CMEO for Junior Engineers

1. Course Content

The following courses comprise the MSC CMEO for Junior Engineers:

- Chemical Testing & Treatment
- Energy Conservation (ENCON)
- Fuel Oil
- Logbook
- LogiQuest
- Machinery Alignment
- SAMM Introduction
    - Dashboard, VTL, Training
- SAMM Condition Monitoring (CMS)
    - Reciprocating Analysis
    - Vibration Analysis
    - Special Tests
    - Lube Oil Analysis
- SAMM Corrective Maintenance
    - Work Requests
    - Ship's Force Work List (SFWL)
    - Voyage Repair Request (VRR)
- SAMM Planned Maintenance
- SAMM Workbook
- Root Cause Analysis (RCA)
- Reliability Centered Maintenance (RCM)
- ShipClip
- RITEMOV / VSA(Vessel Self Assessment)
- Virtual Technical Library (VTL)

2. Pre-Requisites

This course is designed for MSC 2rd Assistant and 3rd Assistant Engineers with little to no experience with the SAMM Program.

3. Administration

Course registration is online at http://mscn7training.com. The course is required every 5 years for all shipboard senior engineers. Completion of the course requires 100% attendance as well as passing an assessment to prove competence in the following areas:

- Logbook
- SAMM Modules
    - Planned Maintenance, Workbook, Corrective Maintenance, Machinery History
- Vibration Monitoring
- Reciprocating Analysis

4. Schedule

The courses are conducted over a period of 5 days, starting at 8:00 on Monday and ending at 5:00 on Friday. The maximum course size is 18 students on a first come first served basis. The courses are taught by Emprise, MSC, and Contract personnel.

The schedule is as follows:

CMEO AFLOAT TRAINING - JUNIOR ENGINEER					
	MONDAY	**TUESDAY**	**WEDNESDAY**	**THURSDAY**	**FRIDAY**
08:00-0900	Reliability Centered Maintenance (RCM) & Root Cause Analysis (RCA)	SAMM Workbook	SAMM Corrective Maintenance	ShipClip	Pump Alignment
0900-10:00					
10:00-11:00		SAMM Condition Monitoring (CMS)	SAMM Machinery History		ENCON
11:00-12:00	Intro to SAMM			Logiquest	
12:00 - 1:00	***Lunch***	***Lunch***	***Lunch***	***Lunch***	***Lunch***
1:00- 2:00	SAMM Dashboard, VTL & Training Modules	SAMM Vibration Monitoring (VMS)	Logbook	Lube Oil Theory, Sampling & Testing	RITEMOV/VSA
2:00-3:00					SAMM Reassessment
3:00-4:00	SAMM Planned Maintenance (PM)	SAMM Reciprocating Analysis (RA)	SAMM Assessments	Chemical Testing & Treatment	
4:00 -5:00					

5. Course Descriptions:

CMS – Condition Monitoring System: This module provides instruction on the different Condition Monitoring System items contained in the SAMM program. Each course will cover interpretation of data and the required action for any alert generated by one of the technologies in the CMS module.

- Reciprocating Analysis – How to collect Cylinder Compression Data and transfer the Data to the Reciprocating Analysis Software in SAMM without introducing errors. How to use the Reciprocating Analysis software in SAMM to review reciprocating analysis data for validity and repair recommendations.
- Vibration Analysis – How to review the Vessel and Equipment VTAG information and use it to properly collect valid Vibration Data and download it to SAMM. Also reviewing collected data to verify if incorrect.
- Special Tests – How to enter and review special test data in the CMS module in SAMM.
- Lube Oil Analysis – How to review Lube Oil Analysis results in the CMS module and actions to take for LO Analysis alerts.

Chemical: This module introduces users to the Chemical products on the MSC Contract and accessing the Material Safety Data Sheets (MSDS) for proper stowage and handling. The student will also be shown best practices for testing and applying treatment. MSC policies and procedures for chemicals will be provided.

Corrective Maintenance: This module provides instructions on the process to initiate and complete a Corrective Maintenance action in the MSC SAMM Program. Instruction will include generating and managing departmental Work Requests (WR) and upgrading all work requests to Ship's Force Work List (SFWL) items or Voyage Repair Requests (VRR). Instructions and guidance on MSC required actions for each of the different repair types (WR, SFWL and VRR) will be provided during this instruction.

ENCON: This module provides information on the Energy Conservation Program, the regulations behind the program, and the various shipboard systems that can benefit from the application of operational and technological improvements designed to reduce energy consumption and improve reliability.

Fuel Oil: This module covers fuel types, the ordering procedure under SEACARD or NAVSUP, sampling procedures, regulatory requirements, shipboard records (e.g. NEURS) and sample shipping procedures.

Logbook: This module provides instruction on the use of an electronic log keeping system for the Engine Department, employed throughout MSC's fleet. Special emphasis will be given on log readings required for the NEURS Monthly report.

LogiQuest: This module instructs the user on how to identify replacement parts by National Stock Number, commercial part number, or by equipment information. This module builds upon the ShipClip module by showing how to access detailed parts information missing from other ship's databases, or when the need arises to cross reference between NSN and commercial part numbers, especially when those numbers have been changed by the OEM.

Lube Oil Commodities / Sampling: The students will be introduced to the Lubricating oils on the Contract, the different types of Oils, and the uses for each type of oil. Also part of this module are sampling procedures, regulatory requirements, shipboard records (e.g. NEURS) and sample shipping procedures.

Machinery Alignment: This module covers issue associated with alignment methodology and issue associated with misalignment, how these issues can be corrected, and how they affect machinery wear and vibration.

Machinery History: This module covers how to review all history (Maintenance, Corrective, CMS, Other) and print reports for inspection and monitoring evolutions. The user will print several reports under instruction based on previous inspections and common reports requested by regulatory organizations.

Planned Maintenance: This module covers the MSC Planned Maintenance process. Students will be shown how to locate and complete any assigned maintenance item, whether scheduled in the Workbook or unscheduled. Included in the presentation is a discussion on the Planned Maintenance (PM) feedback process, showing students the flow-path of all feedback and a method to review status of any submitted feedback item.

Pump Alignment: This module covers basic alignment theory and a discussion on common alignment errors and corrections, such as soft-foot, bar sag, piping stress, and thermal growth. Students will also learn a procedure to perform alignment by dual indicator alignment procedure with only one indicator and a commercially available Microsoft spreadsheet (Excel). Other methods to align belt driven units and mechanical couplings are also discussed.

RITEMOV / VSA: This module covers MSC's RITEMOV initiative to move towards Vessel Self Assessments between SMART inspections, and the additional metrics involved.

RCA: This module covers the need for Root Cause Analysis in sorting symptoms from causes as an effective way to address, reduce or prevent future failures. Techniques to reduce perceptual blindness and bias, with tools available to assist with determining root causes are discussed along with methods on how to gather reliable information from operators and repair contractors. Proper use of RCA techniques allow users to identify potential issues on other equipment across multiple systems, ships, and ship classes.

RCM: This module focuses on Reliability Centered Maintenance; the practice of doing the right maintenance at the right time to reduce costs and downtime while eliminating unnecessary or

ineffective maintenance. This module, together with the one on RCA, explain how best to identify and justify the need for changes to PMs when submitting Feedback change requests.

SAMM Intro: This module covers the architecture, purpose, and use of MSC's Shipboard Automated Maintenance Management system. Common terminology, common features and the Navigation/Search features will be taught during this course. Included in this section is a description of each Tab in the SAMM Dashboard and how each tab applies to the overall management of the vessel's maintenance. Additionally the students will be shown the training modules as well as accessing documents in the shipboard VTL (Virtual Technical Library).

ShipClip: This module focuses on the ship's logistical supply program; parts identification, location, ordering, and equipment specifications.