



# MILITARY SEALIFT COMMAND

## MSC Ship Operation and Maintenance Philosophy

Prepared for Military Sealift Command  
by Emprise Corporation

UNCLASSIFIED//FOUO



# Learning Objectives

- **The overarching objective of this module is to introduce you to MSC's commercial-like ship operation and maintenance philosophy**
- **At the conclusion of this module, you will understand the following elements of MSC's operation and maintenance philosophy :**
  - **MSC's use of commercial ship design, operation, and maintenance standards**
  - **MSC's Safety Management System**
  - **MSC's Quality Management System**
  - **MSC's ship operating models**
  - **MSC's maintenance philosophy**
  - **MSC's maintenance model**
  - **MSC's predictive maintenance tools**
  - **MSC's web-based maintenance planning and management tools**
  - **Visibility of MSC's operating and maintenance costs**
  - **MSC's alignment of life cycle maintenance and fiscal decision-making responsibilities and authorities**



# Ship Design Standards

- **MSC ships are voluntarily designed and built using commercial ship design standards**
  - Use of Navy design standards limited to Navy-unique requirements



# Ship Operation and Maintenance Standards

- **MSC voluntarily complies with internationally recognized commercial standards for ship operation and maintenance**
- **Use of Navy standards limited to:**
  - Navy-unique requirements
  - Statutory inspection requirements for U.S. naval vessels



# American Bureau of Shipping

- Internationally recognized ship classification society
- Designated classification agent of choice for government owned ships per 46 USC § 3316



TABLE	CLASS PARTICULARS	TEST PARTICULARS	JUST HOME
NAME: HESSIG, "BOBBY" WILLIAMS	1	1	1
NAME: KENNEDY	1	1	1
NAME: LINDS & FULLER	1	1	1
NAME: BENT	1	1	1
NAME: US NAVAL SHIP SALES DIV	1	1	1
NAME: USNS T-ESL JACK LUMBER	1	1	1
NAME: USNS T-ESL JACKSONVILLE	1	1	1
NAME: USNS T-ESL JOHN F. BIRD	1	1	1
NAME: USNS AILE	1	1	1

SURVEY NAME	STATUS	START	LAST MODIFIED	START DATE	STATUS DATE	EXPIRES DATE	REPORT DATE
Annual Intermediate Survey 2	Pass	11	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021
Annual Hull Survey 2	Pass	11	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021
Annual Machinery Survey 2	Pass	11	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021
Annual Survey - OROB 2	Pass	11	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021
Annual Survey - Operational Performance 2	Pass	11	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021
Operational Survey - Hull 2	Pass	11	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021
Operational Survey - Performance 2	Pass	11	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021
Operational Survey - Intermediate 2	Pass	11	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021
Tactical Survey - People Shift Post - NOV2021	Pass	11	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021
Tactical Survey - People Shift Post - NOV2021	Pass	11	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021	11 Nov 2021



# U.S. Coast Guard

- U.S. flag state authority
- Establishes and enforces portions of Code of Federal Regulations pertaining to design, operation, maintenance, and inspection of U.S. flagged commercial ships





# MSC Safety Management System

- **MSC voluntarily complies with International Safety Management (ISM) Code**



# MSC Quality Management System

- **MSC voluntarily maintains an ISO 9001: 2008 certified Quality Management System (QMS)**





# Ship Operating Models

- **Government Owned – Government Operated (GOGO)**
- **Government Owned – Contractor Operated (GOCO)**
- **Contractor Owned – Contractor Operated (COCO)**

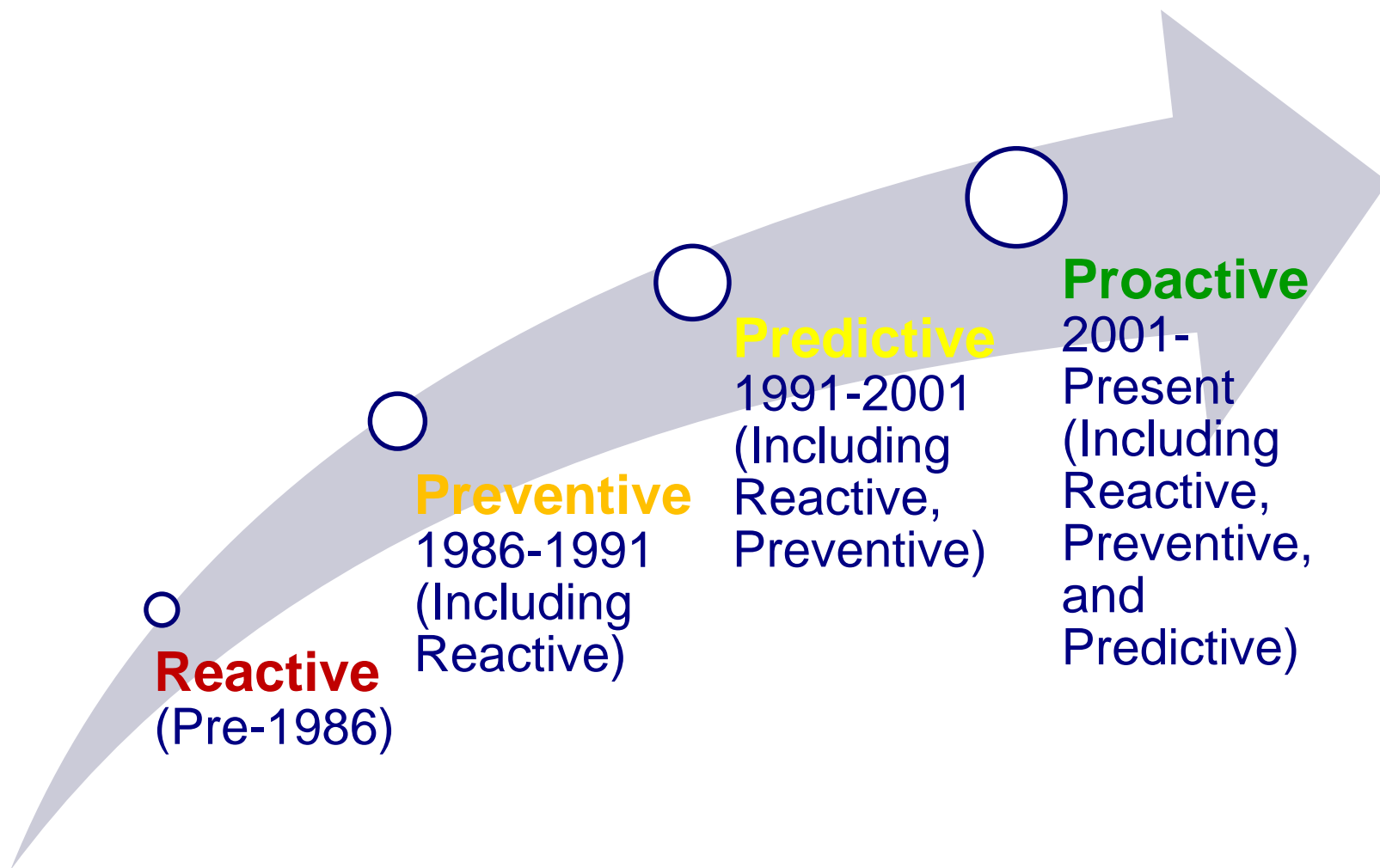


# Manning

- **MSC ships are primarily manned by U.S. Merchant Mariners**
- **Advantages in comparison to Navy model include:**
  - **Highly experienced personnel with specialization in ship operation and maintenance**
  - **No afloat training mission requirements**
  - **No sea/shore crew rotation considerations**
  - **Higher optempo**
  - **No perstempo considerations**



# Evolution of MSC Maintenance Philosophy





# MSC Maintenance Philosophy

- **Major elements include:**
  - **Reliability centered maintenance**
  - **MSC maintenance model**
    - **Robust ship's force maintenance**
    - **Centralized maintenance planning and management**
    - **Selective use of technical representative services and industrial assistance**
  - **Web-based maintenance planning and management tools**
  - **Material readiness reporting**



# Reliability Centered Maintenance (RCM)

- **Structured approach to developing a maintenance strategy for a piece of equipment or system**
  - **Emphasizes performing the right maintenance, on the right equipment, at the right time**
  - **Emphasizes data-driven decision-making**



# Root Cause Analysis (RCA)

- **Traditional approach to corrective maintenance primarily focused on correcting whatever broke, with little emphasis on exploring why it broke**
- **RCA approach emphasizes understanding not only what failure has happened, but also understanding how it happened and why it happened to identify the corrective action necessary to prevent recurrence**



# MSC Maintenance Model

- **Two-tier maintenance model**
  - Crew maintenance managed by Chief Engineer
  - Industrial assistance managed by Port Engineer
- **Material readiness reporting**
  - Casualty Reports (CASREPs)
  - Voyage Repair Request (VRR)
  - ABS Outstanding Requirement
  - Notice of Merchant Marine Inspection Requirement (CG-835)
  - Safety Management System findings
  - Quality Management System findings
  - USCG's Report of Marine Accident, Injury or Death (CG-2692)
  - TRANSALT requests
- **Condition monitoring**



# Lube Oil Analysis

- **Robust assessment of:**
  - **Material condition of equipment**
  - **Condition of lubricants**
- **Shipboard test kits for on-the-spot analysis**





# Vibration Monitoring

- Robust assessment of material condition of equipment



# Reciprocating Engine Analysis

- Robust assessment of diesel engine combustion



# Chemical Analysis

- **Robust assessment of:**
  - **Material condition of equipment**
  - **Condition of treatment chemicals**
- **Shipboard test kits for on-the-spot analysis**



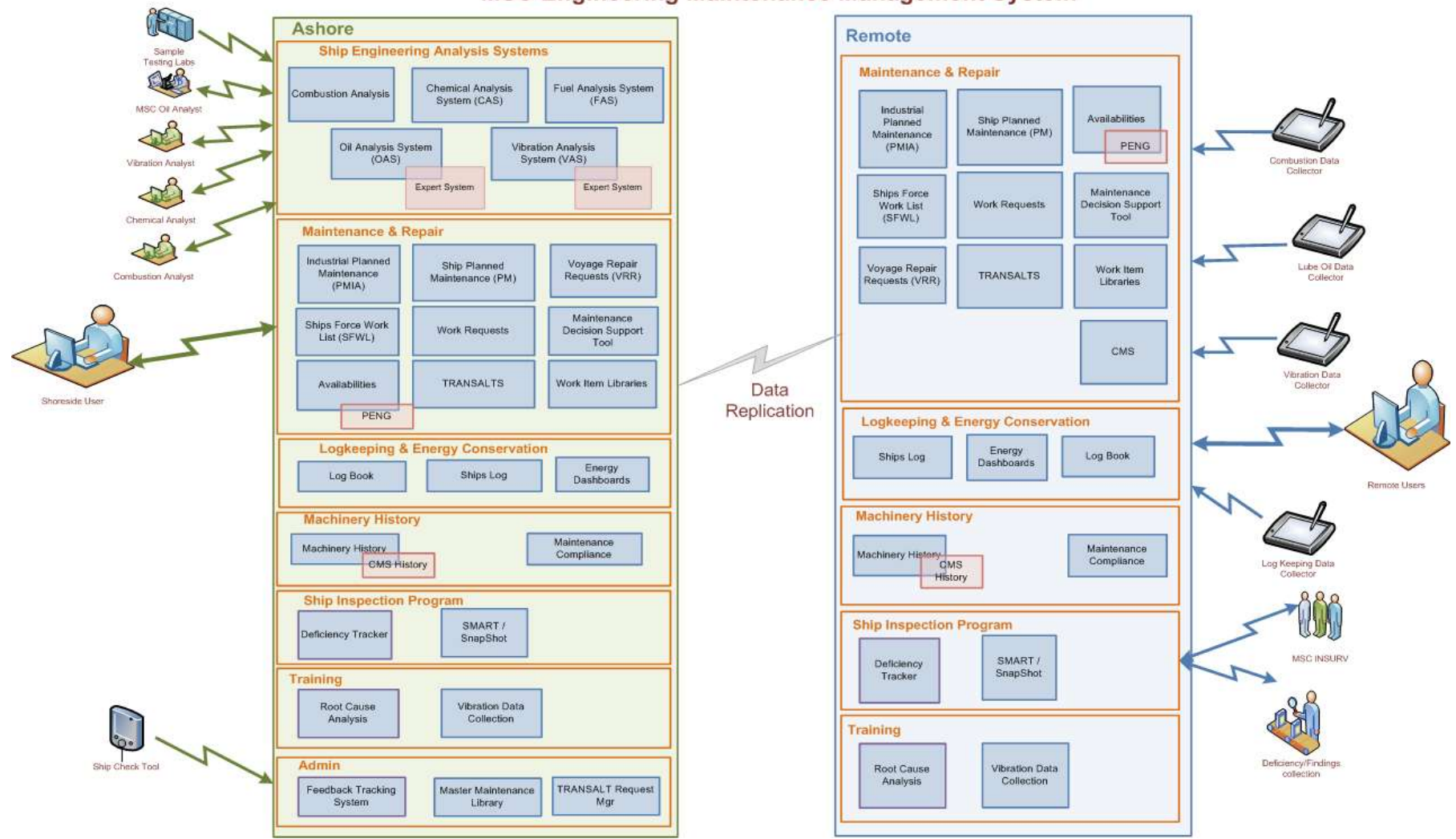
# Fuel Oil Analysis

- **MSC uses fuel oil analysis to:**
  - **Verify bunker fuel complies with established criteria**
  - **Support early identification of emerging problems**
- **Accomplished as part of standard procedure for bunkering**
- **Also accomplished as needed based upon observed shipboard conditions**
- **Shipboard test kits available for on-the-spot analysis**



# Web-Based Maintenance Data Management

## MSC Engineering Maintenance Management System





# SAMM

- **Shipboard Automated Maintenance Management (SAMM)**
- **Software program of record for maintenance planning, management, and history**
  - **Preventive maintenance**
  - **Corrective maintenance**
  - **Machinery history**
  - **TRANSALT management**



# PENG

- **Port Engineering Management System (PENG)**
- **MSC software program of record for managing maintenance availabilities**
  - **Critical business procedures**
  - **Essential contract documentation**



# MSC Virtual Technical Library

- Centrally managed repository of technical information for MSC ships
- Majority of documentation available in electronic format via MSC Virtual Technical Library (VTL)
  - Accessible 24/7 worldwide via MSC iNavy portal or SAMM





# Electronic Log Books

- **Shipslog (Deck Department)**
  - Watch Log
  - Position Log
  - NOAA Weather Log
  - Gyro Log
  - Night Orders
- **Logbook (Engine Department)**
  - PDA used for hand held data collection
  - Night Orders
  - Watch Log



# Visibility of Costs

- **Navy funding structure compartmentalizes ship operation and maintenance costs, which impedes:**
  - Capturing full costs associated with operating and maintaining Navy ships
  - Segregating costs by ship or ship class
- **Working Capital Fund and reimbursable funding requirements dictate capturing full cost of operating and maintaining MSC ships**



# Alignment of Maintenance and Fiscal Decision-Making

- **Program Managers are responsible for all aspects of their assigned ships, including cost, schedule, performance, and life cycle maintenance management**
- **N7 personnel support life cycle maintenance management by identifying technically acceptable maintenance alternatives, including identifying associated costs, benefits, risks, and trade-offs**
- **Program Managers have ultimate maintenance management decision-making authority for their assigned ships**



# Let's Review

- **List the major commercial ship design, operation, and maintenance standards used by MSC.**
- **Name three of MSC's condition-based maintenance tools.**
- **What are MSC's key maintenance planning management tools.**
- **Describe MSC's alignment of maintenance and fiscal decision-making.**
- **Describe three means of material readiness reporting used by MSC.**



# Summary

- **During this module, we have discussed:**
  - **MSC's use of commercial ship design, operation, and maintenance standards**
  - **MSC's Safety Management System**
  - **MSC's Quality Management System**
  - **MSC's ship operating models**
  - **MSC's maintenance philosophy**
  - **MSC's maintenance model**
  - **MSC's predictive maintenance tools**
  - **MSC's web-based maintenance planning and management tools**
  - **Visibility of MSC's operating and maintenance costs**
  - **MSC's alignment of life cycle maintenance and fiscal decision-making responsibilities and authorities**



# Additional Information

- **For additional information, please refer to:**
  - **COMSCINST 4700.1, Military Sealift Command's Technical Authority, Maintenance Philosophy, and Maintenance and Repair Management System (MRMS)**
  - **COMSCINST 4700.18, Contract Technical Requirements Surveillance Process for MSC Ships**
  - **COMSCINST 4730.3F, U.S. Coast Guard Inspection and Certification of MSC Ships**
  - **COMSCINST 4730.4A, SMART Inspection Program**
  - **COMSCINST 3121.9C, MSC Standard Operating Manual (SOM)**
  - **QMS Procedure N0700-101.00-AQ, Duties of Ship's Engineers**
  - **QMS Procedure N0711-001.00-AQ, Shipboard Condition Monitoring and Preventative Maintenance Management**
  - **QMS Procedure N0711-002.00-AQ, Corrective Maintenance**
  - **QMS Procedure N0750.004.00.AQ, Maintenance Management Responsibilities**
  - **10 U.S. Code § 7304, Examination of Vessels; Striking of Vessels from Naval Vessel Register**



## Additional Information (cont.)

- **SECNAVINST 5040.3 (series), Inspections Within the Department of the Navy**
- **OPNAVINST 4730.5 (series), Trials and Material Inspections of Ships Conducted by the Board of Inspection and Survey**
- **MSC/PRESINSURV Memorandum of Understanding (MOU) dated 23 April 2013**
- **INSURVINST 4730.1E, Trials and Inspections of Surface Ships**



# Final Questions







# Revision History

Date	Version	Description	Author
4/8/19	2.0	Revised slide template. Updated content.	Gary Fields
8/7/19	2.1	Verified content is consistent with current COMSC Instructions and QMS and SMS procedures; Added ABS Eagle Survey Manager screen shots; Added RCA slide; Deleted back-up slides pertaining to statutory inspection requirements to eliminate redundancy with SMART Inspection module; Deleted Technical Library and VTL back-up slides and moved to VTL module; Corrected minor format and editorial errors.	Gary Fields