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THE FUNCTIONS AND DUTIES OF THE STANDARDS DIVISION

by

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THE FUNCTIONS AND DUTIES OF THE STANDARDS DIVISION  
PLANNING BRANCH, O.A.S.W.

This paper is concerned with the functions and duties of the Standards Division. Briefly, they relate to the first question that arises in either procurement planning or current procurement. That question is "what to procure" How is a standard item of equipment selected? What is done in order to be assured that the standard selected can be obtained in quantity?

HISTORICAL

As a matter of history, the thought back of the need for such a Division goes back to the World War. The adoption of a standard for each requirement, and use of standards in all stages of production, was never more important. It was first initiated in the Commercial Economy Board of the Council of National Defense in 1917. A year later it was active in the Conservation Division of the War Industries Board. Effort was directed toward saving of labor, service, and material. These savings could then be directed to other essential war activities. The United States had an enormous consuming capacity. Small savings of material in any one item resulted in large savings in the grand total. For example, it is said that the mere holding of the length of thread on a spool at 200 yards instead of 150 yards saved transportation space represented by 600 cars. And that space was at a premium. At the time of the armistice it is reported that definite plans were under way to standardize many items of military equipment with a view to savings in the precious elements of time, material and transportation.

This concentrated effort on standardization gave undeniable proof of the advantages and possibilities of standardization when put on a national basis.

WAR DEPARTMENT POLICY AND AGENCIES

It is the War Department policy that at least one item of equipment be designated as standard for every required type to meet a military requirement. That is to be done in peace-time, in order that, in the event of an emergency, quantity production will not be delayed by not knowing what to procure.

In carrying out this policy The Assistant Secretary of War, The General Staff, and the Arms and Services are all involved.

The Assistant Secretary is charged by law, the National Defense Act, with supervision of procurement of all supplies. The Supply Arms and Services procure the required supplies.

The National Defense Act states that the Assistant Secretary of War "shall be charged with supervision of the procurement of all military supplies --- and the assurance of adequate provision for the mobilization of materiel and industrial organizations essential to war time needs \*\*\*\* Chiefs of Branches of the Army charged with the procurement of supplies for the Army shall report directly to the Assistant Secretary of War regarding all matters of procurement "

The preparation of military characteristics, decision as to suitability of an article for military use, classification of types of equipment, etc , are functions of the General Staff and the Arms and Services

#### STANDARDS DIVISION - MISSION

The mission of The Standards Division as it is now visualized, and as shown in the Mobilization Plan covers three activities. It is charged with

a. Consideration and clearance of items recommended for adoption as standard or substitute standard, as to questions of procurement.

b. Clearance of specifications.

c. Coordination of War Department activities on standardization and specifications with other Federal Agencies and with National Engineering and Technical Societies

It is proposed to discuss these duties in the order shown

#### SELECTION OF A STANDARD - The article to be procured.

Harriman defines a standard "as a criterion, measure, or example, of procedure, process, dimension, extent, quantity, quality, or time, which is established by authority, custom, or general consent, as a definite basis of reference or comparison"

A simpler definition is that contained in "Industrial Standardization" a book issued by the National Industrial Conference Board in 1929. It reads

"Standardization is the selection of a small number of types or sizes which are most suitable, and giving specifications to them in measurable terms so that large quantities can be made therefrom which will be uniform". This definition parallels the mission of the Standards Division as stated above.

A standard is simply the best that can be devised at the time Improvement and development are desired, but the standard should not be changed without reason or detailed study Standardization must not crystallize or retard development

The selection of a standard involves the type needed, the design, the development, and the specification for production The procedure to meet these requirements is set down in A R. 850-25.

If we follow an item through this process, a clearer picture may be had of the various steps, and responsibilities of the agencies concerned.

There is attached a chart showing the Steps in Development and Standardization and Procurement Planning as carried out by the Ordnance Department. If a similar chart were shown for other Supply Arms and Services, the essential steps would follow the same general procedure. Air Corps procedure will be touched upon later. The design, development and production of standard items of military aircraft are done by commercial concerns, at the instance of requests from and coordination by the Army Air Corps.

An idea as to the need of an item, or major modification of an existing item may originate in several ways Finally it will be placed in the hands of the procuring agency to develop. The idea may be initiated by an arm as shown here, or by a service, or by an individual It should normally be forwarded to the Adjutant General, who will refer it to the procuring agency for comment. Comment on it is coordinated by technical personnel of the procuring agency with the using arm. If the idea has merit, it will be sent to the General Staff with appropriate recommendation as to future procedure.

Let us assume, that a using arm has found a need for a certain item of equipment or a major modification of existing equipment

That request goes to the Supply Arm or Service charged with its procurement. The procuring agency, through its Technical Committee, coordinates the military characteristics with the interested using arm. In preparing military characteristics emphasis is placed on exclusion of all non-essential features, particularly those which increase cost, of special types when commercial would satisfy, of any feature that could delay production or complicate procurement. These are reviewed by The General Staff and action taken by the authority of the Secretary of War Once approved, the characteristics cannot be changed except by the same authority. Here we have the first brief specification for the item. Development of the item along these lines is then authorized as part of the Secretary of War's action

The Ordnance Department in its Technical Staff, then sets up the development project. The item is designed by the proper Division of the Industrial Service. The design is considered in the Technical Staff and after approval, manufacture of a pilot or prototype article is authorized. Regulations point out that adaptability to quantity production in an emergency is one of the most important requirements of design. Use of commercial items or their adaptation as far as possible is the policy of the War Department.

The pilot is manufactured at an Arsenal. The unit is given certain preliminary tests of the arsenal.

The pilot then goes to the Proving Ground for engineering tests. The item is classified as experimental in these stages of its development. If it passes these tests, which are observed by representatives of the Using Arm, it is turned over to the Using Arm for service test. These tests are carried out by the Service Board of the Using Arm. It may, of course, be necessary to repeat steps 5 to 10, if changes in the pilot are found necessary.

Based on the report of the Service Board and recommendation of the Chief of Arm, the Technical Staff recommends that a limited number be procured for extended service test.

The General Staff approves this item, then as a Limited Procurement type.

The Industrial Service has the authorized number manufactured at the arsenal,

These are then placed in the hands of an organization for their use over an extended period of, say, six months or a year.

If reports based on this test are favorable, the item is recommended for adoption as standard. Recommendation is included as to the priority of the item, based on its importance as to use - and whether it should be carried in war reserve or not. If it is to be a war reserve item, whether it shall be classified as an essential or a mobilization item. This is a command decision made by the General Staff.

AR 700-10 defines these terms as follows

"Essential items are those items of the War Reserve which are unobtainable from civil stocks or production in time and quantity required."

"Mobilization items are those items of the war reserves which cause less serious problems in procurement than essential items."

Priority for essential items is indicated according to a code. Three stars indicate urgent, two stars rush, and one star special. Unstarred items fall after starred items. It may be noted that not all items go through an extended service test. An item may be adopted as standard after the service test. In these cases steps 11 to 15 are omitted.

The Assistant Secretary must be assured that the article can be procured in quantity under emergency conditions. Therefore, the recommendation is forwarded through the Office of The Assistant Secretary of War for clearance for procurement. The following information is required of the procuring service on which to base this approval

- a. Whether it is for peace or war, or both?
- b. If for war, are adequate sources of supply available, or can they be made readily available?
- c. In war, will the procurement affect the whole program of procurement? Will it interfere with or complicate procurement of other standard items?
- d. Will it be procured from commercial sources or from a Government manufacturing establishment or both?
- e. If manufactured by the Government only, are sufficient facilities available for peace and war production?
- f. If from commercial sources, are its characteristics such as to restrict its procurement to one source of supply?
- g. Does it contain any strategic materials?

Based on this information the Standards Division clears the item for procurement as to type, and designates the procuring Supply Arm or Service, or takes such other action as appears best suited to meet the procurement problem presented

The General Staff approves the article as Standard and designates the classification thereunder

The Technical Staff records the approval in the Book of Standards.

The Division which designed the article then completes the drawings and prepares the specification

It sometimes happens that standardization of an item is delayed. The item may not be entirely acceptable to the using arm or the General Staff may not be ready to approve it as standard. At the same time it may be felt that the item to be superseded by the new development is out of date. Planning for the old item is a doubtful procedure.

With a view to furthering procurement planning in such cases Army Regulations provide that a Supply Arm or Service may, with the approval of The Assistant Secretary of War, initiate planning on items not yet standard. This authority covers items which have successfully passed the engineering tests and service test. The regulation provides that a tentative basis of issue will be furnished by the General Staff in each case for planning purposes.

Commercial participation in this important work is well illustrated by the aircraft program. The Air Corps having completed a study concerning the needs for a new or vastly improved type of aircraft, proceeds to prepare a specification. This specification, in contradistinction to those detailed specifications, having to do with manufacturing, with which we are most familiar, are, for the most part, performance specifications. This, and any other pertinent information bearing on the subject are then transmitted to the aircraft industry, particularly that segment familiar with and capable of building military aircraft of the type in question. Assume that four companies have indicated their interest in designing and building for delivery to the Air Corps a prototype airplane of the type desired, in the time specified in the circular proposal. Here it should be stated the design, engineering and production of such product is the financial responsibility of all companies participating in the competition for a contract award.

The four prototype airplanes are delivered to the Materiel Division of the Air Corps at Dayton, Ohio, where they are tested and otherwise evaluated by a Board of Officers appointed for the purpose. At the same time, the bids submitted by respective contractors, along with their products, are opened and the prices listed therein properly recorded. Following completion of the evaluated proceedings, the Board submits its ratings of the prototypes, a composite of engineering and service test estimates. On the basis of these data, and price considerations the Chief of the Materiel Division forwards recommendations concerning the contract award for a production order. Final approval of the Assistant Secretary of War is required for the execution of the contract.

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Subject to any engineering change order lists deemed necessary to the production of a quality product, the Contractor receiving the award proceeds with the manufacturing prescribed. The initial production items, usually three (3), are delivered to the Air Corps for tests and evaluation before acceptance as to military requirements, engineering refinement and performance considerations. Once approval is given the Contractor is free to increase his manufacturing operations as required for the production and delivery of completed airplanes in the quantities and on the dates agreed upon in the contract.

The coordination of the activities incident to a contract of the sort touched upon briefly above is much more complex than indicated. For instance, certain highly important component parts of the completed airplane are items supplied by the Government to the Contractor for installation. These include engines, propellers, wheels and brakes, instruments, radio, armament, cameras, to name only a few. When it is realized that individual contracts are required for the procurement of each of these items, and that their timely arrival at the aircraft factory is necessary to the delivery of a complete airplane, a better appreciation may be had of the manifold problems involved.

In an emergency, if quantity production is expected with the least delay, the standard on M-Day should not be changed. Change then, or later will undoubtedly cause delay. An example of change is cited when the 75mm caliber was adopted in the World War. It is reported that in one plant 3" shrapnel cases were in production. The change to 75mm is said to have required only a decrease of .05 inch on the outside diameter, and a corresponding slight decrease on the interior. Tools and equipment were available. The plant was experienced in making cases. No changes were required in the forging. Only machining was affected. The change, small as it was, resulted in a loss equal to nine days production, in a period of 5 weeks, amounting to 342,000 cases. If the change had been to a complete new item, or in a more complicated article, months might have been lost.

#### SPECIFICATIONS

The Assistant Secretary of War is charged by regulation "with the supervision of activities concerning the preparation of specifications and the progress of the work." In his office the Standards Division has the duty of clearing specifications. A specification is defined in A. R. 850-25 as "a clear and accurate description of a material, an article or service, which it is necessary to procure and the procedure which the purchaser will follow to satisfy himself that the requirements of the specification have been complied with." Harriman puts it another way.

He says "A standard of quality is a carefully drawn description covering the characteristics of a material, some supply article, or a piece of equipment, and should cover all of the points of variation which it is desirable to consider at the time the standard is adopted. Such standards of quality are termed specifications \* \* \* \* \*

A specification should be complete. It must cover all requirements either directly or by reference to other specifications. It should not repeat matter contained in other specifications to which reference has been made. It should omit matter covered by notes on drawings which form part of the specification. It should not contain matter contradictory to specification referred to as applicable. The preparation of a satisfactory specification is a difficult job. It is not possible to please everybody, but the specification must meet the requirements for the article, and it must be satisfactory for procurement.

A.R 5-140 lists the kinds of specifications which may be used by the Army for procurement. They are.

Federal  
U. S. Army  
Tentative  
Army-Navy, Aeronautical  
Navy

#### FEDERAL SPECIFICATIONS

When the Bureau of the Budget was established in 1921, it was considered desirable to prepare standardized purchase specifications for many of the commonly used articles purchased by the Federal Government. The Federal Specifications Board was formed by Circular No. 42 of the Bureau of the Budget by authority of the President. This Board carried on with the Director of the National Bureau of Standards as chairman, ex officio, until 1935. The order of the Executive Director of the National Emergency Council dated January 24, 1935 abolished this Board along with several other activities of the Government. These activities were made one of the duties of the Procurement Division, Branch of Supply, Treasury Department, as approved by the President on April 12, 1935. The Director of Procurement, Treasury Department, established the present Federal Specifications Executive Committee by Circular Letter No. 106 dated July 16, 1935. The active management of the preparation of Federal specifications is under the direction of the head of the Federal Specifications Section of the Procurement Division. He is also Vice Chairman of the Federal Specifications Committee.

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Generally they are intended to cover items of material or supply non-military in character, that are commonly procured by two or more Government Departments.

Any department of the Government may initiate a request for the preparation of a Federal Specification. If favorably considered the request is referred by the Federal Specifications Section to a Technical Committee made up of representatives of all interested Government Departments. The tentative specification prepared by this committee is submitted to the Federal Specifications Section, which in turn submits it to all Governmental Departments for comment or agreement. The departments review the specification and return it to the Section with recommendation or comment. Depending on the comments received it is either referred back to the Technical Committee for revision or for final draft. Federal specifications when published are mandatory on all procuring agencies of the Government. An exception is made however, in case any executive department finds that for administrative reasons a Federal specification cannot be used to meet a particular need, it is authorized to use purchase specifications of its own. They must, however, include all applicable provisions of the Federal specification. If the purchase is over \$1,000 a report is required to the Procurement Division, Branch of Supply showing the necessity for deviating from the Federal specification.

The Standards Division has several duties in connection with this work. It represents the War Department on the Federal Specifications Executive Committee. It arranges for War Department representation on technical committees, charged with or engaged in preparation of specifications of interest to the War Department. It acts as a clearing house for all War Department administrative activities concerned with the preparation, acceptance, rejection, or revision of Federal specifications. The War Department members of these technical committees are appointed from the Supply Arms and Services having paramount interest in the item, as recommended by the Chief of the Supply Arm or Service concerned. Tentative specifications are referred by the Standards Division to the Chief of the Supply Arm or Service, who would ordinarily prepare a U. S. Army specification for the same item. He coordinates the specification with all other interested Supply Arms and Services and recommends to the Assistant Secretary of War the War Department action. The Standards Division then completes the action for the War Department on the specification and returns it to the Federal Specifications Section.

The work of preparing Federal Specifications is performed by approximately 73 technical committees. The War Department is represented on a large majority of these committees. About 1180 Federal specifications have been prepared.

## U. S ARMY SPECIFICATIONS

These are prepared by the Supply Arms and Services for all standard items of equipment and supply and materials used in the construction of a standard item, if such materials cannot be adequately described in the specification for the item itself. Their use is mandatory on all purchasing agencies of the War Department.

The supervision of activities in the preparation of U.S. Army specifications is a function assigned to the Standards Division. The Division does not concern itself with engineering features or technical requirements. It acts in an administrative and policy forming capacity. It prescribes how a specification will be prepared, how and from whom concurrences are to be secured, and how assurance will be obtained that the specification is adapted to commercial manufacturing methods and mass production. It is required that a specification submitted for clearance be accompanied by data which will indicate its acceptability under policies of The Assistant Secretary of War. A.R. 850-25 is the medium of publishing these instructions and policies.

The specification must adhere to the military characteristics approved for the item by the General Staff. Throughout the development of the item, its adaptability to quantity production must be a matter of continuous consideration. It is a policy of the War Department to require the adoption of standard commercial items, or their adaptation with the fewest practicable modifications. The design of the item, and its subsequent tests are matters which determine the suitability of the item. They constitute the framework around which the procurement specification is written. Every specification after it is written must be coordinated with other interested Arms and Services of the War Department before submission to the Assistant Secretary of War. This serves as a check of correctness, and also to unify as far as practicable the specifications used in common by two or more Supply Arms and Services.

A specification submitted for clearance is accompanied by data to show that the item is an adopted type, that is, it is either standard or substitute standard.

Whether it is restrictive in any way that might curtail production, or which might give one or more manufacturers an advantage in the field of competition.

Whether industry has been consulted in its preparation. If so, have the comments been incorporated in the specification. The best test is actual procurement, but that is not always possible. It is possible, however, to submit the specification to a number of companies for comment.

Whether there are any features which have been commented upon unfavorably by industry, but which are deemed essential for retention in the specification in order to meet the prescribed military characteristics.

If a specification is satisfactory to the using or interested arm or service, if it contains no restrictive features, and if it is acceptable to industry, it can be and is cleared promptly with the assurance that it meets the responsibilities of the Assistant Secretary of War. This clearance by the Standards Division makes it a U. S. Army Specification and it is listed in the Index. The Index is an annual publication listing U. S. Army Specifications and Federal Specifications used by the Army. If it is not satisfactory in the respects mentioned it is returned for further consideration with a view to eliminating the undesirable features insofar as practicable.

Specifications may be returned without clearance for less important reasons. These may relate to incorrect or incomplete form, incorrect numbering, and apparently excessive use of subsidiary specifications or like administrative reasons.

The revision or cancellation of U. S. Army Specifications is accomplished generally by the same coordinating process that governs the clearance of an original specification. Cancellation normally becomes necessary when the item is made obsolete or when the specification is superseded by an applicable Federal specification. This work of revising specifications requires almost as much time and effort on the part of Supply Arms and Services as does the preparation of new specifications. Standards do not remain the same over a given period of time. Improvements in design of military equipment and changing methods of commercial manufacture are constantly taking place which require modifications in specifications. Where these modifications are material ones, the revision of existing specifications becomes necessary and is accomplished by the preparation of an entirely new specification to supersede the old one. However, if only a minor change is involved, this does not require complete revision of a specification but is published in the form of an amendment to the specification which becomes a part of the specification until it is revised. Supply Arms and Services are authorized to prepare and use amendments without the approval of The Assistant Secretary's office.

TENTATIVE SPECIFICATIONS

Tentative specifications are prepared and used by Supply Arms and Services. AR 850-25 authorizes this type for two purposes:

- 1. To cover the purchase of articles required only occasionally or for temporary piece-time use.

b. To test the procurability of a specification when it appears desirable to do so before preparing it in the form of a U. S. Army Specification

The Standards Division has nothing to do with tentative specifications beyond the formulation of policies governing their use. They are not required to be submitted to the office of The Assistant Secretary of War for clearance or for any other action. No record of them is kept except with the Supply Arm or Service that prepared them.

There is one instance, however, where a tentative specification is used in a different way than we have just mentioned. This relates to the purchase of motor vehicles. The General Staff has never included motor vehicles in any standardization program except to approve military characteristics for various types. Consequently, motor vehicles during any one fiscal year are purchased under tentative specifications which are written around these military characteristics. Because of the volume and importance of this type of purchase, The Assistant Secretary decided to make an exception to the usual practice, and to require in the case of tentative specifications for motor vehicles that they be cleared through this office in the same way as U. S. Army Specifications are cleared.

#### STATUS OF U. S. ARMY SPECIFICATIONS

There is attached a chart showing the status of preparation of U. S. Army Specifications as of October 1, 1938. These figures are compiled from monthly progress reports submitted by the Supply Arms and Services.

The second column shows the number of standard items covered by specifications, while the third column shows items not covered by specifications and the fourth column shows specifications on hand.

The fifth column, specifications yet to be prepared, is an estimate of the number yet to be prepared. Several specifications may be necessary for one item in order to cover all the elements required for its manufacture. In some cases one specification may cover several items. That is particularly so in the case of drugs where the standard is established by the U. S. Pharmacopoeia. Much work remains to be done before the U. S. Army specifications can be said to be complete. At the same time, however, there are a considerable number of specifications in use, which have not reached the stage to be placed in U. S. Specification form. The sixth and seventh columns indicate progress of in the past twelve months. The preparation of a satisfactory specification requires considerable work, and it must be done by

qualified personnel. The funds available for specification work are the controlling element. They have not so far been sufficient to make greater progress in the preparation of specifications.

ARMY-NAVY AERONAUTICAL SPECIFICATIONS.

The Aeronautical Board has for several years been engaged in standardization of Army and Navy aeronautical material. Until recently this work consisted of preparation of master drawings of components, and master specifications for material. Based on these masters, each service prepared its own specifications. Within the past year the Board has taken up the project of issuing joint documents which have to do with procurement of aircraft material. One such document is an agreement between the Army and Navy and Commerce on strength of aircraft elements as a uniform basis for calculating the allowable stress of minimum strength of type structures. The Board is now preparing joint specifications for material based on the former master specifications. These specifications are authenticated by the Army and Navy Munitions Board, since that is the joint agency concerned with the procurement of all material. As far as the War Department is concerned the characteristics of these specifications are considered in regard to their suitability for use in the same way as a U S Army specification. It is understood that some 100 such specifications are now in process. They are mandatory in the War Department for use in the procurement of aeronautical material and supplies.

NAVY SPECIFICATIONS

The use of Navy specifications is not mandatory within the War Department. Their use is encouraged wherever applicable, and in the absence of a U. S. Army or Federal Specification, in order to avoid duplication of effort.

LIAISON WITH OTHER TECHNICAL AGENCIES ON STANDARDS

The work of maintaining relations between the Army and certain National Agencies, concerned with the promotion of standards for commercial materials and practices is assigned to the Standards Division.

The most important of these are the American Standards Association, and two separate divisions of the Bureau of Standards, Department of Commerce, namely the division of Simplified Practice and the division of Commercial Standards. All three of these organizations provide the forum for independent standardizing bodies and societies and the mechanism for bringing them together in their work of standardization. Proposals for the adoption of commercial standards or for the elimination of excess varieties of sizes, types, dimensions, etc., as the case may be,

may come from organizations representing the consumer, distributor or producer. The work of preparing the actual standards or simplified practice recommendations is done by committees, as in the Federal Specifications Section, and the acceptance of them is indicated where agreement among all participating bodies has been reached. The Standards Division arranges the necessary War Department representation on the working committees of these national organizations and indicates the agreement or recommendation of the War Department on a proposed standard or practice. The administrative procedure by which this is done is similar to that previously mentioned in connection with the clearance of Federal Specifications. There is a difference however between a Federal Specification and a Trade Standard or Simplified Practice Recommendation of the agencies we are now discussing. The former is an actual procurement specification mandatory in nature and affecting only Federal Departments, whereas commercial standards and simplified practice recommendations are national in scope, and, although not compulsory, are so widely accepted throughout industry as to be just as effective. By utilizing applicable commercial standards and simplified practice recommendations of these general standardizing agencies and of other numerous technical and trade organizations, Chiefs of Supply Arms and Services may improve the quality of specifications as well as reduce the difficulties of procurement.

Before closing, brief mention should be made of certain work in the Standards Division that fits into other work of The Assistant Secretary's office. It has been stated from this platform many times that an answer to the question of "what to procure" comprises the initial step in procurement planning. Carrying this idea further, no satisfactory determination of "what to procure" can be reached for any item, or procurement planning initiated, until that item has first been covered by a specification satisfactory to industry. Consequently, every procurement plan that reaches the Procurement Plans Division, Planning Branch, is a matter of concern to the Standards Division. Every such plan received is examined to insure that proper provision has been made in it for the use of U. S. Army Specifications, Federal Specifications, or some nationally approved commercial standard. Any plan that does not make satisfactory provisions for a standard type of specification is referred back to the Chief of the Supply Arm or Service that prepared it, for revision or recommendation.

The Standards Division has interests in common with the Commodities Division with reference to the use of strategic and critical raw materials in specifications. The conservation of these materials and the use of substitutes are constantly sought. These things are usually done before a specification is prepared, since the Chiefs of Supply Arms and Services, by reason of their representation on Commodity Committees, are familiar with

the quantities of these materials that are expected to be available and they endeavor to restrict the use of them accordingly. Sometimes, it is found necessary to revise an existing specification or to prepare a substitute specification to meet shortages.

The Standards Division also maintains close contact with the Current Procurement branch of the Office of The Assistant Secretary of War in matters that concern the extent to which proper specifications are used during peace time and the suitability of existing specifications for procurement purposes.

I would like to close by giving you, without comment, three quotations from authoritative sources on the subject of the importance of standardization in the Army.

The first is taken from "Industrial Standardization" by the National Industrial Conference Board. It reads

"The War Department is much interested in Standardization. In time of war it must rely to a large degree upon proper specifications, for the reason that a considerable part of the necessary purchasing will be in the hands of inexperienced people. It is important in such circumstances to know from what sources standard goods and equipment can be purchased. In the actual conduct of war, as was shown during the last two years of the World War, success may depend to a large and even crucial degree upon interchangeability of parts of machines, ammunition and other types of equipment. Not only is a variety confusing, but it is very expensive, either in war or in peace."

The other quotation is one with which you are probably already familiar. It is taken from the Annual report of the Chief of Staff for the year ending June 30, 1936. It reads

"I have been convinced for some time that the lack of standardization of equipment of every variety in the Army is a distinct detriment to procurement as well as performance, and that standardization is an essential not only for efficiency but to counteract the mounting cost of production. In past years there has been too much of a tendency to delay adoption of an item pending further test and improvement. There is no question that this procedure has resulted in a delay in the procurement of essential items urgently required for the training of troops, especially in new doctrine and tactics. This is particularly true in the procurement of airplanes, tanks, motor vehicles, and automatic rifles. I believe that we can standardize our equipment, purchase the best that is available at the time, and change the standards annually, if necessary, as improvements or defects develop."

The third quotation is from a talk by The Assistant Secretary of War to Chiefs of Supply Arms and Services, Procurement District executives, the Army Industrial College, representatives of the General Staff and from the Army War College, on December 1, 1938.

"The next bottleneck that I want broken is that of standardization. Because the responsibility in this phase of preparedness is divided, I ask for harmony and cooperation toward its achievement among all those concerned. You of my office, members of the War Department General Staff, line officers and supply officers - all of you must work together toward standardization of equipment. Without standardization, mass production will be impossible.

"In the interests of standardization you must strive toward the simplification of military machines and weapons. Some degree of complexity, I realize, is inescapable but we must try to hold it to a minimum. When faced with the alternatives between a complicated, delicately constructed machine of superior performance and one less perfect but more easily adjustable to mass production, we must choose the latter. We may have to accept something that is eighty percent efficient which we can obtain rather than wait for a more perfect item which may be just around the corner. The standard may not be the most efficient that can be visualized but if M-day comes tomorrow, we will have to go to production on that basis."

WCY/MS  
12-2-38

STATISTICAL STATEMENTS OCT. 1, 1938.

Branches	Number of Specs. Covered by US Fed. Specs	Number of Specs. Covered by US Fed. Specs.	U.S.A. Specs. On Hand Jan 1, 1938	Number of Specs. re- maining to be written.	Clearances new Spec- ifications. 12 months to Oct. 1.	Revised Speci- fications 12 months to Oct. 1.
Quartermaster	979	875	692	792	35	40
Medical	1605	1595	393	548	21	7
Engineer	108	15	243	29	12	3
Communication	237	41	707	109	57	65
Signal	234	436	606	17	41	68
Chemical	38	27	200	57	5	6
Air	267	497	677	497	53	31
Coast Artillery	28	29	56	70	1	0
Totals	3496	5915	3639	2209	225	220

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DISCUSSION

following lecture by Lt. Colonel William G. Young, O.D.

December 8, 1938

Major McPike: In looking at your list there on the board, as far as I can see it, the number of specifications there, compared with the specifications written, looks to me about 50%. Do you think that is a very optimistic picture or not?

A. I have stated the case as I know it, namely, the reasons why there have not been more formal specifications prepared. I say that runs about 60% for formal specifications and does not cover the descriptions. It does not cover the tentative specifications which are in use. It does not cover the secret and confidential specifications which are in use. The policy of the War Department is that they shall be processed to the form of a United States Army specification or a federal specification and that is what we hope to do.

Q. In your opinion, what can the Assistant Secretary of War's Office do to make the process of specifications? Do you think they should take any active part in the preparation of specifications?

A. No. In fact, there has been a great deal of pressure put on the matter already as you all know. Much more than the Standards Division would put on it or could put on it. As a matter of fact, if we followed the policy in the past, it is a matter of money and personnel and it is a long job and it

costs a great deal of money to prepare a good specification. You can't do it in a day and you have to have somebody who knows how to do it. I think the Procurement Division has a great deal on hand to carry it out at present.

Q. Colonel Young, according to the Ordnance Department chart there on standardization and procurement planning, it is indicated that somewhere in that bowl there is a division between development of standardization and procurement. Can you indicate to the class about where that comes?

A. Of course that would come in mainly in the use of substitute materials and there are a number of specifications now which do provide for substitute materials. In fact, it is interesting to note that in the technical committee which I mentioned, a great number of items came up which are recommended and a substitute standard given because that particular item can be obtained with ease, perhaps, whereas the standard item might be difficult to obtain.

Q. I hadn't that in mind. Take that bowl which starts from one to ten. It starts with development in standardization and then you go into procurement. How far does standardization go and where do you enter into procurement? Where does the procurement actually enter into it? I mean, not the actual procurement, but the thought so that the item can be obtained and can be produced in quantity.

A. It starts right here (indicating 2), and it comes in here (indicating 5) in design and in 6, approval of design.

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Of course, those will be subject to change when it gets to manufacture, because at first the design is never perfect.

Q. Then so far as procurement is concerned it enters in practically at the start?

A. It is intended to start at the beginning.

Q. Following that last thought a little bit further, take step 17, the supply arms and services. When they send that down for standardization and there is a certain specific material in question. Suppose they say it cannot be procured readily in time of war. The commercial facilities do not exist. What do you do about it?

A. I think it would be a case for rather serious consideration. Namely, possibly, the use of a substitute, following out the idea of that. You can't always expect to get in quantity the item which is one hundred per cent efficient for the purpose. You might have to take a lesser degree of efficiency. That would be the way it is handled now, at any rate, in the adoption of substitute articles from time to time.

Q. But you know some of them are not readily procurable, even if you say they are.

A. True. We know that a tank is not easy to procure. It is certainly a complicated mechanism, but we have on the other side the actual requirement for that vehicle. The same applies to the semi-automatic rifle. I dare say that without the equipment we now have in the setup--if you started cold it would be quite a job. You have to admit those. You have to have that degree of complexity and accept it, and we do.

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Q. Colonel, several years ago the Quartermaster Corps in connection with the obtaining of trucks for the Civilian Conservation Corps had quite a difficult time of it. They had a suspension against them in the general amount of over five million dollars. One of the motor manufacturers was putting out a truck which has a high speed passenger type of engine in it and which did not stand up on bad roads. The information that came into the J.A.G.'s office in connection with the fight with the Comptroller General showed that those trucks went to pieces in a short period of time. Now they were fine on good concrete roads. The fight lasted for quite a while and finally the Comptroller General allowed payment to be made. However, I understand that the Quartermaster Corps was practically forced to knuckle under and thereafter to leave the thing wide open so that this company could bid, no matter what type of engine they had, no matter whether it held up at all. Now what arrangement have we got in time of war for a specification which would enable us to obtain the rugged truck or tractor that we need, that would hold up, and avoid a similar experience to what the C.C.C. had in that case?

A. I am not familiar with the history of that case, although it did occupy quite a great deal of attention at the time, as you all know, as far as I know, at the present time, the specifications which are prepared every year follow a practice which would permit more than one bidder, and that, as I understand it, is beyond the

system of allocations, of course. It still would be the specification which probably would be used in war.

Q. They permitted more than one bidder but very definitely knocked out one bidder and that bidder was powerful enough, although the legal position of the Quartermaster General was absolutely right and although there was authority from the President of the United States for what the Quartermaster Corps had specified, the ultimate result was that the Quartermaster General had to open this thing up. In time of war that could be very serious.

A. The history shows that the Q.C.C. had a load of bum trucks. I don't know. I haven't check the allocations for motor vehicles. That, however, would be the answer to the point, I believe. Whether it is regarded that the particular motor vehicle in question would be acceptable in war.

Q. They had a performance specification and the performance wasn't there. In other words, we gave in to the Comptroller General.

Colonel Miles: No, we gave in to some politicians.

Q. I note that you have 707 specifications on hand and only 519 yet to be made. How are we to infer from that that the great many of the items are covered by blanket specifications and therefore no individual specifications, because there may be many many hundred more of ordnance items that would be covered by some specifications?

A. I am taking that as the statement of the supply arms and services. I haven't questioned it and you might even raise

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the point as to the number of standard articles. Of course, that definition as to what should be listed as a standard article is susceptible to interpretation. The Quartermaster Corps has a number of items more than the Ordnance Department. A great deal of these are components, etc., which are covered by specifications for the article itself.

Q. Colonel Young, I have a question in regard to the column showing the number of specifications on hand. On any one of those items the articles covered might not be covered by the specification. It might involve a hundred specifications for the one item. Is that right?

A. That is particularly the case here in the Air Corps. That might be and probably is more than 497 when they get into it. These figures will undoubtedly change. They won't come out that way exactly. In fact, I see these figures go round and round and I usually take some figure near it rather than the exact figure.

Q. Colonel Young, I want to go back to Major McPike's question again. It brought out the point that it didn't look like we were making much progress in preparation of specifications. About six years ago I know that some definite action was taken, pressure was brought to bear on different supply arms and services to create or to formulate a program of preparation and specifications and they were to set a definite number on which they would clear monthly. We all know that in our procurement specifications it is vital to obtain the proper light and quality of material, etc. It is not

only vital to us but it is vital to have specifications for the bidders. It appears to me that pressure is not sufficient yet to get these specifications through under your setup of clearance. I notice that the Coast Artillery clears one a year, and they have 70 to clear. At that rate, it will take them 70 years. The same with the Quartermaster Corps. They should have specifications, but the process of getting those specifications is too slow.

A. I think it will be quite active from now on.

~~Major McPike:~~ Will you indicate a little further what, in your opinion, is the future of the Army-Navy specifications. Is there quite a field for development, in your opinion, and is there going to be more?

A. That is the first <sup>joint</sup> Army - Navy specification project that I am familiar with, the first one I have heard of. Of course, they have tried before to make a joint specification for common items such as blankets and things of that sort and they have not, so far, found that they could use the same one for some reason or other. However, here we have an effort being made and results are being obtained by the Aeronautical Board through the cooperation of the Army Air Corps and the Bureau of Aeronautics to prepare a series of specifications which will go into quite a field of items, although at the present they are limited to procurement of aeronautical equipment. I believe that will go farther than just aircraft and the component parts of aircraft, because it will probably include bombs which are used by aircraft and possible the radio equipment used by aircraft. If it is successful it might be the opening for further

SHOULD be proceeded

with, what date the drawings and specifications would be chopped off 513  
and under which procurement would be made where they are  
applicable. However, as it is now set up, that field will cover  
all of the materials or components that enter into those particular  
items. It will, in the first place, make some duplications. I do  
not believe that is objectionable because it may lead to something  
further and better.

Colonel Miles: I think all the cooperation between the Army  
and Navy is bound, sooner or later, to lead to more progress along  
that line. It is certainly desirable. As a matter of fact, the  
Army furnished the Navy and Marine Corps a good many items of equip-  
ment now. They have accepted these standard items which are applicable  
to them in many instances. Colonel Young, the thing that I am most  
interested in, that reverberates around in my mind, if there is any  
such thing, is the necessity for stabilizing these standards. Now  
the other day Colonel Quinton told me that when it came to educational  
orders in connection with the automatic rifle, that he called upon  
the Springfield Armory for advice as to what date should be considered  
as the standard under which the educational order should be proceeded  
with, what date the drawings and specifications would be chopped off  
and under which procurement would go ahead. He said, "What is your  
recommendation?" The Armory said it had no particular recommendation.  
"All right," he said, "It will be 4:30 yesterday afternoon." He  
said that the automatic rifles under the educational orders would be  
procured in accordance with drawings and specifications as they existed  
at 4:30 yesterday afternoon. I told him: "That is the best thing

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you have done since you have been in the Army." Because the Springfield Armory, under the pressure of its development and the pressure induced by the fact that the automatic rifle isn't as perfect now as it will be ten or fifteen years from now, would continue to change it and shoot through changes to the Standards Division here one after the other as long as you let them do it. Now you can't do that and get procurement. I think that is one very important policy that ought to be adopted by the Assistant Secretary of War. He should insist that standards be set as of given dates and that also a period be set over which there would be no change in the standard. Now it may be one year or two years or five years, it depends upon the item and service and all that. That won't mean that development on that item won't go forward but it would mean procurement. As of a certain day we would know what we were going to procure. I think you ought to have a policy that would make every chief of branch report to you within a reasonable period in which the standardization of a particular item and a particular date should hold and make him adhere to it.

Colonel Young: That thought which Colonel Miles advances was put into effect in current procurement in 1935 by a statement from the War Department in which a budget cycle was set up in which no change of standards would be permitted. There was more to it than that. However, one of the first things I looked into was the status of that directive to find out how closely it had been followed. The first answer was "No, it has not been followed", because

we are now in a current procurement year and we don't know certain items that are to be procured. Of course the other phase of it is that planning cannot be brought through its cycle unless you set up the proper one. A period of four or five years has been advanced by the Planning Branch. I don't think you can tie it down to a specified number of years. The airplane situation might demand one length of time and something else another.

Q. But certainly you could make every chief of branch indicate a certain date for every item and you could approve it, under which he would be required to adhere as a standard for the item which he had designated, if he would place a reasonable period.

A. The Chief of Staff indicated the same thought in 1936. He thought the standard should be made annually if necessary, or some period as short as that.

Colonel Miles: We are all too good natured about certain of these things.

Q. Along that same line and following out that thought a little further, it seems to me there is an important lesson that could be drawn from the automotive industry. Now that is one of our most successful industries in this country and every Fall they come out with a new car. Well, that car may be simply a repetition of the one they put out before but at least in appearance it is different, and every once in a while important engineering changes in that car are made. During the year they are working on those changes, but everybody in that car-designing force knows that on

a certain date they have got to produce one car complete, which will have all the modifications and advances which they have been able to make during the year. They come out with that car. Not only is it a new car but no one knows very much what its going to be like until it does come out. Now that is a highly technical item and it is one in which engineering advances are being continually made. Yet, during the production of that car no change is allowed and it goes on for a year without any change and then you have a new car. That same general principle, it seems to me, should apply to our work. I suppose the heads of the designing departments in the automobile factories know that if they don't get their designs in and ready for production on a given date they will lose their jobs, but somehow or other they do produce this improved model on a certain date and thereafter it is standard for a considerable period of time. If some such scheme as that could be utilized in our work--of course, our limitations of funds and engineering assistance and so on, perhaps are not applicable in the automotive industry. Well, the whole difference is, they are out to make money while in the Government we are tied down to a bunch of politicians.

Colonel Miles: We are tied to them in time of peace but we are not in time of war. Somebody else shakes the finger. In time of peace the politician shakes his finger but in time of war he doesn't shake many fingers. He can't be allowed to.

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Q. I was just going to say, in time of peace, if we can't put in a mechanism today to tie the hands of the politicians and get them to think of production right up there, then there is nothing the rest of us can do down below but take orders, because we have got to take orders. The technical staff does its little bit but it doesn't get very far and the General Staff certainly doesn't care much about production--doesn't know about production.

Colonel Miles: Somebody somewhere has got to realize the seriousness of this situation, because, otherwise, if we go into a war under the present halter skelter procedure we are not going to get the stuff. Nobody is going to know on M-Day what is going to be produced or whether some bright-eyed genius is going to work and change the standard entirely. Nothing doing. If they ever make me Chief of Ordnance they had better look out. They are going to have some stabilized standards. For that reason there is probably no danger of it, because too many toes would be trod on. It would be a terrible thing if we had something stabilized and standardized for a period of time. All the little bright-eyed boys would have to draw in their horns.

Q. If you don't mind, Colonel, I'll go from the sublime to the ridiculous. Where does the final word come from on whether essential raw material will be used in a given thing that is to be manufactured for use in the Government, the General Staff? For instance, where a strategic or critical material to go into some item of equipment is needed, who is to say whether or not that

item is needed, or whether, on account of having that material in it, it would be accepted or not?

A. I believe the question there is of the raw material. At any rate, the Assistant Secretary has the say as to whether that particular thing is obtainable for that reason. Of course, he doesn't have the question of priority as between two or three of them, if it is limited. Then it is the General Staff, because they say the military priority of the item. As to whether the use of that material would stop the procurement of it is the Assistant Secretary of War's decision. That is my understanding of it, at any rate.

Q. Colonel Young, in referring to your chart here, "Status of Specifications", I notice that the relationship between the number of standard items not covered by specifications and the number of specifications remaining to be written is rather reasonable in all branches except my own, the Signal Corps. They show there that they have 436 standard articles and only 17 specifications. The rest remain to be written.

A. I can tell you why it is that way. As I said before, those are taken from the statements of the chief of branch, and in this particular case, that point has been questioned many times, and it comes back mainly to your radio equipment. The Signal Corps, and I think there are other branches concerned in a similar situation, the Air Corps, particularly. In the Signal Corps they said that they were using a great quantity of tentative specifications

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which they do change every time they procure, practically, and they have not desired to put those in the formal United States Army specification form. That is the exact status of it at the moment.

Colonel Miles: Are there any further questions? There appear to be none. I think this has been a very important subject this morning and Colonel Young has given us all a clear insight into standardization. I am sure that we are going to get some progress in the next few months on this important work and probably a good many of these will receive a decided jolt this year in comparison with the progress in previous years. I want to thank Colonel Young for his time and very excellent exposition on the subject.