

LAWPS  
PROJECT



Presented by

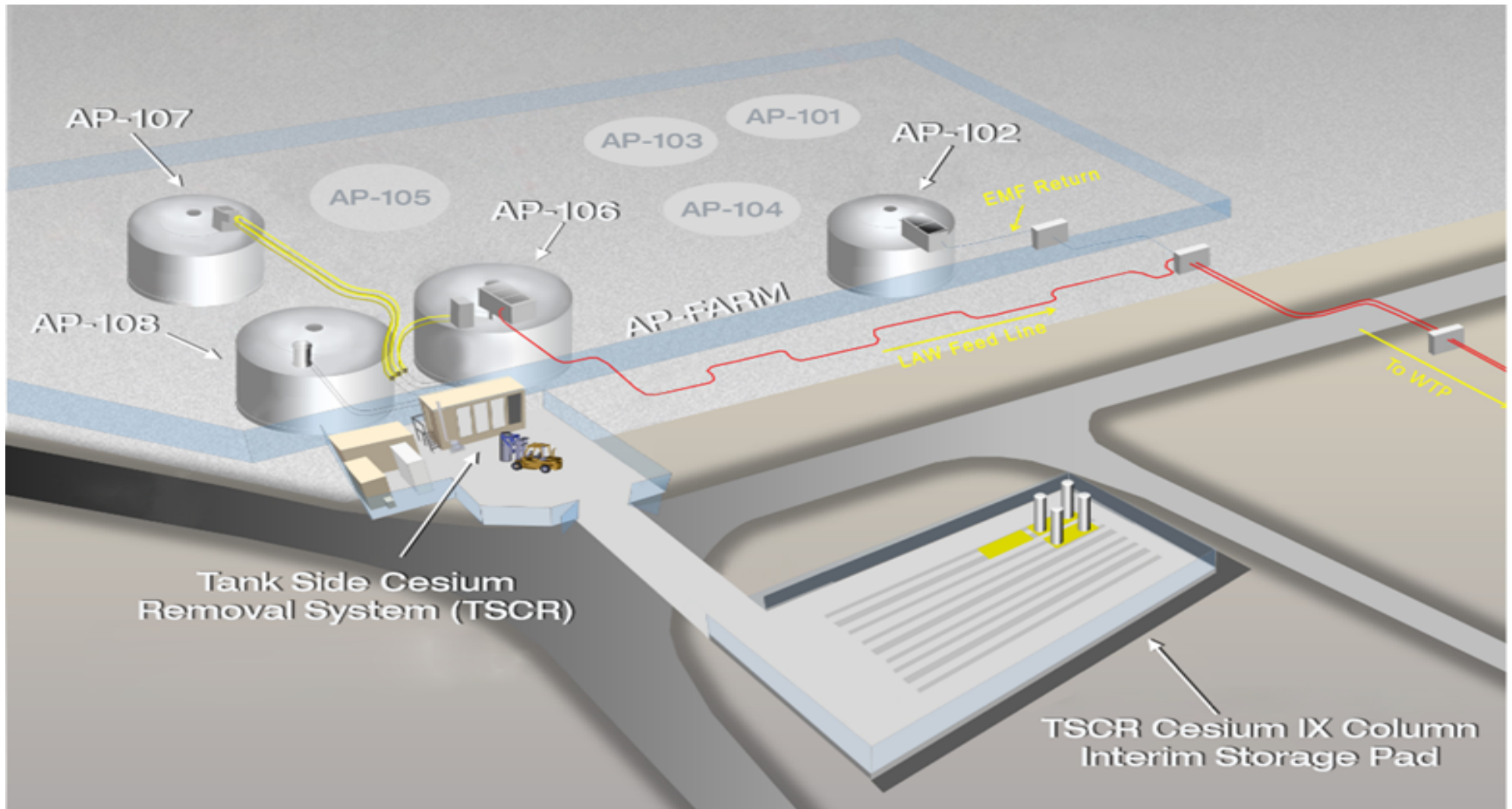
Roger  
Lanning  
Feb 25<sup>th</sup>, 2021

**Tank Side Cesium Removal  
(TSCR) Facility Overview**

# TSCR Facility Overview

- Hanford Waste Treatment and Immobilization Plant (WTP or Vit Plant), will use vitrification to immobilize most of Hanford's waste.
- Vitrified waste (solid glass) is stable and impervious to the environment.
- WTP Low-Activity Waste (LAW) Facility will vitrify low-activity liquids.
- Currently Hanford radioactive liquid waste contains solids and Cs-137 that must be removed prior to transfer to LAW Facility.
- TSCR operational objectives:
  - Treat low-activity waste from Tank Farms
  - Remove solids and Cs-137
  - Immobilize Cs-137 on non-elutable ion-exchange columns
    - Crystalline silicotitanate (CST) used for IXC media

# TSCR Facility Overlay in Hanford Tank Farms

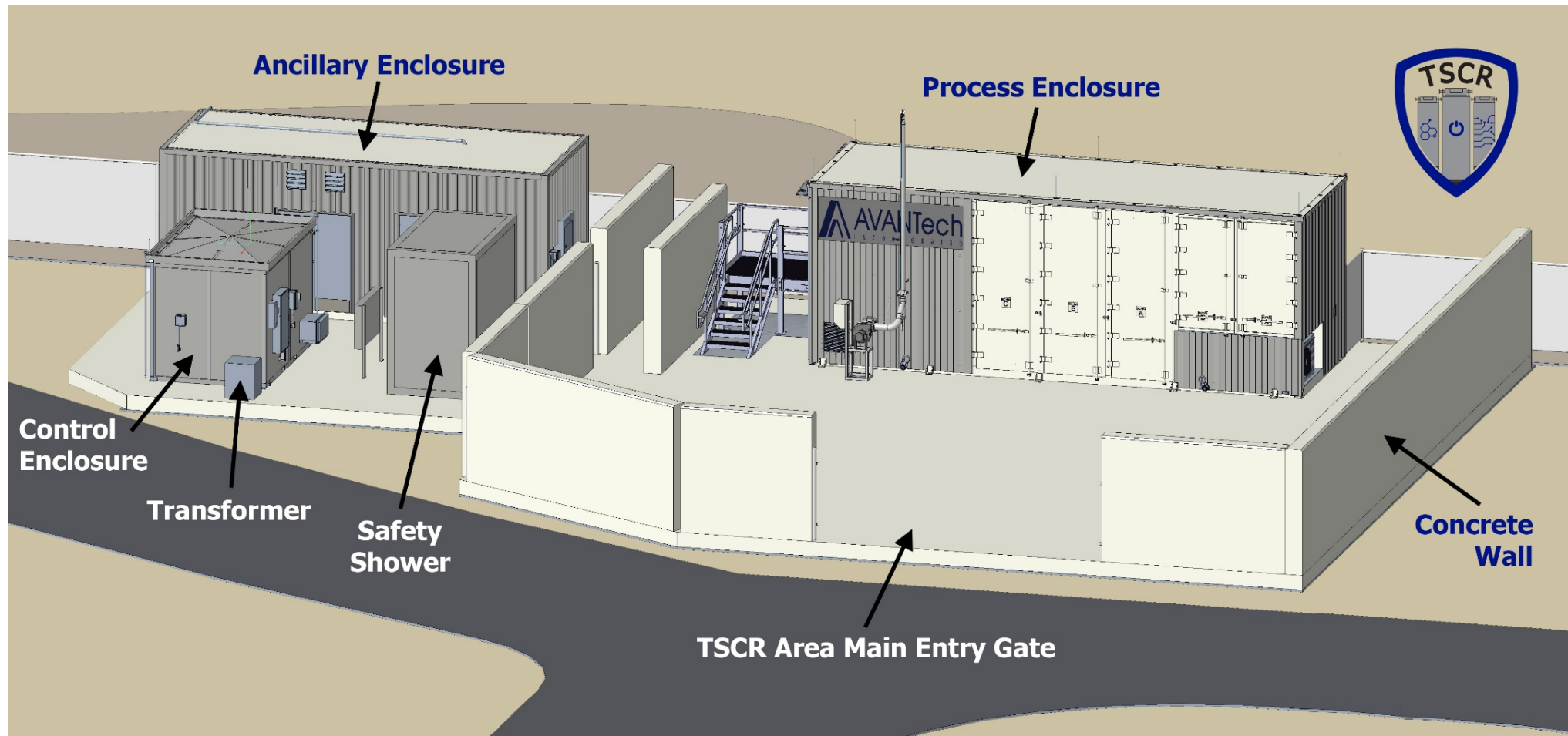


# TSCR Facility Nuclear Safety Overview

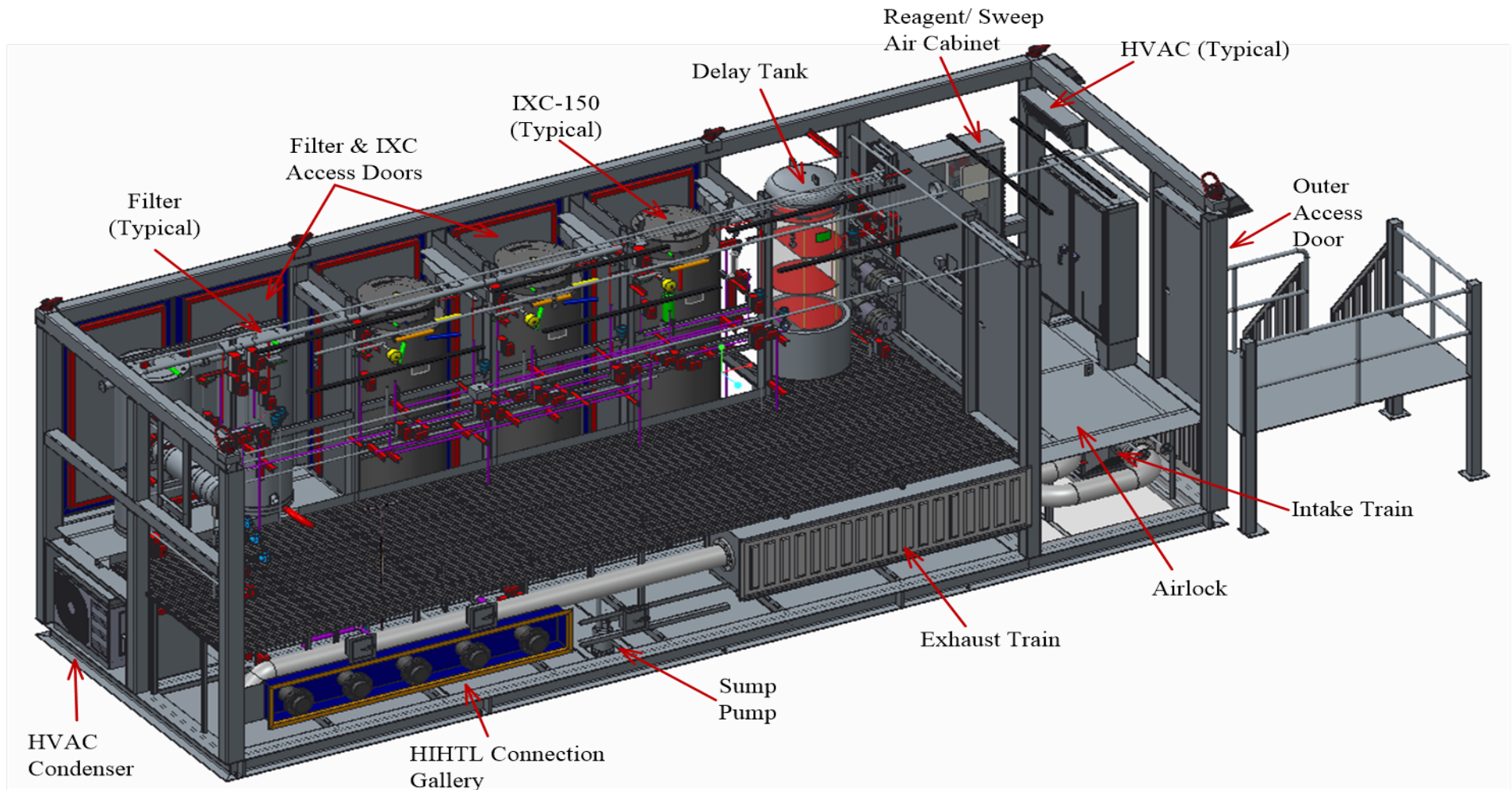
- TSCR early safety basis development requirements
  - DOE-STD-1189-2008 (PDSA, SDS)
  - DOE-STD-3009-94 (per Chief of Nuclear Safety approval)
  - Commitments in approved Safety Design Strategy
- Focus on Safety-in-Design (1189 process):
  - Reduce operating pressures
  - Limit ion-exchange column (IXC) drop height
  - Passive venting of flammable gas
- Philosophy of safety and process controls:
  - Isolate worker from hazards
  - Manual actions over automatic when not time sensitive
  - Use recent precedents where possible (TCCR, Tank Farms)



# TSCR Facility Layout



# TSCR Process Enclosure





# TSCR Process Enclosure





# TSCR IXC Connections



# TSCR Ion-Exchange Columns

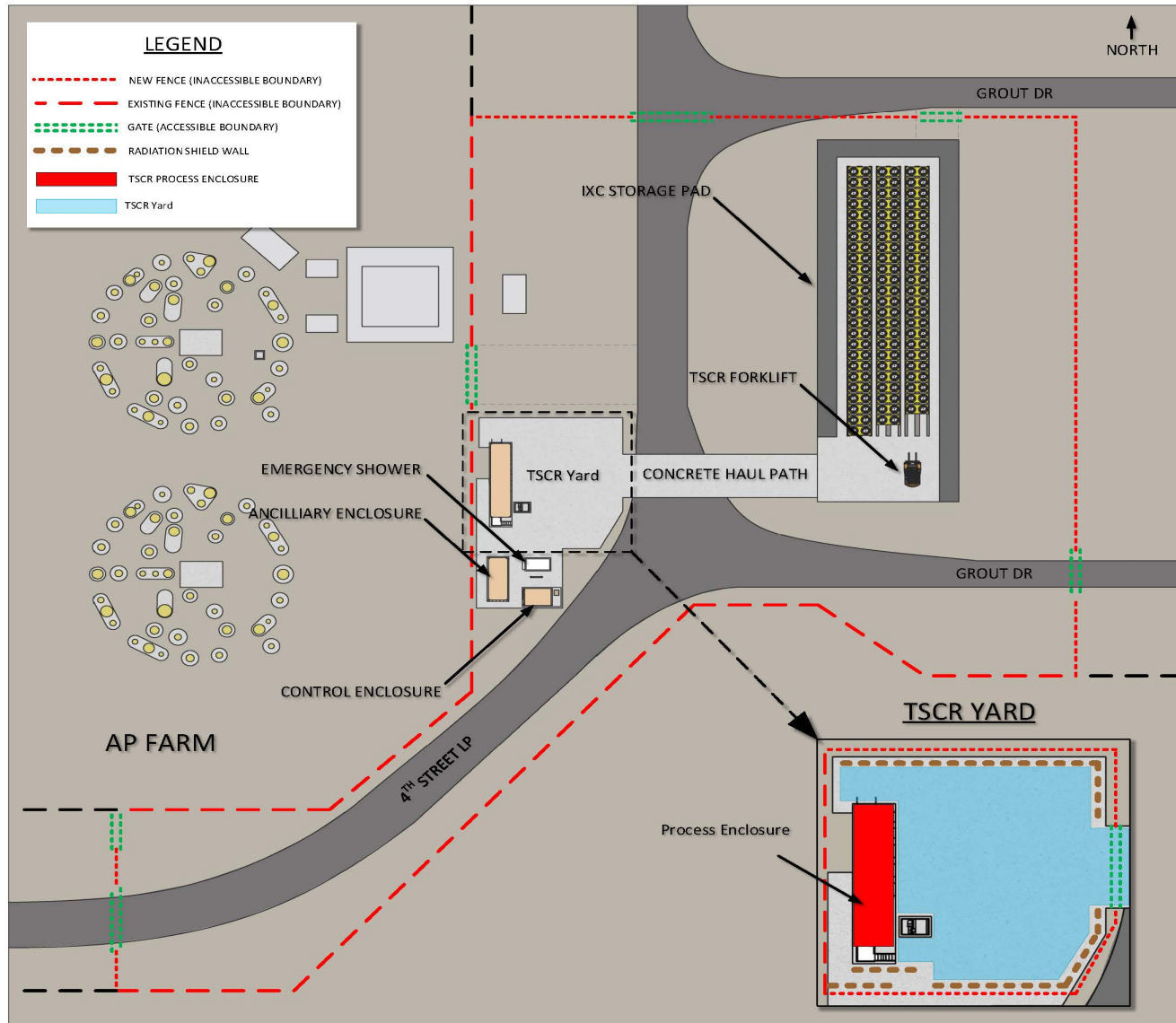




# TSCR IXC Forklift



# TSCR Facility Yard and Perimeter





# TSCR IXC Storage Pad and Seismic Restraints



# TSCR Overview – Hazards and Controls

- Radiological or chemical events that drive safety controls:
  - Direct radiation
  - Liquid spills and sprays
  - Flammable gas explosions
  - IX column drop/impacts
  - Air blow of transfer lines
  - Fires
  - Seismic
- Most events are low to Public and onsite receptors, High radiological or chemical hazard to facility worker.
- TSCR contains 8 safety-significant SSCs, and 8 Specific Administrative Controls.

# TSCR DSA Approval and Path Forward

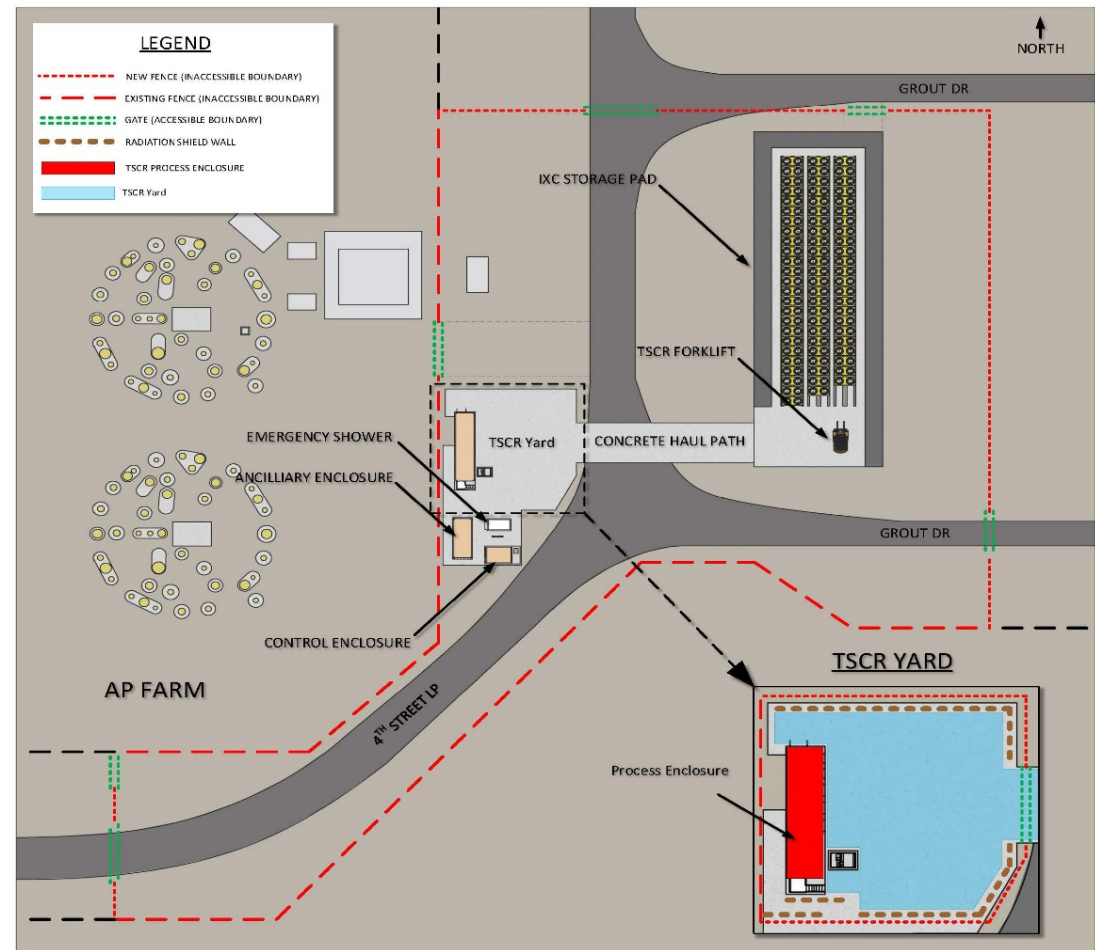
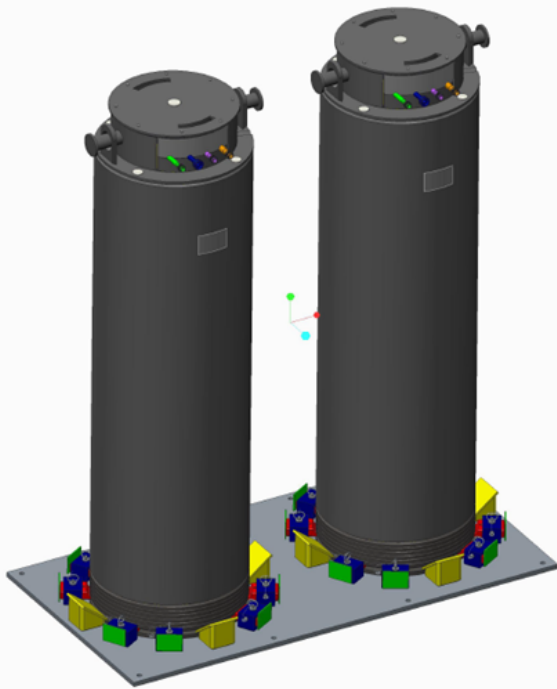
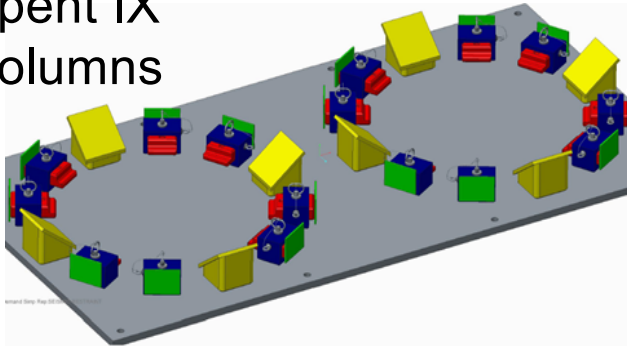
- TSCR Facility added as an addendum to the existing Tank Farms DSA and updates to the TSR document.
- TSCR DSA addendum and TSRs approved by DOE on February 10<sup>th</sup>, 2021.
- Covers TSCR and Tank Farm upgrades that support TSCR operation and transfer of treated waste to WTP.
- DOE Safety Evaluation Report did not identify any Conditions of Acceptance.
- Implementation activities: finish construction, update supporting documentation, procedures, training.
- Complete turnover to operations December 2021.

# Questions?

# Backup Slides

# TSCR IXC and IXC Storage Pad

Seismic restraints for spent IX columns

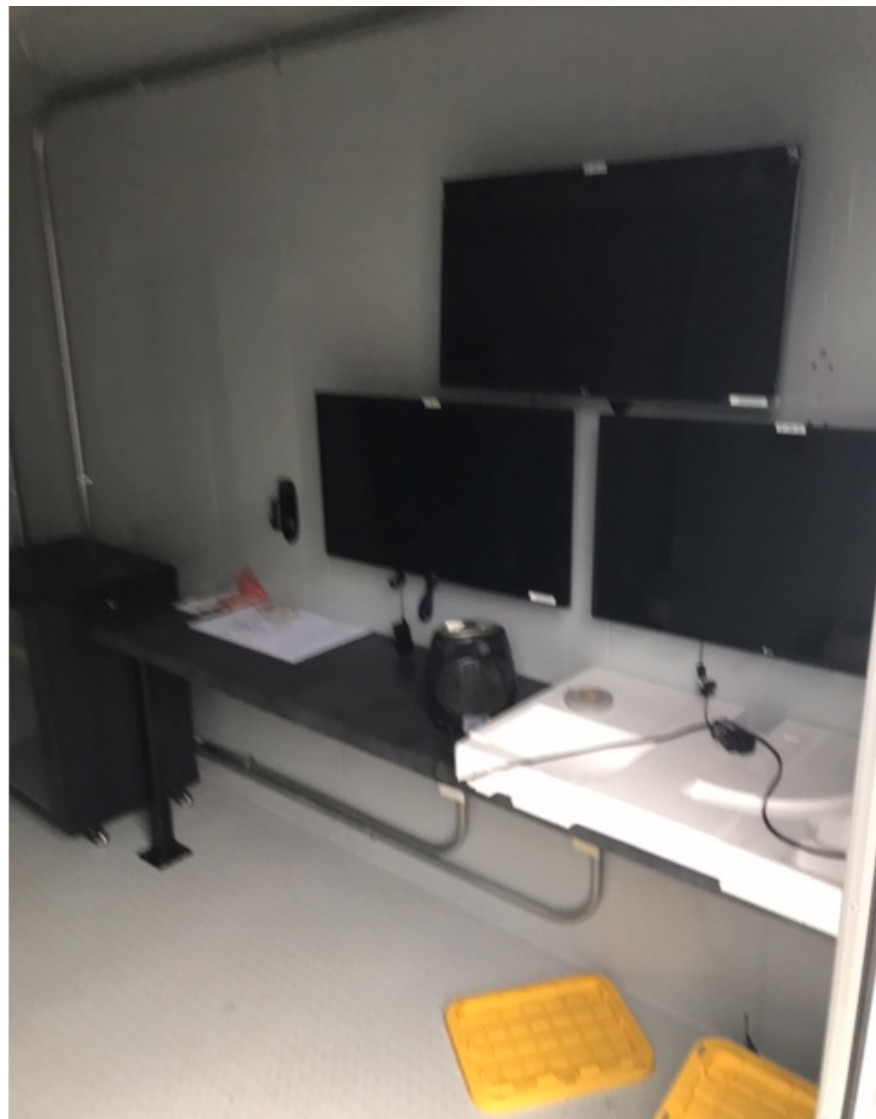






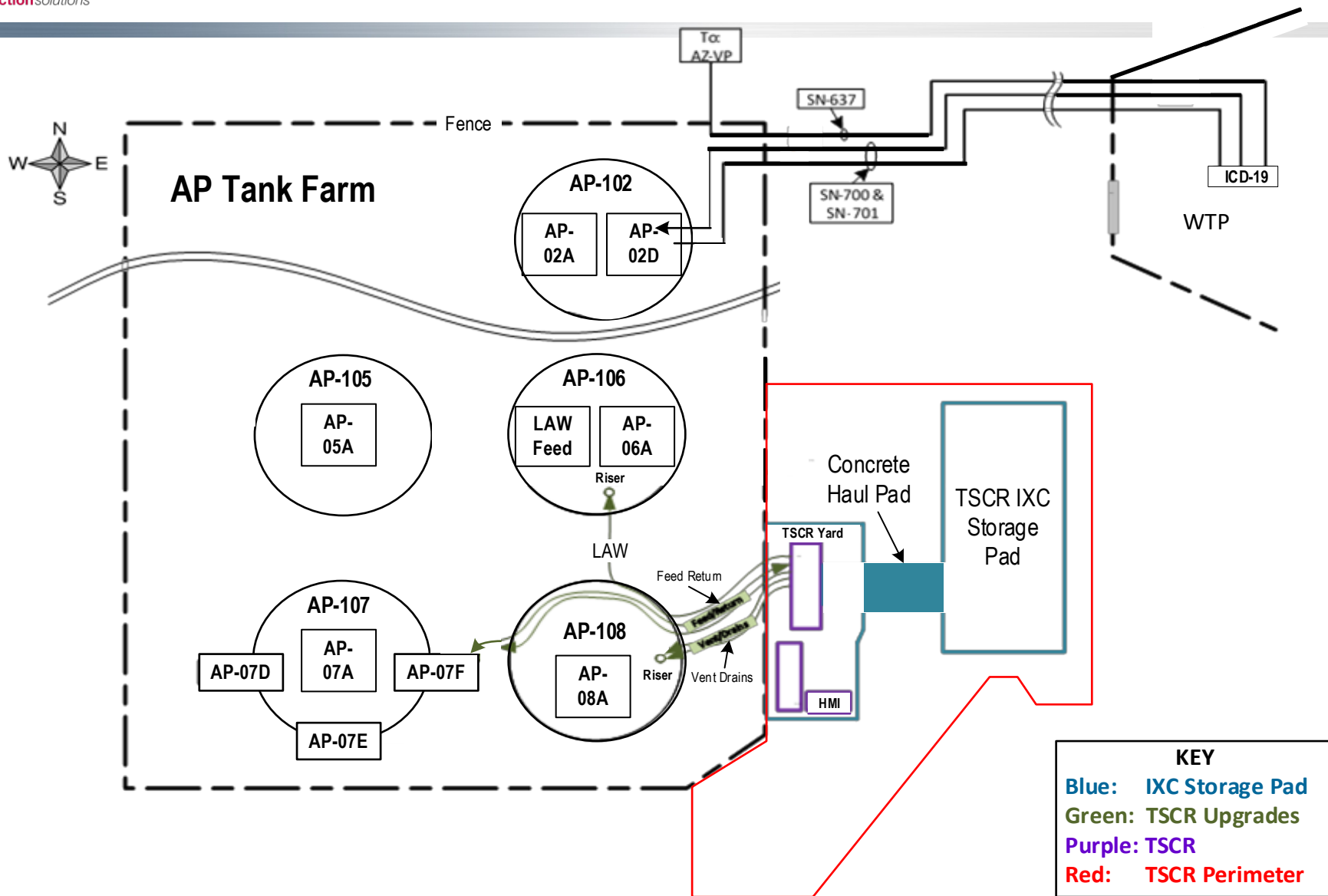
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# TSCR Control Enclosure





# TSCR Facility Site Layout





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# TSCR Ancillary Enclosure

