Operations Research Modeling In Support Of The Hanford Direct Feed Low Activity Waste Program

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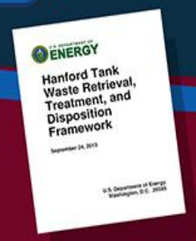


Phase 1 Objectives

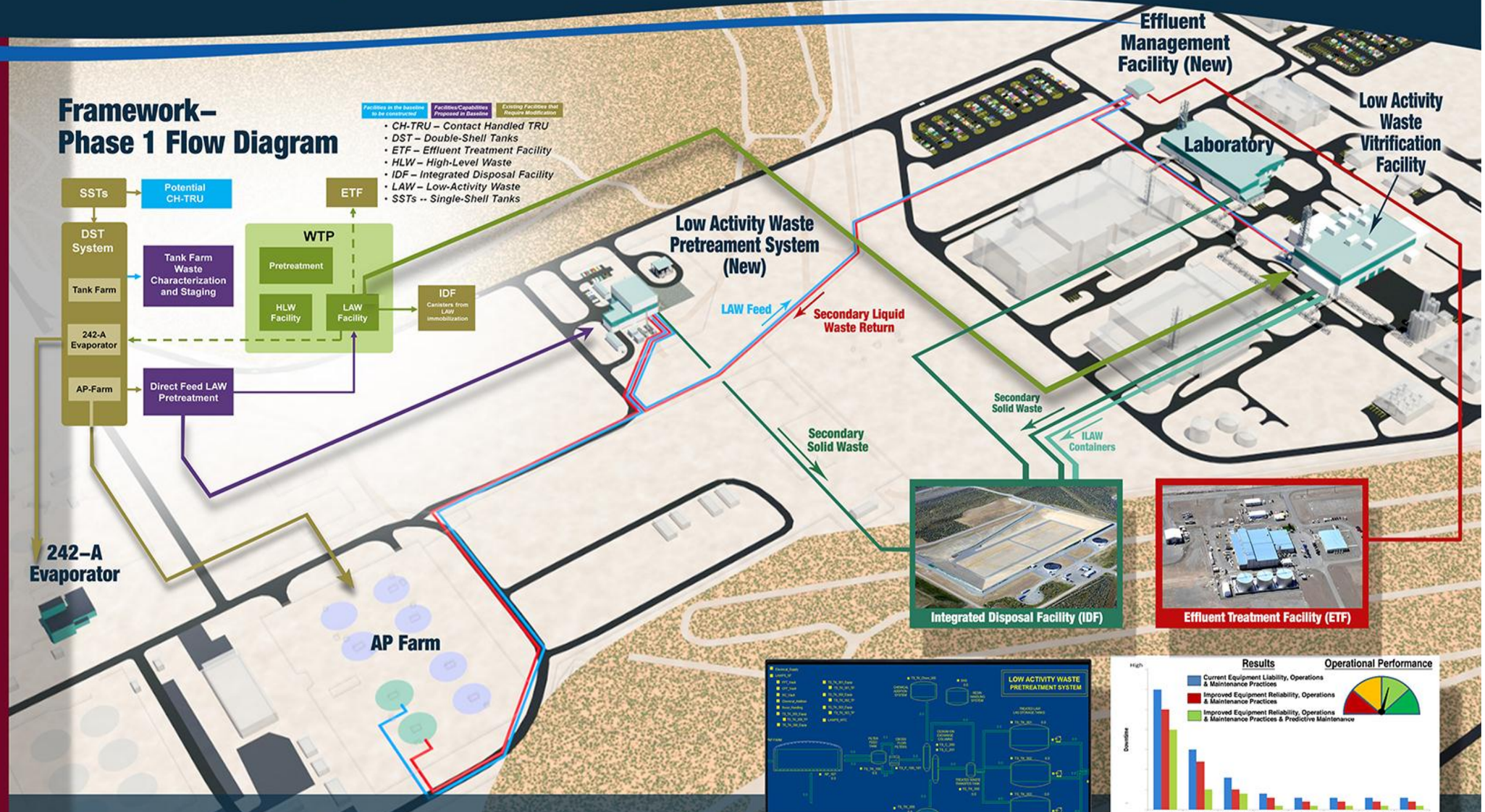
- **Current activities**
  - Completion, commissioning and startup of BOF and LAB
  - Completion of ongoing C Farm retrievals
- **DFLAW activities**
  - Completion of tank farms infrastructure and interim pretreatment capability (for removal of Cs and misc. solids) needed to directly feed LAW
  - Completion, commissioning and startup of LAW
  - Final permitting of the onsite Integrated Disposal Facility for low activity waste
- **CH-TRU activities**
  - Retrieval and shipment of CH-TRU waste from SSTs to WIPP, pending legal classification of wastes as TRU and obtaining necessary permits
  - DFHLW Activities
  - Initiation of tank waste characterization and staging capability in the tank farms to support HLW
- **Technical issue resolution**
  - Completion of full-scale vessel testing and resolution of technical issues in the PT and HLW facilities

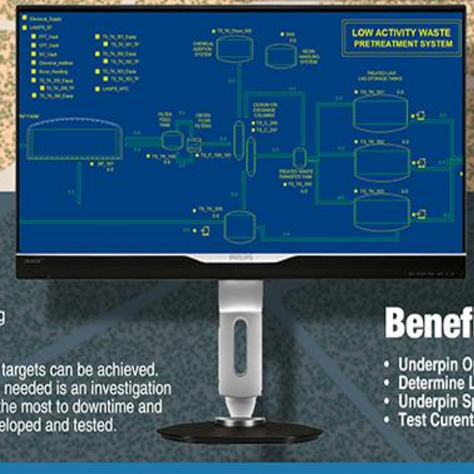
Operations Research Modeling

is being used as a supplemental planning tool to quantify impact of equipment failures and other constraints on operational performance and identify any potential bottlenecks and improvement areas. OR modeling provides critical insight into operational performance of current and planned facilities to identify operational risks.

OR Model is being developed in support of **DFLAW program** and will be a valuable tool in the development of overall operational and management strategies as well as providing input to facility design. The OR model will assess whether **throughput and performance** can be achieved, **identify key process bottlenecks** and any **improvements** that may be required to achieve target throughput and performance. OR model will test alternative design options to improve performance and provide feedback to the design agent for incorporation into the design.

Framework– Phase 1 Flow Diagram





DFLAW OR model simulates

- Tank farm operations including LAW feed staging in AP Farm, 242-A Evaporator Campaigns, DST Space, Secondary Liquid Waste Returns from LAW Vitrification, Solids and Cesium Product Returns from LAWPS
- LAWPS including Feed Receipt, Crossflow Filtration, Cesium Ion Exchange Removal, Cesium Product returns to Tank Farms, Resin Handling, Treated LAW Lag Storage and transfers to LAW Vitrification
- **LAW Vitrification** including Feed Receipt, Melters, Effluent Management Facility and secondary liquid waste returns to the tank farm
- **Equipment failure modes and restoration** times and any other processing constraints
- The model will be used to determine whether throughput and performance targets can be achieved. However operational performance is particularly useful on its own. What is needed is an investigation into the key bottlenecks to determine which items of equipment contribute the most to downtime and overall performance. Once identified then mitigation strategies can be developed and tested.

Benefits

- Underpin Operational Performance
- Determine Lag Storage needs between Tank Farms and WTP LAW Vitrification
- Underpin Spares Inventories for Tank Farms and LAWPS
- Test Curent Maintenance Practices versus Predictive Maintenance Practices

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