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PROCUREMENT PLANNING

by

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PROCUREMENT PLANNING

SECTION I - FUNCTIONS OF PROCUREMENT PLANS DIVISIONS

1. General.- The general mission of the Procurement Plans Division is that of giving effect to the statutory powers of the Assistant Secretary of War in Section 5a of the National Defense Act pertaining to "supervision of the procurement of all military supplies *** and the assurance of adequate provision for the mobilization of material *** essential to war-time needs," insofar as they apply to completed items or their components. The Division is not concerned with basic commodities, like wool or steel, nor with what may be called contributory items, such as fuel or power. Other lectures covered these phases of the procurement problem.

2. Specific Functions.- Flowing out of this general mission are peacetime functions as follows:

a. To supervise and coordinate the procurement planning activities of the supply arms and services.

b. To review, analyze, and coordinate the procurement plans prepared and submitted by the supply arms and services.

c. To coordinate plans for classes of material involving more than one supply arm or service.

d. To prepare plans for supervision of war procurement.

3. War Functions.- At the outset of war, planning of the peacetime type ceases and the Planning Branch of the Office of the Assistant Secretary of War is reorganized into the Procurement Branch.

The Procurement Plans Division becomes the Procurement Progress Division with functions to be discussed later in this lecture.

4. Responsibilities for Planning.- The law provides that chiefs of supply arms and services are responsible for their procurement activities, including procurement planning. The role of the Assistant Secretary of War is that of supervisor. He prescribes the form and general contents of plans to be submitted, examines and coordinates them when

submitted, and renders such other assistance as is practicable. Dictation in matters of detail properly within the sphere of the supply arms and services is carefully avoided. The initiative rests with the supply arms and services where it must always remain if any real results are to be obtained.

SECTION II - NECESSITY FOR PROCUREMENT PLANNING

5. Time Element. - As time is of the essence in war, it is obvious that a nation prepared to throw its trained man power promptly into the conflict, backed by munitions power, has an enormous advantage over an opponent not so prepared. The importance of early deployment of national power therefore needs no argument. Troops in battle are helpless without munitions. Success therefore largely depends on adequate supply either from war reserves or from new production or a combination of both. War reserves are costly in their accumulation and maintenance and should be held at the minimum needed to bridge the gap until new production can fill all needs. New production, as early as possible, and in adequate quantities, is the goal of procurement planning.

6. Procurement Confusion in World War. - "When war was declared there was a general haphazard rush of the supply branches to place war orders each supply branch made its own contracts with private industry without regard to the needs of other departments." This sounds familiar but it does not refer to our own experience. It is from Platoff's account of industrial problems in Russia in 1914 (Army Ordnance, March - April, 1931). Yet how similar was our own experience in 1917! Largely to keep the War Department house in order in the next emergency, the National Defense Act of 1920 placed supervision of procurement plans with the Assistant Secretary of War and made him responsible for an orderly procedure in allocating the existing production capacity among the Army procurement agencies, with appropriate reservations for the Navy and civilian requirements.

7. Basis for Planning. - Since procurement planning is absolutely necessary if initial war-time confusion is to be minimized, what are the essential elements of a procurement plan? Such a plan must furnish satisfactory answers to the following questions.

- a. What is wanted?
- b. How many are needed and when?
- c. Where can the item be procured?
- d. At what rate can it be procured?

An analysis of these elements is necessary to a clear understanding of the problem.

SECTION III - ELEMENTS OF PROCUREMENT PLANNING.

8. What is wanted? - There are two separate viewpoints on this question - the supply viewpoint and the procurement planning viewpoint. To satisfy the supply viewpoint, it is necessary to know what is to be issued to troops. This covers a wide range of articles, all of which must be covered by specifications, drawings or other information necessary for procurement. The supply catalogues are prepared by the supply services under the supervision of the General Staff and includes over 7,000 items. The procurement planning viewpoint recognizes that for the 7,000 items on the supply lists, there are two general categories.

a. Items for which plans are unnecessary because of ample normal supplies. We call these Class III items.

b. Items which present procurement difficulties and should be covered by plans. These are Class I items and to a lesser extent Class II presenting minor procurement problems.

The chiefs of supply arms and services are responsible for the choice of the items for which plans are to be prepared. The Assistant Secretary of War is naturally most interested in those items and has the Procurement Plans Division examine all plans for them in the interests of coordination among procuring agencies.

9. It is not always possible to base procurement plans on the items as listed in supply catalogues. Sometimes it is necessary to break up an item into components for placement of orders. Here the procurement list begins to diverge from the supply list. The Ordnance Department does not order complete rounds of 75 mm shell. It procures separately shell bodies, cartridge cases, fuzes, primers, powder, high explosives, and containers and brings all of these components together at

another plant for assembly. To make these components, it must also procure items never issued to troops but nevertheless necessary for manufacture, like gages and other inspection tools. Plans are required for all of these components and for the finished item. No further elaboration is necessary to show that the procurement list can never be identical with the supply list.

10. There are 7,354 items on the supply list as compared with 1,169 items for which formal plans will be prepared. The procurement planning list changes frequently as planning proceeds. It should be noted that for such supply services as the Quartermaster Corps and the Medical Department whose items are largely commercial, the supply list exceeds the procurement planning list, while for the Chemical Warfare Service with non-commercial items the reverse is true.

11. How many of each item are needed and when? - This question opens up the basic subject of requirements. There was no mobilization plan in 1917 to serve as a basis for requirements for supplies. Such methods as were used were guesses which had to be changed frequently. Often procurement orders had little relation even to such requirements as existed. This year (1938) we have a well considered mobilization plan (Protective Mobilization Plan plus Four Augmentation Plans) which has recently superseded the General Mobilization Plan of 1933. The chief difference between these two plans is that the man power mobilization of the 1938 Plan is only about 50% of that of the 1933 Plan in the first four months, thus making procurement of supplies a more practicable proposition in those early critical months.

12. Any mobilization plan to be practicable for procurement planning must show ultimate troop objectives, the rate of mobilization month by month, the rate of transfer of units from Zone of Interior to Theatre of Operations, and the distribution of the mobilization to corps areas. With these data, it is possible to compute troop requirements. The General Staff provides all of this information in troop basis tables.

13 Monthly troop requirements are computed as follows.

a. Initial issues - The quantities required for the organizations in the troop basis tables are derived from Tables of Basic Allowances and Tables of Organization.

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b. Maintenance factor - To the monthly issues is added a maintenance factor to compensate for wastage or maintenance. The maintenance factors vary widely for different items and are based on the experience of supply services, either from World War data or from peace-time knowledge corrected for probable war effects. The necessity for reasonably accurate maintenance factors is apparent if excessive total requirements from this factor are to be avoided. Different maintenance factors for Zone of Interior and Theatre of Operations are also necessary, those for the Theatre of Operations naturally being greater.

c. Distribution factor - This is a factor applied as a percentage to provide additional stock for tariffs of sizes and for distribution through the line of depots. The percentages range from 3% to 50%. For Class I supplies, individual equipment and ammunition, they are applied to the maximum monthly requirement for initial issue and maintenance. Aside from a few individual cases, the maximum occurs in the first month. For organizational equipment, the present tendency is to apply the distribution factor to initial issues made each month in order to insure that there remains in the distribution system the required percentage of the total amount of the particular item in use in both the Zone of Interior and the Theatre of Operations.

d. Defense projects - This factor covers the requirements for our overseas garrisons and is applied in the first month.

e. Navy requirements - Some items for the Navy and Marine Corps are supplied by the War Department. These requirements are applied as requested by the Navy.

14. The total of these monthly troop requirements described above is shifted forward one month so that supply is available at the beginning of the month concerned. All of the steps described above are controlled by General Staff instructions.

15. The next element brings in the Assistant Secretary of War and the supply services. This element is monthly procurement requirements. Procurement requirements are determined by deducting the stock on hand (war reserves) from the troop requirements and then shifting the figures forward another month to compensate for the time necessary to deliver from the factory to the army depots. If there are large war reserves, procurement requirements for the first few months may be reduced to zero.

16. Where can the item be procured and at what rate? -
By the steps just described, we now know what and how many of any given item are to be procured and the months in which needed. It is now practicable to approach industry for sources of production, for it must be borne in mind that the government arsenals and depots can produce only 10% of the munitions needed. The contact with industry is obtained through the procurement district organization of the supply services. The first step is to apportion the monthly procurement requirements to the various districts. The district organizations survey the most suitable facilities in the districts and report their findings on sources and rates of production to the chiefs of supply services. The chiefs of supply services then obtain allocations, complete or partial, of the productive capacities of the desired facilities from the Assistant Secretary of War. The final step is that of obtaining accepted schedules of production from the allocated facilities, or estimates if accepted schedules cannot be obtained. The important subject of allocations has been covered in another lecture.

17. The form and contents of procurement plans to be submitted to the Assistant Secretary of War for approval are prescribed in Circular No. 2 of the Planning Branch. This circular deals with the details of plans and prescribes among other things the use of Form 1, an abstract of the status of plans for any given item where plans are necessary. The form provides for the assembly of the data discussed in the previous paragraphs, including the matching of requirements against production, the cumulative shortages or surpluses, and other pertinent facts pertaining to the item. What appears on this form is often the culmination of several years' work on development and test of the item, the assembly of technical data, the computation of requirements, and the location of facilities for which allocations and accepted schedules have been obtained. Sometimes an item requires more detail than Form 1 provides. Such items, or groups of items, are covered by supplemental plans, some of which, like the Ordnance plans for artillery items, are quite elaborate.

SECTION IV - EDUCATIONAL ORDERS

18. In the current fiscal year, a new and practical element has been injected into the procurement plans program. This is the educational orders program. It has been realized for years that the best guarantee that manufacturers who are

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scheduled to produce non-commercial munitions in time of war can actually make good on their estimates is to give them small orders in time of peace to gain experience in the problems of tooling, routing of work, and identification of choke points. As a fact of historical interest, it might be noted in passing that Mr. Howard Coffin, during his survey of industry in 1916, wrote to Senator Chamberlain, Chairman of the Senate Military Committee, urging legislation for practical educational work in industrial plants. The 75th Congress finally recognized this need in the Educational Orders Act and authorized \$2,000,000 a year for five years to finance educational orders for the most important non-commercial items. In the program for the present year, you will readily recognize the importance of the following items now being handled from current appropriations:

- Semi-automatic rifle
- Recoil mechanism for 3" A.A. gun
- Forging of 75 mm shell
- Machining of 75 mm shell
- Gas mask
- Anti-aircraft searchlight

19. What will be the effect of an educational order on the war procurement of an item? A concrete example, the aiming circle, will make the effect clear. The monthly troop requirements for this item start off with a heavy initial M-day need followed by sizable monthly initial equipment and replacement requirements until complete mobilization, when the demand becomes stabilized as a replacement proposition. The present production curve for this item indicates that little production can be expected before the 4th month and that it will be the 7th month before maximum production can be reached. Meanwhile the requirements curve during this critical period has been diverging from the production curve so that a large deficit exists in the 5th month in spite of the application of the existing stocks. An educational order is now placed in the picture. It has its effect on the production curve by elimination of some of the time-wasting but nevertheless necessary preparations by the manufacturer to get started. Maximum rate of production is obtained in, say, the 4th month rather than the 7th month. The deficit in the 5th month would be reduced to approximately 50% of what it would have been had there been no educational order. It might be argued that the production curve might be brought even further back and perhaps eliminate the deficit in the example given. This ideal can hardly be realized as there is an irreducible minimum of preparatory time required even if an educational order has been used.

20. A vital secondary effect of educational orders is on the size of war reserves. Obviously the more nearly now production can meet the needs, the less the reserve necessary to bridge the gap until production is an accomplished fact. As reserves are expensive of accumulation and maintenance and difficult to build up to proper size from peace-time funds, measures aimed at reduction of the minimum war reserves assume primary importance. It is no phantasy to insist that the educational orders program properly developed will be the chief measure in reduction of theoretical reserve requirements.

SECTION V - VALUE OF PROCUREMENT PLANS

21. Value to Supply Services.— The objective of procurement plans is to provide chiefs of supply services with workable arrangements to carry out their procurement missions. The simplified Form No. 1 is designed to include only the essential data and to indicate at all times just how the supply service stands for any given item. Revision is also easy. Probable choke points in production become evident and lead to a search for a solution. Sometimes a change of design to improve production possibilities arises out of a plan discussed with a manufacturer. Impossible deficits which cannot be met by available facilities often appear and force a change in some feature of the program.

22. If Form 1 can be completed for an item, it can be produced in time of war, since all basic data are at hand. If, for example, the drawings are not available, the warning is plain that the procuring agency is not ready. Costs and shipping data also appear on Form 1 and have their value in making up war appropriation estimates and for transportation requirements.

23. This form has another value for computation of the war reserves which should be maintained. The greatest monthly cumulative shortage is ascertained by inspection. This represents the necessary increase of existing stocks if there is to be no shortage before production can be developed. The stock plus the cumulative shortage gives the theoretical war reserve. The Protective Mobilization Plan with its slower man-power mobilization reduces the necessary war reserves to more reasonable figures than was the case with the 1933 Plan.

24. Value to Assistant Secretary of War - Procurement plans are never entirely completed but must remain fluid and responsive to revision as the factors change. Often the scrutiny of a plan completed several years ago indicates that some vital change has taken place which has not been covered by a revision. I have in mind one plan which was apparently complete but had the fatal defect that the firm scheduled to produce the item is now out of business. Plans are of value only as long as they are complete and up-to-date.

25. The principal duty of the Procurement Plans Division is to inspect the plans abstracted on Form 1 and evaluate the picture presented. These abstracts give an accurate portrayal of the status for a given item and show whether the chief of service concerned is prepared to procure. Progress can be evaluated. If significant shortages are apparent, the chief of service is requested to review the situation with a view to improvement. Most important choke points caused by shortages of raw materials, machines, skilled labor, or other factors can be detected and special studies undertaken to correct them.

26. These plans also provide a brake for mobilization plans. Obviously the man-power curve must be dependent on the supply curve. If the procurement program cannot meet the troop mobilization, this fact must be brought to the attention of The General Staff so that the mobilization can be brought into line with supply possibilities. The abandonment of the 1933 Mobilization Plan was caused by just such a failure of supply plans to meet the mobilization curve.

27. Coordination studies of items procured by one supply service with related items in other supply services form an important duty of the Procurement Plans Division. Radio equipment, procured by the Signal Corps, is installed in tanks produced by the Ordnance Department and airplanes by the Air Corps. Gas shells are procured by the Ordnance Department, filled by the Chemical Warfare Service with gases procured by them and then turned over to the Ordnance Department again for issue. Anti-aircraft equipment is procured by the Ordnance Department and the Corps of Engineers. Such items must be coordinated in their procurement so that the entire program can be kept in balance. If

choke points in these related items are discovered, the chief of service concerned is requested to bring the item in to balance with the rest of the program

SECTION VI - PROCUREMENT PROGRESS DIVISION (WAR)

28. Principal Objectives - At the beginning of an emergency, the Procurement Plans Division becomes the Procurement Progress Division. The principal objective is supervision of procurement with as little interference as possible with the actual procurement by the responsible supply service. This is accomplished mainly by observation of progress and the application of pressure whenever procurement difficulties cause the program to fall behind schedule.

29. Sections.- The war plan of the Procurement Progress Division provides for organization into three sections.

Procurement Review
Contact and Purchase Information
Procurement Analysis

30. Procurement Review Section.- The peacetime duties of the Current Procurement Branch of the Office of the Assistant Secretary of War are merged with the Procurement Review Section but the policies are changed to suit war conditions. Many of the restrictions on peacetime procurement must be relaxed to the greatest extent consistent with legal procurement of supplies which must be obtained rapidly. Current study of peacetime regulations indicates what restrictions will have to be removed or changed. Among others, advertising and competitive bidding regulations will have to be changed, particularly for non-commercial items. However, for most commercial items, competitive bidding will probably still be employed.

31. Other duties of this section will be (1) to supervise interbranch procurement and foreign purchases and (2) to investigate and settle such conflicts in instructions and procurement methods of the various supply services as raise obstacles to procurement and are not the concern of some other division of the War Procurement Branch.

32. Contract and Purchase Information Section.-

This section is the central source of information in the War Department on procurement. It is also the liaison agency with the supply services and the other procurement agencies of the Government. The outbreak of war will of course bring a flood of contractors to Washington seeking business from the Assistant Secretary of War as procurement director of the War Department. The Contract and Purchase Information Section will receive these men, give them such information as is available and send most of them back to deal with the procurement district from which they come. If restrictions are placed on procurement, this section will also review contracts of the supply services to insure that the restrictions are followed. Close liaison with the Legal Division is also maintained on all legal questions relating to contracts

33. Procurement Analysis Section.-

The Procurement Analysis Section is the principal tool of the Assistant Secretary of War in supervising procurement. Its work is mainly statistical. The facts about progress and their analysis to give a true picture of the situation are fundamental to control of the whole program. Its most important duty is to locate choke points where procurement is lagging and warn all concerned where pressure must be applied. Properly organized and aggressively managed, this Section might conceivably be the nerve center for coordination of the whole procurement program.

SECTION VII - REVIEW OF STEPS IN PROCUREMENT PLANNING

34. The slide now on the screen shows the various steps required to carry a new non-commercial item from its original general performance specification by the using arm through all the processes necessary to final procurement plan. There are 33 of these steps under the Ordnance Department cycle shown on the slide. The first 19 of them dealing with development to standardization have been described in another lecture. The other 14 steps are concerned with activities after standardization. The whole cycle requires years for its completion.

35. Step No 19 is final standardization. Following this step for a time there are two lines of activity. In Step 20 the Ordnance War Plans Division requests a basis of issue from the using arm, the using

in (Step 21a) recommends a basis which is approved by the General Staff (Step 22a) and returned to the Ordnance War Plans Division for wastage factors (Step 23a). The wastage factors are supplied by the Ordnance War Plans Division and returned to the General Staff for approval (Step 24). After approved wastage factors are provided, the problem goes back to the Ordnance War Plans Division where supply and procurement requirements are computed (Step 25) and furnished to the Industrial Service. While these activities are in process, another series involving much detailed work is carried on within the Ordnance Department. The drawings and specifications (Step 20b), work on gage design, check of tolerances, etc. (Step 21b), the preparation of a description of manufacture (Step 22b), and the determination of spare parts and accessories for maintenance (Step 23b) are involved in this series. With the information from the two series of steps at hand, the Industrial Service then tentatively apportions the necessary production to districts for study (Step 26). Each district, after survey of suitable plants, reports the production practicable from the District (Step 27). The Industrial Service then issues final apportionments to districts after taking into account what the persons can produce (Step 28). The District obtains accepted schedules of production from allocated manufacturers for its apportionment and sends copies to the Industrial Service to serve as a basis for the procurement plan (Step 29). The Industrial Service prepares a procurement plan for the item (Step 30) which is approved by the Assistant Secretary of War (Step 31) and returned to the Industrial Service. A copy of the approved plan (Step 32) is given to the Ordnance Field Service to indicate planned accretions to stocks for issue and the Ordnance War Plans Division is advised as to production so that any deficiencies can be reported to the General Staff (Step 33).

SECTION VIII - DESCRIPTIONS OF MANUFACTURE AND PROCUREMENT STUDIES

36. Before closing my remarks, it is essential that you have some conception of several other fundamental details of procurement planning, which I have barely mentioned.

37. You have heard frequently of descriptions of manufacture (Step 22b) which are handed over to a manu-

facturer along with specifications and drawings so that the manufacturer can make a production study suitable for his own plant. I will now pass around for your inspection a very fine example of a description of manufacture, the Upsetter Method for making 3" A.A shell, M42. This description was made at Frankford Arsenal and is the arsenal method for manufacturing this item. Incidentally the description is for an item which is likely to remain standard for a considerable period of time. The procurement requirement is 648,000 a month, a sizable mass production problem.

Note that the description covers the following essential information:

a. Some general notes on the arsenal's shop practice experience (general information).

b. The general drawings

c. The list of operations showing tools, number of operators, output, and the fixtures, jigs, tools, and gages.

d. The bill of material per shell and per 100,000 shell.

e. The contractor's inspection and the Government inspection.

f. The shop layout.

g. A list of machines required.

h. The drawings of gages, tools, jigs and fixtures.

It is readily appreciated how valuable this compilation will be for a commercial manufacturer who has never produced this shell. It is worth from four to six months in getting started.

38. Production Studies for conversion of individual commercial plants may almost be called the keystone of the whole arch of industrial preparedness where an educational order has not been applied. Such production studies are always costly if the necessary detail is to be shown. Some are factory plans, others are mere lists of requirements. Heretofore we have expected

manufacturers to make some sort of a production study at his own expense, when he accepts a schedule of production. Some have patriotically made such studies at their own expense but for many the item has been too heavy for justification in the corporate budget. For example, certain Air Corps production studies would cost \$15,000 to \$20,000 per plant. Some day the Government will either buy production studies made by manufacturers' personnel or have its own production engineers in the districts to make such studies and spare the manufacturers this expense.

39. The production study of the Lyman Gun Sight Corporation, Middletown, Connecticut, is a good example of a plan for a facility. This firm normally makes gun sights and therefore has experience, but please note in the copy being passed around the detail for the relatively small item, the telescopic rifle sight. Below are the elements

a. A bill of material and preferred sources of basic materials for every component.

b. The tools and equipment with preferred sources.

c. The sub procurement schedules for the order (note that there are none of these in the plan thereby making it still incomplete).

d. A list of component drawings.

e. The list of operatives, assembly route sheets, etc.

f. Requirements for power and labor.

I do not know what this plan cost the manufacturer, but it is obvious that planning work of this type must be costly.

40. A number of World War manufacturers were notably successful in their production of certain items and many made up histories of their experience. I will refer to only one of these histories, that of the Bartlett-Bayward Company of Baltimore, for the manufacture of cartridge cases. Please note in the copy now being circulated the following elements

- a. The list of drawings
- b. The equipment.
- c. The description of operations and the tests.
- d. The labor used.
- e. The average output per machine.

Probably the improved facilities of today would call for a different method of manufacture, but there is nevertheless value in this study for what might be called the "tricks of the trade" in metal working. This company had to solve problems in metal working and the history tells how it was done. If I were a district executive looking for cartridge case production, this book would be one of the documents in my brief case when I visited a prospective manufacturer.

41 Sometimes we lose sight, in our preoccupation with the non-commercial items and the difficulties in obtaining them, of the procurement problem for relatively simple commercial items where the factor of quantity enters largely into the picture. Q.M. Procurement Plan #45 now being circulated is for a waist belt. There is nothing difficult about this item in procurement planning. About 8,000,000 are required in 10 months. You will note that the Quartermaster General proposes to spread this load over 20 plants having a potential capacity of 46,000,000. He could of course get his production from a lesser number of plants, but the spread of production to involve only a fraction of potential production has its points of wisdom.

SECTION IX - CONCLUSION

42 At best, procurement planning is a long and tedious task, involving much detailed and sometimes monotonous work. It can pay no dividends until a war emergency galvanizes the country into maximum activity. If properly carried out on a sound basis in time of peace, it is reasonable to expect that the early mass

production of munitions which is its ideal can be realized. Every effort has been made to establish a sound basis. The future has yet to reveal whether our planned munitions power will win our next war.

Note Photostats of slides used in this lecture are available for detailed inspection in Procurement Plans Division, O A S W