

# Paperless Quality Assurance

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# Topics

- The Obvious
- Begin with the End
- Requirements Details
- Instruments
- Benefits
- Questions

# The Obvious

- You cannot determine whether a coating system was applied correctly by looking at it. Accurate, complete preservation process QA data is critical.
  - BUT - The U.S. Navy is not able to oversee preservation work being done on its ships and submarines in real time or to review associated QA data in a timely manner.
- Resultant Problems
  - Technically non-compliant preservation work
  - Lack of accountability
  - Inaccurate/incomplete preservation QA data
  - Rework; increased cost to the Government

# Begin with the End (1)

- The Navy needs a Paperless QA system that allows near real-time monitoring of preservation activity, by personnel with need-to-know, from anywhere.
  - Make it easy for the waterfront to implement – increase the use of the system and improve the reliability of the data
  - Avoid manual entry of inspection data wherever possible
  - Avoid manual data management

# Begin with the End (2)

- Allow for different user types to perform different tasks within the system
- Understand the limitations
- Feedback loop
- Bottom-up Buy-in

# Make it Easy for the Waterfront

- Inspector collects inspection data.
  - Ideally, the inspector seamlessly uploads inspection data to a central server with little intervention on the inspector's part.
  - Realistically, the inspector uploads data to a temporary storage area, annotates the data with location and other pertinent info, then uploads the data to the central server.
- Some data is not electronic; the inspector manually inputs that data, annotates, and uploads.

# Avoid Manual Data Entry

- Manual data entry invites problems.
  - Inaccurate data
  - Number transpositions
  - Math errors
- Alternatives
  - Great – Use automated upload from electronic instruments
  - Good – Use drop boxes with pre-filled information
  - Better than nothing – Allow the inspector to enter data

# Avoid Manual Data Management

- Eliminate drudgery and improve the believability of the information
- Automate
  - Calculations
  - Out-of-spec determinations
  - Problem notifications
- Assist
  - Expedite adjudication of out-of-spec conditions
  - Consistent verbiage

# User Management

- Allow for different user types to perform different tasks within the system.
  - Inspectors may not create jobs or clear adjudications
  - QA may not enter explanations for repair actions
  - Management may not enter inspection data
  - “Visitors” may only view data or reports
- Unique user ID and passwords
  - Limit access to those who need to know
  - Trace data and actions to a particular user

# Understand the Limitations

- There are ways to game any system whether you use paper, direct upload from instruments, or inspector-entered data.
- Goals should be:
  - Reduce the ability to game the system
  - Reduce the chance for errors (typo, math, mis-tagged data)
  - Provide the ability to journal the preservation activities
  - Maximize the integrity of the QA data

# Feedback Loop

- Extensive trial runs
- Codify a method to receive user feedback
- Incorporate those changes
  
- Over the course of managing 102 preservation work items, field testing of the NST Center QA Tool Kit generated over 150 Government and contractor-recommended changes to the system.

# Bottom-up Buy-in

- Navy
- Shipyard
- Contractor
- Management
- Inspector



# Instruments

- Positector 6000 DFT
- Elcometer 456 DFT
- Elcometer 224 surface profile
- Dewcheck II Environmental meter
- SaltSmart soluble salts meter
  
- Given a communications protocol, instruments can be added as needed

# Benefits

- Administrative costs are reduced by 99% (SERMC Lean Analysis)
- Access – Web browser interface allows users to view information from any PC
- Accuracy – Fewer opportunities for data errors due to transpositions, handwriting problems, math mistakes
- Integrity – Once the data is uploaded to the system, it cannot be tampered with
- Timeliness – When data is uploaded to the system, it is immediately checked against specs. Emails notify users of error conditions.

# Questions?

# Thank You

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