



# Common Maintenance Planning Working Group (CMPWG)

## 2008 Highlights

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# CMPWG Predecessors

- SURFMER Program 1996-2006
  - Applied NAVSEA “Back-fit” RCM process to evaluate existing planned maintenance (PMS) tasks
  - Succeeded in reducing shipboard PMS workload by nearly 50% since 1996
  - Solely focused on Organizational Level Maintenance
  - Focused on Surface Ships
- SUBMEPP Classic RCM Workshops 2004-2006
  - Applied classic RCM to specific troubled submarine systems
  - Achieved one time cost avoidance of 384K man-hours and \$13M material costs on Trident systems
  - Integrated look at O, I and D



# CMPWG Charter

- **Goal:** Continuously Improve maintenance across the Fleet, leverage best-practices and achieve commonality where appropriate
- **Expectations:**
  - Improved maintenance planning and execution
  - Reduce costs
  - Improve material condition
  - Achieve ship design service life
- **Process:**
  - Jointly identify troubled systems for review using inputs from across the Navy ship and submarine community and INSURV
  - Conduct RCM based Maintenance Effectiveness Reviews (MERs) and Classic RCM Workshops to continuously improve and align maintenance requirements and procedures
  - Identify cross enterprise best practices for common implementation through Common Maintenance Requirement Alignment MERs



# CMPWG Process

Consolidated, repeatable process developed and proofed for streamlining CMP maintenance requirements and identifying best practices

- Joint identification of target systems using broad based input from Fleet, INSURV, Top Management Attention
- Technical review of requirements and procedures
  - RCM Workshops
    - Narrowly focused problem on specific components
    - Deep dive classic RCM conducted in a weeklong workshop environment on specific troubled components
  - RCM FLEETMERS
    - Periodic broad review of system
    - Back-fit RCM of all system requirements and procedures
  - CMR Alignment MERS
    - Global and systemic problems with underlying technical justification and execution
    - Back-to-basics stem to stern, keel to truck and outside the lifelines review of requirements through execution searching for best theories and practice



# Results 2008

- **Three FLEETMERs conducted on the following systems:**
  - Weapons systems, generators, helicopter recovery, RADARs, Missiles, Trash Disposal, Firefighting, Comms antennas, Electronic cooling, AC&R, SATCOM Systems,
  - 2,581 requirements changed
- **Nine RCM Workshops completed (four common)**
  - Oil Pollution Abatement (OPA), Motor Generator (MG) Actuators, Type 18 periscope, HP air dehydrators, LO/FO purifiers, 400/70/10Hz MGs, Vertical Launch, Hydraulic Control Valves, Circuit Breakers (sub and surf)
  - 170 maintenance requirement changed
- **Three CMR Alignment MERs**
  - Heat Exchanger Inspection and Cleaning Best Practices
  - Vibration Monitoring Best Practices
  - Relief Valve Testing



# 2008 Cost Savings Summary

	CMR Alignment MER	FLEETMER	RCM Workshops	Total
Maintenance Requirement Additions		6	59	59
Maintenance Requirement Deletions/ Mods		2,581	111	1156
Cost Avoidance	\$1.9M	\$1.6M	\$0.9M	\$4.4M
Cost Increases				
Best Practices Identified	6		1	7



# Example – Oil Pollution Abatement System

- Conducted full classic RCM analysis
  - 8 Different systems on 14 ship classes
  - Current annual aver. cost = \$11.3k per ship (CM+PM)
  - Classic RCM identified baseline tasks
  - Compared baseline to Ship and CV current maintenance
  - Modified 9 existing Tasks and Developed 7 New procedures
  - Expect cost avoidance in CM due to increased PM + increased system Ao
    - Reduced cost to discharge oily water



# Where We're Going: FY 2009 Highlights

- CMR Alignment MERs
  - Valves
  - Circuit Breakers
  - Load (Weight) Testing
  - Piping Surveillance
  - Thermal Imaging
  - Ventilation
- FLEETMERs
  - Quarterly
- Classic RCM Workshops
  - Monthly
- Other
  - Implement Past CMR Alignment MER follow-up actions
  - Incorporate “program office” managed maintenance programs into CMPs (e.g. radar restoration programs)
  - Partner with Nuclear Propulsion Plant Engineering Activity





**BACK-UP**

## CMPWG RCM Workshop and MER FY 2009 Schedule

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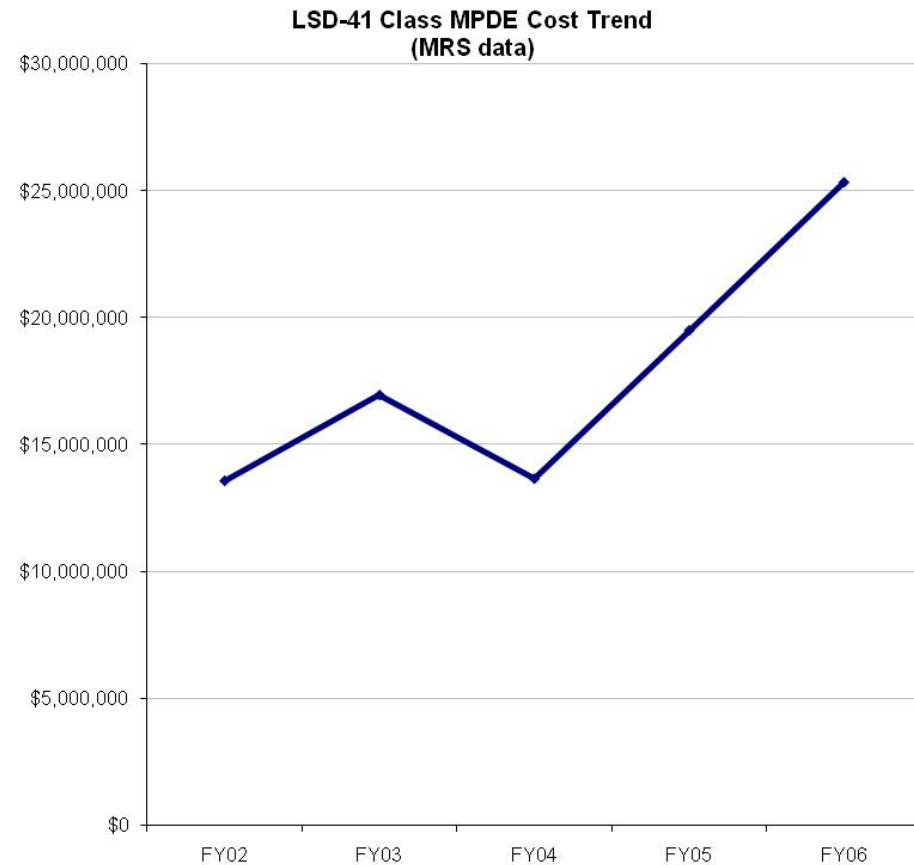
<u>System</u>	<u>Start</u>	<u>End</u>
RCM common WS-AQB Ckt Bkrs	10/6/2008	1/1/10/08
RCM sub WS-ASW Pump/vlvs	10/20/2008	10/24/2008
RCM sub WS-San TLI	11/17/2008	11/21/2008
FLEET MER 60 Feed/Nav/Strng	11/17/2008	11/21/2008
RCM sub WS- haches/WTD	12/1/2008	12/5/2008
CMR Alignment MER 4- Ckt Bkrs	12/8/2008	12/11/2008
RCM sub WS- MBT Vlvs	1/12/2009	1/16/2009
RCM sub WS- TPES (SSBN)	2/2/2009	2/6/2009
FLEET MER 61-AEGIS/SCBA/IPDS/HP Air	2/23/2009	2/6/2009
RCM common WS- ASW Vlvs	3/2/2009	3/6/2009
RCM sub WS- BST-1	4/27/2009	5/1/2009
FLEETMER 62-Elect Dist/ CPP/CW/Incin	5/4/2009	5/8/2009
RCM sub WS-R134 Refrig	5/4/2009	5/8/2009
CMR Alignment MER 5-Valves	5/19/2009	5/21/2009
RCM sub WS- Drain pumps	6/1/2009	6/5/2009
RCM sub WS- HPAC/ LP Blr	6/22/2009	6/26/09
RCM common WS- Total ships monitoring	7/20/2009	7/24/2009
FLEETMER 63- Amphib ballast/Refrig/400hz	8/24/2009	8/28/2009
CMR Alignment MER 6- piping	9/22/2009	9/26/2009
CMR Alignment MER 7- Ventilation	Resked	FY 10
CMR Alignment MER 8- Load (wt) testing	Resked	FY 10
CMR Alignment MER 9- Thermal Imaging	Resked	FY10



# CMPWG Examples

## Diesel Back-fit and Classic Analysis

- CMPWG strengthened requirements and identified improved diagnostic tool cross enterprise best practices
- 5 Year total dollars expended on engines directly analyzed: \$24.5M
  - \$4.9M - CVN
  - \$2.9M – LHA
  - \$17.5M – 688 and 021
- New diagnostics tools should eventually eliminate most intrusive and potentially destructive open and inspect requirements
  - Reduced infant mortality
  - Reduced preventive and corrective maintenance costs
  - Improved engine availability
- Results extendable to all other Diesel Engines including LSD41 class propulsion diesels (see cost graph)





## Other Examples

- HP Air Systems
  - Added surface ship scheduled truck to keel HPAC restoration to decrease unscheduled corrective maintenance, reduce total maintenance cost and improve reliability
- LP and MP Air Systems
  - Deleted or adjusted some planned maintenance periodicities to strike best (lowest cost, highest material condition) balance between planned and corrective maintenance
- R-114 A/C Plants
  - Reduced submarine 100% tube eddy current inspection periodicity to decrease corrective maintenance with no effect on reliability
  - Added surface ship ultrasonic leak inspections to improve leak detection and prediction, ultimately decreasing corrective maintenance cost and improving reliability