Optimizing Data Access for NCNR Equipment

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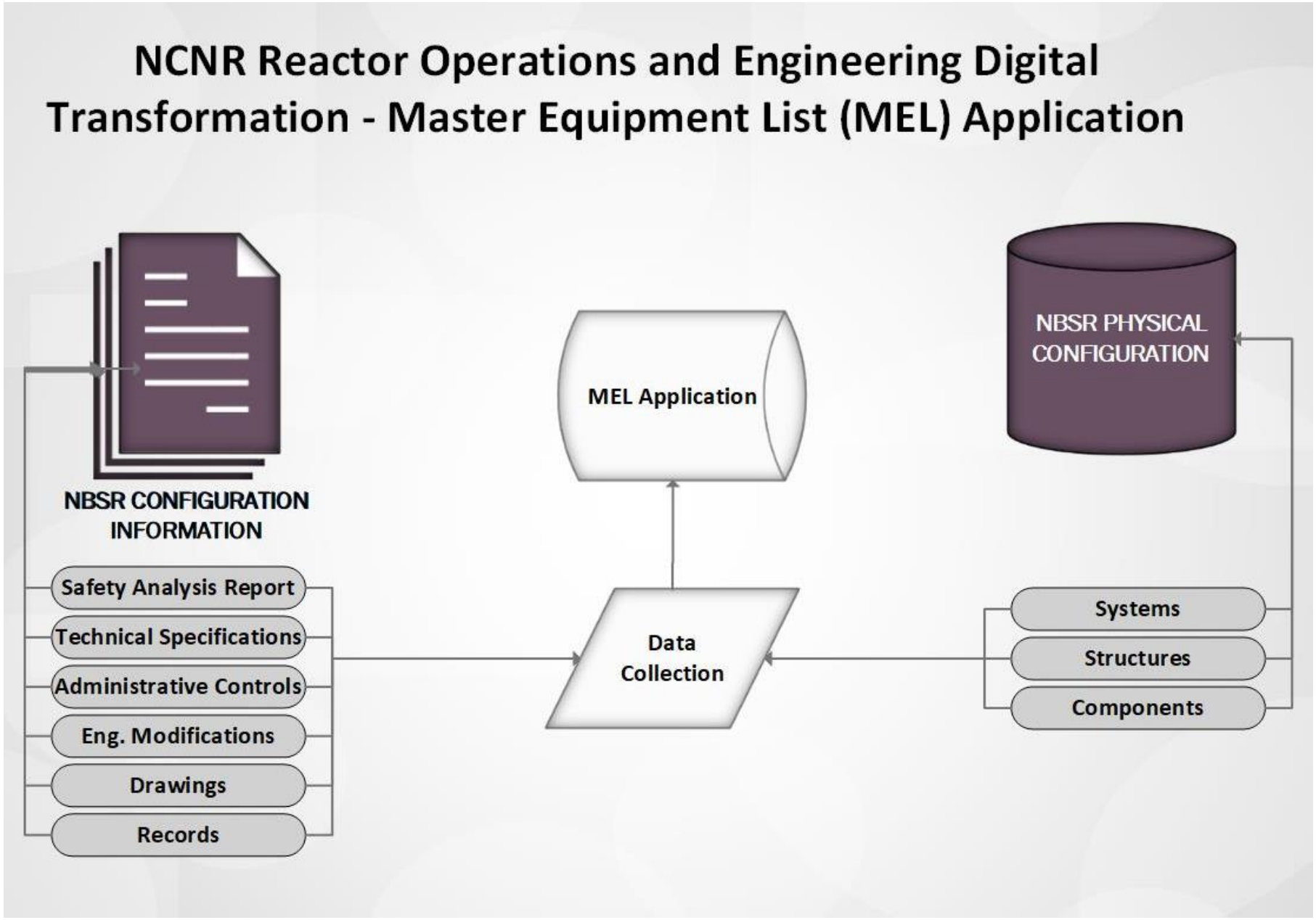
What is the Master Equipment List (MEL)?

- The MEL is a centralized platform where information about equipment—systems, structures, and components—can be accessed.
- The MEL contains accurate information about the status and past maintenance and modifications of equipment.
- The MEL allows quick access to supporting documentation.

NCNR Reactor Operations and Engineering Digital Transformation - Master Equipment List (MEL) Application



Why is the MEL Important?

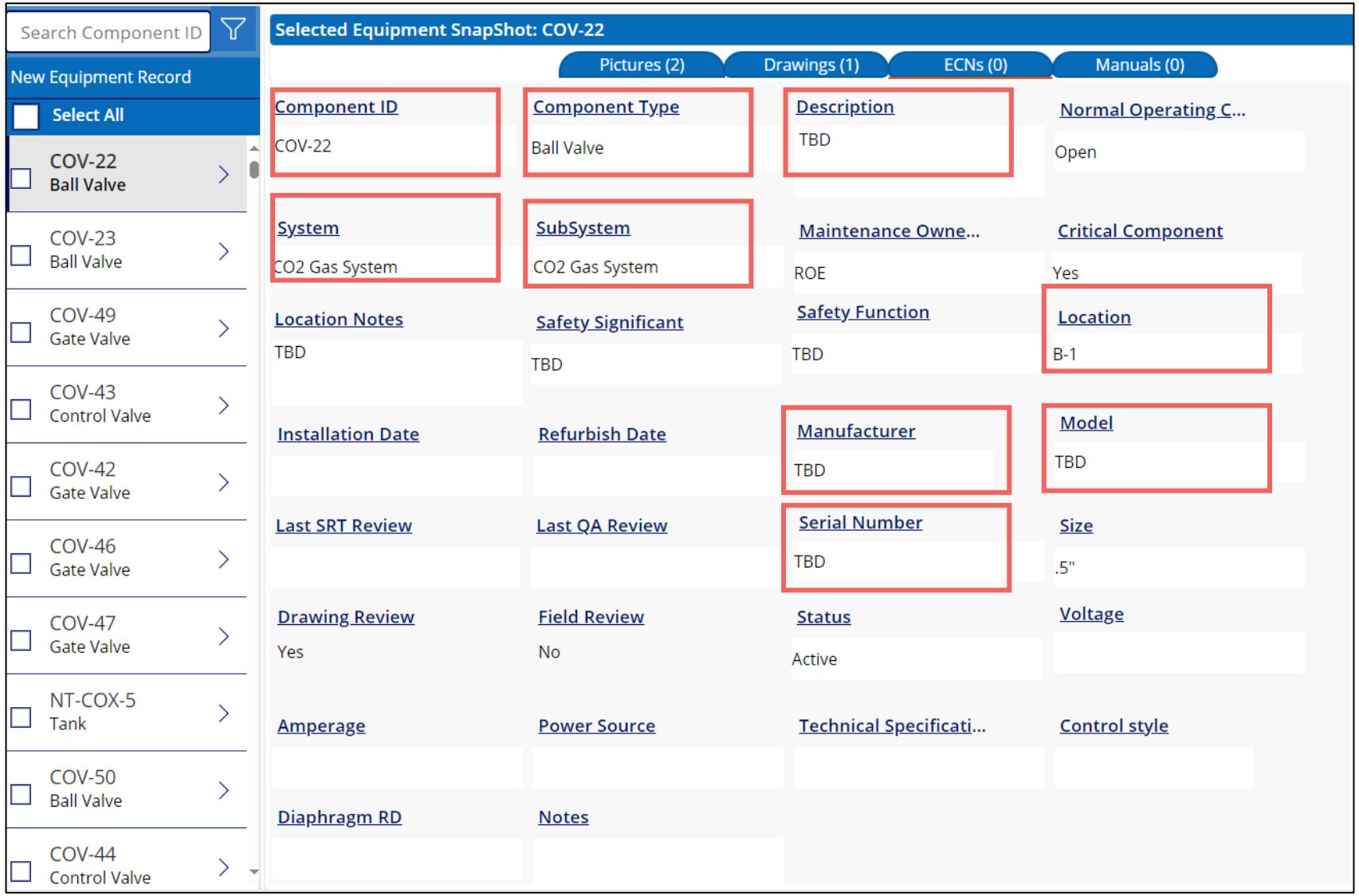
- Delays in accessing information negatively impacts workflows.
  - Data is spread across multiple platforms.
  - Critical information about equipment is not always formally recorded.
  - It is difficult to access records for past work performed on a piece of equipment.
- Completing development on the MEL will improve ease of use for the thousands of pieces of equipment within the NCNR.

Data Population Process

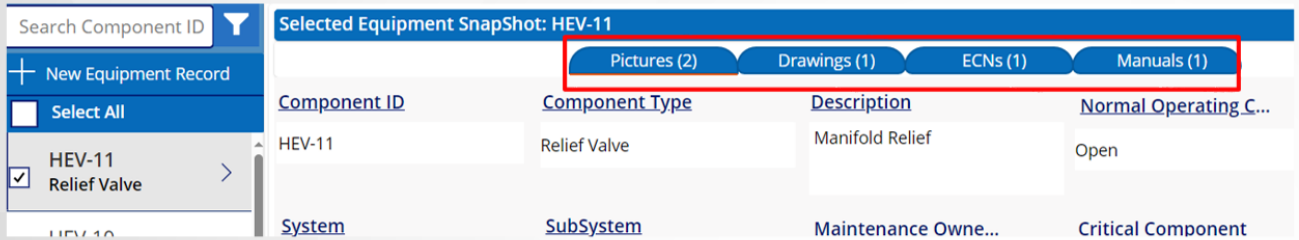
- Identified component IDs and formal names.
- Physically verified the location of equipment and took pictures.
- Cross-referenced drawings for system information and relationships with other pieces of equipment.
- Found information about the function and classification of the equipment as well as supporting documents.

- Populated these data fields:
  - Component ID
  - Pictures
  - System
  - Subsystem
  - Type
  - Description
  - Location
  - Manufacturer
  - Model
  - Serial Number
  - Drawings
  - Manuals

MEL User Interface

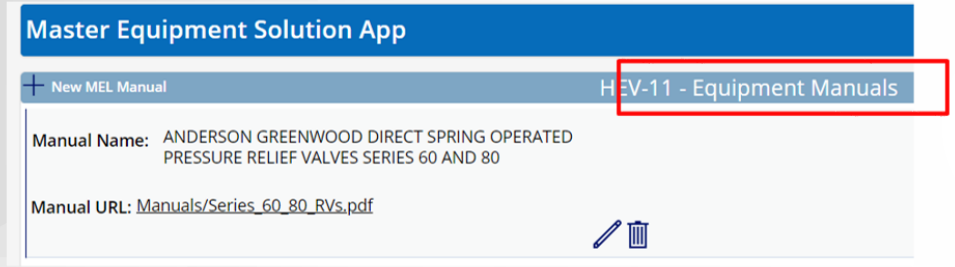


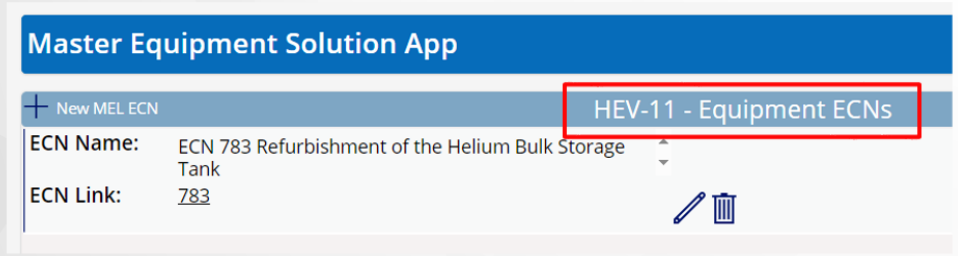
MEL User Interface–Documents

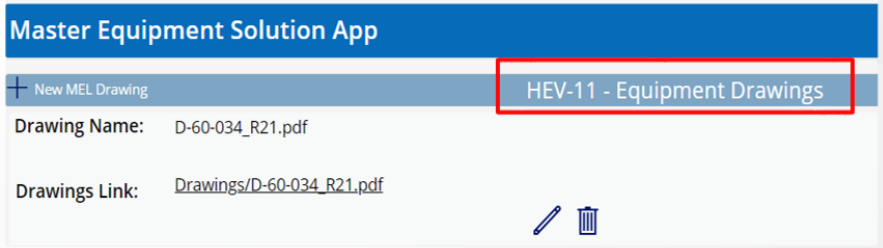


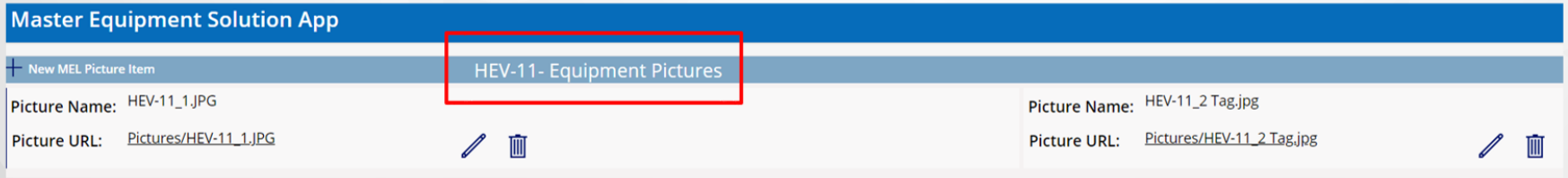
Links to the following libraries provide users a single interface to access the related equipment information.

- Manuals
- Engineering Changes
- Drawings
- Component Pictures

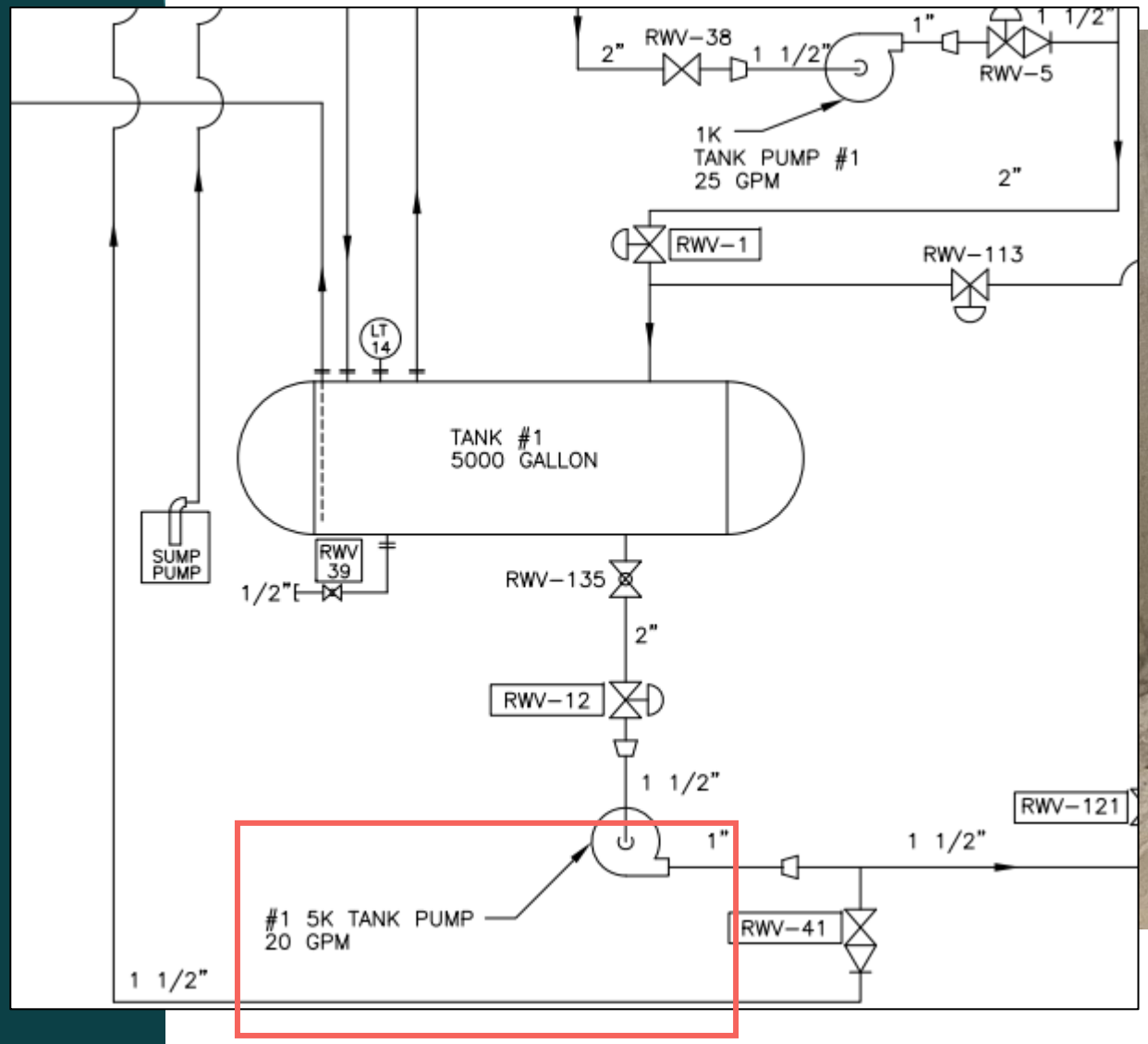








Ex. #1 5K Tank Pump



Collaboration with Aging Reactor Management (ARM) Personnel

- Shadowed ARM to gather details about the equipment they were working on to assist with MEL population.
- Accompanied ARM to access different areas of the NCNR where we could verify equipment data.
- ARM helped clarify ambiguous information and provided descriptions of equipment functions.

Salesforce Tickets and Engineering Change Notices (ECNs)

- Salesforce tickets and ECNs are records of historical and in-progress equipment maintenance and modifications–AKA trouble tickets.
- They need to be connected to the MEL, but:
  - Thousands of ECNs only have physical copies.
  - Many of the tickets do not properly identify the equipment that was worked on.
- To allow the records to be be uploaded to the MEL, we took inventory of physical ECNs and determined the IDs of the components referenced in the trouble tickets.

Salesforce Ticket

Case Information

Case Number
00028171

Status
Rejected

Priority
Medium

Case Origin
Manual

Case Record Type
NCNR ROE

Responding Office
NCNR

Case Type
Reactor Operations and Engineering (ROE)

ECN Number

Description Information

Subject
200 - RM 4-5 used

Description
70-RM(4-5)-ID is the drawing for the Sub pile room radiation alarm. The calibration procedure RM 4-5 is one of the FSA gamma alarm. Typically, our procedures and drawings of the instruments follow a standard form, where the channel designation is used in both the drawing and procedures. For an unmentioned reason, access to the RM 4-5 documentation is restricted. Existence of the duplicate drawing names cannot be confirmed. I would suggest changing the name of one of these systems to differentiate the two systems.

Reactor Operations and Engineering (ROE)

Migrated ROE System
Radiation Monitoring (confinement area radiation monitors, filter monitoring, fume hood

SRT/ROE Category
Procedure or Program Deficiency

SRT/ROE System Equipment/Component

Out of Commission
NA

SRT/ROE System

Single Point Failure

ECN

ENGINEERING CHANGE NOTICE (ECN)		ECR No.:	1357
ECR Title:	Adding Telemetry to the CO2 Bulk Tank		
System:	CO2	Date:	5/31/2024

Design Description

Building 235 has a 52,000-pound capac CO2 storage tank CO2 is used as a purge gas to minimize the amount of air meeting the neutron flux [illegible] The minimization of this contact is necessary due to the small amount of argon in air. Although argon is slightly less than one percent of air, when contacted with neutrons Ar40 readily becomes Ar41. Ar41is radioactive with a half-life of 1.83 hours and emits both a strong beta and gamma particles. The prevention of this contact is made by establishing a purge of the voids with neutron flux with CO2. The CO2 gas is supplied from a bulk storage tank located in the South Yard. CO2 leaves the storage tank at ~250 psig and is routed to the A-wing basement.

The CO2 Supplier is contractually obligated to install telemetry on the CO2 Bulk Tank. The telemetry units will be owned and operated by the CO2 Supplier. NIST shall rent from the Contractor the telemetry units throughout the period of performance of the CO2 contract. The Contractor shall be responsible to monitor all telemetry units to ensure that fills are completed in a manner that will successfully maintain each site. The Contractor must ensure that telemetry unit readings are available via a Contractor provided, password protected website. Telemetry unit readings must be available for reference by NIST. The Contractor shall provide passwords to all NIST Technical Points of Contact and CORS. The Contractor will install plumb the units in parallel with the existing level instrumentation. The telemetry units will not take pictures of the tank levels. The telemetry units will transmit via radio frequency the level of the tanks once a day to the Contractor's database. The telemetry units will be solar powered with an internal backup battery. The telemetry units will not use the NIST network. The units will not send out a 4-20 mA signal. The telemetry units will not use GPS.

Safety Considerations, Identification, and/or Analysis

N/A

Required Tests, Retests, Surveillances, or Measurements

Impact

- Expanded the MEL by improving data population.
- Supported the unification of Salesforce/ECNs with the MEL, which will allow maintenance and modification information for equipment to be retrieved.
- Improved information access, which will support the development of reliability engineering analysis.

Challenges

- The project has a very large scope—accounting for around 7000 pieces of equipment and even more associated documentation.
- Not all information could be found for some equipment and records.
- Pieces of equipment are often referred to by informal names by NCNR staff, which makes it difficult to determine if they have been uploaded to the MEL and under which names/IDs.
- Populating all the fields for a component can be time-consuming, so progress on fully completing the MEL is slow.

Future Goals for the MEL

- Complete data population and walkdowns for all equipment.
- Connect the trouble tickets to the MEL.
- Create a system for classifying the safety significance of equipment and determine each component's safety class.
- Complete reliability engineering analysis.