Engineering Documentation

Fermilab Documentation Management within Teamcenter
Agenda

• Current status of document management
• Fermilab Engineering Manual
• Our Document Management Goals
• How do we achieve our goals?
• Teamcenter Engineering Document Types
• Let’s Get Organized
• Teamcenter for CAD and Doc management
• Demo
• Training requirements
• Schedule
Current Status of Our Documentation

• Where do we keep our documents?
  – Sharepoint
  – DocDB
  – Local Servers
  – Local PCs
  – Paperwork in cabinets
• Is it up-to-date?
• Is it revision controlled? Reviewed? Approved?
• Is it complete or fragmented?
• Is it consistent with standard formatting:
  – Between Users?
  – Between Projects?
  – Between Divisions?
Engineering Manual

Engineers and Designers must be aware of and comply with the Fermilab Engineering Manual.

– Chapter 1 – Requirements and Specifications
  • Functional and Technical requirements
  • Statement of Work
  • ES&H and QA requirements

– Chapter 2 – Engineering Risk Assessment

– Chapter 3 – Requirements and Specification Review
  • Various reviews of all requirements

*This list is not all-inclusive*

– Chapter 4 – System Design
  • Formal Documents
    – Technical Design Report
    – CAD models and drawings
  • Supporting Documents
    – Engineering and design notes
    – Design calculations
    – Assembly and operating procedures
    – Etc.
  • Document control
    – Revision controlled items
    – One standardized location for engineering data
  • Application of standards
    – Applicable standards based upon the FESHM requirements

– Chapter 5 - Engineering Design Review
  • Preliminary Design Review(s)
  • Systems Integration Review(s)
  • Final Design Review

This list is not all-inclusive

– Chapter 6 – Procurement and Implementation

• Procurement Plan
• Request for Information
• Procurement Specification
• Technical Questionnaire
• Procurement Readiness Review
• Request for Proposal
• Vendor Proposal Review
• Vendor Selection
• Vendor Fabrication Review
• Material Certifications

This list is not all-inclusive

– Chapter 7 – Testing and Validation
  • Design Approval
  • Documentation and Training Requirements
  • Safety and Health Plan
  • Fabrication Acceptance Test
  • Performance Acceptance Test

– Chapter 8 – Release to Operations
  • Installation Plan
  • Safety Review(s)
  • Commissioning Plan
  • Operational Readiness Clearance

– Chapter 9 – Final Documentation

This list is not all-inclusive
Our Documentation Goals

• One storage location
• Includes integration of all CAD data with all Engineering documentation
• Revision controlled
• Always up-to-date
• Provides easy access
• Provides a consistent process
• Well organized
• Adherence to the intent of the Fermilab Engineering Manual
• Accessible for global collaboration
How do we achieve our goals?

• We get organized
• We leverage tools that we already own
• We develop a vision for the future and apply it today
• We look beyond our fears of the unknown
• We open our minds to learning new processes
• We look for solutions, not excuses
• We train to succeed
• We strive for constant improvement
Engineering Documents in Teamcenter
Let’s Get Organized

- Begin with the Work Breakdown Structure
- Develop a Document Breakdown Structure
  - Organized from the Top System Level down
  - Broken down into deliverable document packages that can be reviewed and approved
  - Create one document package for every deliverable work package
- Develop a consistent document package checklist to control the required documentation
- Connect all of the document packages into an easy to follow hierarchy
- Connect the CAD data to each document package
The Document Breakdown Structure

NOT Complete; Just a starting point.

Click here for PDF
The Document Checklist (EPDM)

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<th>Requirement</th>
<th>Document Type</th>
<th>Justification for “Not Required?”</th>
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<th>TC Item #</th>
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There is one EPDM per deliverable work package

Provides:
- A checklist of all required documents
- A Listing of all supporting documents
- A hyperlink to each document in Teamcenter

Managed by the Work Package Engineer
Each Document Package is actually a link to the EPDM document checklist.

Quick access to all documents!
How it Looks in Teamcenter

Send the Hierarchy BOM to the 
Structure Manager
How it Looks in Teamcenter cont.

Notice how the Document structure looks exactly like a 3-D model Assembly structure.

It’s built the same way in Teamcenter! Easy to learn.

The data is Live and can be edited at any time.

It can even be released and revised for document control.
How it Looks in Teamcenter cont.

Select any item of interest and quickly send it to My Teamcenter to access the EPDM checklist document.

You only need to remember the Top Level document in your system to have direct access to all of the project documentation and CAD models!
Double-Click on the EPDM Excel dataset to launch the checklist into Excel.
How it Looks in Teamcenter cont.
How it Looks in Teamcenter cont.
How it Looks in Teamcenter cont.
How it Looks in Teamcenter cont.
How it Looks in Teamcenter cont.
Demonstration

• Let’s take a look at how Teamcenter manages documents
• Tracelink Usage
• 3-D CAD data viewing
Training Requirements

• Non-CAD User Track
  – 1 Day training on Teamcenter basics
  – ½ day training on Document Creation, Structure Manager, and Life Cycle Viewer
  – ½ Day training on Workflows

• Video training will be made available for reference use AFTER formal training
Schedule

• Set up training dates beginning in April
• Establish all Teamcenter User accounts
• Collect ALL documentation
  – Users collect and input documents into Teamcenter
  – System Engineers manage the EPDMs
  – Project Engineer:
    • Manages the Top Level EPDM structure
    • Mentors engineers on Teamcenter use
    • Ensures documents are being managed properly in TC
• Introduce scientists to Teamcenter
Summary

• A new era of document management is here
• We start training in April
• Begin collecting your documentation now
• Additional questions?

Thanks for your attention,

Don