

GENERAL DYNAMICS

Information Technology

Enterprise Asset Management for Shipyards

Shipyards Production Process Technologies Panel

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Enterprise Asset Management (EAM)



- Defined: A computer system used to help manage the acquisition, provisioning, maintenance, replacement and decommissioning of Enterprise Assets
- Enterprise Assets
 - High Value (above some \$ value)
 - Critical in Nature (for want of a nail the kingdom was lost)

Benefits of EAM

- Reduce Capital and Operational Costs
- Increase Asset Operational Life and Return on Asset Investment
- Sharing of data
 - Operation Procedures
 - Location Hierarchies
 - Documentation
- Consolidated Reporting

Benefits of EAM (cont'd)

- Single Point of Integration to other Enterprise system
 - Financial
 - HR
- Helps enforce Common Best Practices
- Preventive Maintenance Planning
- Repair and Corrective Maintenance tracking
- Asset Life Cycle Management
- Tracking of all costs (Material, Labor, Tools, Contract)

Technical Characteristics of an EAM System

- Multi-user
 - sometimes in the thousands
- Centrally host
 - Users from multiple locations access the same software and database
- Web based (thin-client)
 - Need to little or no configuration
- Able to segregate data by Department or Location
- Multi-level Security



NAVSEA Shipyards

- **Background**
 - Support for Norfolk, Puget Sound, Portsmouth and Pearl Harbor shipyards
 - 6,000+ Users
- **Industrial Plant Equipment (IPE)**
 - Manages all work done on IPE (demand maintenance, PMs, and projects) ~150,000 Assets
- **Tool Management.**
 - Supports inventory management (stocking, re-stocking, etc of bulk, special, unique, and consumable tools) as well as operations of tool cribs (issuing, exchanges, tracking, etc.). Includes Qualifications to use tools
 - Over 100,000 tools supported with an inventory of 5-7 million
 - Ensures Test, Measurement and Diagnostic Equipment (TMDE) tools are tracked and calibrated on schedule



NAVSEA Shipyards

- **Nuclear Refueling Gear**
 - Tracks the status and condition of nuclear refueling gear
- **Radioactive Material Control**
 - Use Active RFID tags to tracks the location of radioactive material as it moves throughout the shipyard
 - Tracks movement of over 620,000 packages (2.4M transactions) of radioactive material
- **Weight Handling**
 - Tracks the status, condition and issuance of weight handling equipment (cranes)
- **Contract Management**
 - Ties Contracts, Delivery Orders, Purchase Orders to Work Orders for status and cost information.



Facilities Asset Management

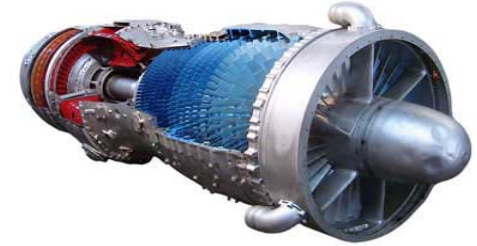
- **Background**
 - Asset Management for many different types of assets integrated into single database structure – industrial plant equipment, facilities, personal property, real property, and vehicles
 - Tracks over 150,000 assets and over 15,000 inventory items
 - Over 4,000 Active Users
- **Vehicles**
 - Tracks over 15,000 vehicles, leasing/rental, inventory objectives, reporting by classification
 - Certification and Maintenance of Class II and IV Cranes (self propelled)
- **Equipment Utilization**
 - Tracks the utilization vehicles
 - Utilization tracked on an as needed, daily, weekly, monthly basis
 - Utilization rates can be viewed on-line or via reports and compared to utilization objectives
- **Labor**
 - Actual costs calculations based on different overhead rates depending on user
 - Actual labor reports can be changed after the labor transaction is approved
- **Installation/Facility Condition Assessments (ICAP/FCAP)**
 - Processes and Data collection for complete asset lifecycle maintenance



NAVAIR Fleet Readiness Centers

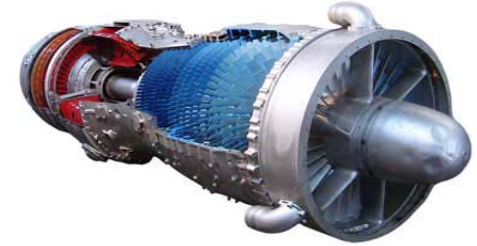
- **Background**
 - Support for North Island, Jacksonville, and Cherry Point Fleet Readiness Centers (FRCs)
 - Asset Management for many different types of assets integrated into single database structure – industrial plant equipment, facilities, weight handling, ground support and metrology equipment
 - Tracks over 370,000 assets and over 26,000 inventory items
 - Centrally hosted with single database supporting the three FRCs
- **Metrology**
 - System used for both Contractor and In-house work force
 - Manages complete business process – Recall, tracking asset thru Lab, capturing work performed (technician, hours, parts, standards, etc.), and shipment
 - Quality Module provides for both In-Process Reviews (IPR) and Quality Process Reviews (QPR)
- **Industrial Plant and Equipment (IPE)**
 - Manages all work done on IPE (demand maintenance, PMs, and large projects)
- **Ground Support Equipment (GSE)**
 - Tracks Pre-Operational Inspection and Custody Maintenance information
 - Maintenance Control Requests and GSE Dispatch

Asset Configuration Management



- **Roll-Royce – Aircraft Engines**
 - **Implemented by IBM (a GDIT partner)**
 - Very complex Assemblies and Sub Assemblies
 - Managing the configuration of Jet Engines
 - Changes to configuration managed by work orders/change orders
 - “Build-out” of approved configuration
 - Visual cues regarding status of configurations versus time (color coded)
 - Notifications of Required Preventive Maintenance
 - Uses MIL-STD-1388-2B and Logistics Support Analysis Record (LSAR)

Asset Configuration Management (Cont'd)



- Meter Recording input for Asset Condition monitoring
- Define Hierarchy of Models, Variants and Revisions
- Create Work Packages based of related required works (Campaigns, Preventive Maintenance, Operational Checklists, etc)
- Trip logs
 - start/ending date,
 - orgin/destination,
 - trip problems,
 - maintenance recommendations,
 - crew certifications
- Tracking Engines while installed on customer equipment
- Accounts for “Organic” Maintenance

Misc

- Handheld Solutions for
 - Work Order Management
 - Shop Stores Inventory
 - Asset Inventory
- Automated Input from SCADA (Supervisory Control and Data Acquisition) and Monitoring equipment