

Senior Officer Ship Material Readiness Course (SOSMRC)

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Course Grade Weighting:

50% Common Core Exam – 50% Specialty Exam

SOSMRC Exams:

- 1 – Pre-Course Exam
- 1 – Common Core (Perception) + 1 – Diagram*
- 1 – Specialty (Perception) + 3 – Diagrams

Self Study: Week 1 of SOSMRC (Week 3 of SCC)

The following topics are self-study. A 30-minute review of the objectives and Q&A session is scheduled for each topic. The material in the presentation is fully testable and incumbent upon the student to fully review and study.

SMRC-CC-154 Replenishment Stations	SMRC-CC-254 EOSS/CSOSS
SMRC-CC-257 Legal Records and Operational Logs	SMRC-CC-263 Tagout/SOMS
SMRC-CC-270 NAVOSH Programs	SMRC-CC-280 Engineering Mechanical Fundamentals PT 1 & 2
SMRC-CC-281 Engineering Electrical Fundamentals	

SOSMRC Quizzes:

Quizzes will be given to cover the week's material during Common Core; there are no Specialty quizzes. While the minimum passing score is 75% within Perception, quizzes are not calculated into the final grade. Each quiz may be taken only once.

SOSMRC Diagrams:

You will be required to draw, from memory, the specific diagrams noted below. Additionally, you should expect to analyze the system diagrams to determine how the component parts relate to one another. The line drawings are found at <G:\Students LPs\SOSMRC Lessons\References\Line Diagrams>

Gas Turbine

Main Space Layout
MRG LO Svc
FO Svc
60Hz Dist
Bleed Air (MER1)
Firemain

Steam

Main Space Layout*
Basic Steam Cycle
60Hz Dist Sys
Main Feed Sys
FO Svc Sys
LO Svc Sys

Diesel

Main Space Layout*
MPDE LO Sys
MPDE FO Sys
60Hz Dist Sys
Firemain Sys
MPDE JW/SW Sys (**)
Aux Sea Water (***)

LCS

Main Space Layout*
MPDE FO Sys
GT FO Sys
Firemain Sys
60Hz Dist Sys
Power Train (PPL)

Hybrid

Main Space Layout*
Electro Distribution
MRG LO Svc
EPCN

* Common Core Exam
** PC/MCM ONLY in lieu
of Aux Sea Water System
*** N/A for PC/MCM

Master Reference Links:	
Master Reference File: G:\Students LPs\SOSMRC Lessons\References	
NSTM: \\naeanrfkfs16\C163\USFF_NRFK_N42158_16AA_1\4335\Library\CORETL\CORETL.html	
NKO BECC/EPOC Courses: https://ile-lms.nko.navy.mil/main_app.asp?main=app	
Naval Safety Center: http://safetycenter.navy.mil/	
The Deliverables	
SRA/Ship Specific Maintenance Seminar (Team Effort by propulsion type)	
	DUE: Wednesday – Week 3 of SOSMRC (Week 5 of SCC)
	REQUIRED: <ul style="list-style-type: none"> • The assigned job sheet • Present to the staff your findings
Restricted Maneuvering Doctrine (Individual Effort)	
	DUE: Wednesday – Week 3 of SOSMRC (Week 5 of SCC)
	REQUIRED: <ul style="list-style-type: none"> • The assigned job sheet • Your ship’s RMD as reviewed and corrected by you • Maximum Engineering Reliability
INSURV Seminar (Team and Individual Effort by Propulsion Type)	
	DUE: Wednesday – Week 3 of SOSMRC (Week 5 of SCC)
	REQUIRED: <ul style="list-style-type: none"> • The assigned job sheet • Present to the staff your findings

COMMON CORE	
CC-100 C5I/AIT	
	Reference:
	<ul style="list-style-type: none"> Alteration Installation Team Manual SL720-AA-MAN-030, Chapter 3, Appendix H JFMM Vol 2, Part 1, Chapter 2
CC-106 System Operability Testing (SOTS)	
	Reference:
	<ul style="list-style-type: none"> MIP 8443 SESEF Test Evaluation Manual, Chpt 2
CC-114 Cyber Security	
	Reference:
	<ul style="list-style-type: none"> DoD 8570.01 – M, Chpt 2 Information Assurance Workforce Improvement Program SECNAV M-5239.2, DoN Information Assurance Workforce (IA) Management Manual COMNAVCYBERFORINST 5239.1, Information Assurance Workforce Improvement Program COMNAVCYBERFORINST 5239.2 (series) Commanding Officer's Information Assurance Handbook CNSP/CNSL 2502.3 SFRM INSURVINST 4730.27 (series) Information Systems Material and Security
CC-118 Waveguides, Antennas, and RADARs	
	Reference:
	<ul style="list-style-type: none"> Electronics Technician – Antennas and Wave Propagation, NAVEDTRA 14092 Series, Volume VII, Chapter 1 Electronics Technician – Radar Systems, NAVEDTRA 14089 Series, Volume IV, Chapter 1 Handbook for Shipboard Surveillance Radars, NAVTECHMAN SE-200-AA-HBK-010, Tables 11/12 Navy Electricity and Electronics Training Series (NEETS) – Radar Principles, NAVEDTRA 14190 Series Chapter 1 AEGIS Radar System AN/SPY-1A Technical Manual, SW272-AA-AEG-010 MIPs 4515 / 4516 / 4517 / 4524 / 4560
CC-119 Combat Systems Programs	
	Reference:
	<ul style="list-style-type: none"> WFIP 52G Combat Systems Smooth Log CFFCINST 4790.3 (JFMM) Vol. VI Chapter 8 WFIP 84H 2M Module Test and Repair Tracking System (MTRTS) Joint Fleet Maintenance Manual (JFMM), COMFLTFORCOMINST 4790.3 Series Vol. VI, Ch-4 Electromagnetic Radiation Hazards, NAVSEA OP 3565/NAVAIR 16-1-529 Series, Volume I, II Navy Safety and Occupational Health (SOH) Program Manual for Forces Afloat, OPNAVINST 5100.19 Series, Chapter B-9 Radiation Safety CNSP/CNSL 4790.5 Command Technical Library Management Certification Program.
CC-127 DCPO and Damage Control Maintenance	
	Reference:
	<ul style="list-style-type: none"> NTP 3-20.31, Surface Ship Survivability 3, 9 NSTM 555, Surface Ship Firefighting 1.4, 1.12, 2.4, 2.9, 2.12, 2.13, 4 NSTM 077, Personnel Protection Equipment, 3.4 NSTM 079 Vol II, Practical Damage Control 21.7, 22.1 NSTM 505, Piping Systems 7.8.2 COMNAVSURFORINST 3541.1 (series), Surface Forces Standard Repair Party Manual , 1 General Specifications for Overhaul of Surface Ships, 602, 622, 624 OCENCO EEBD Manual_340021, 6
CC-129 Firemain and Main Drainage	
	Reference:
	<ul style="list-style-type: none"> NTP 3-20.31, Surface Ship Survivability 1.5.2, 1.5.9,

	<ul style="list-style-type: none"> NSTM 555, Surface Ship Firefighting 2.3 NSTM 079 Vol II, Practical Damage Control 29.1 NSTM 505, Piping Systems 3.4, 4.4, 4.7, 4.8, 12, General Specifications for Overhaul of Surface Ships 505, 534
CC-130 Gas Free Engineering	
	Reference:
	<ul style="list-style-type: none"> NSTM Chapter 074, Volume III, Gas Free Engineering Joint Fleet Maintenance Manual (JFMM), COMFLTFORCOMINST 4790.3 Series, Volume IV Chapter 25 Navy Safety and Occupational Health (SOH) Program Manual for Forces Afloat, OPNAVINST 5100.19 Series (Chapter B8 and Appendix B3) NAVSEA S6470-AA-SAF-010 – Naval Maritime Confined Space Program OSHA General Industry Air Contaminants Standard (29 CFR 1910.1000) - Tables Z-1, Z-2, and Z-3 (Listing of all Permissible Exposure Limits) Pocket Guide to Chemical Hazards, NIOSH 2005-149 – Pages ix - xvi, Appendix E COMNAVSURFPACINST/COMNAVSURFLANTINST 3502.3 - Surface Force Readiness Manual Chapter 4 Section 404 COMNAVSURFPACINST/COMNAVSURFLANTINST 3500.11 – Surface Force Exercise Manual Chapter 3 Section 316
CC-131 Stability	
	Reference:
	<ul style="list-style-type: none"> NTTP 3-20.31, Surface Ship Survivability 5.1-5.5 NSTM 079 Vol I, Damage Control Stability and Buoyancy 2, 3, 10, 11 NSTM 079 Vol II, Practical Damage Control 42.1-42.12, 43.10, 43.11 General Specifications for Overhaul of Surface Ships, 603 Ship's Damage Control Book Section II(a)
CC-132 Collective Protection System (CPS)	
	Reference:
	<ul style="list-style-type: none"> NAVSEA SS200-AF-MMM-010 (Dec 1992) – CPS Description, Operation and Maintenance – Chapters 1-6 NAVSEA SS200-AG-MMM-010 (Dec 1992) – CPS CBR Filter System Surface Ship Survivability, NTTP 3-20.31 Series - Sections 2.1.16-20, 7.8.2.1 Navy Training System Plan for CPS, N76-NTSP-X-80-0407 Joint Fleet Maintenance Manual (JFMM), COMFLTFORCOMINST 4790.3 Series, Volume IV Navy Safety and Occupational Health (SOH) Program Manual for Forces Afloat, OPNAVINST 5100.19 Series (Chapter B8)
CC-150 Anchor Windlass and Capstan	
	Reference:
	<ul style="list-style-type: none"> NSTM 581, Anchoring 1-6 NSTM 582, Mooring and Towing 6, 10 NAVSEA S9581-A8-MMA-010, Electro-hydraulic Windlass (as applicable) NAVSEA S9581-BQ-MMA-010, Electro-mechanical Windlass (as applicable) NAVSEA S9582-A4-MMA-101, Mooring Capstans NAVSEA 0901-LP-200-0001, Winches and Capstans General Specifications for Overhaul of Surface Ships, 581, 582 SIB, Vol 1, Chapters 581 & 582 Tag-Out Users Manual (TUM), NAVSEA S0400-AD-URM-010/TUM

	<ul style="list-style-type: none"> Engineering Operational Sequencing System (EOSS) PMS 5811, 5821, A-005
CC-151 Davits and Small Boats	
	Reference:
	<ul style="list-style-type: none"> NSTM 583 Vol I, Boats and Small Craft 4, 7, 8 NSTM 583 Vol II, Handling and Stowage of Boats and Small Craft 13.1, 13.2, 13.6 NSTM 233, Diesel Engines 4.13, 6 NSTM 220 Vol III, Diesel Jacket Water 42.2 General Specifications for Overhaul of Surface Ships, 583, 611 Maintenance Index Pages (MIP) 5831, 5833
CC-152 Deck Gear & Ground Tackle	
	Reference:
	<ul style="list-style-type: none"> NSTM 077, Personnel Protection Equipment 77.2 NSTM 582, Mooring and Towing 1.2.5, 3.2, 4, 5, 8 NSTM 600, Hull Outfitting Equipment 17.2, 18.2, 18.3 General Specifications for Overhaul of Surface Ships, 502, 612
CC-153 Helo and Aviation Support Equipment	
	Reference:
	<ul style="list-style-type: none"> Aviation Readiness Qualification (ARQ), Aviation Facility Certification (AVCERT) and Aviation Certification Of COMNAVSURFOR Ships, COMNAVSURFORINST 3700.1, dated 7 Mar 13, Pages 3-6, 9 -11, Enclosures (3) – (5), (9) – (12), (16), (18) Air Capable Ship Aviation Facilities Bulletin No. 1M, Pages 12-76 Amphibious Assault Ships Aviation Facilities Bulletin No. 1C, Pages 12-42 Helicopter Operating Procedures for Air-Capable Ships NATOPS Manual, NAVAIR 00-80T-122, Chapters 1-5, 8, 9, Appendix A Helicopter Operating Procedures for Air-Capable Ships, NWP 3-04.1 Series
CC-154 Replenishment Stations	
	Reference:
	<ul style="list-style-type: none"> NSTM Chapter 571, Underway Replenishment 1-5 Underway Replenishment, NWP 4-01.4 Series, Chapters 2-6 Fleet Replenishment Guides, COMNAVSURFPACINST 3180.2 Series (as applicable) Fleet Underway Replenishment Guide, COMNAVSURFLANTINST C9010.1 Series (as applicable) NAVSEA S9570-AD-CAT-010, Underway Replenishment Hardware and Equipment Manual NAVSEA 0905-LP-487-2010, Underway Replenishment Station Capabilities Handbook General Specifications for Overhaul of Surface Ships, 570, 571, 572, 573 SIB, Vol 1, Chapters 571 & 572 Engineering Operational Sequencing System (EOSS) PMS 5711, 5713, 5714, A-124, EL-031
CC-178 Desalination and Potable Water	
	Reference:
	<ul style="list-style-type: none"> NSTM 531 Vol I, LP Distilling Plants, 3 NSTM 531 Vol III, RO Desalination Plants, 11.1, 12.2, 13.3, 14 NSTM 533 Potable Water Systems 1.1.3, 2.3, 3.4, 3.5, 4 NAVMED P5010-6 Water Supply Afloat, pp. 6-5 thru 6-18, 6-37 thru 6-45 General Specifications for Overhaul of Surface Ships 531, 532
CC-179 Galley and Habitability	
	Reference:
	<ul style="list-style-type: none"> OPNAVINST 9640.1A NAVMED P-5010-1 Sect 4 & 6

	<ul style="list-style-type: none"> Commissary Equipment, NSTM 651 1, 2.1-2.10, 3 Laundry and Dry Cleaning, NSTM 655 1.3, 1.4, 2.4, 2.5 Heating, Ventilating and Air Conditioning, NSTM 510 1, 2, 4.2 NAVSUP P486 1, 5, Part H, App. M, Q, & R NAVSUP P487 ROM II Part A Navy Safety and Occupational Health (SOH) Program Manual for Forces Afloat, OPNAV 5100.19 (Series) Vol I & II PMS 65XX, 6641, 5121
CC-181 Package Conveyors, Dumbwaiters, and Elevators	
	Reference:
	<ul style="list-style-type: none"> NSTM 572, Shipboard Stores and Provision Handling (Sections 2-4, Appendix B) NSTM 772, Cargo and Weapons Elevators (Sections 1-6) MIP Series 5721/5731/7121 Ships Information Book (SIB) Volume 1 Section 572 NAVEDTRA 43111B, 43108F EDORM Article 3301
CC-200 Marine Sanitation Devices	
	Reference:
	<ul style="list-style-type: none"> NSTM 593, Pollution Control, 4.1, 4.2, 4.3, 4.4, 4.5, 4.7 General Specifications for Overhaul of Surface Ships 593
CC-203 Navy Environmental Protection Systems	
	Reference:
	<ul style="list-style-type: none"> NSTM 593, Pollution Control, 1-3 OPNAVINST 5090.1 Series, Environmental and Natural Resources Program Manual, Chapters 1, 4, 9, 11 OPNAVINST 5100.19 Series, Navy Occupational Safety and Health Program Manual for Forces Afloat, Chapters 10, 19 OPORD 2000-11 Appendix L, Environmental Protection Requirements NAVSEAINST 9593.2A Inspection and Certification Process for OPA Systems in U.S. Navy Surface Ships and Craft, Apr 2004 International Convention for the Prevention of Pollution from Ships, Annex I-VI (MARPOL) Act to Prevent Pollution from Ships (APPS) General Specifications for Overhaul of Surface Ships 593 SIB, Vol 1, Chapter 593 Engineering Operational Sequencing System (EOSS) PMS 5931, 5932, 5933
CC-225 Explosive Safety	
	Reference:
	<ul style="list-style-type: none"> Ammunition and Explosives Safety Afloat, NAVSEA OP 4 Department of the Navy Physical Security Instruction for Conventional Arms, Ammunition, and Explosives (AA&E), OPNAVINST 5530.13 Series Navy Personnel Ammunition and Explosives Handling and Certification (QUAL/CERT) Program, OPNAVINST 8023.24 Series Handling Ammunition, Explosives and Hazardous Materials with Industrial Material Handling Equipment (MHE) NAVSEA SWO23-AH-WHM-010 Shipboard Explosive Safety Inspection Program (SESI), NOSSAINST 8023.12 Series Ammunition and Explosives Ashore; Safety Regulations for Handling, Storing, Production, Renovation and Shipping, NAVSEA OP 5, Volume I Approved Handling Equipment For Weapons and Explosives, NAVSEA OP 2173 Series Department of the Navy Explosives Safety Policy Manual, OPNAVINST 8020.14 Series Explosives Safety Accidents and Lessons Learned NAVSEA SW020-AD-SAF-010 Periodic Testing Arrangements for Ordnance Handling Equipment, NAVSEA SG420-AP-MMA-010

	<ul style="list-style-type: none"> Series Shipboard Ammunition Handling and Stowage, NSTM Chapter 700 CNSP MSG DTG 021651ZJan13 CNSL MSG DTG 121615ZFeb13
CC-226 Magazine Protection Systems	
	Reference:
	<ul style="list-style-type: none"> Ammunition and Explosives Safety Afloat, NAVSEA OP 4 Series Chapter 5-5 Joint Fleet Maintenance Manual (JFMM), COMFLTFORCOMINST 4790.3 Series, Volume IV, Chapter 14.2 Maintenance Manual for Magazine Sprinkling Systems, S9522-AA-HBK-010, Chapter 3, 4 & 5 Mk 41 Vertical Launching System, SW394-AF-SUP-010 WFIP 133C MSSV
CC-227 Small Arms	
	Reference:
	<ul style="list-style-type: none"> Planned Maintenance System MIP <ul style="list-style-type: none"> 7611/XXX Small Arms 7631/XXX Pyrotechnic Lockers NSTM Chapter 700-5.14 Ammunition and Explosive Safety Afloat, NAVSEA OP 4, Chapter 3.
CC-228 Naval Gun Systems	
	Reference:
	<ul style="list-style-type: none"> Ordnance Safety Precautions, NAVSEA OP 3347 Planned Maintenance System MIPs 7111/XXX Hydraulic Equipment (Power Transmission and Control), NSTM Chapter 556 Gunner's Mate 1 & C, NAVEDTRA 14110 Gunner's Mate 3 & 2, NAVEDTRA 14109 Procedures for Inspection, Reporting, and Re-gunning Barrels, NAVSEAINST 8300.1C Survivability of Naval Gun Barrels, SW300-BB-GTB-010 Close-In Weapon System, NAVSEA OP 4154, Volume 1 Mk 31 Mod 1 Rolling Airframe Missile, SW261-L1-MNO-030 VLS Operation and Maintenance, SW394-AF-MNO-040/VLS
CC-229 Combat Systems Alignment	
	Reference:
	<ul style="list-style-type: none"> SW225-A0-MMA-010/ALIGNTHEORY, Combat System Alignment Theory, 1, 4 General Specifications for Overhaul of Surface Ships 184
CC-250 3M/Planned Maintenance System	
	Reference:
	<ul style="list-style-type: none"> Ships' Maintenance and Material Management (3M) Manual, NAVSEAINST 4790.8C, dated 14 Mar 2013, Section 1, Chapters 1 – 3, Appendices F and G Joint Fleet Maintenance Manual (JFMM), COMFLTFORCOMINST 4790.3 Series, Volume VI, Chapter 19 (Maintenance and Material Management) COMNAVSURFPAC/LANT INST 4790.1G 17 JUL 13 (Surface Force Maintenance and Material Management Program) COMNAVSURFPAC/LANT INST 4790.2 17 JUL 13 (Surface Force Maintenance and Material Management Assessment and Certification Program)
CC-251 – Preservation of Surface Ships	
	Reference:
	<ul style="list-style-type: none"> NSTM 631, Preservation of Ships in Service 1.3, 6, 8.1 thru 8.18, 8.20, 10 NSTM 634, Deck Coverings, 4, 7 NSTM 635, Cathodic Protection 2.1, 2.3, 3, 5, 6.3 General Specifications for Overhaul of Surface Ships (GSO 2012), 630, 631, 633, 634

	<ul style="list-style-type: none"> Maintenance Index Page (MIP) 6330
CC-252 CSMP/Eight O'clock Reports	
	Reference:
	<ul style="list-style-type: none"> Joint Fleet Maintenance Manual (JFMM), COMFLTFORCOMINST 4790.3 Series, Volume II, Part 1, Chapters 2 – 4 (Availabilities), and Part 2, Chapters 1 – 3 (Work Package Preparation/Execution) Joint Fleet Maintenance Manual (JFMM), COMFLTFORCOMINST 4790.3 Series, Volume VI, Chapter 19 (Maintenance and Material Management), Chapter 33 (MMBP), Chapter 41 (Maintenance Team) Ships' Maintenance and Material Management (3-M) Manual, NAVSEAINST 4790.8C, dated 14 Mar 2013, Section 1, Chapter 4 COMNAVSURFPAC/LANT INST 4790.1G 17 JUL 13 (Surface Force Maintenance and Material Management Program) COMNAVSURFPAC/LANT INST 4790.2 17 JUL 13 (Surface Force Maintenance and Material Management Assessment and Certification Program)
CC-253 Electrical Safety	
	Reference:
	<ul style="list-style-type: none"> Electric Plant-General, NSTM Chapter 300 Rev 9 Navy Safety and Occupational Health (SOH) Program Manual for Forces Afloat, OPNAVINST 5100.19 Series Standard Organization and Regulations Manual (SORM) of the US Navy, OPNAVINST 3120.32 Series
CC-254 EOSS/CSOSS	
	Reference:
	<ul style="list-style-type: none"> Combat Systems Operational Sequencing System (CSOSS) User's Guide Engineering Operational Sequencing System User's Guide (EUG) Engineering Department Organization and Regulations Manual (EDORM), COMNAVSURFORINST 3540.3 Series Engineering Department Organization Manual for Non-Nuclear Steam Propulsion Ships of the Naval Surface Forces COMNAVSURFPACINST 3540.13 Series Operational Sequencing Systems (OSS), NAVSEAINST 4790.7 series Operational Sequencing Systems (OSS), OPNAVINST 9200.3 Series Principles of Naval Engineering, NAVEDTRA 12960 Series
CC-255 Gauge Calibration	
	Reference:
	<ul style="list-style-type: none"> Joint Fleet Maintenance Manual, USFFCINST 4790.3 Series, Vol VI, Chapter 9 (Metrology and Calibration) ST700-AM-GYD-010, Chapter 2, Appendix D, and Enclosure (1) - METCAL Laboratory Requirements and Certification Guide NSTM Chapter 504 (Sections 504-1.6.3, 2.3.1, 2.7, 3.7, 4.7, 5.7, 6.3, 9.6, 10.7, 11.8, 14.6) - Pressure, Temperature and other Mechanical and Electromechanical Measuring Instruments
CC-257 Legal Records and Operating Logs	
	Reference:
	<ul style="list-style-type: none"> Navy Regulations Articles 0845, 0846 Standard Organization and Regulations Manual of the US Navy (OPNAVINST 3120.32 Series) Sections 423, 424 Engineering Department Organization and Regulations Manual (COMNAVSURFORINST 3540.3 Series) Appendix E – Log Keeping Principles NSTM Chapter 090 (Inspections, Tests, Records, and Reports) Sect. 2.2 NSTM Chapter 079 (Damage Control, Engineering Casualty Control) Volume III Sections 49.1.3, 49.3, 49.5 NSTM Chapter 220 (Boiler Water/Feedwater – Test and Treatment) Volume II, (Section 27)

	<ul style="list-style-type: none"> • NSTM Chapter 633 (Cathodic Protection) Section 6.3 • Full Power and Economy Trial Requirements for Non-Nuclear Surface ship Classes (OPNAVINST 9094.1 Series) • Department of the Navy Records Management Program (SECNAVINST 5210.5 Series)
CC-258 Fuel Oil Quality Management	
	Reference:
	<ul style="list-style-type: none"> • Engineering Department Organization and Regulations Manual(EDORM), COMNAVSURFORINST 3540.3 Series • Ship Fuel and Fuel Systems, NSTM Chapter 541 (Sections 542-1.5, 1.8, 2.1, 2.4, 4, 5, 10) • Gasoline and JP-5 Fuel Systems, NSTM Chapter 542 (Sections 2.3, 2.6, 4, 7) • Engineering Operational Sequencing System – SNOK, FOCL, SRFO • Fuel Oil Quality Management (FOQM) Program Afloat Self-Assessment (ASA) Check-sheet • CNSP 192300Z OCT 12, COMNAVSURFPAC OIL SPILL PREVENTION • CNSF 311606Z MAR 09, STANDING COMNAVSURFOR OIL SPILL PREVENTION AND RESPONSE GUIDANCE • OPNAVINST 5090.1C Environmental and Natural Resource Program
CC-259 Lube Oil Quality Management	
	Reference:
	<ul style="list-style-type: none"> • Engineering Department Organization and Regulations Manual(EDORM), COMNAVSURFORINST 3540.3 Series • Joint Fleet Maintenance Manual (JFMM), COMFLTFORCOMINST 4790.3 Series (www.submepp.navy.mil/jfmm) <ul style="list-style-type: none"> – Volume V, Part 1, Chapter 2 – Quality Maintenance Practices • Lubricating Oils, Greases, Specialty Lubricants, and Lubrication Systems, NSTM Chapter 262, (Sections 262-1, 2.1.2, 3.6.4, 3.6.5, 3.7, 4, 5, App D) • Diesel Engines, NSTM Chapter 233 (Section 8) • Propulsion Reduction Gears, Couplings, Clutches and Associated Components, NSTM Chapter 241 (Section 241-3.2) • Propulsion Bearings and Seals, NSTM Chapter 244 (Sections 244-1.7.8, 2.4.2, 2.5.2, 2.6.3, 3.6) • Propellers, NSTM Chapter 245 (Section 245-5.5.2) • Hydraulic Equipment (Power Transmission and Control), NSTM Chapter 556 (Sections 556-5.1.2, 8.3 – 8.5) • Planned Maintenance System (PMS), MIPs 2000, 2331, 2451, 3112 • Lube Oil Quality Management (LOQM) Program Afloat Self-Assessment (ASA) Check-sheet
CC-260 Planning Board for Maintenance (PB4M)	
	Reference:
	<ul style="list-style-type: none"> • Joint Fleet Maintenance Manual, COMFLTFORCOMINST 4790.3 Series, REV B, CH 5, (JFMM) Volume VI, Chapter 41 (Maintenance Team), Chapter 41, para 41.4 (PB4M) • JFMM, Volume VI, Chapter 33 (MMBP) • JFMM, Volume II, Part II, Chapter 1 (Surface Ship Maintenance Validation, Screening and Brokering) • JFMM, Volume II, Part II, Chapter 3 (CNO Availabilities) • JFMM, Volume II, Part II, Chapter 4 (Fleet Maintenance Availabilities)
CC-262 – Quality Maintenance	
	Reference:
	<ul style="list-style-type: none"> • Joint Fleet Maintenance Manual (JFMM), COMFLTFORCOMINST 4790.3 Series (www.submepp.navy.mil/jfmm) <ul style="list-style-type: none"> – Volume V, Part 1, Chapter 2 – Quality Maintenance Practices • Material Control Standard (Non-Nuclear), NAVSEA 0948-LP-045-7010 • Afloat Self-Assessment (ASA) Check-sheets for your ship

CC-263 Tagout/SOMS	
	Reference:
	<ul style="list-style-type: none"> • Tag-Out Users Manual (TUM), NAVSEA S0400-AD-URM-010/TUM ACN 1/A • Engineering Department Organization and Regulations Manual (EDORM), COMNAVSURFORINST 3540.3 Series • Navy Safety and Occupational Health (SOH) Program Manual for Forces Afloat, OPNAVINST 5100.19 Series, Vol. 1, B7 • Shift Operations Management System (ESOMS) Program Policy and Status, COMNAVSURFOR SAN DIEGO, CA 240304Z APR 08 • Ship's Engineering Operational Sequencing System (EOSS) • Zone Inspections, COMNAVSURFORINST 3120.1 Series • NSTM Chapter 300 Rev 9, 300.G.5.3
CC-264 Zone Inspection and Self-Assessment	
	Reference:
	<ul style="list-style-type: none"> • United States Navy Regulations 1990, Chapter 8, para 0808 • Zone Inspections, COMNAVSURFORINST 3120.1 Series • 3M Manual, COMNAVSEASYSKOMINST 4790.8C, dated 14 Mar 2013, Section 2-8 (PMS Self-Assessment) • General Specifications for Overhaul of Surface Ships 670, 671 • INSURV Handbook, Edition 1.0, May 2013
CC-265 Integrated Condition Assessment System (ICAS)	
	Reference:
	<ul style="list-style-type: none"> • DDG SIB (S9DDG-DE-SIB-100/DDG104 Section 1-7)
CC-270 NAVOSH Programs	
	Reference:
	<ul style="list-style-type: none"> • OPNAVINST 5100.19 (series), A2, A5, B2, B3, B4, B5, B6, B12 • NSTM 077, Personnel Protection Equipment, 4.2.3, 6, 8 • NSTM 600, Hull Outfitting Equipment 18.2, 18.4 • https://www.osha.gov/dsg/hazcom/ghs.html • BUMEDNOTE 6260 dtd 13DEC12
CC-272 Restricted Maneuvering Doctrine (RMD)	
	Reference:
	<ul style="list-style-type: none"> • COMNAVSURFORINST 3540.3 Series, Engineering Department Organization and Regulations Manual (EDORM), Chapter 4, Section 4303 • EOSS User's Guide (EUG)
CC-279 Engineering Mechanical Fundamentals (Part 1)	
	Reference:
	<ul style="list-style-type: none"> • NSTM 505, Piping Systems 1, 7, 9 • NSTM 075, Fasteners 1, 8 • Machinist's Mate 3 & 2 (Surface), NAVEDTRA 14151 Series, Chapter 10 • Joint Fleet Maintenance Manual, COMUSFLTFORCOMINST 4790.3 Series <ul style="list-style-type: none"> – Volume V, Part 1, Chapter 5 – In-Process Control (fasteners, joints, piping) • General Specifications for Overhaul of Surface Ships, 075, 505, 558 • Tag-Out Users Manual (TUM), NAVSEA S0400-AD-URM-010/TUM • Engineering Operational Sequencing System (EOSS) • PMS 5000
CC-280 Engineering Mechanical Fundamentals (Part 2)	
	Reference:
	<ul style="list-style-type: none"> • NSTM 254, Condensers, Heat Exchangers, and Air Ejectors 1, 3, 4

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GT-317 Gas Turbine Generator Mechanical	
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HYB-903 Machinery Control System (MCS)	
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	Required Reference:
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	Required Reference:
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DSL-412 Diesel Engines 101	
	Required Reference:
	<ul style="list-style-type: none"> • NSTM 233, Diesel Engines, Sections 3 & 4 • Engineman EN NAVEDTRA 14075A • (LPD) Colt-Pielstick PC-2.5V (STC) Diesel Engine Tech Manual (S9233-DL-MMM-010) • (LSD) Colt-Pielstick PC-2.5V Diesel Engine Tech Manual (S9233-A8-MMO-010) • (MCM) Isotta Fraschini Diesel Engine Tech Manual (S9233-B9-MMM-010/A0106) • (MCM) Waukesha Motors Co. Diesel Engine Tech Manual (S9233-AS-MMO-010) • (PC) Paxman Valenta Diesel Engine Tech Manual (S9233-E1-MMC-010) • (Ship Specific) SIB Vol 2, Part 1, Machinery Plant/Propulsion Plant, Chapters 1 and 4 (section 1) • General Specifications for Overhaul of Surface Ships (GSO 2012), 200, 203 • PMS 2331
DSL-430 Ballasting, Deballasting, and Wet-well Operations (LSD/LPD/LHD Only)	
	Required Reference:
	<ul style="list-style-type: none"> • NSTM 551, Compressed Air Systems, Sections 551-2.5.6 and 551-4.5.3 • NSTM 556, Hydraulic Equipment Power Transmission and Control, Sections 2 and 4

	<ul style="list-style-type: none"> Wet Well Operations Manual, COMNAVSURFINST 3340.3 Series, Chapters 2, 5, 9, 10 (Ship Specific) SIB Vol 7, Ballasting/Deballasting , Chapters 1-4 (Ship Specific) Damage Control (DC) Book, Ballasting and Air Deballasting Systems Diagrams RMG R201900Z Jul 12, PEO SHIPS LPD-17 Class Ad 11-10, Stern Gate Operation General Specifications for Overhaul of Surface Ships, 529 PMS 5290, 5291, 5292, 5293, 5295, 5296
DSL-431 Cranes	
	Required Reference:
	<ul style="list-style-type: none"> NSTM Chapter 589 (Cranes) Sections 2 through 6 NSTM Chapter 573 (Booms) Sections 2 through 5 NSTM Chapter 613 (Wire and Fiber Rope and Rigging) Section 1.2 through 1.10 NSTM Chapter 700 (Shipboard Ammunition, Handling and Stowage) Sect. 2 & 4 NSTM Chapter 262 (Lubricating Oils, Greases, Specialty Lubricants, and Lubrication Systems) Appendix A Hydraulic Equipment: Power Transmission and Control, NAVEDTRA Chapter 556 JFMM (COMFLTFORCOMINST 4790.3 Series) Vol. IV, Chapter 13 PMS MRC DI-MNTY-80991 Ship's Information Book (SIB) NAVSEA SG811-BD-MOO-010, Operation and Maintenance Manual for Nonmagnetic Stern Cranes (Model S-536) – MCM-1 Class
DSL-450 MMTG (MCM Only)	
	Required Reference:
	<ul style="list-style-type: none"> Saturn Gas Turbine Power Plant Assembly, Models T-1000S-28AA and T-1302S-28AA Series; Organizational and Intermediate Level Maint Manual (S9234-FG-MMM-010) MCM Propulsion Plant Manual, Vol. 2 MCM SIB (S9MCM-AP-SIB-020) Vol. 2 Part I Chapter 6 MCM SIB (S9MCM-AP-SIB-040) Vol. 3 Part I Sections 1-4 and 2-4.4 MCM SIB (S9MCM-AP-SIB-090) Vol. 6 Sections 4-7 through 4-13, 4-18 and 8-1 EOSS Procedures MGTSO, MGTS, DGTP, CGTBT, CGTLL, LFOPT, LGTG NSTM 234 (Marine Gas Turbines) Section 8 MGTESR ASA Checksheets (Rev. MAR12) Introduction to Naval Engineering, Chapter 4 (p224-226)
DSL-470 Combat Craft Retrieval System (CCRS) (PC Only)	
	Required Reference:
	<ul style="list-style-type: none"> NSTM 551, Compressed Air Systems, Sections 551-2.5.6 and 551-4.5.3 S9PC0-AC-SIB-010/PC-3, Hull and Hull Mechanical Systems, 583-1.3 S9PC0-AC-SIB-030/PC-3, Machinery Plant, Auxiliary Machinery, Piping, Air Conditioning, Ventilation, and Heating Systems, 3
DSL-471 PC Halon (PC Only)	
	Required Reference:
	<ul style="list-style-type: none"> S9PC0-AC-SIB-010/PC-3, Hull and Hull Mechanical Systems, 555-1 S9PC0-AC-SIB-030/PC-3, Machinery Plant, Auxiliary Machinery, Piping, Air Conditioning, Ventilation, and Heating Systems, 17
DSL-472 PC Fin Stabilizers	
	Reference:
	<ul style="list-style-type: none"> S9PC0-AC-SIB-020 Machinery Plant, General Design and Operating Procedures S9PC0-AC-SIB-030 Machinery Plant, Auxiliary Machinery, Piping, Air Conditioning, Ventilation, and Heating Systems, 566-1 S9566-AB-MMA-010 PC1 Class Fin Stabilizer System

STEAM	
STM-700 Nucleate Boiling	
	<p>Reference:</p> <ul style="list-style-type: none"> • Elements of Applied Thermodynamics, Robert M. Johnson • Principles of Naval Engineering, NAVPERS 10788 series • Applied Engineering Principles • NAVEDTRA 14150 MM1 & MMC • NSTM CHAPTER 220/221 Boiler Water Feed Water • Manufacturer's Technical Manual for 600 psi Main Boiler • Engineering Operational Sequence System
STM-701 Basic Steam Cycle	
	<p>Reference:</p> <ul style="list-style-type: none"> • Elements of applied thermodynamics • NSTM Chapter 221 (Boilers) • NSTM Chapter 231 (Propulsion and SSTG Steam Turbines) • NSTM Chapter 254 (Condensers Heat Exchangers and Air Ejector) Section 2 and 5 • NSTM Chapter 255, vol 1 (Feedwater System and Apparatus, Feed and Condensate System) • NSTM Chapter 255, vol 2 (Feedwater System and Apparatus – Deaerating Feed Tanks) • NSTM Chapter 503 (Pumps) • NAVEDTRA 14150A Machinist Mate (Surface)
STM-702 Main Steam System	
	<p>Reference:</p> <ul style="list-style-type: none"> • Main Steam Piping, NAVSEA 0910-LP-142-3600 • NSTM Chapter 231 (Propulsion and SSTG Steam Turbines), Sections 2.3 • Piping Systems, NSTM Chapter 505 (Piping Systems), Sections 2 and 7 • NAVEDTRA 14150A Machinist Mate (Surface)
STM-703 Boiler Construction	
	<p>Reference:</p> <ul style="list-style-type: none"> • NSTM Chapter 221, Boilers • NAVEDTRA 14150A Machinist Mate (Surface) • S9221-A3-MMO-A10 600 PSI TYPE V2M MAIN BOILER FOR LHD-1 CLASS. Sec A, F, H, M, N • 9221-DT-MMO-010 BCMS Technical Manual. • S6435-Q1-MMO-010, REMOTE OPERATED PILOT SAFETY VALVE SYSTEM FOR 600 AND 1200 PSI BOILERS, MODEL #8000 PILOT UNIT MODEL #6350 SAFETY VALVE • Engineering Operational Sequencing System (EOSS)
STM-704 Combustion Air	
	<p>Reference:</p> <ul style="list-style-type: none"> • NSTM CHAPTER 221 Boilers, Section 3 and 4 • NAVEDTRA 14150A Machinist Mate (Surface) • S9221-A3-MMO-A10 600 PSI TYPE V2M MAIN BOILER FOR LHD-1 CLASS, Section A • S9251-B4-MMA-010 TURBINE DRIVEN TWO STAGE HORIZONTAL FORCED DRAFT BLOWER, 44BH-2, Chapter 1, 2, and 3 • S9251-B5-MMA-010/09519 PORT USE FORCED DRAFT BLOWER, SIZE 660BL, Chapter 1, 2, and 3 • Engineering Operational Sequencing System (EOSS)
STM-705 Automatic Boiler Controls	

	<p>Reference:</p> <ul style="list-style-type: none"> • NAVEDTRA 14150A Machinist Mate (Surface) • NAVSEA S9221-BJ-MMO-010/020, Automatic combustion and feed water control system • NSTM CHAPTER 225, Steam Machinery Control Systems, Section 2, and 3.4 • On-line alignment verification procedures (Vol. 2 of Auto Boiler Controls Technical Manual or appropriate OLV manual) • Boiler, Manual/Automatic controls level 2 - system test (MIP-2212/146-B6) • S-4R Boiler flexibility test (MRC-45 A6QP N)
STM-707 Boiler Casualties	
	<p>Reference:</p> <ul style="list-style-type: none"> • Engineering Operational Casualty Control (EOCC) • NSTM Chapter 079 Vol. III, Casualty Control • NSTM Chapter 221, Boilers
STM-708 Boiler Operations	
	<p>Reference:</p> <ul style="list-style-type: none"> • S9221-A3-MMO-A10 600 PSI TYPE V2M MAIN BOILER FOR LHD-1 CLASS, Chapter B • NSTM Chapter 221 (Boilers), Section 4 • Engineering Operational Sequencing System (EOSS)
STM-709 Boiler Appraisals and Inspections	
	<p>Reference:</p> <ul style="list-style-type: none"> • Boiler Water / Feedwater Test and Treatment NSTM Chapter 220 • Boilers NSTM Chapter 221 • Boiler Inspection Manual NAVSEA S9221-D2-MMA-010 • Joint Fleet Maintenance Manual COMFLTFORCOMINST 4790.3 (series) Chapter 3 • Repair and Overhaul Manual for Main Propulsion Boilers NAVSEA S9221-C1-GTP-010 • Standard Organization and Regulations for U.S. Navy OPNAVINST 3120.32 • Steam Generator Plant Inspector certification program OPNAVINST 9220.3
STM-710 Main Feed System	
	<p>Reference:</p> <ul style="list-style-type: none"> • S6226-JZ-MMA-010, Turbine-Driven, Main Feed Pump, Chapter 1, 2, and 3 • S6226-EB-MMA-010, MAIN FEED BOOSTER PUMP, Chapter 1, 2, and 3 • 0938-LP-047-8010, Deaerating Feedwater Heater, Chapter 1, 2, and 3 • NAVSEA 0941-LP-051-6010 Propulsion Plant Manual • NAVEDTRA 14150A Machinist Mate (Surface) • NSTM CHAPTER 255 Vol. 2, Feedwater Systems and Apparatus DFT, Section 5 and 6 • NSTM CHAPTER 503 Pumps, Section 2 • NSTM Chapter 225 STEAM MACHINERY CONTROL SYSTEMS, Section 2 and 3
STM-712 Boiler Light-Off	
	<p>Reference:</p> <ul style="list-style-type: none"> • S9221-A3-MMO-A10 600 PSI TYPE V2M MAIN BOILER FOR LHD-1 CLASS. Sec A, F, H, M, N • Boiler Water/Feedwater – Test and Treatment, NSTM Chapter 220, Volume II • NSTM Chapter 221, Boilers, Section 3 and 4 • Engineering Operational Sequencing System (EOSS) • Feedwater System and Apparatus Feed and Condensate Systems, NSTM Chapter 255 Volume I • S9251-B4-MMA-010 TURBINE DRIVEN TWO STAGE HORIZONTAL FORCED DRAFT BLOWER, 44BH-

	<p>2, Chapter 1, 2, and 3</p> <ul style="list-style-type: none"> • S9251-B5-MMA-010/09519 PORT USE FORCED DRAFT BLOWER, SIZE 660BL, Chapter 1, 2, and 3 • NSTM Chapter 503, Pumps, Section 2, 3, and 4 <p>Ship Fuel and Fuel Systems, NSTM Chapter 541</p>
STM-714 Main Engines and Turbine Theory	
	<p>Reference:</p> <ul style="list-style-type: none"> • NAVEDTRA 14150A Machinist Mate (Surface) • NSTM Chapter 231, Propulsion and SSTG Steam Turbines, Section 1 and 2 • Ship's Engineering Operational Sequencing System (EOSS)
STM-715 Main Fuel Oil system	
	<p>Reference:</p> <ul style="list-style-type: none"> • Engineering Operational Sequencing System (EOSS) • Gasoline and JP-5 Fuel Systems, NSTM Chapter 542 • Planned Maintenance System (PMS) • Pollution Control, NSTM Chapter 593 • Ship's Fuel and Fuel Systems, NSTM Chapter 541 • Standard Notes to the Oil King (SNOK)
STM-716 Distilling Plants / Evaporators	
	<p>Reference:</p> <ul style="list-style-type: none"> • NSTM CHAPTER 531, DESALINATION, VOLUME 1, LOW-PRESSURE DISTILLING PLANTS, Section 3 • S9531-BJ-MMA-010-09647, maintenance Manual for 100,000 Gallon Per Day Flash-Type Distilling Plant, Model S4167 FL-6, Chapter 1, 2, and 3 • NSTM Chapter 533, Potable Water Systems, Section 3 • NAVPERS 10788 series, Principles of Naval Engineering • NAVEDTRA 14151, MM 3 & 2, Chapter 9
STM-719 Main Lube Oil System	
	<p>Required Activity:</p> <ul style="list-style-type: none"> • Engineering Department Organization and Regulations Manual (EDORM), COMNAVSURFORINST 3540.3 Series • S0947-LP-079-4010 Electric Lube Oil Pump Manual, Chapter 1, 2, and 3 • S0945-LP-004-6010, Lube Oil Heater Manual, Chapter 1, 2, and 3 • S0945-LP-017-6010 Lube Oil Purifier Manual, Chapter 1, 2, and 3 • S6226-AA-MMA-010/63857, MAIN LUBE OIL PUMP TYPE 525TS, Chapter 1, 2, and 3 • NSTM Chapter 231, Propulsion and SSTG Steam Turbines, Section 3 • NSTM Chapter 241, Propulsion Reduction Gears, Couplings, Clutches, and Associated Components, Section 3 • NSTM Chapter 262, Lubricating Oils, Greases, Specialty Lubricants, and Lubrication Systems, Sec 3 and 5 • NSTM 503, Pumps, Section 3 • Planned Maintenance System (PMS) • Ship's Engineering Operational Sequencing System (EOSS) • CNSF Main Lube Oil Sump Inspection Guidance, COMNAVSURFPAC MSG DTG 160224Z NOV 04 • Lessons Learned on Loss of Lube Oil Pressure to MRG, COMNAVSAFECEN MSG DTG 011938Z MAY 06
STM-720 Auxiliary Steam and Auxiliary Exhaust System	
	<p>Reference:</p>

	<ul style="list-style-type: none"> • NSTM Chapter 221, Boilers, Section 2 and 4 • NSTM Chapter 503, Section 2 • NSTM Chapter 254, Condensers, Heat Exchangers, and Air Ejectors, Section 5 • NSTM Chapter 255, Volume II Feedwater Systems and Apparatus, Deaerating Feed Tank, Section 5 • NSTM Chapter 225, Steam Machinery Control Systems, • NSTM Chapter 531 Vol 1, Sec 1 • NSTM Chapter 225, Steam Machinery Control Systems, Section 1 and 2 • S6226-JZ-MMA-010, Main Feed Pump, Chapter 1 • S9251-B4-MMA-010 Forced Draft Blower, Chapter 1 • NAVEDTRA 14150A Machinist Mate (Surface)
STM-721 Ship Service Turbine Generator	
	<p>Reference:</p> <ul style="list-style-type: none"> • NSTM Chapter 231, Propulsion And SSTG Steam Turbines, Section 2 • S9311-A7-MMA-010, SSTG Technical Manual, Chapter 1 and 2 • OPNAVINST 5100.19 series Volume 2, NAVOSH Manual • NSTM Chapter 262, Lubricating Oils, Greases, Specialty Lubricants, and Lubrication Systems, Section 3
STM-723 60/400 Hz Electrical Distribution	
	<p>Reference:</p> <ul style="list-style-type: none"> • NSTM Chapter 300, Electric Plant – General, Section 4 • NSTM Chapter 320, Electric Power Distribution Systems, Section 1 and 2 • NSTM Chapter 310 Electric Power Generators and Conversion Equipment, Section 3 • S9311-A7-MMA-010, SSEDG, Chapter 1 • S9324-B6-MMB-010/06841, Electrical Plant Control Panel Maintenance Manual, • NAVEDTRA 14344 Electrician’s Mate, • Ship’s Engineering Operational Sequencing System (EOSS) • Ship’s Information Book (SIB) • S9324-CA-MMA-030, Ship’s Service Switchboard Maintenance Manual
STM-724 Ships Steering and Control	
	<p>Reference:</p> <ul style="list-style-type: none"> • Principles Of Naval Engineering, NAVEDTRA 12960, Unit 2 and 3 • Shipboard Electrical Systems, NAVEDTRA 10864 • NSTM Chapter 562, Surface Ship Steering Systems
STM-725 Main and Auxiliary Condensate System	
	<p>Reference:</p> <ul style="list-style-type: none"> • NSTM Chapter 254, Condensers, Heat Exchangers and Air Ejectors, Section 1, 2, and 5 • NSTM Chapter 503, Pumps, Section 2, and 3 • S0946-LP-010-9010 Main Condensers, Chapter 1, 2, and 3 • S0946-LP-010-7010 Main Air Ejectors, Chapter 1, 2, and 3 • S0947-LP-090-6010 Main Condensate Pump, Chapter 1, 2, and 3
STM-728 Basic Diesel Engine and Construction	
	<p>Reference:</p> <ul style="list-style-type: none"> • NSTM Chapter 233, Diesel Engines, Section 3 • Engineman (EN) NAVEDTRA 14075A • S9312-AR-MMC-010 EMERGENCY DIESEL GENERATOR 2000 KW, 450 VOLTS, 3 PHASE 60 HERTZ,

	<p>MODEL 701, Chapter 2</p> <ul style="list-style-type: none">• Ship Specific Propulsion Operating Guides (POGs)• Ship Specific Ship Information Books (SIBs)
STM-733 Main Reduction Gear and Shafting	
	<p>Reference:</p> <ul style="list-style-type: none">• Engineering Operational Sequencing Systems (EOSS)• NSTM Chapter 243 Shafting, Entire Document• NSTM Chapter 241 Propulsion Reduction Gears, Section 2• NAVSEA Manufacturer's Technical Manual, Stern Tube Seal, Type MX9• Vent Fog Precipitator Manual NAVSEA 0938-LP-024-5010

LCS-1	
Basic Gas Turbine	
	Reference:
	<ul style="list-style-type: none"> Planned Maintenance System (PMS) Personnel Qualification Standard (PQS) - EOW Engineering Operational Sequencing System (EOSS) SHIP'S INFORMATION BOOK (SIB)
Fuel Oil Service System	
	Reference:
	<ul style="list-style-type: none"> NSTM Chapter 541, Ship Fuel and Fuel Systems Engineering Operations Sequencing System (EOSS) Technical Manual MMC 541-01-0001, Blackmer Fuel Oil Transfer Pump TM S6226-SY-MMC-010, Fuel Oil Transfer Pump TM S9261-BH-MMC-010, Gas Turbine Fuel Oil Return Cooler TM S9261-BJ-MMC-010, Gas Turbine Fuel Oil Service Pre-filter, Aircraft Appliance and Equipment Model 74048D-1, Operation and Maintenance TM MMC 261-01-E0006, Aircraft Appliance and Equipment Gas Turbine Fuel Service Filter/Separator
LCS Combining / Splitter Gears Lube Oil Scavenge System	
	Reference:
	<ul style="list-style-type: none"> NSTM 262 Lubricating Oils and Greases NSTM 241 Propulsion Reduction Gears NSTM Chapter 244, Propulsion Bearings and Seals MMC 241-01-00001, USS Freedom (LCS-1) MAAG Reduction Gears and associated equipment; Vol 1, 2 and 3. Littoral Combat Ship (LCS) Blackmer Shaft Bearing Lube Oil Scavenge Pump, MMC 262-01-E0006 Littoral Combat Ship (LCS) Shaft Bearing Lube Oil Scavenge Pump, S6226-S3-MMC-010 S9241-C7-TRS-010 (Combining Gear TRS)
Intro & Propulsion Overview	
	Reference:
	<ul style="list-style-type: none"> LCS-1 USS Freedom Ship Information Guide Technical Manual S9LCS-AA-SIB-020 LCS-1 USS Freedom Propulsion Operating Guide, S9LCS-AA-POG-010
Lube Oil Service System	
	Reference:
	<ul style="list-style-type: none"> NSTM 262 Lubricating Oils and Greases TM S9202-BC-MMO-010, Littoral Combat Ship, Centralized Machinery Control System Manual. Technical Manual S9262-BE-MMC-010, Lube Oil Purifier, Circulation Heater and Controller, Chromalox Models NWHO-1860E4XX & 4239-90043 Installation, Operation, and Maintenance Manual. Technical Manual S9LCS-AA-SIB-020 Vol. No. 2 (Part 1), LCS-1 FREEDOM Ship Information Book, Machinery Plant. Technical Manual S9LCS-AA-SIB-010, Vol. 1, LCS-1 FREEDOM Ship Information Book Hull, Mechanical, and Equipment Systems.

	<ul style="list-style-type: none"> • Technical Repair Standard MMC 593-02-E0002- Pump/Motor Lube Oil Transfer; Dirty Lube Oil Transfer; and Dirty Synthetic Oil Transfer Model H-125. • Engineering Operations Sequencing System (EOSS) Preliminary. • S9LCS-AA-POG-010, Propulsion Operating Guide. • Technical Manual 0910-LP-106-2209, Radar Tank Level Indicator VEGAFLEX 67, Operation and Maintenance Manual.
Lube Oil Fill & Transfer System	
	Reference:
	<ul style="list-style-type: none"> • NSTM 262 Lubricating Oils and Greases • TM S9202-BC-MMO-010, Littoral Combat Ship, Centralized Machinery Control System Manual. • Technical Manual S9262-BE-MMC-010, Lube Oil Purifier, Circulation Heater and Controller, Chromalox Models NWHO-1860E4XX & 4239-90043 Installation ,Operation, and Maintenance Manual. • Technical Manual S9LCS-AA-SIB-020 Vol. No. 2 (Part 1), LCS-1 FREEDOM Ship Information Book, Machinery Plant. • Technical Manual S9LCS-AA-SIB-010, Vol. 1, LCS-1 FREEDOM Ship Information Book Hull, Mechanical, and Equipment Systems. • Technical Repair Standard MMC 593-02-E0002- Pump/Motor Lube Oil Transfer; Dirty Lube Oil Transfer; and Dirty Synthetic Oil Transfer Model H-125. • Engineering Operations Sequencing System (EOSS) Preliminary. • S9LCS-AA-POG-010, Propulsion Operating Guide. • Technical Manual 0910-LP-106-2209, Radar Tank Level Indicator VEGAFLEX 67, Operation and Maintenance Manual.
MPCMS Components & HMI	
	Reference:
	<ul style="list-style-type: none"> • S9LCS-AW-POG-010 Propulsion Operating Guide • Technical Manual S9LCS-AA-SIB-020 LCS-1 FREEDOM Ship Information Book • Engineering Operational Sequencing System (EOSS)
Main Propulsion Diesel Engines	
	Reference:
	<ul style="list-style-type: none"> • NSTM Chapter 233 Diesel Engines • NAVSEA S9233-DT-MMC-010/LCS, Main Propulsion Diesel Engine for Littoral Combat Ships • S9LCS-AW-SIB-010, Littoral Combat Ship Hull and Mechanical Systems • S9LCS-00-SIB-020, Littoral Combat Ship Main Machinery Plant, General Design and Operating Procedures
MT-30 Gas Turbine Engine	
	Reference:
	<ul style="list-style-type: none"> • Technical Manual S9234-DZ-MMC-010 MT-30 Vol. I, Operation and Maintenance Manual • S9234-DW-IMC-010 (MT30 GT Sensors) • S9234-DV-MMC-010 (Compressor Wash-down System) • S9LCS-AW-SIB-010, Littoral Combat Ship Hull and Mechanical Systems • S9LCS-00-SIB-020, Littoral Combat Ship Main Machinery Plant, General Design and Operating Procedures • S9086-HC-STM-010, CHAP 24, Marine Gas Turbine Engines
Fuel Oil Fill & Transfer	
	Reference:
	<ul style="list-style-type: none"> • Littoral Combat Ship (LCS), Fuel Oil Transfer Pump, S6226-SY-MMC-010 • Littoral Combat Ship (LCS), Fuel Oil Level Gauge System, S9437-CH-MMC-010 • Littoral Combat Ship (LCS), Fuel Oil Transfer Pump, MMC541-01-0001 • Littoral Combat Ship (LCS), Radar Tank Level Indicator, MMC 202-01-00005
Ride Control System	
	Reference:

	<ul style="list-style-type: none"> • S9560-EA-MMC-010 – Interceptors • S9565-AK-MMC-010 - Sliding Stabilizer System
Shafting/Clutches/Brakes	
	Reference:
	<ul style="list-style-type: none"> • USS Freedom (LCS-1) Propulsion Shafting System, S9243-B7-MMC-010 • Naval Ships' Technical Manual (NSTM) Chapter 241 • Naval Ships' Technical Manual (NSTM) Chapter 243, Propulsion Shafting
Waterjets/Steering	
	Reference:
	<ul style="list-style-type: none"> • S9247-AJ-MMC-010 PROPULSION WATER JETS MODEL 153SII/153BII • Technical Manual MMC 202-01-00001A Machinery Plant Control & Monitoring System (MPCMS) Control Consoles • Rolls-Royce 45158-E Remote Control System Type CanMan
400 Hz Distribution	
	Reference:
	<ul style="list-style-type: none"> • NSTM 300 Electric Plant General • NSTM 320 Electric Power Distribution System • MMC 202-01-00001A Machinery Plant Control & Monitoring System (MPCMS) • Ship Information Book S9LCS-AW-ISB-010, Hull, Mechanical, and Electrical Systems • MMC 324-01-00001, LCS Switchboards • MMC 324-02-00001, LCS Load Centers
Electrical Power Distribution	
	Reference:
	<ul style="list-style-type: none"> • NSTM 300 Electric Plant General • NSTM 320 Electric Power Distribution System • MPCMS Control Concept 0403-1-202-012 (M) • MMC 202-01-00001A Machinery Plant Control & Monitoring System (MPCMS) • Ship Information Book S9LCS-AW-ISB-010, Hull, Mechanical, and Electrical Systems • MMC 324-01-00001, LCS Switchboards • MMC 324-02-00001, LCS Load Centers • S9LCS-AA-POG-010, 0910-LP-104-3971 Propulsion Operation Guide
Governors & Voltage Regulators	
	Reference:
	<ul style="list-style-type: none"> • NSTM 300 Electric Plant General • NAVSEA 0910-LP-087-7400, EGB-2P And EGB-1P Governor/Actuator • Engineman (EN) NAVEDTRA 14075A • NAVEDTRA 10547-series, Electrician's Mate 1& C • S9233-DS-MMC-010
Power Management System	
	Reference:
	<ul style="list-style-type: none"> • NSTM 300 Electric Plant General • Machinery Plant Control & Monitoring System (MPCMS), MMC 202-01-00001A • MPCMS Control Concept 0403-1-202-012 (M) • Engineering Control System Manual , S9560-CZ-MMO-010 • Propulsion Operation Guide, S9LCS-AA-POG-010
Ship Service Diesel Generators	
	Reference:
	<ul style="list-style-type: none"> • NSTM 300 Electric Plant General • S9233-DS-MMC-010 (Ships Service Diesel Generator) • S9233-DX-TRS-010 (SSDG DE TRS) • S9LCS-AA-POG-010, Propulsion Operating Guide • Technical Manual S9233-DS-MMC-010, Operation and Maintenance Manual, Isotta Franchini

	<ul style="list-style-type: none"> Motori (IFM) Marine Engine Technical Manual S9LCS-AA-SIB-020 Vol. No. 2 (Part 1), LCS-1 FREEDOM Ship Information Book, Machinery Plant Technical Manual S9314-D6-MMC-010, 750KW, 450VAC 60HZ 3Ø, Hitzinger LCS Generator Model SGS 7C 04T, Description, Operation, and Maintenance Manual S9LCS-AA-SIB-010, Vol. 1, LCS-1 FREEDOM Ship Information Book Hull, Mechanical, and Equipment Systems Engineering Operations Sequencing System (EOSS) Preliminary
Switchboards/ABTs/MBTs	
	Reference:
	<ul style="list-style-type: none"> NSTM 300 Electric Plant General NSTM 320 Electric Power Distribution System Technical Manual MMC 324-01-00001, LCS Switchboards. Technical Manual MMC 324-02-00001A, Circuit Breakers, Navy Type, AQB-L400QF, AQB-L400QM, AQB-LL400QS AND NQB-LL400 Technical Manual MMC 324-02-00001, LCS Load Centers Technical Manual MMC 202-01-00001A Machinery Plant Control & Monitoring System (MPCMS) Control Consoles Ship Information Book S9LCS-AW-SIB-010, VOL 1, Hull, Mechanical, and Electrical Systems Ship Information Book S9LCS-AA-SIB-050, VOL 3, Part 2, Power and Lighting Systems, General Descriptions of Electrically Operated Auxiliaries S9LCS-AA-POG-010, 0910-LP-104-3971 Propulsion Operation Guide
Aqueous Film Forming Foam	
	Reference:
	<ul style="list-style-type: none"> Littoral Combat Ship (LCS), Centralized Machinery Control System, S9202-BC-MMO-010 AFFF Balanced Pressure Proportioning System, S9555-B9-MMA-010 AFFF Pump, S6226-DZ-MMO-010/07524 Safety for Forces Afloat, OPNAV 5100.19 Series OPNAV 5090.1 Appendix L
Anchor Windlass	
	Reference:
	<ul style="list-style-type: none"> TM S9LCS-AA-SIB-010, LCS 1 Freedom, Ship's Information Book VOL 1, Hull, Mechanical, and Equipment Systems TM S9581-BG-MMC-010, Anchor Windlass, Appleton Marine Model BMD-0544 and Hydraulic Power Unit, 50 HP Model, Operation and Maintenance Manual, LCS NSTM S9086-TV-STM-010/CH-581R3, Anchoring
Firemain System	
	Reference:
	<ul style="list-style-type: none"> S6226-W6-MMC-010 Carver Pumps M-Series 6x4-10 TM 0910-LP-104-5043, LCS, Centralized Machinery Control System TM S9436-A9-MMC-010, MXL-CG Fire Alarm System; Fire Protection and Operations and Maintenance Manual
Air Conditioning & Refrigeration	
	Reference:
	<ul style="list-style-type: none"> NSTM Chapter 510, Ventilating, Heating, Cooling and Air Conditioning Systems for Surface Ships NSTM Chapter 516, Refrigeration Systems NAVSEA Technical Manual MMC-514-01-00001
HFP/CO2 System	
	Reference:
	<ul style="list-style-type: none"> S9555-DT-MMC-010, ANSUL, Heptafluoropropane (HFP) Fire Extinguishing System, Description,

	Operation and Maintenance Manual
Heating, Ventilation, & Air Conditioning	
	Reference:
	<ul style="list-style-type: none"> USS FREEDOM (LCS-1) Pressurized Zone Heating, Ventilation and Air Conditioning (HVAC), MMC 512-01-00007. LCS-1 USS Freedom Ship Information Book Volume 2 Part 1 Machinery Plant, S9LCS-AA-SIB-020. LCS-1 USS Freedom Ship's Information Book Volume 2, Part 2, S9LCS-AA-SIB-030. Heating, Ventilating and Air Conditioning, S9512-BS-MMA-010
JP-5: Fuel Oil System / Fill, Transfer, Service and Stripping System	
	Reference:
	<ul style="list-style-type: none"> Naval Ships' Technical Manual (NSTM) Chapter 542, Gasoline and JP-5 Fuel Systems S9261-BN-MMC-010 - Fuel Oil Purifier Littoral Combat Ship Blackmer JP-5 Service Pump, MMC 542-01-E0002 LCS-1 USS Freedom Engineering Operating Sequencing System (EOSS)
Launch, Recovery, & Handling System	
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	<ul style="list-style-type: none"> MPCMS Control Concept 0403-1-202-012 (M), Appendix D, Group 4. S9LCS-AA-SIB-010, Ship Information Book, Vol. 1, Hull Technical and Equipment Systems. S9LCS-AW-SIB-060, Ship's Information Book, Vol. 4, Electronic System. S9LCS-AA-SIB-070, Ship's Information Book, Vol. 5, Part 1, Interior Communications. Document 0403-1-583-003 B1, Off board Vehicle Operability Report. S9169-A5-MMC-010 LITTORAL COMBAT SHIP, UNIDYNAMICS LAUNCH RECOVERY HANDLING AND STOWAGE (LRHS) SYSTEM, SIDE LAUNCH DOOR S9169-A3-MMC-010 LITTORAL COMBAT SHIP, UNIDYNAMICS LAUNCH RECOVERY HANDLING AND STOWAGE (LRHS) SYSTEM, STERN DOOR
Main & Secondary Drainage	
	Reference:
	<ul style="list-style-type: none"> S9202-BC-MMO-010, Littoral Combat Ship, Centralized Machinery Control System Manual S6226-W6-MMC-010, Fire Pump Carver M-Series 6X4-10 0910-LP-104-2366, LCS 1 Freedom Ship's Information Book VOL 2, Part 2, Machinery Plant, Auxiliary Machinery, Piping, Air Conditioning, Ventilation, and Heating
Medium Pressure Air System	
	Reference:
	<ul style="list-style-type: none"> S9553-CF-MMC-010 MEDIUM PRESSURE AIR COMPRESSOR (MPAC) MODEL 4VX3B-131 S6220-ER-MMC-010 COMPRESSOR, MEDIUM PRESSURE, AIR 3-STAGE, AIR COOLED: MODEL WP-121L; DESCRIPTION, OPERATION, AND MAINTENANCE 0910-LP-104-5043, LCS, Centralized Machinery Control System 0910-LP-103-6441, SCBA BAC, Operation and Maintenance Manual with Illustrated Parts List
Oily Waste Transfer System	
	Reference:
	<ul style="list-style-type: none"> S9593-DW-MMC-010 Technical Manual Operations And Maintenance Instructions LCS-1 Pollution Abatement Manual S9593-EV-MMC-010 Oily Water Separator TM 0910-LP-488-6100 Oily Waste Transfer Pump, Sliding Shoe Horizontal, Model H-125, Installation, Operation, Maintenance Instructions TM 0994-LP-013-6010, U S Navy Oil Spill Containment and Clean up Kit, Mark I TM 0910-LP-106-2209, radar Tank Level Indicator, Vegaflex 67, Operation and Maintenance Manual Technical Repair Standard MMC 593-02-E0002, Littoral Combat Ship, Pump/Motor Lube Oil Transfer, Dirty Lube Oil Transfer, and Synthetic Oil Transfer Model H 125
Potable Water/RO System	
	Reference:

	<ul style="list-style-type: none"> NSTM 533 Potable Water S9531-C4-MMC-010 Reverse Osmosis Unit, Village Marine Tec 0910-LP-105-3756, Reverse Osmosis Unit, Village Marine Tec, Model LCS-1, Operation, Maintenance and Repair Instructions with Parts List S9531-BQ-MMA-010, Operation and Maintenance, Bromine Feeder, Recirculating TRS MMC 533-01-ETRS5, LCS, Pump, Centrifugal Brominator Model 169082 (EV592100) 0910-LP-331-8900, Bromine Feeder, Proportioning, SSFM-50AC-SERIES S6225-ZR-MMM-010, Maintenance, Motor Pumps for Brominator System 910-LP-434-1600, Operation, Maintenance and Repair Instructions with Parts List for Bromine Analyzer, Everpure Part Number 9063-35
Seawater Service System	
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	<ul style="list-style-type: none"> Carver Pump Co. Main Seawater Pumps, MMC 256-01-E0001 Main Seawater Pump, S6226-SV-MMC-010 LCS "FREEDOM CLASS" Ship Information Guide Ship's Information Book (SIB) Vol 1, S9LCS-AW-SIB-010
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	Reference:
	<ul style="list-style-type: none"> NSTM Chapter 583, Boats and Small Craft NSTM Chapter 262, Lubricating Oils and Greases NSTM Chapter 541, Ship Fuel and Fuel Systems NSTM Chapter 542, Gasoline and JP-5 Fuel Systems NSTM Chapter 220 Vol. 3, Corrosion and Contamination Control for Diesel Engine Cooling Water Systems
Vacuum, Collection, & Holding System	
	Reference:
	<ul style="list-style-type: none"> LCS-1 USS Freedom Vacuum, Collection, Holding, and Transfer (VCHT) System and Marine Sanitation Device (MSD) System, S9593-EB-MMC-010 LCS-1 USS Freedom Chlorination Unit, Electrolytic, S9593-EA-MMC-010 LCS-1 USS Freedom Ship's Information Book Volume 2, Part 2, S9LCS-AA-SIB-030 NSTM Chapter 593, Pollution Control, S9086-T8-STM-010 MPCMS Control Concept 0403-1-202-012 (M)
Watermist Fire Suppression	
	Reference:
	<ul style="list-style-type: none"> Littoral Combat Ship (LCS), Centralized Machinery Control System, S9202-BC-MMO-010 Littoral Combat Ship (LCS), Water Mist Fire Extinguishing System, MMC 555-07-E0002 Littoral Combat Ship (LCS), Water Mist transfer Pump, S6226-XA-MMC-010 Littoral Combat Ship (LCS), Engineering Control System, S9560-CZ-MMO-010 LCS-1 USS Freedom, Propulsion Operating Guide, S9LCS-AA-POG-010

LCS-2	
Propulsion Plant Overview	
	Reference:
	<ul style="list-style-type: none"> Information Sheet 2-6-1-IS, Auxiliary Steering Propulsion Unit Information Sheet 2-2-1-IS, Main Propulsion Diesel Engine Information Sheet 2-1-1-IS, Main Propulsion Gas Turbine Engines Information Sheet 2-4-1-IS, Shafting System Ship Information Book S9LCS-AB-SIB-020/LCS 2, Volume 2, Part 1 Technical Manual for Reduction Gear BOS 156 Technical Manual for Reduction Gear ASL 95 Technical Manual for Water Jets
Engineering Control System	
	Reference:
	<ul style="list-style-type: none"> LCS-2 Engineering Control System (ECS) Technical Manual for Operation and Organizational Maintenance Portable Propulsion Control Unit Technical Manual
MTU 20V8000 Main Propulsion Diesel Engines	
	Reference:
	<ul style="list-style-type: none"> Information Sheet 2-2-1-IS, Main Propulsion Diesel Engine Ship Information Book S9LCS-AB-SIB-020/LCS 2, Volume 2, Part 1 Technical Manual S9233-D6-MMC-010, MTU Diesel Engine Plant Description
LM2500 Marine Propulsion Gas Turbine Engine	
	Reference:
	<ul style="list-style-type: none"> Information Sheet 2-1-1-IS, Main Propulsion Gas Turbine Engines Technical Manual, Gas Turbine Operations, 7LM2500-SB-MLG11 Technical Manual, Gas Turbine Controller, 91518 Revision 1 Technical Manual, LM2500 Hydraulic Unit
Main Propulsion Shafting	
	Reference:
	<ul style="list-style-type: none"> Information Sheet 2-4-1-IS, Shafting System LCS-2 Ship Information Book Volume 2 Part 1 (Propulsion Plant) Technical Manual L00086TR00-6000-03815-240 (Vulkan Diaphragm Coupling (Steel Shaft))
Diesel ASL 95 Reduction Gear	
	Reference:
	<ul style="list-style-type: none"> Information Sheet 2-3-1-IS, Reduction Gears S9086-HK-STM-010/CH-241 Naval Ships' Technical Manual Chapter 241 (Propulsion Reduction Gears, Couplings, Clutches, and Associated Components) Technical Manual for RENK Reduction Gear ASL 95
Gas Turbine BOS 156 Reduction Gear	
	Reference:
	<ul style="list-style-type: none"> Operating Instructions BOS 156 GT Reduction Gear, Technical Manual L00086TR00-6000-03815-237 Propulsion Reduction Gears, Couplings, Clutches, and Associated Components, Naval Ships' Technical Manual, Chapter 241 Ship's Information Book, Vol. 2 Part 1, Propulsion Plant, L00086TR00-6000-03815-378
Water Jet Drives	
	Reference:
	<ul style="list-style-type: none"> L00086TR00-6000-03815-243-TM For WATERJETS LJ-150E-LJ-160E S9247-AH-MMC-010 TM Waterjet, Wartsila Models LJ-150E/ LJ-160E; Installation, Operation and Maintenance Manual

Ride Control System	
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F-76 Fuel Oil System	
	Reference:
	<ul style="list-style-type: none"> Diesel Fuel Oil Service Pump (CDRL 11826), S6226-SX-MMC-010 Engineering Operational Sequencing System (EOSS) Fuel Oil Service pre-filter, Aircraft Appliance and Equipment Model 74048D-1 TM S9261-BJ-MMC-010 Fuel Oil Transfer Pump, TM S6226-SY-MMC-010 Gas Turbine Fuel Oil Return Cooler, TM S9261-BH-MMC-010 L00086TR00-6800-03815-295-TM for Fuel Oil Conditioning Module Main Propulsion Diesel Engine (MPDE) NSTM Chapter 541, Ship Fuel and Fuel System
Lube Oil System	
	Reference:
	<ul style="list-style-type: none"> Auxiliary Machinery Piping, SIB Vol 2 Part 2, L00086TR00-6000-03815-380 Dirty Oil Extraction Pump Local Control Panel, S9324-LA-MMC-010 Lube Oil Transfer Pump Local Control Panel, S9324-LC-MMC-010 Propulsion Plant G, SIB Vol 2 Part 1, L00086TR00-6000-03815-378
Auxiliary Steering Propulsion Unit	
	Reference:
	<ul style="list-style-type: none"> Auxiliary Steering Propulsion Unit Information Sheet: 2-6-1-IS Motor and Turbine-396 Diesel Engine Information Sheet: 2-7-1-IS S9568-A2-MMC-010 Technical Manual for Retractable Azimuthing Thruster
450VAC Electrical Distribution System	
	Reference:
	<ul style="list-style-type: none"> NSTM S9086-KC-STM-010/CH-300R7, Electric Plant, General NSTM S9086-KY-STM-010/CH-320R6, Electric Power Distribution Systems Technical Manual for Gas Turbine Enclosure Vent Exhaust Fan VSD Technical Manual Operation, Maintenance and Installation of the Main Switchboard Volume 1 Technical Manual Operation, Maintenance and Installation of the Main Switchboard Volume 2 Technical Manual Operation, Maintenance and Installation of the Main Switchboard Volume 3 Technical Manual 450V Automatic Bus Transfer Panel Technical Manual 450V Distribution Panel (Type 4190-4) Technical Manual 450V Essential Power Panel (Type 4190-7) Technical Manual 450V Fire Pump Controller Technical Manual 450V Motor Control Centers, 120V Motor Control Centers, 450V Vital Motor Control Centers Technical Manual 450V Vital Distribution Panel Technical Manual 450V Vital Motor Starter Panel, Dual Supply Vital Motor Starter Panel, Two-Speed Motor Starter Panel, Essential Motor Starter Panel Technical Manual 450V Vital Power Panel (Type 4190-1) Technical Manual 450V Power Panel (Type 4190-2) Technical Manual Ship's Information Book Volume 3 Part 1, LCS-2 Technical Manual Ship's Information Book Volume 3 Part 2, LCS-2

60 Hz Electrical Distribution System	
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24VDC Electrical Distribution System	
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Ship's Service Diesel Generators	
	Reference:
	<ul style="list-style-type: none"> • General Dynamics Information Sheet 2-7-IIS • Propulsion Plant General Design and Operation Procedures, L00086TR00-6000-03815-378, SIB 020 Part 1 • Technical Manual MTU Diesel Engine Plant Description S000007/00E L00086TR00-6000-03815-246
Generator Set	
	Reference:
	<ul style="list-style-type: none"> • General Dynamics Information Sheet 3-1-21S, Diesel Generator Sets • General Dynamics Information Sheet 2-7-1IS, MTU-396 Diesel Engine • LCS-2 Ship Information Book Volume 3, Part 1 • LCS-2 Ship Information Book Volume 3, Part 2
Seawater Service System	
	Reference:
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JP-5 Fuel Oil System	
	Reference:
	<ul style="list-style-type: none"> • Information Sheet 4-6-1, IS Fuel/JP-5 Fill, Transfer, Service and Stripping System • Legacy PPT 4.6 LCS-2 F-76/JP-5 Fill, Transfer, Service and Stripping System
Small Boats	
	Reference:
	<ul style="list-style-type: none"> • Information Sheet 5-5-1-IS, Boat Crane/Slewing Arm Davit
Anchoring, Mooring, & Towing Equipment	
	Reference:
	<ul style="list-style-type: none"> • Information Sheet 5-1-1-IS, Anchoring, Mooring, and Towing Equipment • NSTM S9086-TV-STM-010/CH-581R3, Anchoring • Technical Manual, Vertical Hydraulic Mooring Capstan MDL VHMC100G
Oily Waste System	
	Reference:
	<ul style="list-style-type: none"> • Auxiliary Machinery, Piping, Environmental Pollution Control, Air Conditioning, Ventilation, And Heating Systems, L00086TR00-6000-03815-380, SIB 020 Volume 2, Part 1 • General Dynamics Information Sheet 4-13-1IS • Naval Ships' Technical Manual, Chapter 593 Pollution Control
AC&R/HVAC	
	Reference:
	<ul style="list-style-type: none"> • Technical Manual Chilled Water Pump, Aurora Pump Series 340A • Technical Manual Freezer/Refrigerator Model, R7F2-2M-SNML

	<ul style="list-style-type: none"> • Technical Manual Self-Contained Air Conditioners • Technical Manual Ship's Information Book Volume 3 Part 2, LCS-2
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	Reference:
	<ul style="list-style-type: none"> • Information Sheet 4-11-1-IS Drainage Systems • Technical Manual S6226-UD-MMC-010) for Eductor, Vita model 1802-4 • Technical Manual S9593-EL-MMC-010) for Waste Water Pump, Grundfos Models AP-12, AP35, AP50
Firemain System	
	Reference:
	<ul style="list-style-type: none"> • Build Specification for General Dynamic LCS flight 0 L00041BSPC-2113-04093-SWBS-555 • Information Sheet 8-2-1-IS, AFFF System • LCS-2 Damage Control Book • S6225-W6-MMA-010/53711 Navy Standard, Titanium Centrifugal Pump 1,000 GPM Technical Manual • S9593-C3-MMM-010 Pulper, Small Technical Manual
Water Mist System	
	Reference:
	<ul style="list-style-type: none"> • NSTM Chapter 555 Volume 1 Surface Ship Firefighting, S9086-S3-STM-010 • Ship's Information Book Volume 1, LCS-2, S9LCS-AB-SIB-010/LCS 2 • Ship's Information Book Volume 2 Part 1, LCS-2, S9LCS-AB-SIB-020/LCS 2 • Ship's Information Book Volume 2 Part 2, LCS-2, S9LCS-AB-SIB-030/LCS 2
Reverse Osmosis/Potable Water System	
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	<ul style="list-style-type: none"> • Electric Water Heater Operating and Maintenance Manual, S9533-B4-MMC-010 • Engineering Operational Sequencing System (EOSS) • Fresh Water Circulation Pump, Webtrol Models Installation and Maintenance Manual, S6226-UN-MMC-010 • Hot Water Circulating Pump, Price Pump Company, type M5S0SS, S662-UR-MMC-010 • Recirculating Bromine System, Village Marine Model 19011-15-SP, S9531-DE-MMC-010 • Reverse Osmosis Desalination System, Village Marine TEC Pure Water Series 200 – 2000 gpd, S99531-C8-MMC-010 • Ship's Information Book (SIB) Vol. 1, S9LCS-AB-SIB-010/LCS 2 • Ship's Information Book (SIB) Vol. 2 Part 2, S9LCS-AB-SIB-030/LCS 2
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	<ul style="list-style-type: none"> • Information Sheet 8-2-1-IS, AFFF System • S6435-QU-MMM-010 Hycheck Valve • S6435-QX-MMO-010 Powercheck Valve • S6435-RF-MMA-010 Solenoid Operated Valves • S9320-A9-MMM-010 AFFF Dual Supply Vital Motor Starter 450V • Technical Manual Ship's Information Book Volume 3 Part 2, LCS-2
Twin Boom Extendable Crane & Stern Door	
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	<ul style="list-style-type: none"> • Information Sheet 5-7-1-IS, Stern and Side Doors • Ship Information Book S9LCS-AB-SIB-010/LCS 2, Volume 1

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Pneumatic System	
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	<ul style="list-style-type: none"> • Engineering Operational Sequencing System • Information Sheet 4-5-1-IS, Pneumatic System • Ship's Information Book (SIB) Vol. 2 Part 2, S9LCS-AB-SIB-030/LCS 2
Hydraulic SmartPac System	
	Reference:
	<ul style="list-style-type: none"> • Engineering Operational Sequencing System • Information Sheet 4-8-1-IS, Hydraulic System
SCBA Recharging System	
	Reference:
	<ul style="list-style-type: none"> • SS600-AR-MMA-010 Breathing Apparatus Compressor • Information Sheet 8.4 High Breathing Air Compressor
Underway Replenishment System	
	Reference:
	<ul style="list-style-type: none"> • Gypsy Winch, Single Drum, SG813-HH-MMA-01 • Ship Information Book (SIB) Vol. 1, S9LCS-AA-SIB-010 LCS-2 • Under Replenishment, Cargo, Stores, and Weapons Handling System, S9LCS-AB-URS-010 LCS 2
Mission Bay Support Equipment	
	Reference:
	<ul style="list-style-type: none"> • Mission Handling Equipment Student Guide Information Sheet: 6-2-1-IS • S9196-BC-MMC Hydraulic Cylinders Applicable to the Side Door (Ramp) and Stern Door • SG800-A7-MMC-010 Technical Manual For Mobicon Straddle Carrier 12.75 Ton Capacity, Operation And Maintenance Manual • Stern and Side Doors Student Guide Information Sheet: Stern and Side Doors 5-7-1-IS