Ship Material Condition Metrics Model

Maintenance Figure Of Merit (MFOM) 2.0

Basics of MFOM 2.0

- **Computer based tool built on a hierarchical structure that calculates material condition against operational requirements**

- **Designed to consistently and objectively calculate a material condition readiness value for equipment, systems, tasks, missions or the ship.**

- **Provides the Navy Maintenance community with a single, authoritative, centrally managed application that provides the necessary data upgrades and improvements to support <u>readiness</u> and <u>maintenance</u> reporting.**

Near real time reporting of ship's material condition to support maintenance planning and operational readiness reporting (supports DRRS-N)

Single Tool for Afloat Maintenance

- **To provide the necessary readiness and maintenance picture MRAS will:**

  – **Reduce the burden on the sailor for managing and performing maintenance**

  – **Improve 2K / Notification accuracy (e.g., auto fill certain fields, pull downs)**

  – **Capture Non-2K related maintenance actions (e.g., Tag outs, ICAS data)**

  – **Provide visibility of the entire ship maintenance picture**

  – **Facilitate sharing of data between existing maintenance systems**

- **Solution**

  – **Afloat Toolbox for Maintenance (ATM) connects existing tools for better functionality**

- **Delivery**

  – **Tagging of systems/equipment with Item Unique Identification (IUID) barcode**

  – **Provides portable maintenance tools with barcode reading capability**

  – **Facilitates capturing and maintaining ship's configuration**

  – **Utilizes a "Turbo Tax" like front-end for building a maintenance action**

  – **Provide _ship's force_ a single portlet for maintenance management**

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MFOM Roadmap

- **MFOM reached IOC 01 October 2007.**

  – Plan to have installed on 50 ships by 31 December 2007.

  – Installed on all ships in 15 months.

- **MFOM integrates several maintenance applications**

  – Fleet Material Assessment Tool provides a common assessment tool

  – Integration of tag-out isolation, departure from specs, & QA Tools

  – Integration of high priority equipment deficiencies (CASREPs) – Jan 2008

- **Validation, Screening and Brokering (VSB) online March 2008**

  – Provides functionality to abandon legacy maintenance systems

- **ATM Phase II release July 2008**

  – Provides functionality to abandon current shipboard work candidate generation application

IUID DDG 51 Pilot Project Overview

- **MFOM 2.0 has implemented a pilot project integrating IUID technology**
  - **Will use the MRAS shipboard database**
  - **Effort focused on DDG-51 class**
    - **Pilot Ship USS FORREST SHERMAN (DDG-98)**
- **The project's objective is the application of IUID technology to mark legacy equipment and assets and to further register IUID number in the DoD registry**

- **Targets items that will have maintenance performed on them during the course of a one year period through the tag out system.**

- **Marking would take place primarily at the organizational level during maintenance.**

- **MFOM (ashore) and MRAS (afloat) will be modified to track equipment with an associated IUID.**
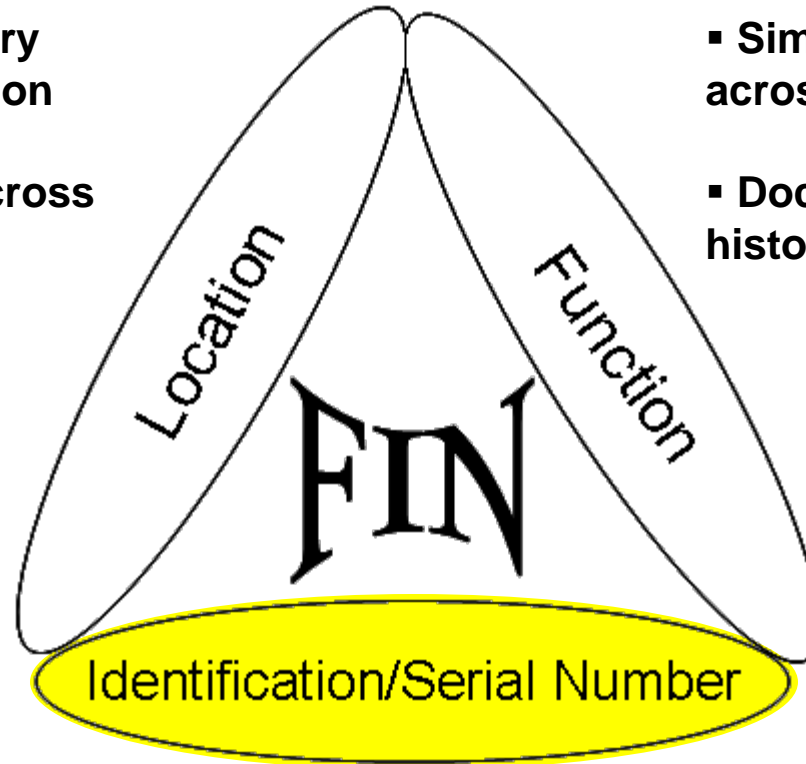
FIN
(Location)(Function)(ID)

Functional Index Number (FIN):

An alpha/numeric value assigned to all items in the model.

- **Uniquely identifies every shipboard item by function**

- **Identifies same item across ship classes**

- **Simplifies retrieving data across ship classes**

- **Documents material history**

Location:

Compartment Number, Compartment Name, or XYZ Coordinates

Location

FIN

Function

Identification/Serial Number

Function:

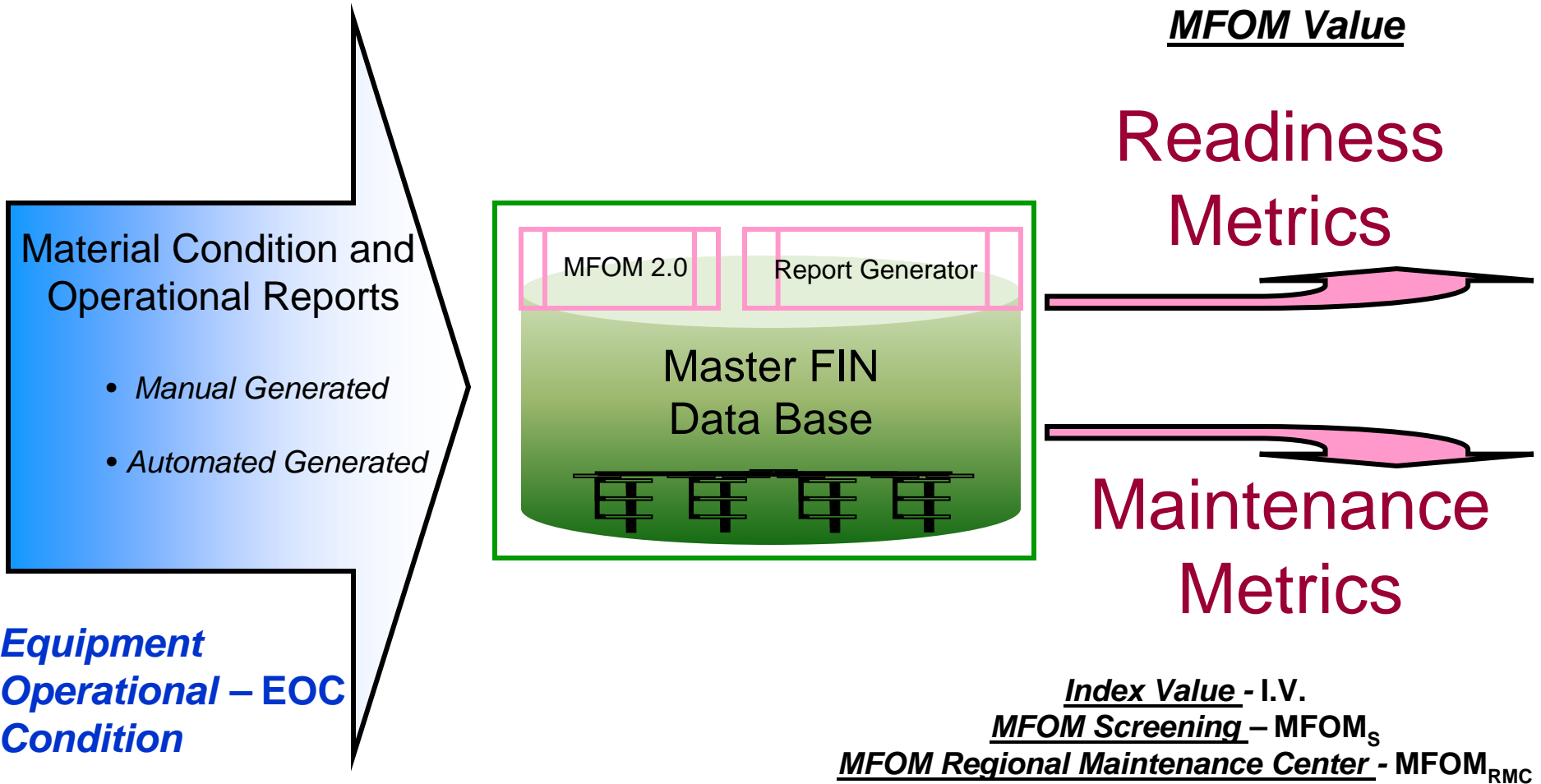**Defines the operational contribution, action, purpose or activity of an object.**

Identification/Serial Number:

Applies an Item Unique Identifier to an object.

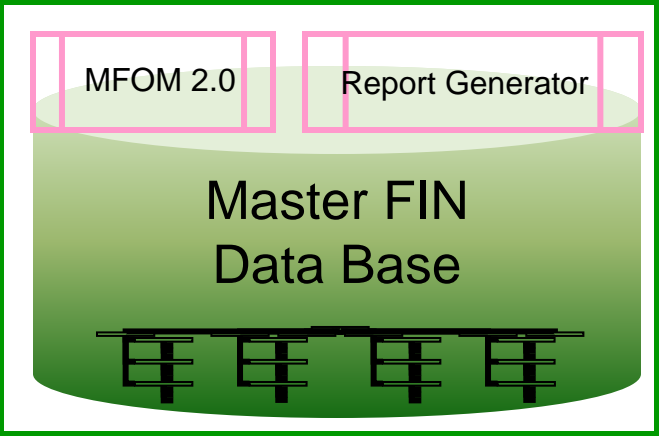**Can be composed of an IUID or Material Identification Number (MIN).**

FIN AND MFOM RELATIONSHIP

MFOM Value

Readiness Metrics

Material Condition and Operational Reports

- *Manual Generated*

- *Automated Generated*

MFOM 2.0

Report Generator

Master FIN Data Base

Maintenance Metrics

Equipment Operational – EOC Condition

Index Value - I.V.
MFOM Screening – $MFOM_S$
MFOM Regional Maintenance Center - $MFOM_{RMC}$

IMPACT CHART
EQUIPMENT LEVEL MFOM VS TOTAL OPERATING COST
(ONE MINUS PROBABILITY OF MISSION FAILURE IS USED TO REPRESENT MFOM)
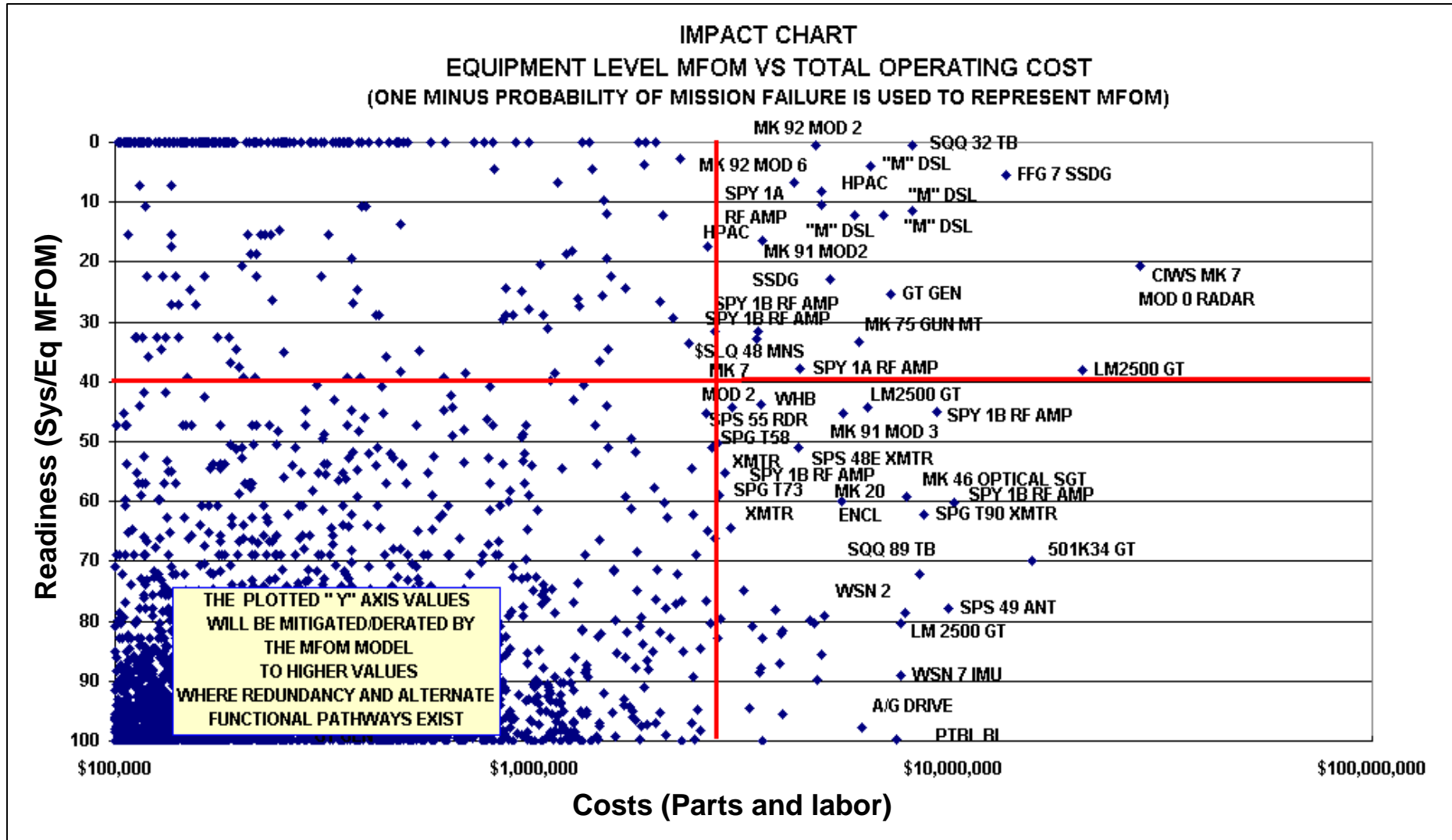
Pulling It All Together

- ## FIN Implementation

  – **Items identified and numbered in shipboard model**

  – **When any maintenance performed IUID tag is printed and hung for those items if an ID tag is not already hung**

  – **ID tags then have a first and second check on tag location by using the in-place isolation tag system**

- ## Benefits

  – **Allows one touch UPS-like tracking**

  – **Provides for Model Improvement**

  – **Provides Better Reporting**

  – **Reduces sailor work-load**

  – **Provides for Better Parts Control**

  – **Provides for correct maintenance documentation for shipboard equipment**

Ships With IUID Implementation
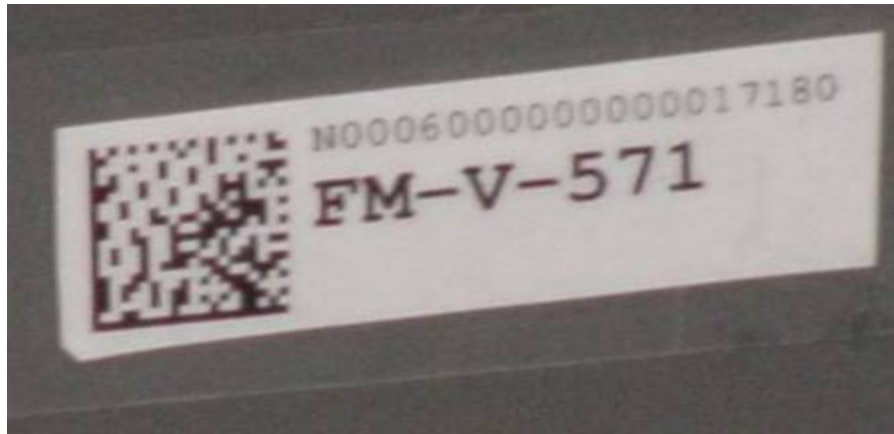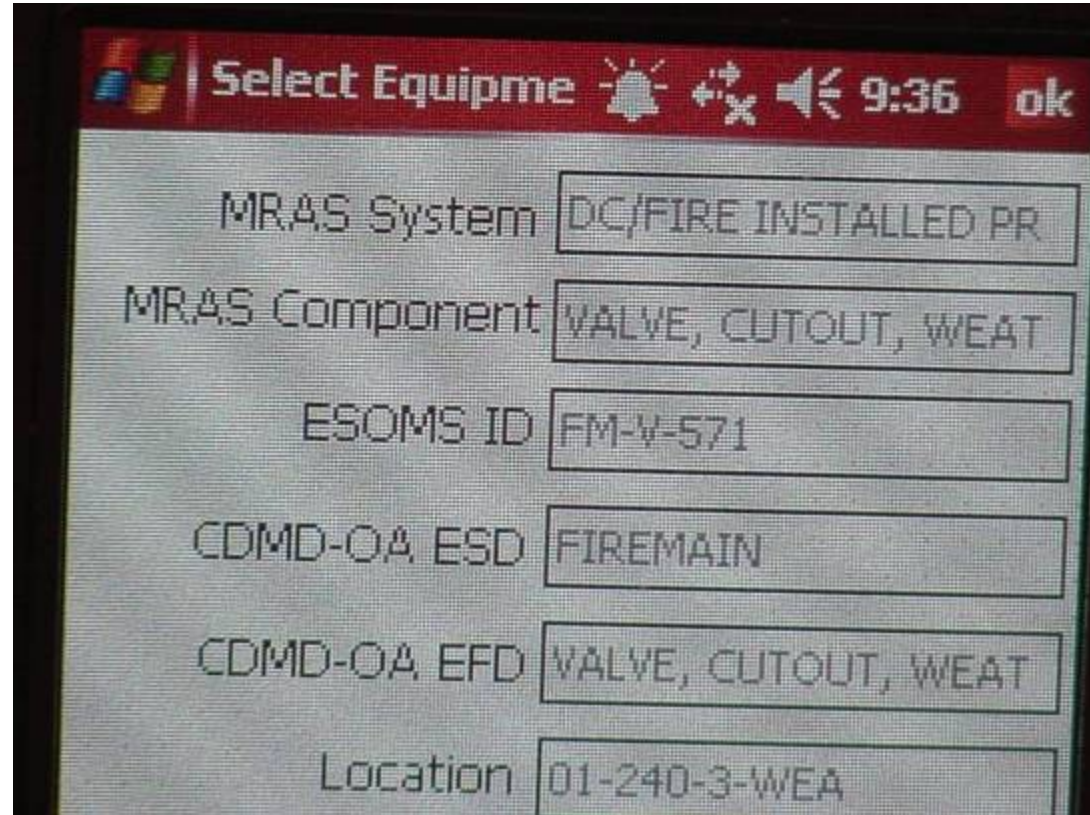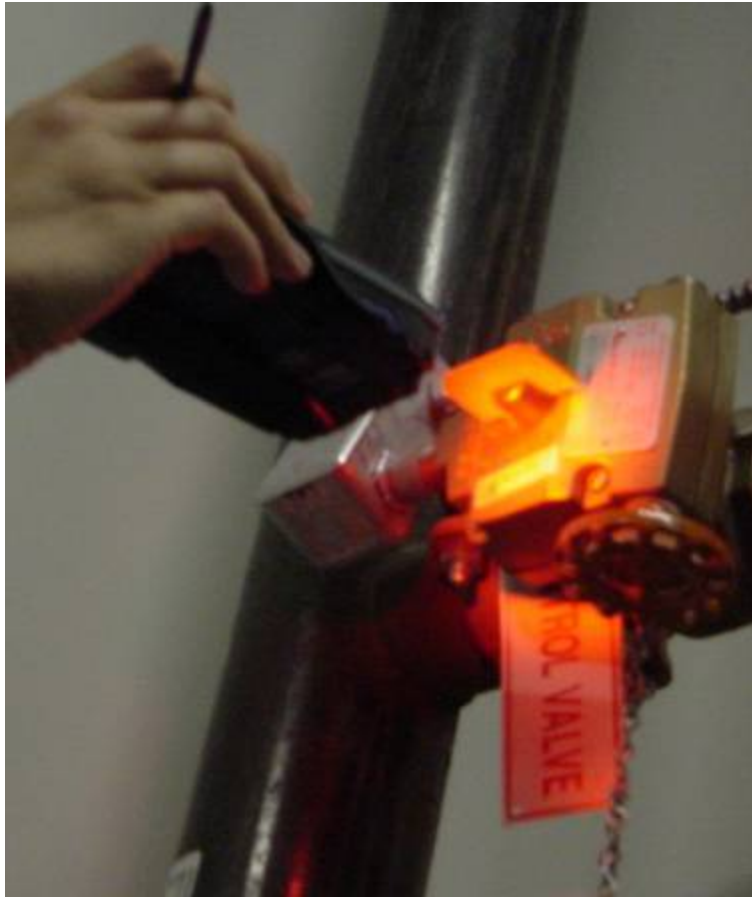

IUID Tag

IUID Tag on Valve

Handheld Use

Authorizing Officer

Tag Being Hung

Scanning with IUID Tags

Scanning

Results of Scan

DOWNLOAD OF SCANNER TO AWN

JOB ID: 7842

EQUIPMENT STATUS: 1 - OPERATIONAL

CAUSE: 7 - NORMAL WEAR AND TEAR

METER READING:

SUMMARY: CAT: 2 2007070*MEMBRANE FAILED

FIRST CONTACT: user1

EQUIPMENT: AIR, GAS, AND MISCELLANEOUS FLUID SYSTEMS MAIN DEHYDRATOR HP AIR SYSMAIN DEHYDRATOR 4-174-0-E

STAR: - (BLANK) NOT STAR CARD

RESPONSIBILITY: - (BLANK)

FUNCTIONAL AREAS: AUX

SAFETY: - (BLANK) NOT SAFETY CARD

RAC: - BLANK (NOT SAFETY CARD)

INSURV DEPARTMENT: AS - ASW

WHEN DISCOVERED: 4 - DURING INSPECTION

DATE DISCOVERED: 8/16/2007 12:00:00 AM

EOC VALUES: 0.7 - Minor problems

REMARKS: DURING PRE-INSURV GROOM OF NR 1 H NOTED THAT THEMEMBRANE FOR NR1 I MEMBRANE DEHYDRATOR (IMD-60) WAS ANDCAUSING NR 1 HPAC TO FAIL CAPAC

RATE: O-1

IMPORTANCE: 1 - PART 1

ROOT CAUSE: A1 - RELIABILITY - MANUFACTURING DEF

DEGRADE: - (BLANK)

RELIABILITY/MAINTAINABILITY: - (BLANK)

SERIAL NUMBER:

CORRECTED: ☐

REFERENCE

REFERENCE 1: ☐ AVAILABLE ON BOARD

REFERENCE 2: ☐ AVAILABLE ON BOARD

REFERENCE 3: ☐ AVAILABLE ON BOARD

REFERENCE 4: ☐ AVAILABLE ON BOARD