



MM CAREER PATH (SW)



Machinist's Mates (Surface). MMs operate and maintain steam turbines and reduction gears used for ship propulsion and auxiliary machinery such as turbo-generators, pumps and oil purifiers. They also maintain auxiliary machinery outside of main machinery spaces, such as electro-hydraulic steering engines and elevators; operate and maintain desalination plants used to make fresh water from sea water; operating and servicing refrigeration plants and air conditioning systems. They may also operate and maintain compressed gas producing plants.

YEARS OF SERVICE	CAREER MILESTONES	AVERAGE TIME TO ADVANCE	COMMISSIONING OR OTHER SPECIAL PROGRAMS	SEA/SHORE FLOW	TYPICAL CAREER PATH DEVELOPMENT
27-30	MMCM	21.1 Yrs	CSEL	36	4 th Shore Tour Billet: ECM/TECHAD, Dir of Training, Ship Sup, ATG Lead, Instructor Duty: NPC, RMC, ATG, Squadron Qualification: SGPI, MTS, ATS, SEA
24-27	MMCM MMCS	21.1 Yrs 17.7	CSEL, Staff Duty	48	4 th Sea Tour Billet: Dept. LCPO, 3MC Duty: CVN, AS, CG, DDG, EOD, LHA, LHD, LPD, LSD, Staff Duty Qualification: ESWS, EAWS, EXW, EOOW, ETT Coordinator, SGPI. (CVN's) Chief of the Watch, EDO in-port, NEC U57A, U16A, SEA
21-24	MMCM MMCS MMC	21.1 Yrs 17.7 13.2	CWO, CSEL Staff Duty, RDC, Recruiter	36	3 rd Shore Tour Billet: ECM/TECHAD, Dept. LCPO, Ship Sup, Instructor Duty: BUPERS, RTC, NPC, Recruiting, NSYD, SRF, RMC, 3MC, ATG, NSW Qualification: MTS, ATS, SGPI, SEA
17-21	MMCS MMC	17.7 Yrs 13.2	CWO, CSEL, Staff Duty	48	3 rd Sea Tour Billet: Dept. LCPO, LCPO, 3MC Duty: CVN, AS, CG, MSRON, DDG, EOD, LHA, LHD, LPD, LSD, LCC, NSW, Staff Qualification: ESWS, EOOW, ETT Coordinator, SGPI, EXW, (CVN's) Chief of the Watch, EDO in-port, NEC U57A, U16A, U68A, SEA
14-17	MMC MM1	13.2 Yrs 8.2	LDO, CWO, Staff Duty, Brig Duty, RDC, Recruiter	36	2 nd Shore Tour Billet: Instructor, Eng. Repair Tech, Staff Duty: ATG, NSYD, RTC, SRF, RMC, Squadron, NSW Qualification: MTS, ATS, SGPI



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9-14	MMC MM1 MM2	13.2 Yrs 8.2 3.7	LDO, CWO, OCS, Staff Duty	60	2 nd Sea Tour Billet: LCPO, LPO, WCS Duty: CVN, AS, CG, MSRON, DDG, EOD, LHA, LHD, LPD, LSD, LCC, LCS, NSW, Staff Qualification: Prop Plant Mgr. (U16A NEC), Equipment Operator/ Supervisor, Engine Room Operator/ Supervisor/ Chief Machinery Operator (CVNs) /Chief Auxiliary Operator (CVNs) /A Division Central Control Desk Supervisor (CVNs), ETT, DCTT, EOOW, EDO, Chief of the Watch (CVNs), Fire Marshal, Oil King/Water King, EXW, NEC U57A, U59A, U68A
6-9	MM1 MM2	8.2 Yrs 3.7	STA-21, OCS, MECP, Naval Academy, NROTC, RDC, Recruiter, Instructor Duty, SARP, Staff Duty, Brig Duty	36	1 st Shore Tour Billet: Instructor, ENG Repair Tech Duty: Instructor, RTC, Recruiting, RMC, SRF, NSYD Qualification: MTS, ATS
2-6	MM2 MM3	3.7 Yrs 1.5	STA-21, OCS, MECP, Naval Academy, NROTC	54	1 st Sea Tour Billet: Maintenance person WCS Duty: CVN, AS, CG, MSRON, DDG, EOD, LHA, LHD, LPD, LSD, PC, LCC, NSW Qualification: ESWS, EXW, Equipment Operator, Engine Room operator, Auxiliary Machinery Operator (Aux Division), Oil King/Water King, (CVN's) Elevator Operator, Catapult Mechanic
1+/-	MMFN MMFA Accession Training	9 Months			Recruit Training, "A" and "C" Schools

Notes:

1. "A" School is not required.
2. In-rating shore duty is common at IMA and ATG. MMs are encouraged to do a tour as an instructor, recruiter or RDC.
3. Tours at NPC and BUPERS require special screening.
4. Tour at BUPERS 3 as an Enlisted Community Manager or Enlisted Community Manager Technical Adviser is for high-performing E8s or E9s. It is a highly competitive tour requiring thorough understanding of the Rating and manning and manpower policies. ECMS handle multiple Ratings affecting thousands of Sailors, adjudicate Career



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Waypoints applications, develop and present advancement quotas, school quotas, accession and strength policies and initiatives for community health.

5. The Boiler Inspector (SGPI) NEC 749B program is open to E-7 and above (E6 may attend the SGPI course and receive the 749B NEC but will not be able to certify as an SGPI until advanced to E7). Sea duty for the (SGPI) Inspectors is limited to LHD/LCC Class ships. Sea tours for SGPIs are limited. Those who qualify SGPI often assume a different career path once qualified and are limited to shore tours at RMC facilities. They are expected to maintain regular Sea/Shore flow (back to back shore duty often occurs due to limited sea duty billets) and should demonstrate leadership throughout those billets in which they are assigned.

6. MMs are encouraged to complete their EOOW qualifications (assigned to Surface Ships).

7. MMs at pay grades E-7 thru E-8 are encouraged to complete a 3M tour either at sea or as a 3M Inspector ashore.

8. NEC information:

a. U14A - Cryogenics Technician, Overseas Shore Based Equipment Operator/Maintainer operates, tests, inspects, and performs organizational and intermediate level maintenance on shore based (overseas) high and low pressure liquid oxygen and nitrogen generating plants in the manufacture of liquid oxygen and liquid nitrogen. Tests liquid oxygen and liquid nitrogen for purity and acetylene contamination. Performs required checks on O2/N2 compressed gas cylinders both prior to and after charging them to proper pressure. Operates and maintains mechanical refrigeration systems, reciprocating high pressure and centrifugal low pressure air compressors, cryo generators, vacuum pumps, and gaseous distribution systems. Detects, analyzes and corrects abnormal situations which may arise during operation of liquid oxygen/nitrogen generating plants.

b. 734B - Steam Propulsion Maintenance Supervisor supervises organizational level maintenance and conducts onboard maintenance training on conventional propulsion boilers, steam propulsion engines, forced draft blowers, associated machinery, ship service turbine generators (SSTG), steam plant controls/regulating components (less automatic boiler controls), supporting auxiliary equipment, valves and piping systems. Conducts equipment material inspections, identifies abnormal equipment conditions and initiates corrective action. Maintains a current inventory of all required maintenance/repair records, technical documentation, special tools and repair equipment.

c. U16A - Shipboard Engineering Plant Program Manager administers, manages and evaluates shipboard engineering programs. Recognizes engineering systems and major components external to the propulsion plant which comes under the cognizance of the Engineering Officer of the Watch (EOOW). Evaluates operating conditions and makes recommendations to the engineering officer.

d. 736B - NAMTS Pump Repair Technician performs Navy Afloat Maintenance Training Strategy (NAMTS) organizational and intermediate-level maintenance procedures, inspecting and repairing marine main propulsion and auxiliary pumps and associated equipment in support of Fleet-directed requirements. Demonstrates knowledge of intermediate-level repair procedures, repair and maintenance standards, quality assurance specifications, and proper use of maintenance industrial machinery.

e. U17A - NAMTS Air Conditioning and Refrigeration Technician performs Navy Afloat Maintenance Training Strategy (NAMTS) intermediate-level support procedures including inspecting, troubleshooting, and repairing air conditioning systems and compressors in support of Fleet-directed requirements. Demonstrates knowledge of intermediate-level repair procedures, repair and maintenance standards, quality assurance specifications, and proper use of maintenance industrial machinery.

f. U18A - NAMTS Heat Exchanger Repair Technician performs Navy Afloat Maintenance Training Strategy (NAMTS) intermediate-level maintenance procedures in the inspection, repair, and testing of heat exchangers and related components in support of Fleet-directed requirements. Demonstrates knowledge of intermediate-level repair procedures, repair and maintenance standards, quality assurance specifications, and proper use of maintenance industrial machinery.



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g. 741B - High and Low Pressure Cryogenic Technician operates, tests, inspects, and performs organizational and intermediate level maintenance on high and low pressure liquid oxygen and nitrogen generating plants. Tests liquid oxygen and liquid nitrogen for purity and acetylene contamination. Performs required checks on O2N2 compressed gas cylinders prior to and after charging them to the proper pressure. Manufactures liquid oxygen and liquid nitrogen by operating liquid oxygen and nitrogen generating plants to achieve capacity production under various climatic conditions. Operates and maintains mechanical refrigeration systems, reciprocating high pressure and centrifugal low pressure air compressors, cryogenerators, vacuum pumps, and gaseous distribution systems. Detects, analyzes, and corrects abnormal situations which may arise during the operation of liquid oxygen/nitrogen generating plants and associated equipment as prescribed on PMS maintenance requirement cards and applicable instructions. Documents corrective maintenance on relevant MDCS forms.

h. 742B - Refrigeration and Air Conditioning Systems Technician starts, operates, performs organizational and/or intermediate level maintenance and overhauls all types of refrigeration, cooling and air conditioning equipment utilizing centrifugal or reciprocating compressors, including accessories and controls. Identifies abnormal conditions and corrects malfunctions that may lead to inadequate refrigeration, cooling or air conditioning. Performs refrigerant recovery and recycling in accordance with section 608 of the Clean Air Act as amended. Universal certification in accordance with EPA mandate is required.

i. U19A - UNREP Equipment Mechanic operates and performs organizational level maintenance on hydropneumatic and electro-hydraulic equipment and machinery associated with UNREP Systems. Tests and repairs hydraulic power supplies, circuits, motors, valves, and other components.

j. 743B - Shipboard Elevator Hydraulic/Mechanical System Mechanic tests, inspects, and performs organizational maintenance on shipboard weapons and cargo handling elevators on a system and component level. Troubleshoots and repairs hydraulic, mechanical and hydromechanical systems and equipment, not including electronic and electrical components and interfaces. Coordinates efforts with operators and maintainers of other ratings using or servicing the systems.

k. 746B - Outboard Engine Maintenance Technician performs periodic and routine maintenance, preoperational and operational inspections, troubleshooting procedures, and repairing outboard engines.

l. U28A - LAMPS MK III RAST Mechanical Maintenceman performs organizational maintenance on Recovery Assist, Securing and Traversing (RAST) system hydraulic and mechanical subassemblies. Removes and replaces failed modules and piece parts.

m. U30A - Auxiliary Systems Technician performs at the organizational level, operational procedures and preventive and corrective maintenance on auxiliary systems onboard CG-47 and DDG-51.

n. 748B - Boiler Repair Technician performs intermediate level maintenance on marine propulsion boilers. Reviews and maintains records and reports pertinent to boiler repair.

o. 749B - Main Propulsion Steam Generating Plant Inspector inspects material condition, monitors general readiness, and diagnoses improper operating procedures and equipment casualties/failures. Recommends operational and maintenance corrective measures. Details repairs of all marine main propulsion plant boilers, auxiliary/waste heat boilers, steam catapult accumulators, re-boilers, appurtenances, component systems or related electronic automatic pressure and temperature control systems such as combustion and feedwater control systems, fill and blowdown systems and steam generating plant ancillary equipment (feed and fuel pumps, forced draft blowers, deaerating feed tanks, etc.). Evaluates Boilerwater and Feedwater Test and Treatment Program, OLV Boiler Flexibility Program, reviews associated operational and maintenance records and witnesses prescribed steam generating plant tests.

p. 750B - Automatic Boiler Controls Console Operator stands watch on Automatic Boiler Control Console, identifies abnormal in-plant conditions that lead to emergencies and/or casualties, and initiates corrective or emergency actions/procedures when such conditions arise.



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- q. 751B - Electronic Automatic Boiler Controls Maintenance Technician performs organizational level maintenance on electronic automatic boiler controls systems, steam plant control systems (chameleon), boiler combustion monitoring systems, boiler ignitor system. Maintenance includes preventive and corrective maintenance, troubleshooting, calibration, and testing on system and subsystem components.
- r. 761A - NAMTS Hydraulics Repair Technician performs Navy Afloat Maintenance Training Strategy (NAMTS) organizational and intermediate-level maintenance procedures on hydraulic systems and components of propulsion machinery, auxiliary equipment, and outside machinery in support of Fleet-directed requirements. Demonstrates knowledge of intermediate-level repair procedures, repair and maintenance standards, quality assurance specifications, and proper use of maintenance industrial machinery.
- s. U34A - NAMTS Outside Machinist performs Navy Afloat Maintenance Training Strategy (NAMTS) intermediate-level on all types of main propulsion systems, equipment, and auxiliary machinery in support of Fleet-directed requirements. Demonstrates knowledge of intermediate-level repair procedures, repair and maintenance standards, quality assurance specifications, and proper use of maintenance industrial machinery.
- t. 768A - Oil Analysis Operator/Evaluator performs analysis and evaluation of oils/lubricants. Uses spectrometric analysis to evaluate oil/lubricants for wear metals. Uses physical property tests to evaluate oil/lubricants for properties such as viscosity, particulate presents, water, or other chemical presents and flash point. Maintains records of analytical data. Performs trend analysis. Recommends subsequent actions and reports findings.
- u. U57A – Senior Auxiliary Engineering Course. Provides senior auxiliary engineering Machinist Mates (MM) (paygrades E6 through E9) serving at sea in senior auxiliary engineering Machinist Mates (MM) leadership roles for management and supervision of equipment material condition assessments, preventative maintenance, trend analysis and troubleshooting, and corrective maintenance. Provides administrative responsibilities required to support auxiliary engineering personnel and off-ship personnel in their performance of organizational-level maintenance tasks, promoting consistency across ship classes in the supervision of auxiliary equipment maintenance.
- v. U59A - Deck Systems Mechanical Technician performs organizational mechanical maintenance on the various deck equipment and systems to include Amphibious Assault, Boat Handling, UNREP, Anchoring and Hull Outfitting Equipment.
- w. U66A - Mechanical Habitability Auxiliary Technician performs mechanical preventive maintenance, troubleshooting and corrective maintenance tasks at the journeyman level on galley, laundry and solid waste processing equipment onboard all Naval Surface Ship classes.
- x. U68A - Steering Gear Systems Mechanical Technician performs Organizational or Intermediate Level Preventive Maintenance (PM) and Corrective Maintenance (CM) on shipboard steering systems to include operation and troubleshooting.
- y. U69A - LCS-1 (Freedom Variant) Readiness Control Officer (RCO) Cross-trained in Main Propulsion and Support systems, Auxiliary systems, Electrical systems, Damage Control systems and the Main Propulsion Control and Monitoring System (MPCMS). Serve in supervisory and watch team management as well as advanced technical positions as RCO at sea and Engineering Duty Officer (EDO) in port. Utilizing Human Machine Interfaces (HMIs), Local and Remote Control Panels and Consoles, System Diagrams, oversee or perform aligning, operating, monitoring and casualty control procedures on all engineering systems in accordance with Engineering Operational Sequencing System (EOSS). Using PQS manuals, oversee career training of junior personnel. Using PMS maintenance cards, ship's technical manuals and EOSS procedures, supervise and guide planned and corrective maintenance. Perform tasks associated with the RCO (underway) and EDO (in port) shipboard watch station/position with limited to no supervision under all conditions of readiness.

Considerations for advancement from E6 to E7

1. Sea Assignments (all)

- LPO at Sea/Operational/Joint/Expeditionary
- Qualified EDO/EOOW/RCO (LCS Specific)/Chief of the Watch (CVN)
- At least one warfare pin
- DCTT/ETT
- Command Collateral with documented impact



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- Qualified 3M 301- 305
- FCPOA involvement
- Sailor 360 involvement
- Completed PPME, USMAP

2. Shore Assignments (all)

- RDC (w/MTS)/ATG (w/ATS)/TYCOM Staff/BUPERS/Expeditionary Service/SPECWAR/Expeditionary/Rating Instructor (All screened billets)
- Instructor Duty (805A) (MTS at all levels)
- Completed PPME, USMAP
- Community involvement

Considerations for advancement from E7 to E8

1. Sea Assignments (all)

- Department LCPO/ LCPO at Sea/Operational/Joint, FDNF a plus
- Qualified EDO/EOOW/RCO (LCS Specific)/Chief of the Watch (CVN)
- SGPI a plus
- At least one warfare pin
- ETT Coordinator a plus
- Command Collateral with documented impact
- Completed PPME/JPME/USMAP/SEA
- Active CPO Mess involvement, holding a position with documented performance
- Leading Initiation or a committee a plus

2. Shore Assignments (all)

- Recruiting Duty (serving as LSO or LCPO)/RDC/ATG (obtained ATS/MTS)/TYCOM Staff/BUPERS/SPECWAR/Expeditionary/Rating Instructor (obtained MTS) (All screened billets)/FLCs (impact billet on the waterfront)/ASD (with documented impact) Disaster Preparedness operations team leader a plus
- Completed PPME/JPME/SEJPME I/USMAP/SEA

Considerations for advancement from E8 to E9

1. Sea Assignments (all)

- DLCPO/LCPO (CVN) at Sea/Operational/Joint, FDNF a plus
- SGPI a plus
- At least one warfare pin
- ETT Coordinator
- Qualified EOOW/EDO/RCO (LCS Specific)/Chief of the Watch (CVN)
- Command Collateral with documented impact
- Completed PPME/JPME/USMAP/SEA
- Active CPO Mess involvement, holding a position
- Leading initiation or a committee

2. Shore Assignments (all)

- Recruiting Duty (serving as LSO or DLCPO)/RDC (Ship LCPO)/ATG (obtained ATS/MTS)/TYCOM Staff/BUPERS/SPECWAR/Expeditionary/Rating Instructor (obtained MTS) (All screened billets)/FLC's (impact billet on the waterfront)/ASD (with documented impact)
- Completed PPME/JPME/SEJPME I and II/USMAP/SEA
- Served as SEL or DLCPO