Automation for Reduced Manning
• Automation:

used to describe a system that carries out a predetermined sequence of events in response to a situation!
Systems to be Discussed

- Integrated Bridge System (IBS)
- Standard Monitoring and Control System (SMCS)
- Damage Control System (DCS)
Automated Manning Levels

- **GOAL**: Reduce Manning Levels to:
  - Bridge: 2 watchstanders
  - Engineering: 1 watchstander
  - Damage Control: 0 on watch
  - 1 small highly capable Repair Party
Automated System Interaction

Admin Network

ICAS

SMCS

DCS

IBS
Zonal Network
Integrated Bridge System
Integrated Bridge System

• Full Ship Control
• Computer Navigation System
Other Navigational Inputs

• RASCAR VT Radar
  - Collision Avoidance
  - Radar Overlayed images

• ADG3000 Autopilot

• Gyro, Doppler, GPS, Depth, and Weather

• Additional Modules: Precision Anchoring, Man Overboard, Engineering Status, and Remote TV Camera Displays
Standard Monitoring and Control System (SMCS)
Engineering Systems Monitored and Controlled

- Propulsion Machinery
- Auxiliary Machinery
- Electric Plant and Distribution Systems
- Steering Systems
- Damage Control Machinery
System Control

• The three main consoles
  - have full control capability of any engineering system
  - example: CIC can display and control all navigation functions acting as a redundant bridge control center

• Local Operating Panels are single screen displays but have full control capabilities...just one system at a time!
Location of Control Stations

- Main Control Centers
  - Bridge, CIC, Engineering Control

- Local Operating Panels
  - Main engineroom, generator room, forward generator room, and located with other major machinery
Integrated Condition Assessment System (ICAS)

• Monitors, tracks, and provides a complete machinery condition assessment.
Damage Control System (DCS)
Damage Control System

• Graphic Displays
• Provides Real time Damage Control Information for Decision Making
• Utilizes SMCS to control DC Equipment
Two Wire Automatic Remote Sensing Evaluation System
Firemain, AFFF and Water mist
Foam in Salvage Coverage
Automation and Survivability

Highly Survivable Ship
Automation to help Control Damage
Conclusions

- The systems shown are available today and are proven systems.
- The Arsenal Ship will have to embrace the technology to achieve a substantial manpower savings without loss of mission capability.
- A True Balance between Automation and manning must be achieved!
Mine Hit Example

- Mine strikes Auxiliary Machinery Room Zone 14
- Zone 14 begins to flood. Remote detection reports a fire and flooding!
- SMCS Secures the Space: Material, Electrical, & Ventilation
- DCS Evaluate Stability and Damage,
- Attempts to Control!
• DCS/SMCS Energizes Fire Pumps and sprays water mist to extinguish fire!
• Bilge drainage energized to handle fire fighting water and flooding.
• Electrical load is evaluated by SMCS and additional generators are provided.
• Fire’s out but still have flooding!
• Pumps are working but not enough!
• SMCS shifted electric load to PTGs and EDG, Minimal loss of power! Ship is able to continue to launch missiles!
• DCS recommends Foam in Salvage!
• Foam In Salvage System Activated!
• Auxiliary Machinery room can not flood!
• Ship will not sink and can continue to fight!