

MIL-S-80095D
12 February 1986
SUPERSEDING
MIL-S-80095C
22 May 1981

MILITARY SPECIFICATION

SAWS, BAND, WOODWORKING

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers floor mounted, electric motor driven, woodworking saws, with a vertical cutting band type blade.

1.2 Classification. This specification covers saws of the following types and sizes. The type and size supplied shall be as specified (see 6.2.1).

Type I - Right hand operation - Band on right, column on left
of operator

Type II - Left hand operation - Band on left, column on right
of operator

Size 20 - 20-inch diameter band wheels

Size 24 - 24-inch diameter band wheels

Size 30 - 30-inch diameter band wheels

Size 36 - 36-inch diameter band wheels

Size 42 - 42-inch diameter band wheels

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Defense Industrial Plant Equipment Center, ATTN: DIPEC-SSM, Memphis, Tennessee 38114-5297, 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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2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issue of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

MILITARY

MIL-M-18058 - Machinery, Metal and Woodworking, Packaging of.

STANDARDS

FEDERAL

FED-STD-H28 - Screw Thread Standards for Federal Services.

FED-STD-376 - Preferred Metric Units for General Use by the Federal Government.

MILITARY

MIL-STD-461 - Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference.

2.1.2 Other Government documents and publications. The following other Government documents and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

U. S. DEPARTMENT OF LABOR

OSHA 2206 - General Industry, OSHA Safety and Health Standards (29 CFR 1910).

(Copies of specifications and standards required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issue of the documents which are DoD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issue of documents not listed in the DoDISS shall be the

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issue of the nongovernment documents which is current on the date of the solicitation.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI 01.1 - Safety Requirements for Woodworking Machinery.

ANSI/NFPA-79 - Electrical Standards for Metalworking Machine Tools.

ANSI/NEMA MG-1 - Motor and Generators.

ANSI/NEMA ICS-1 - Industrial Control and Systems.

(Application for copies should be addressed to the American National Standards Institute, ATTN: Sales Dept., 1430 Broadway, New York, NY 10018.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3951 - Standard Practice for Commercial Packaging.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103.)

(Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified in the contract or purchase order (see 6.2.1), a sample shall be subjected to first article inspection (see 4.4 and 6.3).

3.2 Design. The band saw shall be new and one of the manufacturer's current models capable of operations in accordance with the requirements herein. The saw shall include all components, parts, and features necessary to meet the performance requirements specified herein. All parts subject to wear, breakage, or distortion shall be accessible for adjustment, replacement, and repair.

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3.2.1 Measurement systems. Unless otherwise specified, either the U. S. Customary System of Units (US) or the International System of Unit (SI) shall be used in the design and construction of the band saw. When only one system of measurement is acceptable, the particular system required shall be as specified (see 6.2.1). In this specification, all measurements, dimensions, sizes, and capacities are given in US units. These measurements may be converted to SI units through the use of the conversion factors and methods specified in FED-STD-376.

3.2.2 Reclaimed materials. The saw may contain reclaimed materials provided such materials will not jeopardize the saw's intended use and performance. The reclaimed materials shall have been reprocessed, remanufactured, or recycled in a manner which will restore them to the same chemical composition and physical properties as the materials originally selected for use on the saw.

3.2.3 Energy efficiency. The band saw and its applicable components that directly consume energy in normal operation shall be designed and constructed for the highest degree of energy efficiency as governed by the latest developments available within the industry.

3.2.4 Controls. All operating controls shall be located convenient to the operator at his normal work station.

3.2.5 Safety and health requirements. Covers, guards, or other safety devices shall be provided for all parts of the saw that present safety hazards. The safety devices shall not interfere with the operation of the saw. The safety devices shall prevent unintentional contact with the guarded part, and shall be removable to facilitate inspection, maintenance, and repair of the parts. All saw parts, components, mechanisms, and assemblies furnished on the saw, whether or not specifically required herein, shall comply with all of the requirements of OSHA 2206 that are applicable to the saw itself. In addition, the saw shall comply with all the requirements of ANSI O1.1 that are designated therein as the responsibility of the saw manufacturer. In the event of conflict between the requirements of OSHA and ANSI Standard, the requirements of OSHA shall apply. Additional safety and health requirements shall be as specified (see 6.2.1 and 6.4).

3.2.6 Lubrication. Means shall be provided to insure adequate lubrication for all moving parts. Recirculating lubrication systems shall include a filter which is cleanable or replaceable. Each lubricant reservoir shall have means for determining fluid level. All oil holes, grease fittings, and filler caps shall be accessible.

3.2.7 Interchangeability. To provide for replacement of worn parts, all parts shall be manufactured to definite dimensions and tolerances.

3.3 Construction. The saw shall be constructed of parts which are new, without defects, and free of repairs. The structure shall be capable of withstanding all forces encountered during operation of the saw to its maximum rating and capacity without distortion.

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3.3.1 Castings and forgings. All castings and forgings shall be free of scale and mismatching. No processes such as welding, peening, plugging, or filling with solder or paste shall be used for reclaiming any defective part.

3.3.2 Fastening devices. All screws, pins, bolts, and other fasteners shall be installed in a manner to prevent change of tightness. Fastening devices subject to removal or adjustment shall not be swaged, peened, staked, or otherwise permanently installed.

3.3.3 Surfaces. All surfaces shall be clean and free of sand, dirt, fins, sprues, flash, scale, flux, and other harmful or extraneous materials. All edges shall be either rounded or beveled unless sharpness is required to perform a necessary function. Except as otherwise specified herein, the condition and finish of all surfaces shall be in accordance with the manufacturer's commercial practice.

3.3.4 Painting. Unless otherwise specified (see 6.2.1), the saw shall be painted in accordance with the manufacturer's commercial practice.

3.3.5 Threads. All threaded parts used on the saw and its related attachments and accessories shall conform to FED-STD-H28 and the applicable "Detailed Standard" section reference therein.

3.3.6 Plates. All words on instruction and indicating plates shall be in the English language. Characters shall be engraved, etched, embossed or stamped in boldface on a contrasting background.

3.3.7 Electromagnetic interference control. When specified (see 6.2.1), equipment furnished under this specification shall comply with MIL-STD-461. The equipment and subsystems class and the emission and susceptibility requirements shall be as specified.

3.4 Components. The saw shall consist essentially of a frame with a base, band drive system, band guide post and band guides, workpiece support table and such other components as are described herein.

3.4.1 Frame and base. The frame and base shall have means of mounting to the floor or foundation. The frame and base shall support the drive motor, band carrier wheels, band drive mechanism, workpiece support table and other accessory equipment manufactured for installation thereon. The frame and base structure shall be adequately rigid to maintain component alignment to the degree necessary to enable the saw to meet the performance requirements specified herein. The saw shall have hinged or removable access doors to facilitate changing bands, servicing, and adjusting the internal components. The frame or lower guard shall have an exhaust outlet either shaped to fit a pneumatic dust removal duct or have an adaptor for connection to a pneumatic dust removal system.

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3.4.2 Band carrier wheels. The band carrier wheels shall have tires of resilient material, crowned for tracking the band. Unless otherwise specified, the tires shall be either cemented to the wheel, fit into a groove or be mechanically attached. When specified (see 6.2.1), the tires shall be of the mechanically attached type. The band carrier wheels shall be true and dynamically balanced to a level required for performance as specified herein. The wheels shall be supported by permanently lubricated ball or roller bearings. The saw shall have a band tensioning mechanism capable of providing tensions required for bands through the width specified in table I. Controls, including the tensioning and tracking handwheels, shall be conveniently located. The band tension indicator shall reveal the amount of band tension applied.

3.4.3 Band drive system. Unless otherwise specified, the band drive system shall consist of an electric motor and V-belt drive, constructed to transmit full motor torque, belt alignment, tension adjustment and belt replacement. When specified (see 6.2.1), saws shall have a motor directly driving the lower band carrier wheel. The band drive system shall provide band surface feet per minute in conformance with table I. Special band speed shall be as specified (see 6.2.1).

3.4.4 Guide post. The saw shall have a vertically adjustable guide post supported on the upper band carrier wheel housing. The guide post shall be capable of being securely clamped in any adjusted position within its adjustment range. The guide post shall have adequate rigidity to prevent twisting of the band, and assure that the band travel is perpendicular to the table top surface, to provide performance requirements herein.

3.4.5 Guides. The band saw shall have guides located at the bottom of the guide post and immediately below the table. Unless otherwise specified (see 6.2.1), the guides shall be of either the ball-bearing type or the jaw type with a back up thrust bearing. The jaws for jaw-type guides shall be either of steel, hardened to not less than 40 Rockwell C or of other material having equal wear qualities.

3.4.6 Table. The worktable of each saw shall be of the fixed (nonfeeding) type, capable of being tilted not less than 5 degrees in one direction and 45 degrees in the opposite, off the normal horizontal plane. A quadrant graduated in increments of one degree, and marked with a numerical value each five degrees or less, shall indicate the angle of table tilt. A locking device shall securely retain the table in any tilt position within its adjustment range. The work support surface of the table shall be finished and shall be flat within 0.010 inch per foot. Table dimensions shall meet or exceed those specified in table I.

3.4.6.1 Auxiliary table. With the exception of size 20 saws, an auxiliary table shall be mounted to support workpieces overhanging the main worktable to the frame column. The workpiece support surface of the auxiliary table shall be finished and comply with the flatness requirements of the worktable in non-tilt adjustment.

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3.4.7 Brake. Each band saw shall have a manually actuated brake. Manual actuation of the stop button and the brake shall shut off the motor and stop band motion within a time period of 10 seconds. Size 30 saws and larger shall have a brake on the upper wheel which is automatically applied upon the loss of band tension, either by the band breaking, or running off the band carrier wheel.

3.4.8 Band welder. When specified (see 6.2.1), a band welder shall be furnished with each saw. The band welder shall be capable of welding and annealing various width bands through 1/2 inch width or greater as specified (see 6.2.1). A shear shall be mounted adjacent to the welding fixture for cutting the band. The welder shall be equipped with quick acting clamps for holding the band ends while they are being welded. A set of band thickness gauges shall be furnished with each band welder. An independent electric motor driven grinding wheel, for grinding the flash area of the band after welding, shall be furnished with each band welder.

3.4.9 Rip fence. When specified (see 6.2.1), a rip fence shall be mounted on the tilting table. The rip fence shall either be double faced or reversible for rip sawing on either side of the blade. The rip fence shall have a locking device which will retain the fence in infinite adjustments, at any point, across the entire width of the table.

3.4.10 Miter gauge. When specified (see 6.2.1), a miter gauge shall be fitted on the tilting table. The gauge shall consist essentially of an adjustable fence attached to an alignment bar sliding in a T-slot, or a dovetail slot in the table. The gauge shall have a swing adjustment not less than 45 degrees on both sides of the centerline of the alignment bar, and shall have a scale indicating each degree of adjustment on or about the base of the fence. Each five degrees shall be marked with a longer scribed mark, and each 15 degrees shall be marked with the numerical value, indicating the fence angle to the band.

3.4.11 Work light. When specified (see 6.2.1), a work light shall be mounted on the band saw. The work light shall consist essentially of a shatterproof shade, reflector, on-off switch and shall be attached to a flexible cable. The work light shall be wired through the 115-volt control circuit.

3.4.12 Electrical system. Unless otherwise specified (see 6.2.1), the electrical system shall conform to ANSI/NFPA 79. Each band saw shall draw all of its electrical power from a single 230/460 volt, 3 phase, 60 Hz circuit. Each band saw shall have a fused safety disconnect switch or circuit breaker. The band saw shall be initially wired for operation on 460 volts. An identified terminal for grounding the band saw when it is installed shall be mounted in or near the disconnect switch. The terminal shall be suitable for connecting the size grounding conductor specified in ANSI/NFPA 79 for the disconnect fuse rating.

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3.4.13 Motors. The motor shall be totally enclosed, fan cooled, and have ball or roller bearings. Unless otherwise specified, the motor horsepower shall be not less than the standard horsepower requirements of table I. When required, the motor horsepower shall be selected from the optional horsepower listed in table I and shall be as specified (see 6.2.1). The motor shall conform to NEMA Standard MG-1.

3.4.14 Solid state components. Solid state design shall be used throughout for electronic components.

3.4.15 Control circuit voltage. Auxiliary control circuits shall be isolated from the input electric power supply by a low-voltage transformer having a secondary nominal voltage of 120 volts, and shall conform to NEMA ICS-1.

3.5 Size and capacity. The characteristics and capacities of the band saw shall be not less than those specified in table I for the size required.

3.6 Performance. The band saw shall be capable of producing contour, angular, and square cuts in wood workpieces when tested in accordance with 4.4.

TABLE I. Sizes and capacities.

Characteristics	Size 20	Size 24	Size 30	Size 36	Size 42
Band wheels diameter, inches	20	24	30	36	42
face width, inches	1	1-1/4	1-1/2	1-3/4	2
vertical adjustment, inches	2-1/2	3	3	5	5
Vertical clearance guide to table with guide in extreme position a minimum of inches blade to column, inches	12	10	15	19	20
Main table minimum size, inches	20 x 24	22 x 24	26 x 28	29 x 36	36 x 37
Auxiliary table minimum size, inches	none	10 x 12	12 x 14	16 x 18	18 x 20
Table height, inches +3	40	40	40	40	40
Motor horsepower standard	1	3	3	5	7-1/2
optional	1-1/2, 2, 3	5	5	7-1/2, 10	10
Band width range, inches	1/8 to 1	1/8 to 1	1/8 to 1	1/8 to 1-1/4	1/8 to 1-1/4
Band speed, surface feet per minute	4500	5600	7000	7400	7800

NOTE: Saw sizes and capacities shall be not less than the stated requirements of the size ordered nor greater than the requirements of the next larger size as shown in above table. When the largest size and capacity saw shown in the above table is ordered, the size and capacity of the saw offered shall not exceed the stated requirements by more than 10 percent. When a range is shown, the required performance is from the stated minimum or less to the stated maximum or greater.

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3.7 Alignment accuracies. Each band saw shall have workpiece support and guiding surfaces meeting the alignment accuracies specified in table II.

TABLE II. Alignment accuracies.

Test	Permissible error
Table flatness	0.010 inch per foot
Table fence, face flatness	
Table fence face, parallel to band	
Miter fence face flatness	
Table square with band	+ one degree
Table, tilt range	
Miter fence, square with table	
Miter fence, swivel range	

3.8 Standard equipment. Unless otherwise specified, all standard equipment normally furnished by the manufacturer shall be furnished. Additional equipment shall be furnished as specified and fully described (see 6.2.1).

3.9 Nameplate. Unless otherwise specified (see 6.2.1), a nameplate shall be securely attached to each saw and contain the information listed below. If the saw is a special model, the model designation shall include the model of the basic standard saw and a suffix identified in the manufacturer's permanent records. The captions listed may be shortened or abbreviated, provided the entry for each caption is clear as to its identity.

Nomenclature
 Manufacturer's name
 Manufacturer's model designation
 Manufacturer's serial number
 Power input (volts, total amps, phase, frequency)
 Contract Number or Order Number
 National Stock Number or Plant Equipment Code
 Date of manufacture

3.10 Technical data. When technical data (operating manuals, maintenance manuals, parts catalogs, prints, wiring diagrams, lubrication charts, machine alignment and accuracy test results) is required, it shall be furnished in accordance with the requirements of DD Form 1423. All technical data furnished shall be written in the English language.

3.11 Workmanship. Workmanship of the band saw and accessories shall be of a quality equal to that of the manufacturer's commercial equipment of the type specified herein.

4. QUALITY ASSURANCE PROVISIONS

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4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspections set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.4).
- b. Quality conformance inspection (see 4.5).

4.3 Inspection conditions. Unless otherwise specified herein, all inspections, tests, and examinations shall be performed in the manufacturer's designated indoor test area under the ambient temperature, the relative humidity, and the air pressure existing inside the building at the time the inspections, tests, and examinations are performed.

4.4 First article inspection. When a first article inspection is required, it shall be applied to the first article submitted in accordance with consist of the examination in 4.6 and all tests in 4.7. Failure of the item to pass the first article examination and all tests shall be cause for rejection.

4.5 Quality conformance inspection. Quality conformance inspection shall be applied to each item prior to being offered for acceptance under the contract. Unless otherwise specified (see 6.2.1), quality conformance inspection shall consist of the examination in 4.6, the test in 4.7.1, and the inspection in 4.8. Failure of the item to pass the examination, the test, or inspection shall be cause for rejection.

4.6 Examination. The band saw shall be visually examined to determine compliance with all requirements of this specification.

4.7 Tests.

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4.7.1 Operational test. The band saw shall be equipped with a 1/2 inch size band and operated at no load for a minimum of 30 minutes. The controls, electric motor, tilting table, fence guide post and guides shall be observed to determine that the saw operates properly.

4.7.2 Alignment accuracy test. The saw shall be tested for conformance with the alignment accuracy requirements of table II. The test methods and instruments used for the alignment accuracy tests shall be at the supplier's option provided they accurately measure the saw's alignment.

4.7.3 Performance test. The workpieces used in the performance test shall be not less than 18 inches in length, 4 inches wide, and 4 inches thick. The table shall be set at 0 degrees tilt and an "S" curve pattern shall be produced having a reversing 3-inch radius. The table shall be set at 45 degrees, the rip fence secured in adjustment, and a straight cut shall produce equal triangular strips from the square workpiece bisected.

4.7.4 Brake test. The brake shall be tested by allowing the hand to travel at maximum no load speed and applying the brake. From the moment of application, the band motion shall stop within a time period of 10 seconds.

4.8 Packaging inspection. Packaging of each item shall be inspected to determine compliance with the requirements of section 5.

5. PACKAGING

5.1 Preservation, packing, and marking. Unless otherwise specified, preservation, packing, and marking shall be in accordance with ASTM D 3951. When specified (see 6.2.1), level A preservation, level A or level B packing, and marking shall be accomplished in accordance with MIL-M-18058.

6. NOTES

6.1 Intended use. The saws covered by this specification are intended for use in woodworking shops where the sawing of straight, angular, and contour patterns are required.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type, class, and size required (see 1.2).
- c. First article, if required (see 3.1).

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- d. If band saw is required to be configured in a specific measurement system (US or SI), state required system (see 3.2.1).
- e. Additional safety and health requirements, if required (see 3.2.5).
- f. Painting, if different (see 3.3.4).
- g. If electromagnetic interference control is required, specify the equipment and subsystem class and the emission and susceptibility required (see 3.3.7).
- h. Mechanically attached tires, if required (see 3.4.2).
- i. Specify direct motor drive or special band speed, if required (see 3.4.3).
- j. Band guides, if different (see 3.4.5).
- k. Band welder and width capacity, specify if required (see 3.4.8).
- l. Rip fence, if required (see 3.4.9).
- m. Miter gauge, if required (see 3.4.10).
- n. Worklight, if required (see 3.4.11).
- o. Electrical system, if different (see 3.4.12).
- p. Optional horsepower, specify, if required (see 3.4.13).
- q. Standard equipment, if different (see 3.8).
- r. Nameplate, if different (see 3.9).
- s. First article inspection, if different (see 4.4).
- t. Quality conformance inspection, if different (see 4.5).
- u. If preservation, packing, and marking in accordance with MIL-M-18058 is required, specify level required (see 5.1).

6.2.2 Contract data requirements. Required technical data (operating manuals, parts lists, wiring diagrams, foundation and anchor bolt plans and acceptance test reports) should be specified on a DD Form 1423, Contract Data Requirements List, incorporated into the contract.

6.3 First article. When first article inspection is required, the item to be tested should be the first item offered for acceptance under the con-

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tract. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.4 Safety and health requirements. Paragraph 3.2.5 requires compliance only with those OSHA requirements that concern the saw itself. It does not require compliance with those OSHA requirements that concern "the saw in its operating environment" such as noise levels, radiation levels, electromagnetic emissions, noxious vapors, air contaminants, and heat. Since OSHA limits the total hazard level of these hazards in the environment (and does not limit the hazard level of individual saw in the environment), the procuring activity is advised to analyze the existing hazard levels in the proposed operating environment, and specify additional requirement that will integrate the new saw into its future operating environment. The saw shall be equipped with all point-of-operation guarding normally furnished as standard on the manufacturer's commercial guards supplied to the commercial market. If specific point-of-operation guarding is required, the procuring activity should specify the exact configuration of the guard required, since the guard configuration is dependent on the size and configuration of the workpieces. The above, and any other additional safety and health requirements should be specified in detail under 6.2.1(e).

6.5 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:
 Army - AL
 Navy - SH
 Air Force - 99

Preparing activity:
 DLA - IP
 (Project 3220-0144)

Review activities:
 Air Force - 84
 Army - AR, ME
 DLA - GS
 Navy - YD

User activities:
 Navy - MC

