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MILITARY STANDARD

INTERFACE STANDARD FOR SHIPBOARD SYSTEMS

SECTION 534

AUXILIARY STEAM SERVICE, SURFACE SHIPS

FSC 1990

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DEPARTMENT OF THE NAVY

WASHINGTON, DC 20362

Interface Standard for Shipboard Systems,
Auxiliary Steam Service, Surface Ships

MIL-STD-1399(NAVY)
SECTION 534

1. This Military Standard is approved for use by all interested Commands of the Department of the Navy in the technical development plans, design, and procurement specifications for new ship acquisitions, ship modernizations or conversions, and systems/equipment for installation therein and into active fleet ships where applicable, and is available for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendation, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Ship Engineering Center, SEC 6124 Department of the Navy, Washington, DC 20362, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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FOREWORD

Purpose. This section defines the standard interface requirements for, and the constraints on, the design of shipboard systems/equipment which will utilize auxiliary steam service provided in surface ships.

Nature of the interface. Navy surface ships have a requirement for an auxiliary steam system supplying steam to a variety of users and at differing characteristics. Auxiliary steam is centrally generated and then distributed throughout the ship to satisfy the needs of various users. This section provides guidance to ensure compatibility between each user and the auxiliary steam system involved.

Structure. The technical content first delineates the characteristics of the auxiliary steam system in terms of steam supply characteristics and system capacity. The constraints on systems/equipment design which are necessary to achieve shipboard compatibility with these characteristics are then established.

Numerical quantities. Numerical quantities stated in this section are expressed in metric (SI) units followed by U. S. customary units in parentheses. The SI equivalents of the U. S. customary units are approximated to a practical number of significant figures. The values stated in U. S. customary units are to be regarded as the current specified magnitude.

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FIGURES

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1. GENERAL, SCOPE, INTERFACE, AND APPLICABILITY

1.1 General. Policies and procedures established by MIL-STD-1399 are mandatory. This section and the basic standard are to be viewed as an integral single document.

1.2 Scope. This section establishes interface requirements for shipboard systems/equipment utilizing auxiliary steam services to ensure compatibility between such systems/equipment and the auxiliary steam system.

1.3 Interface. Basic characteristic and constraint categories concerned with this interface are shown symbolically on figure 1 (see section 3 "Definitions" of MIL-STD-1399):

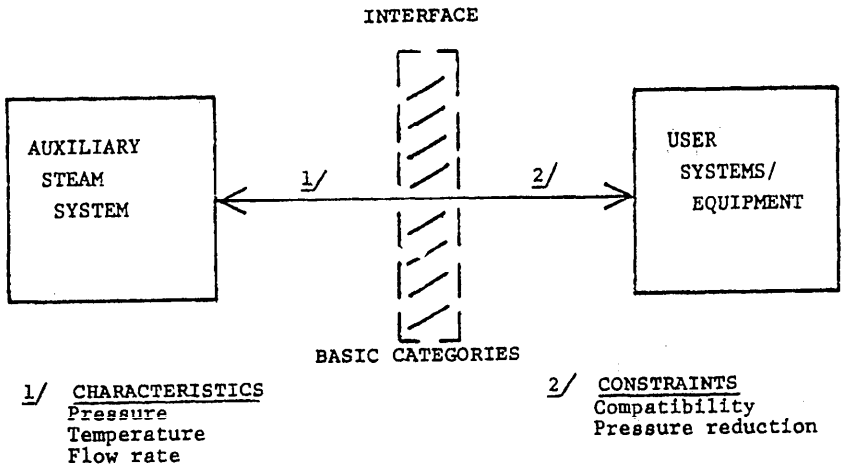

FIGURE 1. Interface.

The particular interface characteristics and constraints pertinent to this section are described in 5.2 and 5.3.

1.4 Applicability. This section applies to interface considerations between the auxiliary steam system provided in surface ships and the systems/equipment which utilize this service. This section does not apply to the main steam system which supplies the propulsion power.

2. REFERENCED DOCUMENTS

2.1 Not applicable.

3. DEFINITIONS

3.1 Auxiliary steam system. An auxiliary steam system is a steam distribution system designed to provide steam with standard characteristics as specified herein in support of specific auxiliary equipment.

3.2 User system/equipment. A user system/equipment is any facility or apparatus which utilizes steam provided by an auxiliary steam system.

4. REQUIREMENTS

4.1 Requirements. The specific interface requirements and constraints established herein are mandatory and shall be adhered to by SYSCOMs, Project managers, contractors, and

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all others engaged in any aspect of shipboard auxiliary steam system design to which these requirements and constraints apply including systems/equipment design, production, and installation (see section 4 "Requirements" of MIL-STD-1399).

5. INTERFACE CHARACTERISTICS AND CONSTRAINTS

5.1 System description. The auxiliary steam service system provides for the distribution and control of steam to the various machinery and equipment units that are not an integral part of steam-powered propulsion plants. On ships equipped with steam-powered propulsion plants, steam for the auxiliary steam service is supplied from the ships boilers at boiler pressure and partially desuperheated. On other ships, special auxiliary boilers are utilized to provide auxiliary steam service. The auxiliary steam system operates at relatively constant pressure for maximum efficiency and with minimum pressure fluctuation. Pressure reducing stations of various types and sizes are provided depending upon the applicable requirements of the systems and components served. Steam service supplied to vital systems or components shall be maintained at constant pressure during all normal and emergency operating conditions. The auxiliary steam service system also provides steam required for "hotel services" via suitable reducing stations. Figure 2 illustrates the basic elements of a typical auxiliary steam service system.

5.2 Interface characteristics. Interface characteristics of the ship's auxiliary steam system are specified below. Each shipboard system will provide an adequate supply of auxiliary steam at the systems/equipment interface with the characteristics specified in 5.2.1 through 5.2.4.

5.2.1 Pressure. The auxiliary steam system will provide steam to its various branches at the following nominal operation pressures:

(a) Boiler pressure auxiliary steam branch. This branch supplies machinery, equipment, and systems which require partially desuperheated steam at boiler pressure.

(b) 600 pound branch. This branch supplies equipment, machinery, and other systems which require partially desuperseated 4,000 kilopascals (kPa) (600 pounds per inch square (lb/in^2)) steam. Where ship boilers operate at a higher pressure, steam reduced to 4,000 kPa (600 lb/in^2) will be supplied this branch from the boiler pressure auxiliary steam branch via at least two parallel reducing stations per propulsion plant. This branch, where applicable, will be used to supply steam to the emergency feed pump at a maximum temperature of 270°C (520°F).

(c) 150 pound branch. This branch supplies equipment, machinery, and other systems which require 1,000 kPa (150 lb/in^2) steam, excluding main and auxiliary air ejectors, which are supplied steam from a separate 600/150 lb/in^2 reducing station, without a desuperheater. The 150 pound branch will be supplied from the 600 pound branch via a suitable reducing station. This steam will be supplied at a temperature of approximately 190°C (375°F).

(d) 100 pound branch. This branch is provided steam from the 150 pound branch or from auxiliary boilers for laundry and tailor shop operations.

(e) 50 pound branch. This branch is provided steam from the 150 pound branch or auxiliary boilers for water heater, commissary equipment, sterilizers, and various other equipments and services.

5.2.2 Temperature. The auxiliary steam system will provide partially or completely desuperheated steam as required by a particular user.

5.2.3 Flow rate. Flow rate will be as required by the user being supplied and will be controlled by flow valves in the supply branches.

5.2.4 System design capacity. System capacity will be based on the documented user systems/equipment requirements, with an allowance for standby capacity and growth.

5.3 Interface constraints. Interface characteristics of the ships auxiliary steam system impose certain constraints on the design of shipboard systems/equipment utilizing this service. These constraints are described in 5.3.1 through 5.3.2.

5.3.1 Compatibility. Design of systems/equipment utilizing the auxiliary steam system shall be compatible with the interface characteristics specified in 5.2.

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5.3.2 Pressure reduction. When user systems/equipment cannot use steam at the pressures specified in 5.2.1, suitable pressure reduction shall be accomplished by reducing devices provided within the auxiliary steam system. Reducing valve setting shall be equal to or less than the user system/equipment design pressure.

6. DEVIATIONS

6.1 Conditions. In achieving the purpose of this section, it is recognized that there must be some flexibility of application. During the early design state of shipboard equipment utilizing the ships auxiliary steam system, it may become apparent that significant advantages in the overall design/operation of such equipment can be achieved by deviating from the standard characteristics specified herein. In such instance, the provisions of section 6 "Deviations" of MIL-STD-1399 shall be complied with.

6.1.1 Deviation procedure. Requests for deviations shall be submitted to the Naval Sea Systems Command with copies to:

(a) Program/Project manager
(b) NAVSEC 6154

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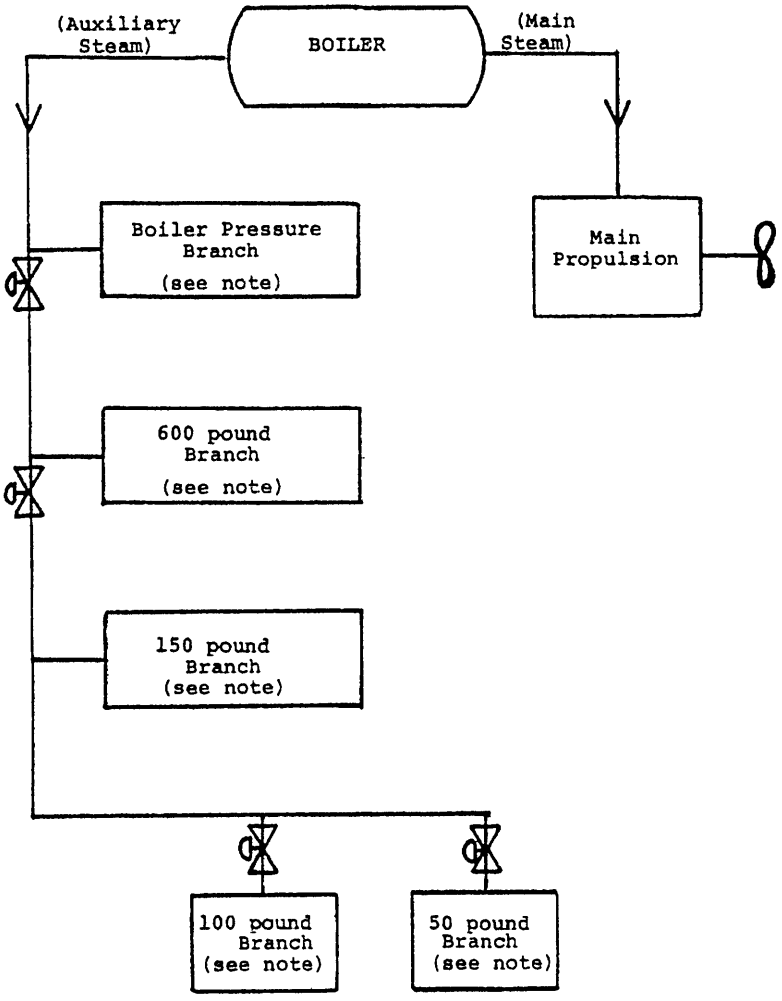

Note: See 5.2.1 for auxiliary steam services provided by each branch.

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FIGURE 2. Basic elements, auxiliary steam system.

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