



Washington Division



Safety In Design Workshop

Major Modification Determinations

John Schwenker

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Vault 2 Organic Modification

- Saltstone Facility requires additional vaults
- Vault 2 is the first of a new design consisting of two round cells
- Vault 2 Final Design was submitted to DOE at the end of FY'06
- Vault 2 Final Design was not originally intended to address the Organic (Isopar) Carryover from MCU or SWPF
- This new Project expands the original Final Design to provide the necessary temperature interlocks to address the organic carryover
- The temperature controls are consistent with the ongoing modifications being made to Vault 4.
- The Vault 4 PDSA addressing receipt of Isopar carryover has been approved by DOE.

Vault 2 Organic Modification

Major Modification Determination

1. Add a new building or facility with Material At Risk (MAR) or Maximum Anticipated Quantity (MAQ) > HC 3 inventory limits or increase the HC of an existing facility?
 2. Change the footprint of an existing HC 1, 2, or 3 facility with the potential to adversely affect any credited safety function?
 3. Change an existing Process or add a new process resulting in a Safety Basis change requiring DOE approval?
 4. Utilize new technology or GFE not currently in use or previously formally reviewed / approved by DOE for the affected facility?
1. No, Vault #2 final design has been approved. This project just adds equipment to the existing design.
 2. No, Vault #2 final design has been approved. This project just adds equipment to the existing design.
 3. The current design of the vault does not include processing of isopar containing waste. However, the safety basis (PDSA) for Saltstone (Vault #4) does address processing isopar.
 4. The new vault will not utilize any new technology.

Vault 2 Organic Modification

Major Modification Determination

- 5. Create the need for new or revised Safety Basis Controls (hardware or administrative)?
- 6. Involve a hazard not previously evaluated in the DSA?
- 5. This project implements controls already agreed upon in the DOE approved Vault #4 PDSA.
- 6. No, the PDSA for Vault #4 MCU Operations addresses the hazards this project addresses.

Vault 2 Organic Modification

Major Modification Conclusion

- Vault #2 Organic project changes to allow the stream to Vault 2 to contain Isopar. Isopar introduces a flammability concern that has not been addressed in the Vault 2 design or safety basis. However, this concern and the required controls have been addressed and DOE approved in the Vault #4 MCU Operations PDSA. Therefore, this is NOT considered a major modification requiring a PDSA.

Chemical Cleaning

- Chemical Cleaning is a Closure Project
- Following Bulk Waste Removal, it is necessary to further reduce the amount of radioactive material left in the waste tanks.
- Chemical Cleaning project adds the necessary equipment to add Oxalic acid and remove the dissolved material
- The equipment includes a chemical unloading station, dewatering pump, transfer pump,
- Tank Farm DSA currently addresses similar equipment
- The project introduces a process change (the addition of Oxalic Acid)
- Chemical Cleaning is expected to take 3 months and is one of the final closure activity in a tank prior final closure of the tank

Chemical Cleaning

Major Modification Determination

1. Add a new building or facility with Material At Risk (MAR) or Maximum Anticipated Quantity (MAQ) > HC 3 inventory limits or increase the HC of an existing facility?
 2. Change the footprint of an existing HC 1, 2, or 3 facility with the potential to adversely affect any credited safety function?
 3. Change an existing Process or add a new process resulting in a Safety Basis change requiring DOE approval?
 4. Utilize new technology or GFE not currently in use or previously formally reviewed / approved by DOE for the affected facility?
1. No, Chemical Cleaning Project adds equipment to existing waste tanks.
 2. No, the Chemical Cleaning Projects only add equipment to existing waste tanks which already makeup the footprint of the Tank Farm
 3. Yes, Chemical Cleaning adds oxalic acid to certain waste tanks. This introduces a corrosion induced hydrogen generation source and additional heat of reaction to certain waste tanks.
 4. Yes, Chemical Cleaning technology is not addressed in an approved DSA.

Major Modification Determination

5. Create the need for new or revised Safety Basis Controls (hardware or administrative)?
6. Involve a hazard not previously evaluated in the DSA?
5. The expected controls are similar to the existing controls. The controls may need revision due to the higher hydrogen generation rate and heat addition.
6. The Chemical Cleaning project adds the corrosion induced hydrogen which is not addressed in the current DSA.

Major Modification Conclusion

- Chemical Cleaning Project introduces oxalic acid into the carbon steel waste tanks which may lead to increased hydrogen generation and corrosion. The expected controls are required by the current DSA. Any additional controls required are expected to be simple to implement. The existing DSA addresses the equipment that is required to perform Chemical Cleaning. Therefore, Chemical Cleaning Project is not a major modification and does not warrant a PDSA.

Tanks 18/19 Mechanical Cleaning Project

- Tanks 18/19 Mechanical Cleaning Project is a Closure Project
- Tank 18/19 are Type IV Tank ready for Closure
- Bulk Waste Removal had been completed and it has been decided that more material must be removed from these tanks
- Equipment will consist of high pressure eductor transfer system (salt mantix) that is remotely moved around the tank bottom, above ground transfer line, high pressure water lance and mechanical size reducer in the receipt tank
- Mechanical Cleaning is expected to take 6 weeks/tank

Tanks 18/19 Mechanical Cleaning Project

Major Modification Determination

1. Add a new building or facility with Material At Risk (MAR) or Maximum Anticipated Quantity (MAQ) > HC 3 inventory limits or increase the HC of an existing facility?
 2. Change the footprint of an existing HC 1, 2, or 3 facility with the potential to adversely affect any credited safety function?
 3. Change an existing Process or add a new process resulting in a Safety Basis change requiring DOE approval?
 4. Utilize new technology or GFE not currently in use or previously formally reviewed / approved by DOE for the affected facility?
1. This project does not add any new structures. Tank 18 & 19 are Hazard Category 2 facilities.
 2. This project does the work on Tanks 18 & 19. Tank 18 & 19 are within the current Tank Farm Facility.
 3. The process to remove the material from Tanks 18 & 19 will utilize new technology and will require a Safety Basis change. This new technology will eliminate certain current postulated events for the associated transfer path and is not expected to introduce any new types of accidents. The applicable locations involved in the project (e.g., Tank 18, 19 and 7) already include safety related confinement ventilation systems that have been evaluated against DNFSB 2004-2.
 4. The technology to be deployed in Tanks 18 & 19 is new technology, however, this new technology will eliminate certain currently postulated events and is not expected to introduce any new types of accidents. The applicable locations involved in the project already include safety related confinement ventilation systems that have been evaluated against DNFSB 2004-2.

Tanks 18/19 Mechanical Cleaning Project

Major Modification Determination

5. Create the need for new or revised Safety Basis Controls (hardware or administrative)?
6. Involve a hazard not previously evaluated in the DSA?
5. This new technology will eliminate certain current postulated events for the associated transfer path and is not expected to introduce any new types of controls. The applicable locations involved in the project (e.g., Tank 18, 19 and 7) already include safety related confinement ventilation systems that have been evaluated against DNFSB 2004-2.
6. The hazards expected from this process are bounded by those currently analyzed in the Tank Farm Safety Basis

Tanks 18/19 Mechanical Cleaning Project

Major Modification Determination

- Waste Tanks 18 & 19 mechanical cleaning safety basis change will use a new technology. This technology eliminates a large portion of the safety basis issues associated with transferring of waste and does not introduce any new hazards. The other hazards within the Tank are expected to be bounded by the current DSA. The applicable locations already include safety related confinement ventilation systems that have been evaluated against DNFSB 2004-2. Therefore, this project is **not considered a major modification.**