

INCH-POUND

MIL-DTL-8795F
 17 December 2007
 SUPERSEDING
 MIL-DTL-8795E
 22 September 2000

DETAIL SPECIFICATION

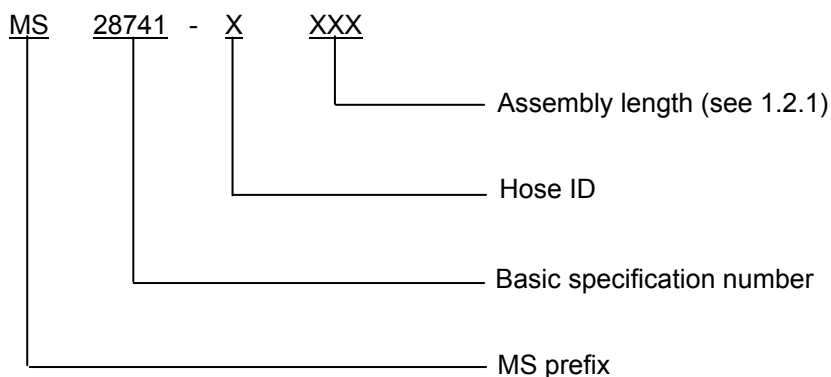
HOSE ASSEMBLIES, ELASTOMERIC, HYDRAULIC,
 FUEL, AND OIL RESISTANT,
 GENERAL SPECIFICATION FOR

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

1. SCOPE

1.1 Scope. This specification covers the requirements for hose assemblies, elastomeric, hydraulic, fuel, and oil resistant.

1.2 Part or Identifying Number (PIN). The PIN consists of the letters MS, the basic specification number, a dash, a number for the hose inside diameter (ID), and three numbers for the hose assembly length.



1.2.1 Hose assembly length. Length of hose assembly in inches. (Always use 3 digits. Use leading zeros as required.)

Comments, suggestions, or questions on this document should be addressed to: Defense Supply Center, Columbus, Attn: DSCC-VAI, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to Construction@dsccl.dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://assist.daps.dla.mil>.

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2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3, 4, or 5, of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL-5070	- Adapter, Hose to Tube, Pipe and Flange, Reusable - Hydraulic, Fuel, and Oil Lines, General Specification for
MIL-DTL-8794	- Hose, Elastomeric - Hydraulic Fluid, Fuel, and Oil Resistant
MIL-PRF-5606	- Hydraulic Fluid, Petroleum Base; Aircraft, Missile, and Ordnance
MIL-PRF-83282	- Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Aircraft, Metric, NATO Code Number H-537
MIL-PRF-87257	- Hydraulic Fluid, Fire Resistant; Low Temperature, Synthetic Hydrocarbon Base, Aircraft and Missile

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-889	- Dissimilar Metals
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(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or <http://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

ASTM INTERNATIONAL

ASTM D380	- Standard Test Methods for Rubber Hose
ASTM D471	- Standard Test Method for Rubber Property-Effect of Liquids

(Copies of these documents are available online at <http://www.astm.org> or from ASTM International, P.O. Box C700, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

NCSL INTERNATIONAL

NCSL Z540.1	- Calibration Laboratories and Measuring and Test Equipment, General Requirements (DoD adopted)
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(Copies of these documents are available online at <http://www.ncsli.org> or from NCSL International 2995 Wilderness Place, Suite 107 Boulder, Colorado 80301-5404.)

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SAE INTERNATIONAL

SAE-AMS-2700	-	Passivation of Corrosion Resistant Steels
SAE-AS1933	-	Age Controls for Hose Containing Age-Sensitive Elastomeric Material
SAE J1966	-	Lubricating Oil, Aircraft Piston Engine (Nondispersant Mineral Oil)

(Copies of these documents are available online at <http://www.sae.org> or from SAE World headquarters, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between the requirements of this specification and the specification sheet, the latter shall govern.

3.2 Materials. Hose assemblies shall comprise of hose conforming to MIL-DTL-8794 and adapters conforming to MIL-DTL-5070, see 4.1.1.

3.2.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle cost.

3.2.2 Dissimilar metals. When dissimilar metals are used in intimate contact with each other, protection against electrolysis and corrosion shall be provided. Dissimilar metals such as brass, copper or steel (except corrosion-resisting steel passivated in accordance with SAE-AMS-2700) shall not be used in intimate contact with aluminum or aluminum alloy. Protective measures for dissimilar metals shall be in accordance with MIL-STD-889.

3.3 Performance.

3.3.1 Operating pressure. Hose assemblies shall be capable of operating at the operating pressures specified in [table I](#).

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TABLE I. Physical requirements of hose assemblies comprising MIL-DTL-8794 hose and MIL-DTL-5070 adapters.

Dash number (Size)	Length of hose assemblies for all tests (inches)	Minimum bend radius at inside of hose bend (inches)	Hydraulic		Fuel		Oil			Burst pressure (psi)
			Operating pressure (psi)	Proof pressure (psi)	Operating pressure (psi)	Proof Pressure (psi)	Operating pressure (psi)	Surge pressure (psi)	Proof pressure (psi)	
-3 ^{1/}	14	3	N/A ^{1/}	N/A ^{1/}	1,000	1,500	50	400	600	4,000
-4	14	3	3,000	6,000	1,000	1,500	50	400	600	12,000
-5	16	3.375	3,000	6,000	1,000	1,500	50	400	600	12,000
-6	18	4	2,000	4,500	1,000	1,500	50	400	600	9,000
-8	21	4.625	2,000	4,000	1,000	1,500	50	400	600	8,000
-10	23.5	5.5	1,750	3,500	1,000	1,500	50	400	600	7,000
-12	27.5	6.5	1,500	3,000	1,000	1,500	50	400	600	6,000
-16	18	7.375	800	1,600	750	1,000	50	400	600	3,200
-20	18	9	600	1,250	500	750	50	400	600	2,500
-24	18	11	500	1,000	250	375	50	400	600	2,000
-32	18	13.25	350	700	200	300	50	400	600	1,400
-40 ^{2/}	18	24	N/A	N/A	200	300	N/A	N/A	N/A	1,000
-48 ^{2/}	18	33	N/A	N/A	200	300	N/A	N/A	N/A	800

^{1/} Size -3 hose assemblies shall not be used in hydraulic applications.

^{2/} -40 and -48 shall not be used in hydraulic and oil applications.

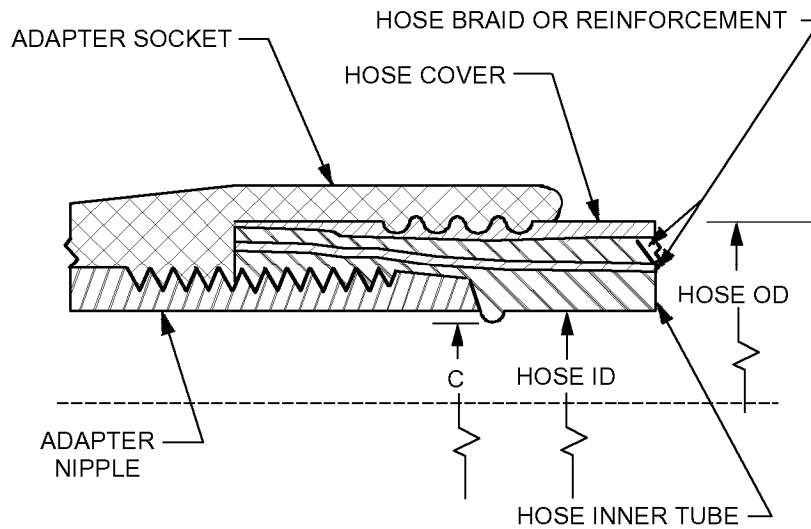
3.3.2 Proof pressure. Hose assemblies when tested in 4.5.2 shall withstand the applicable hydraulic proof pressure specified in [table I](#) without separation at the hose-to-adapter interface or without showing evidence of imperfections. There shall be no evidence of leakage or damage to the hose or adapters.

3.3.3 Bulge. Hose assemblies when tested in 4.5.3, the bulge of the elastomeric tube of the hose shall not reduce the inside diameter (ID) of the hose to less than the C dimension shown on [figure 1](#).

3.3.4 Leakage. Hose assemblies when tested in 4.5.4 shall withstand 70 percent of the burst pressure specified in [table I](#). The hose assembly shall show no evidence of leaking of the hose or the hose to adapter interface, deformation or damage to the hose or adapters, or adapter movement relative to the hose.

3.3.5 Burst pressure. Hose assemblies when tested in 4.5.5 shall not burst, separate at the hose-to-adapter interface, or leak at any pressure up to the burst pressure specified in [table I](#).

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Hose size number	Adapter size number	C diameter (see note 3) minimum Inches (mm)
-3 (see note 4)	-3	.080 (2.03)
-4	-4	.132 (3.35)
-5	-5	.200 (5.08)
-6	-6	.260 (6.60)
-8	-8	.350 (8.89)
-10	-10	.450 (11.43)
-12	-12	.575 (14.61)
-16	-16	.781 (19.84)
-20	-20	1.015 (25.78)
-24	-24	1.250 (31.75)
-32	-32	1.719 (43.66)
-40 (see note 5)	-40	2.178 (55.32)
-48 (see note 5)	-48	2.803 (71.20)

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. "C" diameter indicates maximum permissible bulge of inner tube when hose is assembled with adapters, see 3.3.3.
4. Hydraulic applications for size -3 prohibited.
5. Hydraulic and oil applications for -40 and -48 prohibited.

FIGURE 1. Minimum diameter of hose inner tube when adapters are assembled with hose in accordance with MIL-DTL-8794.

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3.4 Age limits. The age of the hose shall not exceed the age limits specified in SAE-AS1933.

3.5 Identification of product. Each hose assembly shall be identified with a durable permanently attached tag plainly marked with the following:

- a. Hose assembly PIN from the applicable specification sheet (see 1.2).
- b. Date of assembly (in quarter of year and year).
- c. Commercial and Government Entity (CAGE) Code of the assembler.
- d. Length shall be specified by four digits, with the last digit to indicate fractions in eighths of an inch.

3.6 Workmanship. Hose assemblies shall be free from oil, grease, dirt, or other foreign materials, both internally and externally, and shall be free of irregularities or defects that could adversely affect performance. Components of the hose assembly shall not be degraded from their individual performance capability as the result of assembly.

4. VERIFICATION

4.1 Conformance inspection.

4.1.1 QPL manufacturers. When the hose assembly manufacturer is also listed on the QPL for the hose (MIL-DTL-8794) and fittings (MIL-DTL-5070) used for the hose assembly, conformance inspection shall be waived.

4.1.2 Individual inspection. Each hose assembly shall be subjected to the individual inspection consisting of the inspections specified in table II.

TABLE II. Individual inspection.

Inspection	Requirement paragraph	Inspection paragraph
Examination of product	3.1, 3.4, 3.5, and 3.6	4.5.1
Proof pressure	3.3.2	4.5.2

4.1.2.1 Individual inspection sampling. Individual inspection tests specified in table II shall be performed on a production lot basis. All defective material shall be removed from the production lot and shall not be supplied to this specification.

4.1.2.2 Periodic sampling inspection. Periodic sampling inspection shall consist of inspections in table III. At least one hose assembly shall be selected at random from the inspection lot. For each size manufactured under essentially the same conditions, periodic sampling inspection shall be performed on either four samples from every 10,000 hose assemblies produced or one sample from every 2,500 hose assemblies. If there has been some production but the number hose assemblies produced has not reached 2,500 for a specific size within three years, the manufacturer shall perform periodic sampling inspection on one hose assembly of that size.

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TABLE III. Periodic sampling inspection.

Periodic inspection	Requirement paragraph	Inspection paragraph
Bulge	3.3.3	4.5.3
Leakage	3.3.4	4.5.4
Burst pressure	3.3.5	4.5.5

4.1.2.3 Non conformance sampling and periodic inspections. In the event a failure should occur during periodic sampling inspection tests, specified in table III, then the production lot shall be screened for that particular defect and defects removed. An inspection lot shall be selected from the production lot and all periodic sampling tests shall be performed. If one or more defects are found in the second inspection lot, the production lot shall be rejected and shall not be supplied to this specification. Test data of part performance shall be made available to the contracting agency upon request.

4.1.2.4 Disposition of test specimens. Test specimens that have been subjected to periodic sampling inspection in table III shall not be delivered on the contract or purchase order.

4.2 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with NCSL Z540.1 or equivalent.

4.3 Responsibility for compliance. All items shall meet all requirements of sections [3](#), [4](#), and [5](#). The inspection 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 ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.4 Sample preparation.

4.4.1 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in ASTM D380, or in accordance with the applicable test method referenced in the test procedures. Unless otherwise specified, room temperature shall be defined as +60°F to +90°F (15.56°C to 32.22°C).

4.4.2 Test fluid. The test fluid shall be water; lubricating oil conforming to SAE J1966, grade 50; hydraulic fluid in accordance with MIL-PRF-5606, MIL-PRF-87257 or MIL-PRF-83282; or fuel in accordance with ASTM D471, ASTM Reference fuel B. Water is an acceptable test fluid only for the leakage, proof pressure, and burst tests. If water is used, the test article must be thoroughly dried before use in further testing or prior to delivery.

4.5 Methods of examinations and tests.

4.5.1 Examination of product. Each hose assembly and its related manufacturing records shall be examined for compliance with the requirements specified herein with respect to dimensions, materials used, age limitations, identification of product, and workmanship, see [3.1](#), [3.4](#), [3.5](#), and [3.6](#).

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4.5.2 Proof pressure (see 3.3.2). Proof pressure individual inspections (see table II.) Each hose assembly shall be subjected to the hydraulic proof pressure in accordance with ASTM D380 and shall meet the requirements of 3.3.2. The following details shall apply:

- a. Proof pressure shall be as specified in table I.
- b. Pressure shall be applied for a period of not less than 30 seconds and not more than 5 minutes.

4.5.3 Bulge test (see 3.3.3). Hose assemblies shall be measured for bulging of the hose inner tube caused by the attachment of the hose to the adapter and shall meet the requirements of 3.3.3. The following details shall apply:

- a. A ball-type gauge, size as shown in table IV, is recommended for the bulge measurement.
- b. The diameter of the ball gauge shall be within ± 0.001 inch (0.03 mm) of the C diameter shown on figure 1.
- c. Holding the hose in a vertical position, the gauge is inserted into the end of the hose assembly at the bulge inspection point C shown on figure 1.
- d. The gauge shall fall through the section at the end of the adapter in the hose under its own weight without lubrication and without forcing the gauge through the adapter-to-hose interfacing section.

TABLE IV. Ball gauges. 1/ 2/ 3/

Dash number (size)	Ball diameter inches (mm)	Volume in ³	Weight	Weight
			ounces	grams
-3	0.080 (2.03)	0.00027	0.0012	0.034
-4	0.132 (3.35)	0.00120	0.0054	0.154
-5	0.200 (5.08)	0.00419	0.0188	0.534
-6	0.260 (6.60)	0.00920	0.0414	1.173
-8	0.350 (8.89)	0.02245	0.1010	2.862
-10	0.450 (11.43)	0.04771	0.2146	6.083
-12	0.575 (14.61)	0.09954	0.4477	12.691
-16	0.781 (19.84)	0.24943	1.1218	31.803
-20	1.015 (25.78)	0.54752	2.4624	69.808
-24	1.25 (31.75)	1.02265	4.5993	130.388
-32	1.719 (43.66)	2.65966	11.9615	339.106
-40	2.178 (55.32)	5.40968	24.3297	689.735
-48	2.803 (71.20)	11.53102	51.8594	1470.206

1/ Dimensions are in inches.

2/ Metric equivalents are given for information only.

3/ Steel balls are used to ensure that hoses are free of debris and bulging rubber.

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4.5.4 Leakage test (see 3.3.4). Hose assemblies when subjected to the leakage test shall meet the requirements of 3.3.4. The following details shall apply:

- a. The hose assemblies shall be subjected to 70 percent of the burst pressure specified in [table I](#) for 5 minutes.
- b. The pressure shall then be reduced to 0 pounds per square inch (psi), after which it shall be raised to 70 percent of the specified burst pressure for a final 5-minute check.

4.5.5 Burst pressure test (see 3.3.5). Hose assemblies shall be subjected to the burst pressure specified in [table I](#) and shall meet the requirements of 3.3.5. The following details shall apply:

- a. Testing shall be performed within 45 days after assembly of the adapters to the hose.
- b. The burst pressure test shall be conducted in accordance with the straight bursting test in accordance with ASTM D380, except that pressure shall be applied at a rate between 15,000 and 25,000 psi per minute (103.4 to 172.4 MPa per minute).
- c. During this test, one end of the test article shall be free.
- d. The hose assembly shall not burst, and there shall be no evidence of leaking or separation of the hose from adapter, at pressures up to the burst pressure in [table I](#).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. These hose assemblies are for use in aircraft hydraulic, fuel, and oil systems operating in an environment from -65 F to 160°F (-53.9°C to 71°C), and in oil systems sizes -3 through -12 operating in an environment from -65°F to 250°F (-53.9°C to 121°C) (see MIL-DTL-8794). The hose assemblies covered by this specification are intended for use in medium pressure applications in hydraulic, fuel, and oil systems of aircraft. Size -3 hose assemblies are not to be used in hydraulic applications (see [table I](#)).

6.1.1 Military unique rationale. The rubber hose assemblies described by this specification must be capable of interoperability and compatibility which can only be assured through strict adherence to the detail specification sheet requirements and this specification. Commercial parts are not designed to be interchangeable with aircraft hydraulic systems.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of the specification.
- b. Title, number, and date of the applicable specification sheet and the complete PIN (see [1.2](#)).
- c. Level of preservation, packaging, and marking required (see section [5.1](#)).
- d. Shelf life requirements (see 6.2.1).

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6.2.1 Shelf life. This specification covers items where shelf life is a consideration. Specific shelf-life requirements should be specified in the contract or purchase order. The shelf-life codes are contained in the Federal Logistics Information System Total item Record. Additive information for shelf-life management may be obtained from DoD 4120.27-M, Shelf-life Management Manual, or the designated shelf-life Points of Contact (POC). The POC should be contacted in the following order: (1) the Inventory Control Points (ICPs), and (2) the DoD Service and Agency administrators for the DoD Shelf-Life Program. Appropriate POCs for the DoD Shelf-Life Program can be contacted through the DoD Shelf Life Management website: <http://shelflife.hq.dla.mil/>.

6.3 Definitions:

6.3.1 Elastomer. A material that possesses elastic properties similar to those of natural rubber in the vulcanized state. At room temperature, an elastomer can be stretched repeatedly to at least twice its original length and will, upon release of stress, return to its approximate original length. (Source: SAE-AS1933.)

6.4 Subject term (key word) listing.

- Adapter
- Aircraft
- Delivery fluid
- Fitting
- Fluid connector
- Pressure-range-by-size
- Rubber

6.5 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmentally Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals is available on their website at <http://www.epa.gov/epaoswer/hazwaste/minimize/chemlist.htm>. Further information is available at the following EPA site: <http://www.epa.gov/epaoswer/hazwaste/minimize/>. Included in the EPA list of 31 priority chemicals are cadmium, lead, and mercury. Use of the materials on the list should be minimized or eliminated unless needed to meet the requirements specified herein (see section 3).

6.6 Guidance on use of alternative parts with less hazardous or nonhazardous materials. This specification provides for a number of alternative plating materials via the PIN. Users should select the PIN with the least hazardous material that meets the form, fit and function requirements of their application.).

6.7 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue, due to the extent of the changes.

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CONCLUDING MATERIAL

Custodians:

Army - AV
Navy - AS
Air Force - 99
DLA - CC

Preparing activity:

DLA - CC

(Project 4720-2005-020)

Review activities:

Army - AT, MI
Navy - CG, MC, SA
Air Force - 11, 71

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