dispersion and Production Continuity. The objective of Industrial Dispersion is the spreading out of the facilities which a weapon of mass destruction can destroy. Current policy, now under review, however, provides that new defense-supporting facilities for production must be located at least 10 miles from highly industrialized or densely populated sections, or from major military installations.

As an example of the progress that has been made in this field, 84 percent of the facilities, costing one million dollars or more, for which rapid tax amortization was granted during the first half of 1953, have been located on dispersed sites.

The "Continuity of Production" program deals principally with facilities which are already established in the prime target cities. Since it is not feasible to relocate these facilities, planning to assure maintenance of output is directed along many lines. One of these is duplication of records, specifications, and critical data, and their storage at a safe location. Also, alternate production sources at dispersed sites must be incorporated to minimize both material damage and the loss of skilled workers. Another plan involves the stockpiling, at safe locations, of raw materials, components, and maintenance and repair equipment.

The Government, through the use of rapid tax amortization devices and loan funds, has taken a very active part in providing assistance and guidance in this new problem. However, industry alone has the authority, enterprise, competence, and knowledge required to attain effective results.

On the other hand, there are problems concerning which we have a tremendous amount of experience, but which we approach sometimes with a less than realistic attitude. One that bedevils us all is "Lead Time."

In your careful and detailed reading of the Production Monograph, during the quiet of the Holidays, of course, I'm sure you will have noted that lead time is one of the six most important characteristics of mass production.

I have selected lead time to discuss at length because it is the least mechanical and the most variable of all these characteristics and because we can do something about it. The other characteristics--the breakdown of the productive effort into simple elements or jobs; the extensive use of automatic and special-purpose machinery and of semi-skilled and unskilled workers; the interchangeability of parts; and the detailed planning, organization, and scheduling of production--are elements or factors about which there can be little argument or misunderstanding. But, more often than not, lead time is misunderstood. I would like to fix it in your minds now so that you can take it into account as our study of production progresses.

Chart 2, page 7.--This chart portrays schematically what is involved in lead time. You will note that there is no indication of time in terms of hours, days, months, and years. However, to get some idea of the period of time involved, it is generally years from the beginning of the development phase until shipments from the mass production line become an established fact. If the research phase is included, any number of years may be added, depending on the novelty and complexity of the item. The first atomic bomb became a reality after some 3 years of intensive work and an expenditure of more than 2 billion dollars. But behind the detailed work of the Manhattan Project was at least 40 years of basic research and 6 years of concentrated and exhaustive research work by eminent scientists.

Let's look at a few of the more modern tools of warfare. When the U.S.S. Forrestal enters service, an estimated 4 years and 7 months will have elapsed from the time the design was accepted. And her sister ships, the Saratoga and the Ranger--well, it's rather difficult to calculate because we haven't used a British Field Marshal's ideas and an American Admiral's memo's as lead-time factors before.

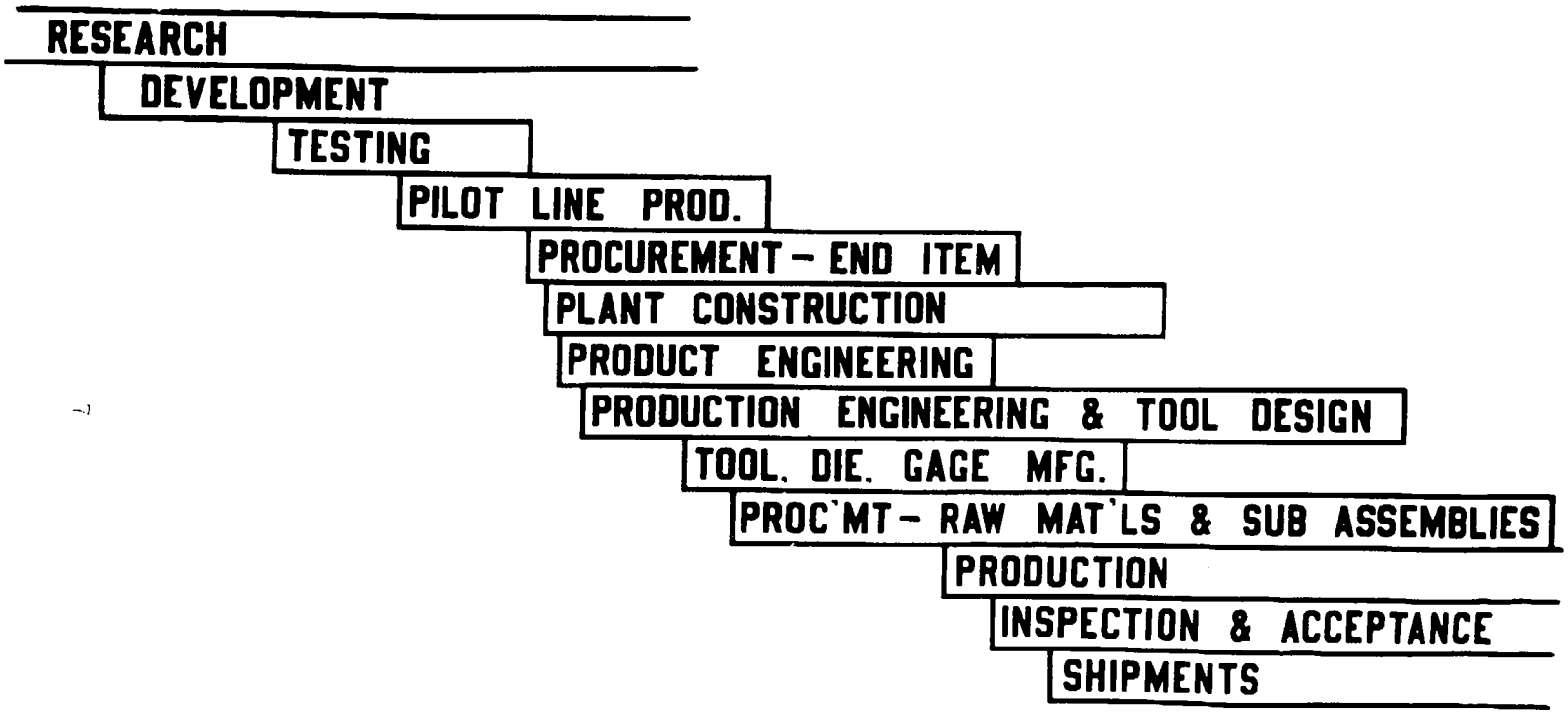
The B-29 bomber of World War II fame required approximately seven years to progress from the drawing board to mass production. Then the B-47 took eight years. And the new B-52 will also take about eight years. We can see a trend here, too, which ties in with technological progress. For even though a larger number of specialists are acquiring more knowledge in aircraft design and production, this competence is counter-balanced to a great extent by the increasing complexity of the aircraft required.

We also have the Army's medium tank, the M-48, which you saw in operation at the Aberdeen Proving Ground. It came off the production line some 15 months after decision had been made on the design to be used.

You heard many times in your study of requirements that an easy way to scale your requirements down is to reduce the lead time. In many recent budget hearings there has been an insistence that lead time, particularly on reorders, be eliminated. For small, uncomplicated items that have a commercial use, lead time may be only the few days required to process a simple purchase order and obtain delivery from a local merchant. But you need only look again at this chart to recognize that for most of our military end items we can keep lead time down to a minimum by careful and detailed planning and control, but we cannot eliminate it.

CHART 2

LEAD TIME



This lead-time problem places a terrific responsibility on our military planners. They must attempt to forecast with accuracy if, when, and how an enemy might strike us and how much and what kind of supplies and equipment we would need and when and where we would need them.

Some of the problems of lead time can be counteracted. One way is a buildup of the productive capacity of our major industries to levels where they can better meet wartime requirements--in other words, excess capacity. The steel, aluminum and petroleum industries are well along the program road; the power industry and certain others are progressing satisfactorily.

Another method is a reexamination of the stockpiling program. For instance, should steam boilers, turbines, and large shapes and forms of steel be stockpiled? However, limited reserve stocks should be maintained of supplies for which there is a definite requirement. Stockpiled items, both as to type and quantity, have to be selected with the greatest of care to avoid the obsolescence which can be created by modern technology.

I have emphasized lead time in this discussion because, as I pointed out earlier, it is the most variable of the characteristics of mass production and it is the one about which we must be doing something now.

You have in the Production Monograph a very clear discussion of the basic factors of production and of the problems incident to mobilization in an emergency. Our 15 guest lecturers, who will be with us starting tomorrow, will cover and reemphasize the fundamentals of production, production planning and operations, and production factors, such as, facilities, automation, quality control, management controls, power, technological trends in production, and the problem of maintaining an industrial base capable of ready expansion in event of economic mobilization.

You will also note that most of our lecturers are men from industry. They are top-flight, too. My proof for that lies in the fact that the Washington representatives of their parent firms tell us that guy is a big shot, and you know as well as I how hard it is to get to be called a big shot in this town.

The general information relative to the Production Unit of this year's course is contained in the Production Curriculum. Any questions you may have, and further particulars, will be brought up in the conferences scheduled for this afternoon.

Chart 1, which I showed at the beginning of this discussion, evidenced the relationship between the work unit you completed before Christmas and those you are now undertaking.

In concluding, I would like to extend this concept.

Chart 3, page10.--In selecting a scene it is only appropriate that I put some water in it somewhere. The size of my "ditch" is in consonance with the latest concept of global strategy on the size of oceans. The hull down on the horizon is a carrier--with our Marines embarked. In this day of jet aircraft the Air Force is only depicted as a cloud in the sky showing where they have been. And last, but certainly not least, is the tank (courtesy of our Army members of the Branch).

Thus we of the military are represented.

Our industrial support lies in the piers of our economic mobilization span.

In the cooperation of this industry-military team lies the strength to maintain our democratic way of life.

With their teamwork, we can indeed "Cross Over the Bridge."

CHART 3