STATEMENT OF WORK

USS BATAAN (LHD 5)

SECTION 1.O SCOPE

1.1 Title: Ship's Service Turbine Generator (SSTG); repair

1.2 Location of Work:

1.2.1 Machinery Room No. 2 (6-81-0-E)

1.3 Identification:

1.3.1 Quantity (One EA), Ships Service Turbine Generator Number 5, Mfr ID DEV718151042, 9956 RPM, OP Steam Press 600 PSIG, 7 Stages, Type Helical Gearing, Power Rating 2500 KW, Red Ratio 8.13, Mfr Dwg 501E466FA, Mfr General Electric Co., APL 057260225

1.3.2 Quantity (One EA), Coupling Assembly, High Speed, Part No. 501E157BYG-4, Figure 9-5 of 2.2.

1.3.3 Quantity (One EA), Bearing Assembly, Thrust, Part No. 101C14FFG-1, Figure 9-7 of 2.2

1.3.4 Quantity (One EA), Gear Assembly, Speed Reducer, Mfr: Philadelphia Gear Corp., Mfr ID: H44856, Input Speed: 9,955 RPM, Output Speed: 1,200 RPM, Figure 9-45 of 2.2, APL: 692060158A

1.3.5 Quantity (One EA), Bearing Assembly, Journal, HP Turbine End, Part No. 509E205DR-1, Figure 9-9 of 2.2

1.3.6 Quantity (One EA), Bearing Assembly, Journal, LP Turbine End, Part No. 509E205DX-1, Figure 9-10 of 2.2

1.3.7 Quantity (One EA), Overspeed/Hand Trip Assembly, Part No. 125D247CX-1, Figure 9-21 of 2.2

SECTION 2.0 REFERENCES:

2.1 Standard Items

2.2 S9311-A7-MMA-010 Rev 3, Technical Manual 2500 KW AC Ship's Service Turbine - Generator Set and Static Excitation and Voltage Regulation System

2.3 S9086-G9-STM-010, Naval Ships Technical Manual Chapter 231 Propulsion and SSTG Steam Turbines

2.4 MIL-STD-777, Schedule of Piping, Valves, Fittings, and Associated Piping Components for Naval Surface Ships

2.5 S9086-GX-STM-020, Chapter 220, Volume 2, Boiler Water/Feedwater Test and Treatment

2.6 T9074-AS-GIB-010/271 Rev 1, Requirements for Nondestructive Testing Methods

2.7 077-01-001, Hazardous Waste Produced on Naval Vessels; Control

2.8 555-6858751 Rev A, Halon 1301 System Diagram SRD

2.9 SL460-AA-HBK-010, Handbook for Inspection, Packaging, Handling, Storage and Transportation

SECTION 3.0 REQUIREMENTS:

(V)(G) "VERIFY LEVEL I MATERIAL PRIOR TO INSTALLATION"

3.1 Accomplish the requirements of 009-27 of 2.1.

3.1.1 Accomplish the requirements of 009-09 of 2.1 for the Level 1 hardware of No. 5 Ship Service Turbine Generator.

3.1.2 The Level I requirements in this work item applies to the Trip Throttle Valve inlet steam inlet flange fasteners and HP drain flange fasteners for No 5 Ship Service Turbine Generator.

3.2 Remove the upper half guard of the coupling listed in 1.3.2, to allow inspections and alignment verification, using 2.2 for guidance. Retain hardware and fasteners for reinstallation.

(V)(G) "PRE-REPAIR ALIGNMENT VERIFICATION"

3.3 Accomplish high speed coupling alignment verification in accordance with 2.2 and applicable OEM drawings/procedures.

3.3.1 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.4, to the SUPERVISOR.

3.4 Remove high speed coupling assembly and accomplish cleaning and inspection in accordance with Paragraph 4-1-1-1-20.c and Figure 9-5 of 2.2.

3.4.1 Inspect coupling teeth for unusual wear, pitting, or major irregularities that can cause excessive friction in operation in accordance with 2.3.

3.4.2 Inspect lubricating oil spray nozzles for restrictions and areas of damage or distortion in accordance with 2.3.

3.4.3 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.4.1 and 3.4.2, to the SUPERVISOR.

3.4.4 Restore mating surfaces exposed by removal. Repair by removing high spots, burrs, abrasions, and foreign matter, where removal can be accomplished by hand tools in accordance with 2.3.

3.5 Remove the upper housing half of the reduction gear listed in 1.3.3, using 2.2 for guidance. Retain fasteners and hardware for reinstallation.

3.5.1 Clean and inspect the pinion and gear, including each associated high speed (HS) bearing, for unusual/excessive wear, using 2.2 for guidance.

3.5.1.1 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.5.1, to the SUPERVISOR.

3.5.2 Restore mating surfaces exposed by removal. Repair by removing high spots, burrs, abrasions, and foreign matter, where removal can be accomplished by hand tools.

3.6 Disassemble the manual trip housing listed in 1.3.7 to the extent necessary to accomplish inspection of overspeed and emergency trip shaft for damage and loose fasteners using 2.2 for guidance. Retain hardware and fasteners for reinstallation.

3.6.1 Accomplish an inspection of the over-speed and emergency trip assembly for proper installation and match-marks with rotor, no looseness on the rotor, there are no over-speed trip parts that have come adrift and measure over-speed trip body run-out and alignment to rotor, using 2.2 for guidance.

3.6.2 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.6.1 to the SUPERVISOR.

3.6.3 Remove each bearing listed in 1.3.1.3 and 1.3.1.4, using Figures 9-7 and 9-9 of 2.2 for guidance. Retain hardware and fasteners for reinstallation.

3.6.4 Clean and inspect each bearing cap and shaft bearing journal in accordance with Paragraphs 4-1-1-1-13 and 4-1-1-1-14 and Figures 9-7 and 9-9 of 2.2.

3.6.4.1 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.6.4, to the SUPERVISOR.

3.6.5 Remove burrs and high spots from exposed mating and sliding surfaces, screw threads, keys, and keyways.

3.6.6 Clear and clean each pocket and passage free of obstructions and foreign matter.

3.7 Disassemble and remove the upper-half turbine casing, using Paragraph 6-1-1-1-1 of 2.2 for guidance.

3.7.1 Remove existing Halon piping as designated by the SUPERVISOR.

3.7.2 General cleaning shall be Level II.

3.7.3 Remove and dispose of system fluids from the lube oil system of the equipment listed in 1.3.1 and 1.3.4 in accordance with 2.7 and federal, state, local laws, regulations, and ordinances.

3.7.4 Clean the lube oil sump with lint free clean rags.

3.8 Remove the turbine rotor and inter-stage diaphragms, using Paragraph 6-1-1-1-2 of 2.2 for guidance.

3.8.1 Accomplish a visual inspection of inter-stage diaphragms for dents, tears, erosion, and corrosion pitting, using 2.2 and Paragraph 231-7.1 of 2.3 for guidance.

3.8.2 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.8.1 to the SUPERVISOR.

3.8.3 Match mark, identify, and retain fasteners, chocks, shims, shock mounts, sound damping pads, and other accessories associated with equipment.

3.8.4 Crate and secure the turbine rotor removed in 3.8. Packing shall conform to 2.6.

3.8.4.1 Visually inspect the removed equipment for general condition and completeness prior to packing and crating.

3.8.4.2 Turn over crated and secured rotor to the SUPERVISOR for disposition.

3.9 Inspect couplings, bearing caps, thrust collar, thrust bearing housing, and journals for cracks, broken segments, wear, misalignment, and signs of over-heating. Measure and record all as found sizes and clearances, using 2.2 and 2.3 for guidance.

3.9.1 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.9 to the SUPERVISOR.

3.10 Clean exposed parts free of contamination and debris, leaving no residue or injurious effects.

3.10.1 Handwork each machined sealing, aligning, mating and gasket surface, using Paragraphs 231-8.5 through 231-8.5.3.3 of 2.3 for guidance. Ensure no excessive material is removed, causing loss of critical size or alignment.

3.10.2 Remove high spots, burrs, abrasions, nicks, corrosion, gasket material, and foreign matter from exposed flanges and mating surfaces.

3.10.2.1 Chase and tap exposed threaded areas.

3.10.3 Scrape, lap, and fit metal-to-metal joints of each turbine packing box, turbine case, turbine case cover in accordance with Paragraph 231-8.5 of 2.3.

(V)(G) "BLUE CONTACT"

3.10.3.1 Inspect contact, using bluing transfer method. Contact shall be 75 percent, with a continuous band of contact 1/4-inch-wide between inner bolting perimeter and the sealing surface pressure source.

3.10.3.2 Polish machined surfaces in way of repairs.

3.10.3.3 Accomplish the requirements of 009-84 of 2.1.

3.11 Assemble the equipment listed in 1.3.1 installing fasteners retained in 3.6.3 and the following new parts, using 2.2 for guidance:

TOTAL QUANTITY REQUIRED	NAME OF PART	PIECE NO.	REF. NO.	FIGURE NO.	PART NO.
1 EA	Rotor, Turbine		2.2	9-3	509E217CR-1
7 EA	Shoe	1	2.2	9-8	7 1/2-5320-1
One EA	Shoe	11	2.2	9-8	7 1/2-5320-11
7 EA	Shoe	26	2.2	9-8	8-5320-26
One EA	Shoe	29	2.2	9-8	8-5320-29
1 EA	Shim- Thrust	3	2.2		165A527RYpc1
One ASY	HP BRG	1	2.2	9-9	509E205DR-1
One ASY	LP BRG	1	2.2	9-10	509E205DX-1
1 EA	Shim- Nozzle	2	2.2		165A527RYpc2
2 EA	Deflector, Oil	2	2.2	9-12	134B475AR-1
3 EA	Ring, Packing	3	2.2	9-12	134B407ER-4
2 EA	Ring, Packing	4	2.2	9-12	134B407EF-4
One EA	Ring, Packing	5	2.2	9-12	134B409BD-4
One EA	Ring, Packing	6	2.2	9-12	134B409BE-3
3 EA	Ring, Packing	7	2.2	9-12	134B409BE-7
One EA	Ring, Packing	8	2.2	9-12	134B409BD-7
3 EA	Ring, Packing	9	2.2	9-12	134B407EE-1
12 EA	Spring	10	2.2	9-12	101A150EE-5
4 EA	Spring	11	2.2	9-12	101A150FR-5
2 EA	Spring	12	2.2	9-12	101A150FR-9
6 EA	Spring	13	2.2	9-12	101A150FR-8
4 EA	Spring	14	2.2	9-12	101A150EE-6
16 EA	Pin	15	2.2	9-12	101A173AD-1
8 EA	Ring	16	2.2	9-12	134B384EA-1
16 EA	Screw	17	2.2	9-12	101A728AA-63
16 EA	Lug	18	2.2	9-12	101A441BY-1

4 EA	Pin, Spring	19	2.2	9-12	N509P1910
2 EA	Packing	14	2.2		101A247CB-5
1 EA	Gasket	45	2.2		101B290FE-1
1 EA	Gasket	53	2.2		101A362AApc14
1 EA	Gasket	27	2.2		101A782BXP1
2 EA	Seal	4	2.2		165A216BB-1

(V)(G) "FINAL CLEAN"

3.11.1 Clean exposed parts, upper and lower casing free of foreign matter, leaving no residue or injurious effects.

3.11.2 Measure and record each final diametrical dimension and clearance for the shaft rotor inlet end packing box labyrinth seal and seal housings in accordance with accept or reject criteria requirements of 2.2.

3.11.2.1 Cold clearances shall be in accordance with Figure 9-43 of 2.2. Submit one legible copy, in hard copy or approved transferrable media, of a report listing all results of the requirements of 3.11.2 to the SUPERVISOR.

3.11.3 Assemble upper casing in accordance with Paragraph 6.1.1.2 of 2.2

3.11.3.1 Fit and install fasteners retained in 3.6.3.

3.11.3.2 Install new steam system piping joint gasket and threaded fasteners, conforming to 2.4, including Category and Group A-1.

3.11.3.3 Apply anti-seize compound conforming to MIL-PRF-907 on high temperature fasteners.

3.11.3.4 Apply approved casing sealing compound in accordance with Paragraphs 231-8.6.3.2 through 231-8.6.3.5 of 2.3.

(Q)(G) "FINAL TORQUE"

3.11.3.5 Assemble and tighten each turbine steam joint in accordance with Paragraph 6.1.1.14 and Table 6-1-1 of 2.2.

3.11.4 Install Halon piping which was removed in 3.5.1, using MAF (1-1/2-inch lock-ring coupling SS-3300, 316 SS) in accordance with 009-95 of 2.1.

(V)(G) "OPERATIONAL TEST"

3.11.5 Accomplish the requirements of 009-71 of 2.1 for new and disturbed Halon piping system.

3.11.5.1 Hydrostatic test pressure shall be 1600 psi using fresh water.

3.12 Install the upper housing half of the reduction gear removed in 3.5, including bearing covers, using retained fasteners/hardware in accordance with Paragraph 6-2-2 and Figure 9-45 of 2.2.

3.12.1 Apply sealing compound conforming the requirements of 2.2 on joints/mating surfaces, ensuring sealing compound does not enter the oil/lubrication system.

(V)(G) “FINAL CLEANLINESS”

3.12.2 Accomplish a final cleanliness inspection of the lube oil sump of the equipment listed in 1.3.4, no foreign object large enough to be visible to the naked eye shall be present.

3.12.3 Fill the lube oil sump to operational level with clean new oil, using 2.2 for guidance.

(V)(G) "POST REPAIR ALIGNMENT VERIFICATION"

3.13 Install the high speed coupling and accomplish alignment verification in accordance with CH. 8, Section 2 and Figure 8-2-1 of 2.2.

3.13.1 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.13, to the SUPERVISOR.

3.13.2 Install the upper half guard for the high speed coupling, installing retained hardware and fasteners and using 2.2 for guidance.

(Q)(G) "OPERATIONAL TEST"

3.14 Restore system to operational status and accomplish an operational test of the SSTG under normal operating conditions, using 2.2 for guidance. Allowable steam or lube oil leakage: None.

3.15 Install new aluminized cloth spray shields on lube oil piping and valve flanges and components in accordance with ASTM F1138.

3.16 Accomplish the requirements of 009-11 of 2.1 for new and disturbed lagging and insulation.

3.16.1 Accomplish the requirements of 009-12 of 2.1 for new fasteners (studs) to support insulation and lagging.

3.16.2 Accomplish the requirements of 009-32 of 2.1 for surfaces to be insulated with the exception of non-ferrous and corrosion resistant steel (CRES) piping, plating, and vent ducting.

3.16.3 Accomplish the requirements of 009-32 of 2.1 for new insulation, lagging, and reusable covers to match surrounding areas.

3.17 Accomplish the requirements of 009-32 of 2.1 for new and disturbed surfaces.

SECTION 4.0 NOTES:

4.1 FY-19 CH-3 Standard Items apply.

4.2 Known source of Original Equipment Manufacturer (OEM) parts, service and onsite technical representative:

Curtiss-Wright

1101 Cavalier Blvd

Chesapeake, VA.

757-494-1226

4.3 Parts listed in Paragraph 3.11 are considered Long Lead Time Materials (LLTM).

4.4 Ships Force will remove and provide required 2190 TEP for paragraphs 3.7.3 and 3.12.3.

4.5 Contractor production work shall be completed by 25 JUN 2019 to allow for 10 days of Load Bank Testing of Generator with Curtiss-Wright support.

SECTION 5.0 GOVERNMENT FURNISHED MATERIAL(GFM):

1. Rotor, Turbine, Ref. 2.2, Figure 9.3, Part Number 509E217CR-1

SECTION 6.0 GOVERNMENT FURNISHED EQUIPMENT (GFE):

1. None.

SECTION 7.0 CONTRACTOR FURNISHED MATERIAL (CFM):

1. All supplies, components, materials, and hardware necessary to accomplish the requirements of this task order, that are not specifically identified as GFM, shall be supplied by the contractor.

SECTION 8.0 PERFORMANCE AND DELIVERY:

1. Contractor shall be responsible for demonstrating the satisfactory performance of all items related to this task to the Ships Project Manager and COR for final acceptance.

SECTION 9.0 CONFERENCES AND MEETINGS:

1. Contractor personnel shall be available for meetings at the Government facilities, as required, throughout the performance of this task. The COR shall give notice before meetings.

SECTION 10.0 COR DESIGNATION:

TBD