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THE STANDARDS DIVISION

PLANNING BRANCH

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Lecture delivered November 13, 1935.

by

Lieutenant Colonel John Mather, Ordnance Department,

to

The 1935-1936 Class of the Army Industrial College

and to

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FUNCTIONS
OF
THE STANDARDS DIVISION
OFFICE OF THE ASSISTANT SECRETARY OF WAR.

America's experience in the World War showed the very great importance munitions play in a modern war and the absolute necessity of fixing responsibility in advance and of making proper plans for munitions procurement in the relative tranquility of peace instead of having to make the plans and perform the procurement under the stress of actual war as was done in 1917 and 1918.

That this will be done, it was so written into the National Defense Act and made the responsibility of The Assistant Secretary of War. The Planning Branch, Assistant Secretary of War is the agency for supervising and coordinating this work in the procuring branches. The Standards Division is one section of the Planning Branch.

The Standards Division, Office of The Assistant Secretary of War, is the successor to the Conservation Section, Procurement Control Division of the Office of the Director of Procurement, as that organization was proposed, until the Industrial Mobilization Plan of 1933.

The original concept on which the Conservation Section was formed was that it should carry on for, and within the War Department, the conservation activities of the Conservation Section of the War Industries Board. Briefly, those activities consisted of efforts to conserve materials necessary in war by a judicious process of standardization and of simplification. To this end the mission of the Conservation Section, Office of The Assistant Secretary of War was defined in the Unit Plan, edition of 1931 as follows:

"Mission: The Conservation Section is the technical coordinating agency of the Director of Procurement. It is charged with:

- a. Clearance of War Department designs and specifications for procurement.
- b. Supervision of liaison between Supply Agencies of the War Department and national engineering and technical societies and agencies dealing with standardization of practices and materials specifications.
- c. Supervision of the building up of war reserve stocks of munitions and the use of materials held in War Reserve."

Following the revision of the Industrial Mobilization Plan in 1933, the War Organization of the Office of The Assistant Secretary of War was also revised. Under this revised organization the Conservation Section, Procurement Control became the Standardization and Specifications Division of the Office of the Director of Procurement, Office of The Assistant Secretary of War. Its duties are defined in the Unit Plan, 1933, as follows:

"1. Mission: The Standardization and Specification Division is the technical coordinating agency of the Director of Procurement.

It is charged with:

- a. Clearance of War Department designs and specifications for procurement.
- b. Supervision of liaison between supply agencies of the War Department and national engineering and technical societies and agencies dealing with standardization of

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practices and materials.

- c. Liaison with War Department General Staff concerning the building up of war reserve stocks of munitions and the use of materials held in war reserve."

In the Tentative Procurement Organization, Planning Branch, Office of The Assistant Secretary, which became effective tentatively in August, 1934, the Division became known as the Standards Division with the following indicated duties:

- Standardization
- Specifications
- Essential Item List.

At a recent conference in the Planning Branch, it was decided that the duties pertaining to keeping the Essential Item List and the use of materials held in War Reserve Stock were more appropriately a function of the Plans Division and they have been made a part of that Division in the latest approved Office Chart.

These duties have not been further defined, and the mission of the Division is conceived to be the same as shown in the Unit Plan, Office of The Assistant Secretary of War, 1933, quoted before, with the exception of the functions pertaining to the Essential Item List and War Reserve Stock.

The subject of standards and specifications has been a growing one during the past twenty years. Much impetus has been given to an industrial program of standardization and simplification in industry following the activities and report of the War Industries Board.

A great national movement was launched by technical societies and trade associations in this country to standardize on grades, sizes, kinds and qualities of commodities produced or needed for national existence; to increase and assure the flow of production of these commodities and to eliminate unnecessary sizes and varieties.

STANDARDIZATION

To quote from Harriman, "Standardization may be defined as the unification of the methods, practices, and technique involved in the manufacture, construction, and use of materials, machines, and products, and in all lines of endeavor which present the necessity for performing repetition work. From the viewpoint of the buyer and vendor, it is the establishment of a criterion for the dimensions, quality, or performance of those materials, machines and products. In its former aspect, it tends to assist scientific and engineering development and to prevent waste in manufacturing. In its latter aspect, its purpose is principally to assist in promoting a common understanding between producer and user."

"Standardization primarily means the setting up of standards by which extent, quantity, quality, value, performance, or service, may be judged or determined. It is the crystallization of the best

thought and practice of industry, business, or art into definite forms for general usage."

A standard is simply the best that can be devised at the time. While improvements and developments are desired, standards should not be changed without reason or detailed study. Standardization must not crystallize practices or retard development.

DEVELOPMENT

The first step in procurement planning is to determine what to procure. This involves a determination as to types of equipment needed, their design and development, and the preparation of proper specifications to enable industry to manufacture them.

The development of military equipment involves many agencies within the War Department and must pass through many stages before it can be classed as standard. The military necessity of an article having been determined, the using arm or service must formulate the military characteristics, coordinated through the appropriate technical committee. After approval by the Secretary of War, no material departure from established characteristics will be made without specific authority.

The Chief of the Supply Arm or Service charged with the development of the article must prepare a development program, which will vary according as the article is purely military, purely commercial, or an adaptation of a commercial item to military use.

The design is usually a function of the procuring service but it must be concurred in by the using arm and approved by the

General Staff.

One of the most important requirements of design is that the article be adapted to quantity production in an emergency.

Further development should not be impeded but the desire to obtain perfection in any item should not delay the standardization of at least one item for every required type so that, in an emergency, quantity production would not be delayed.

Engineering tests are usually conducted by the Chief of the Supply Arm or Service concerned, followed by service tests to determine the suitability of the item under service conditions. These are usually made by an organization of the using arm or service. In certain cases it is found desirable to conduct an extended service test before adopting an article as standard.

Before an article can be classed as standard, it must be cleared for procurement by The Assistant Secretary of War, and approved by the using arm, General Staff, and Secretary of War. The clearance by The Assistant Secretary of War is provided for in Army Regulations in the following language: "Prior to the adoption of a type or the classification of an item of equipment or supply as standard or substitute standard, the item will be cleared through The Assistant Secretary of War by the Chief of the Supply Arm or Service concerned, as to questions of procurement arising in connection therewith." In pursuance of this policy the attendance of a representative of the Office of The Assistant Secretary of War is provided for at Branch Technical Committee meetings. In submitting items for procurement clearance the Office requests the Chief of each Supply Arm or Service to show that he has fully con-

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sidered the procurement difficulties of that item. Such questions as to the following should have received consideration:

Are adequate sources of supply available or can they be made readily available?

What effect will the procurement of this item have on the procurement program as a whole?

Will the procurement of this item delay, interfere with or complicate the procurement of other items already standardized?

Is it contemplated that this item will be procured from commercial sources or will it be manufactured at a Government Arsenal?

If manufactured at a Government Arsenal are the facilities for its manufacture already available?

If procured from commercial sources does it possess characteristics which restrict its procurement to one source of supply?

The regulations require that the Chief of each Supply Arm or Service consider it as "most essential in all stages of development work that adaptability of the items to quantity production in emergency be considered as one of the most important requirements of design." They also provide that one item of every required type should be standardized.

This places the responsibility for a thorough investigation of production facilities and the recommendation for the standardization of a type that can be produced in the quantity required in war up to the Chief of each Supply Arm and Service. It is only the responsibility of The Assistant Secretary of War to see that these liabilities of the Chiefs of Supply Arms and Services

are fulfilled.

SPECIFICATIONS

Another function of The Assistant Secretary of War assigned to the Standards Division is the supervision of activities concerning the preparation of specifications.

To quote from Army Regulations, "A specification is a clear and accurate description of a material, an article or a 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. "

"The responsibility for the preparation of a specification rests primarily with the supply arm or service principally interested in the development, or having a paramount interest in the supply of the article or material." "Each supply arm or service is responsible for the availability of all specifications necessary for its supply program."

"A specification should be complete so as to cover all requirements either directly or by reference to other specifications. It should not repeat matter covered in other specifications to which reference has been made or matter covered by notes on drawings forming part of the specification, and should not contain matter contradictory to provisions in such other specifications unless it is desired to make special exception to such provisions, in which case a statement will be made that specific exception is made to such a specification".

This last paragraph has also been quoted from Army Regulations and I wish to call particular reference to its provisions because it has, at times, apparently been interpreted as mandatory in the use of subsidiary specifications, whereas a careful reading of it/^{will} show the opposite to be the case.

The practice of seeking out and using subsidiary specifications has grown to such an extent that frequently manufacturers are obliged to refer to a large number of such specifications, i. e., Tripod - Shoe Stretcher.

It is not desired to limit in any way the use of subsidiary specifications to the extent that these are essential, and the Army Regulation is wise in providing that when such references are necessary extracts must not be incorporated in the basic specification.

The correct practice would seem to be to analyze the requirements, use subsidiary specifications by reference thereto whenever the component or process in question is required in the quality and detail which the subsidiary specification is designed to produce but otherwise cover requirements by original statements in the basic specification or on the drawing.

"Specifications will be prepared for all items of equipment and supply, and for the materials used in their construction unless such materials are adequately proscribed in the specifications for the item itself. The existence of an applicable Federal Specifi-

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cation renders the preparation of a corresponding U. S. Army Specification unnecessary. U. S. Army Specifications will not be required for articles of occasional or temporary peace-time use not included in any general procurement program.

"In the preparation of U. S. Army Specifications, it is important that the published standards of the American Standard Association and of technical societies of national scope and of commercial bodies be followed as closely as practicable in order to facilitate procurement in time of war."

"Each specification prepared will be submitted for coordination to the supply arm or service to which is assigned the class to which the specification belongs. Coordination with all interested arms and services of the War Department and other agencies, the purpose of which is to secure the maximum of effectiveness with a minimum of duplication, will be effected by this arm or service, which will also assign a number to the specification."

After the specification has been coordinated, the arm or service which prepared it will present it to The Assistant Secretary of War for procurement clearance.

The specification and accompanying information is gone over in the Standards Division to see that:

- a. The specification is in the prescribed form.
- b. That it is a clear and understandable description of what is to be procured.
- c. That the specification is based on industrial practices.

d. That all procurement questions have been considered.

e. That the specification has been submitted to industry for comment.

f. That it has been coordinated with other interested supply arms and services.

With the clearance of the specification accomplished, provision is made to advise all supply arms and services and list it in the next edition of the Index of Specifications.

FEDERAL SPECIFICATIONS

The foregoing relates to U. S. Army Specifications. In addition to these there are in use by the Army, several hundred Federal Specifications.

There has been established by Executive Order a Federal Specifications Section in the Procurement Division, Branch of Supply, Treasury Department. This section coordinates the preparation of specifications for all Federal Departments.

The preparation of a Federal Specification may be proposed for consideration by the Federal Specifications Section, by any supply arm or service of the War Department, through the War Department representative. If it is decided to initiate the preparation of a Federal Specification, the subject is referred to a Technical Committee. The Technical Committees are made up of representatives from all interested Federal Departments. The Technical Committee prepares a tentative specification which is submitted officially by the Secretary of the Federal Specifications Section to all governmental departments or establishments for comment or agreement. These proposed Federal Specifications, in the case

of the War Department are referred to the supply arms or services responsible for the preparation of the equivalent U. S. Army Specification for coordination and indication of the appropriate War Department action.

The comments of the various Federal Departments are referred to the Technical Committees for consideration and the specification is put in final form and submitted to the Procurement Division for promulgation.

Ordinarily five weeks are allowed for consideration by the Federal Departments but when additional time is required by a supply arm or service, an extension of the time allowed should be requested, through the War Department representative.

Certain items are considered strictly military and confidential and will not be considered for Federal Specifications. There are 74 Technical Committees and many sub-committees working on Federal Specifications. The War Department is represented on 68 of these committees by 48 different individuals. To date 1025 Federal Specifications have been published. It is the duty of the Standards Division to represent the War Department on the Federal Specifications Executive Committee and to coordinate the activities of that section insofar as they may affect specifications in the War Department.

SIMPLIFIED PRACTICE.

Simplified Practice is one of the principal activities for the elimination of available waste. It was undertaken by the Department of Commerce at the request of industry and is a direct outgrowth of the Conservation Division of the War Industries Board. The Division of Simplified Practice was organized in December, 1921, for the purpose of assisting industry to find a practical limitation of the numerous varieties of size and type in which many commodities were manufactured. Its activities are confined solely to consideration of size, variety and trade demand. Contact with the Division of Simplified Practice is established and maintained by this division. Through this contact we are advised of the various simplification projects that that Division has been able to coordinate with the producer and consumer. This information is used in the preparation of specifications so that we aid those industries which have agreed to new standards. By limiting our demand to those items which have been agreed upon we broaden our field of procurement and are assured of a larger available stock on hand when the demand arises. Through this contact we have an opportunity of expressing our preferences for sizes and dimensions of items under consideration. 162 Simplified Practice Recommendations have been coordinated and published.

COMMERCIAL STANDARDS

It was evident during the development of some of the simplified practice recommendations that more and greater benefits could

be derived from certain projects if the simplification were supplemented by quality standards. In October, 1927, as an outgrowth from Simplified Practice, the Bureau of Standards set up a procedure for the cooperative establishment of definite grades and qualities on given commodities as commercial standards.

It may be well to differentiate between simplified practice and commercial standards more fully. Simplified practice is the elimination of excess or unnecessary variety of sizes, dimensions, types and immaterial differences on the basis of production and demand, whereas commercial standards are specific limitations below or beyond which the grade, quality, composition or dimensions of a commodity shall not be allowed to fall. There have been 65 commercial standards made available since the set-up of this Division in 1927. The information concerning the commercial standards is made available to the War Department through this Division.

THE AMERICAN STANDARDS ASSOCIATION

To facilitate standardization there was formed an organization known as the American Engineering Standards Committee in 1918. Its purpose was to serve as a clearing house through which trade associations, technical societies and governmental departments could develop national standards. Such an organization, it was believed, would strengthen the industrial standardization movement and bring into national focus such of their standards activities as had national significance.

Adm. Messer
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As the work of the committee grew and its activities ex-
tended into new industrial fields, new Member-Bodies were added
and, in 1928, the Committee was reorganized to include a broad-
er industrial scope and the name was changed to American Standards
Association.

Today, the American Standards Association is essentially a
federation of national technical societies, trade associations and
Federal Government departments. Under its procedure, standards
may be initiated by any responsible group. The basic principles
upon which the American Standards Association is founded provide
adequate means for the appointment (by the various groups con-
cerned) of broadly representative technical committees whose
function it is to study and formulate standards. Since these
committees are made up of individuals officially appointed by the
organizations that are concerned with the subject under consider-
ation, there is assurance, when the preponderance of committee
opinion is favorable, that the standard recommended has the ex-
tensive approval necessary to make it an "American Standard" in
the broadest sense.

The general administration of American Standards Association
affairs lies with the Board of Directors, composed of experienced
industrial executives, while the final approval of standards that
have been duly submitted by technical committees rests with the
Standards Council, composed of representatives of all Member-Bodies
of the Association. The details of the Association's work are
handled by a staff of trained workers including engineers who have
had practical industrial experience. The War Department is repre-

sented on 40 of the Technical Committees by 33 representatives.

It is desired to make it clear that there is nothing in Standardization Division procedure which delays current procurement. From our point of view, a purchase under a specification is the best test of the efficacy of the specification. As a result of the responses to the Circular Proposal, it may be desirable to materially change the specification. While the procurement clearance is no bar to further revisions or amendments of a specification, it is desirable that the procurability under the specification should be carefully investigated prior to its clearance and an actual procurement is a means to this end. After an item has been standardized and a specification cleared as a U. S. Army Specification, then procurement for that item under the U. S. Army Specification is mandatory for all procuring agencies of the War Department. In the event that a Federal Specification is later written for the item, the purchase under the Federal Specification becomes mandatory for all Government departments except that "if any executive department finds that for administration reasons a Federal Specification cannot be used to meet its particular needs, it is authorized to use its own purchase specification, but such specification shall include all applicable provisions of the Federal Specification and in those cases where the purchase exceeds \$1,000, a report shall be made to the Procurement Division, Branch of Supply, showing the necessity for deviation from the Federal Specification."

To review then what has been covered in this paper, it will be realized that procurement clearance as to type in type procedure is an entirely distinct process and relates only to that procedure. When a branch desires to have a new type approved or to have some changes in type approved, it should make application at the proper stage in the procedure to The Assistant Secretary of War for procurement clearance with reasonably explicit statement of what procurement questions are involved.

After type procedure is satisfied there arises the necessity of writing performance into definite specifications. No specification can be considered as a formal U. S. Army Specification, nor can it be so printed, or listed in the Index, until it has been cleared. There is no bar to its use as a tentative specification when a cleared specification does not exist for the item, except in cases where a Federal Specification exists.

November 13, 1935.

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have been freely used in this paper.