

Systems Engineering and Document Management

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Near Site Integration Workshop

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U.S. DEPARTMENT OF
ENERGY

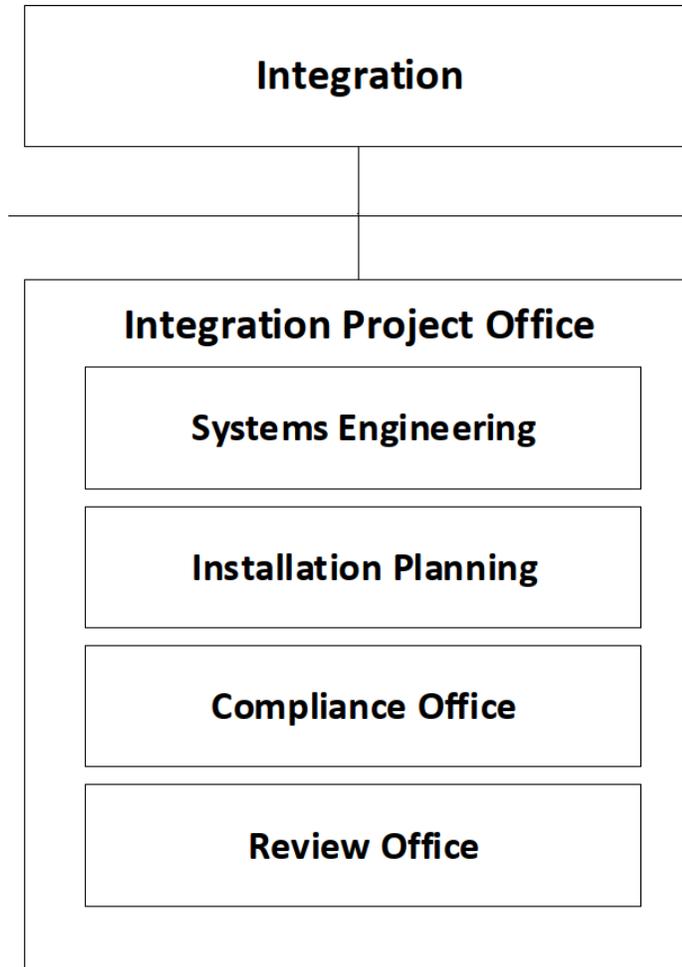
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Outline

- Responsibilities
- Requirements and Interfaces
- 3D Models
- EDMS

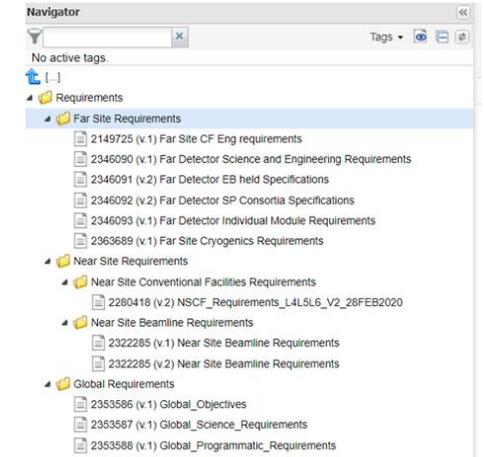
Overview and Project Role for Systems Engineering

- Systems Engineering (SE) resides in the Integration PO and serves with the Joint PO to provide LBNF/DUNE/Integration tools to manage, control and integrate the project:
 - Provides engineering support and coordination for the installation efforts
 - Works closely with the Compliance Office to ensure conformance to applicable codes and standards
 - Participates in Review Office design reviews and follow up
 - Work with ES&H and QA to resolve related issues
 - Supports the integration effort with the project engineers from Technical Coordination and the consortia
- [Systems Engineering Management Plan](#) outlines SE management roles and responsibilities



Requirements

- Requirements for the NSCF are currently under configuration control. Changes to controlled requirements must go through the Change request process and be approved by the Change Control Board
 - ND specific requirements begin with #2342 and the latest approved list contains 22 ND requirements
- There have been several approved requests for changes and additions
 - New loading for cavern crane
 - Transfer of scope for underground mezzanines
- Current requests being discussed
 - New power and grounding requirements
 - Networking and communications



Primary	Item	Requirement	
008	Floor Surface	NSCF shall provide regular anchor holes in floor trenches as indicated in interface drawing DU-1001-6831	New scope
032	Electrical Power Distribution	NSCF shall locate power distribution equipment according to interface drawing DU-1002-1073. Equipment and power lines shall not encroach into detector stay-clear zones defined in interface drawing DU-1001-6831.	Requires re-design
034	Electrical Grounding	NSCF shall provide electrical grounding according to DUNE ND electrical grounding plan.	New scope
037	Underground Cryogenic Space	NSCF shall reserve the underground north-west corner of the cavern for a cryogenic service mezzanine as indicated in interface drawings DU-1001-6831 and DU-1001-6348. No equipment shall encroach into the space reserved for the cryogenic mezzanine.	Requires re-design
038	Underground Cryogenic Space	NSCF shall prepare and install pads and anchors for cryogenic mezzanine installation as indicated in interface drawing DU-1001-6348. Total weights are summarized in engineering note DU-1001-7858	New scope
041	Surface cryogenic equipment space	NSCF shall provide a 57 ft x 33 ft concrete pad for cryogenic storage and distribution components as indicated in interface drawing DU-1001-7015. The pad shall provide concrete footings and foundations for storage tanks as indicated in DU-1001-7015. Tank sizes are indicated in interface drawing DU-1001-7015. Tank mounting details and masses are provided in the interfaces section of this document (DU-1001-7116).	New scope
055	Fire Suppression Underground (design costs combined with 037 & 038)	NSCF shall provide fire suppression connection points to connect the cryogenic equipment mezzanine sprinkler system.	New scope

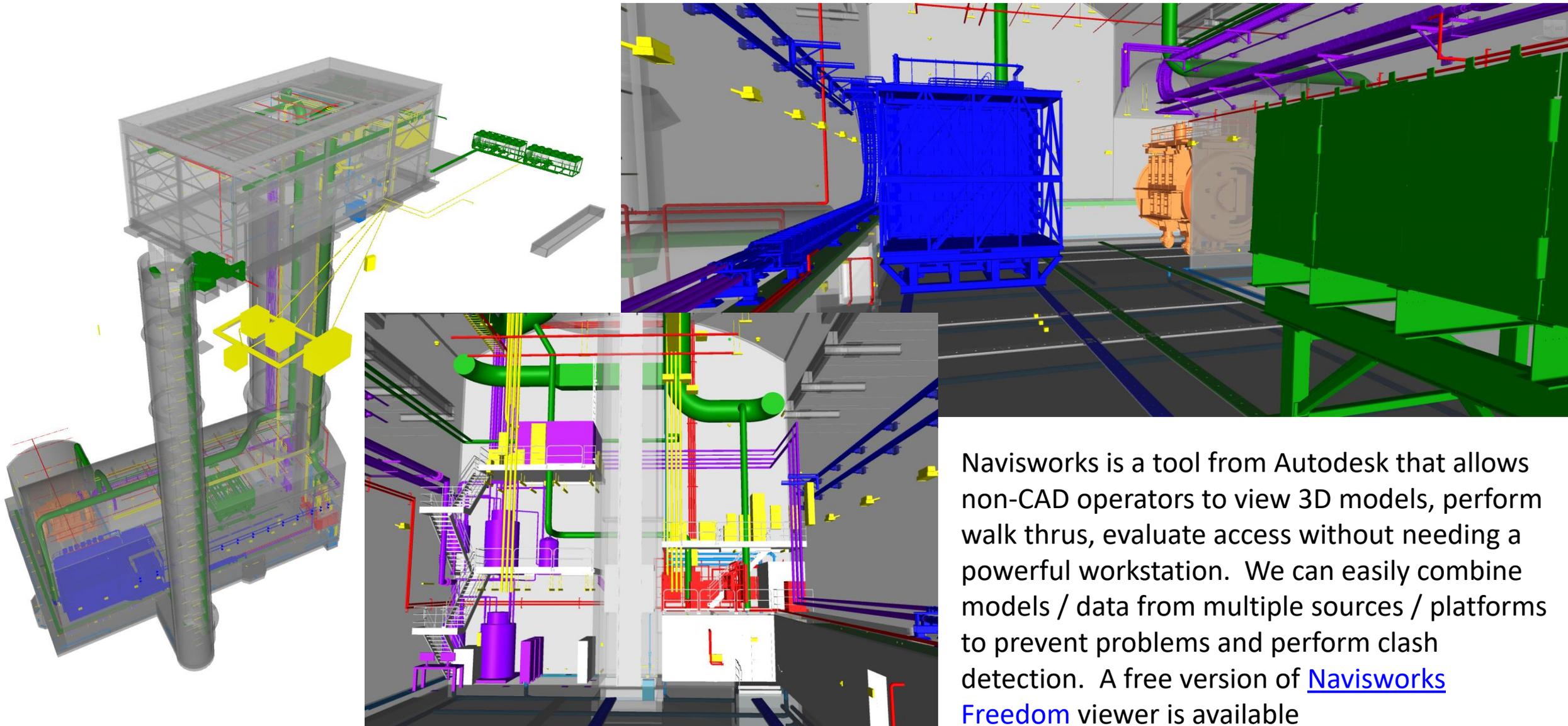
Interfaces

- Interface documents and drawings are being coordinated by F Matichard team
- <https://edms.cern.ch/project/CERN-0000213294>
- More from Matichard and Cline on this

3D models and integration

- The latest integrated ND and NSCF models are posted [here](#)
 - SE is posting Navisworks files of the integrated models
 - Step versions are available of the latest ND model [here](#)
- The latest NSCF 30% final design models are posted [here](#)
 - NSCF models are available in native Revit, Step, Navisworks and Catia formats
 - 60% models are due at the end of March and will be available in early April
- Electrical integration documents and drawings are posted [here](#)

Views from latest Navisworks model



Navisworks is a tool from Autodesk that allows non-CAD operators to view 3D models, perform walk thrus, evaluate access without needing a powerful workstation. We can easily combine models / data from multiple sources / platforms to prevent problems and perform clash detection. A free version of [Navisworks Freedom](#) viewer is available

EDMS primer

- The project is using Engineering Data Management System (EDMS) to store, manage, organize and distribute technical information – some tutorials can be found [here](#)
- EDMS is not a PLM or a replacement for. It is an easily accessible collaborative tool for data management and sharing
- Most of our documents are public and will not need an account to access (read). However, an account is needed for those that will post documents and do approvals of documents
- For people that do not have a CERN users account, you can obtain a LightWeight account [here](#)
- Your account will need to be associated with our project's Egroups. So please send me an email (jfowler@fnal.gov) after you have obtained your account and I will get you added to the appropriate Egroup

Questions?