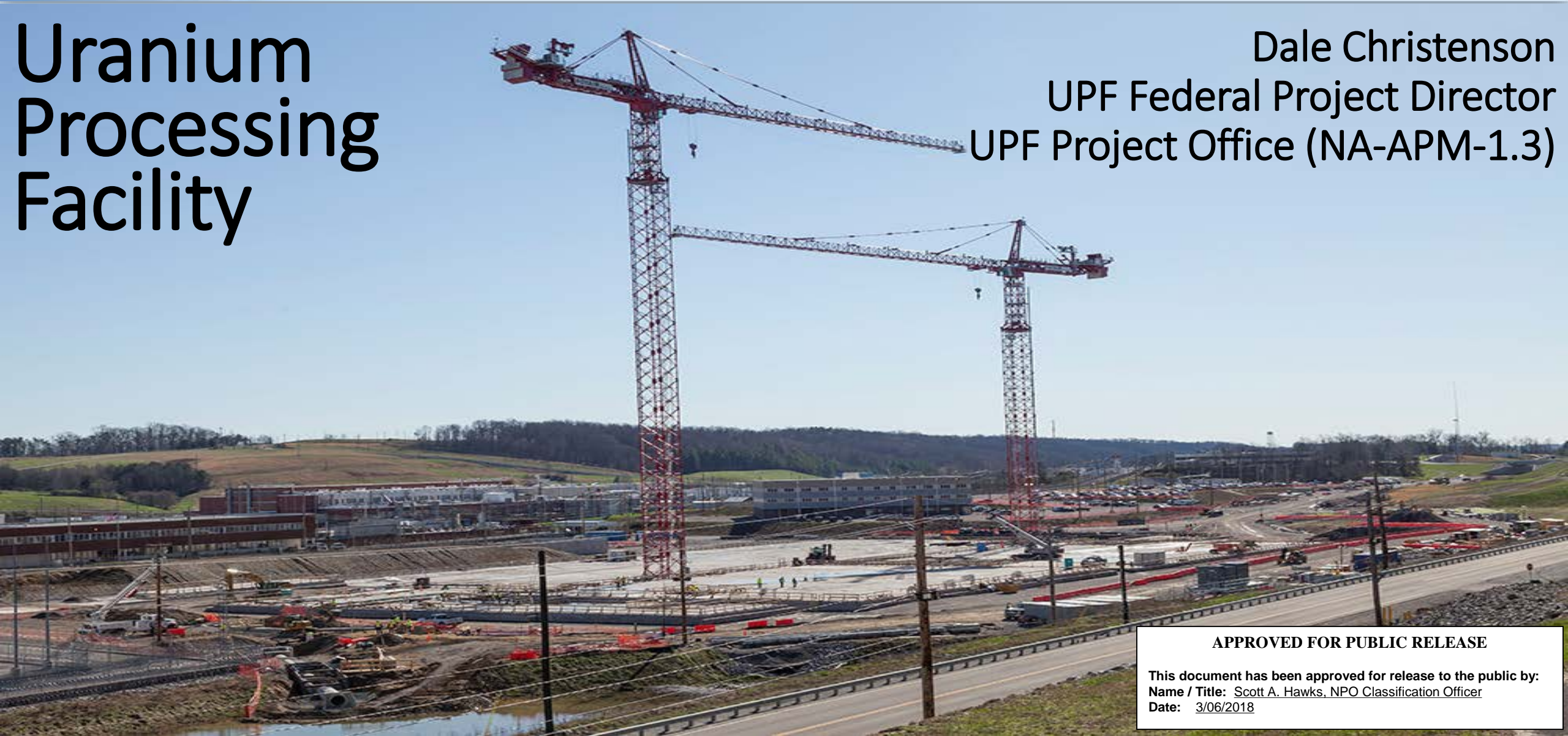




Uranium Processing Facility

Dale Christenson
UPF Federal Project Director
UPF Project Office (NA-APM-1.3)

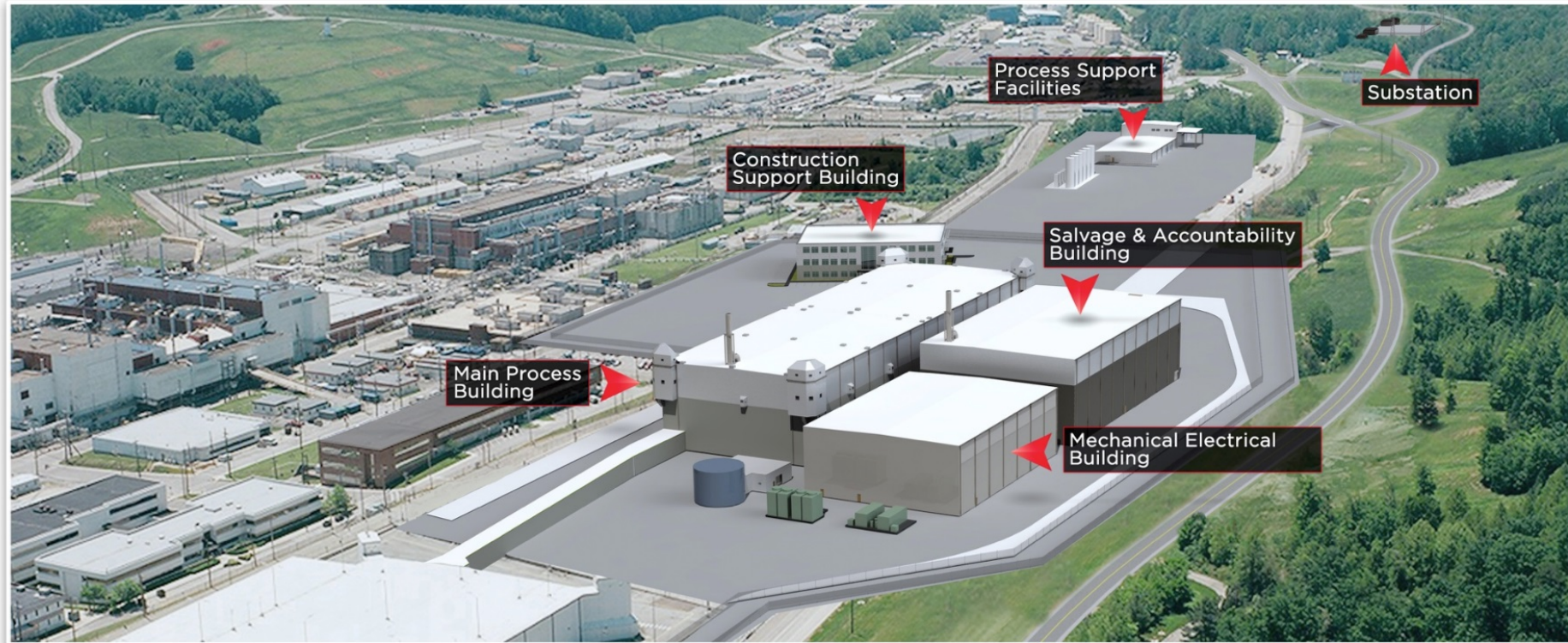


APPROVED FOR PUBLIC RELEASE

This document has been approved for release to the public by:
Name / Title: Scott A. Hawks, NPO Classification Officer
Date: 3/06/2018



Uranium Processing Facility (UPF)



- Provides a new facility to replace highly enriched uranium operations from Building 9212 (WWII facility)
- Supports phasing out mission dependency on 9212

Complete by 2025 for no more than \$6.5 Billion



Project Background



- Mission Need

“Provide safe, efficient, and secure enriched uranium processing and storage within the Nuclear Weapons Complex to meet the mission of the U.S. Department of Energy’s National Nuclear Security Administration”

- Revised CD-1 approved in June 2012

- Build UPF to replace Building 9212 enriched uranium capabilities
- Cost range of \$4.2B to \$6.5B using a build to budget acquisition strategy

- Revised design approach in April 2014

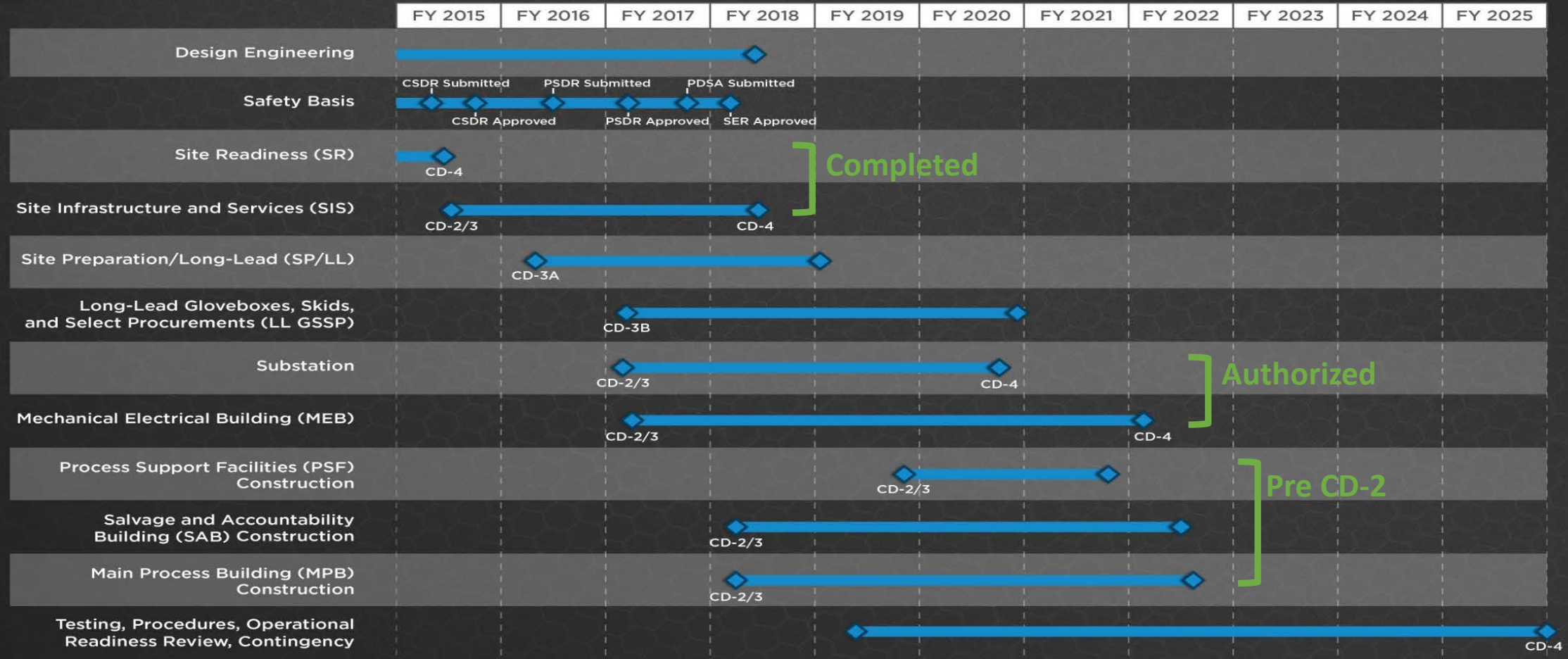
- Moved from single facility to multiple facilities
- No change in top end of cost range at \$6.5B
- Recovered process design, restarted facility at conceptual design



UPF Execution Schedule



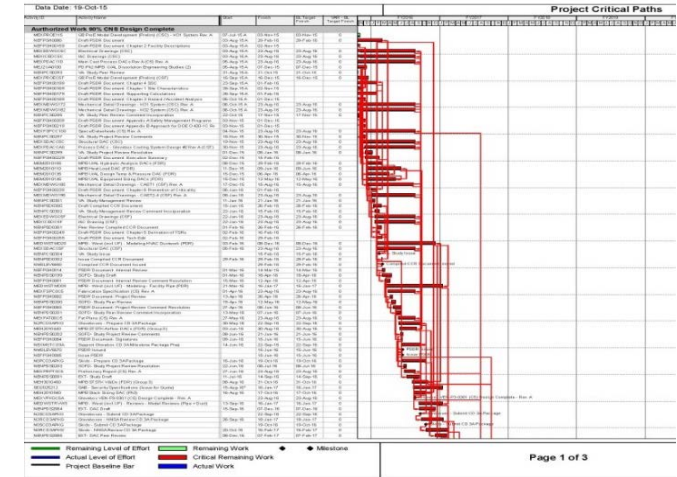
UPF | Uranium Processing Facility Schedule





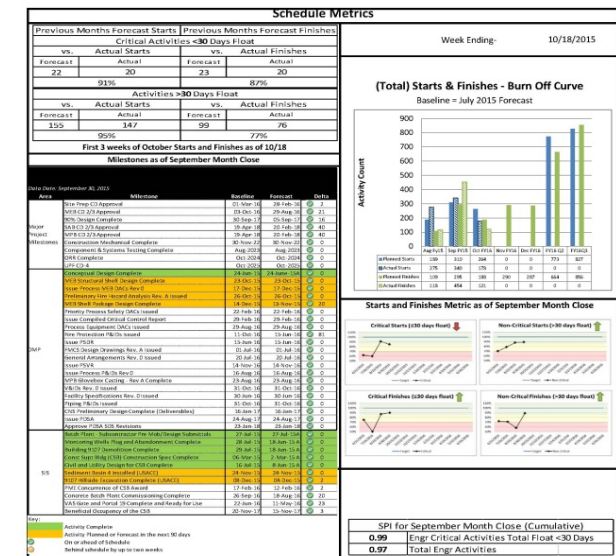
UPF Design Management Approach

- Design Management Plan
 - Defined all activities to complete design and technology development
 - Identified all activities to achieve CD-2
 - Over 11,000 activities in the schedule
 - Baselined and managed like a project



• Design Status

- Completed 90% design in September 2017
- Achieved TRL 7 for all UPF technologies in September 2017



UPF Technologies (TRL 7)



- Calcination
- Bulk Metal Oxidation



- Microwave Casting
 - Microwave and furnace loading glovebox

Minimizes Technology Uncertainty and Improves Operational Readiness



UPF Design Characterization



Commodity	Comparisons
132,000 cubic yards of mass fill concrete	A 10 story building the size of a football field
63 million pounds of recycled asphalt	A single lane paved asphalt road that is 4 miles long
15,000 tons of structural steel	Equivalent to 7,500 average-sized cars
200,000 linear feet of pipe	The distance from Oak Ridge, TN to Knoxville, TN and back—about 38 miles
11,000 tons of rebar	Equivalent to 275 loaded semi-trucks
3.2 million feet of wire and cable	The distance from Oak Ridge, TN to New Orleans, LA



Design Considerations for Major System Projects



- Plan for Design Duration consistent with Project Complexity
 - UPF design duration exceeded 4 years
 - Mature process equipment design prior to facility design
- Mature Nuclear Facility Design prior to baseline (CD-2)
 - UPF completed 90% design prior to finalizing final CD-2 cost estimate
 - Advance Technology Readiness to minimize risk
 - Design changes less impactful prior to construction starting
- Manage Safety Analysis Development
 - UPF maintained high visibility on iterative nature of safety analysis
 - Close coordination with external stakeholders
 - Office of Enterprise Assessments, DNFSB



UPF Subproject Approach





Use of Subprojects on Major System Projects



- Define early scope to prepare the site
 - Early infrastructure such as roads, bridges, or ground water features
 - Substations or other Construction Infrastructure (i.e., Batch Plant)
 - Permanent or temporary facilities to be used during construction
- Complete scope that will reduce risks associated with unforeseen conditions
 - Sub-foundation work conducted as Site Preparation (CD-3A)
 - Storm drain systems (CD-3A)
- Initiate Long Lead procurements (CD-3A)
 - Procure and Install Tower Cranes
 - Procure Large Engineered Equipment (Gloveboxes, Large Tanks, Furnaces)



Site Readiness Subproject



Bear Creek Road and Bridge

CD-4:	February 2015
TPC:	\$43.7M

UPF Construction Haul Road





Site Infrastructure and Services Subproject



Construction Support Building

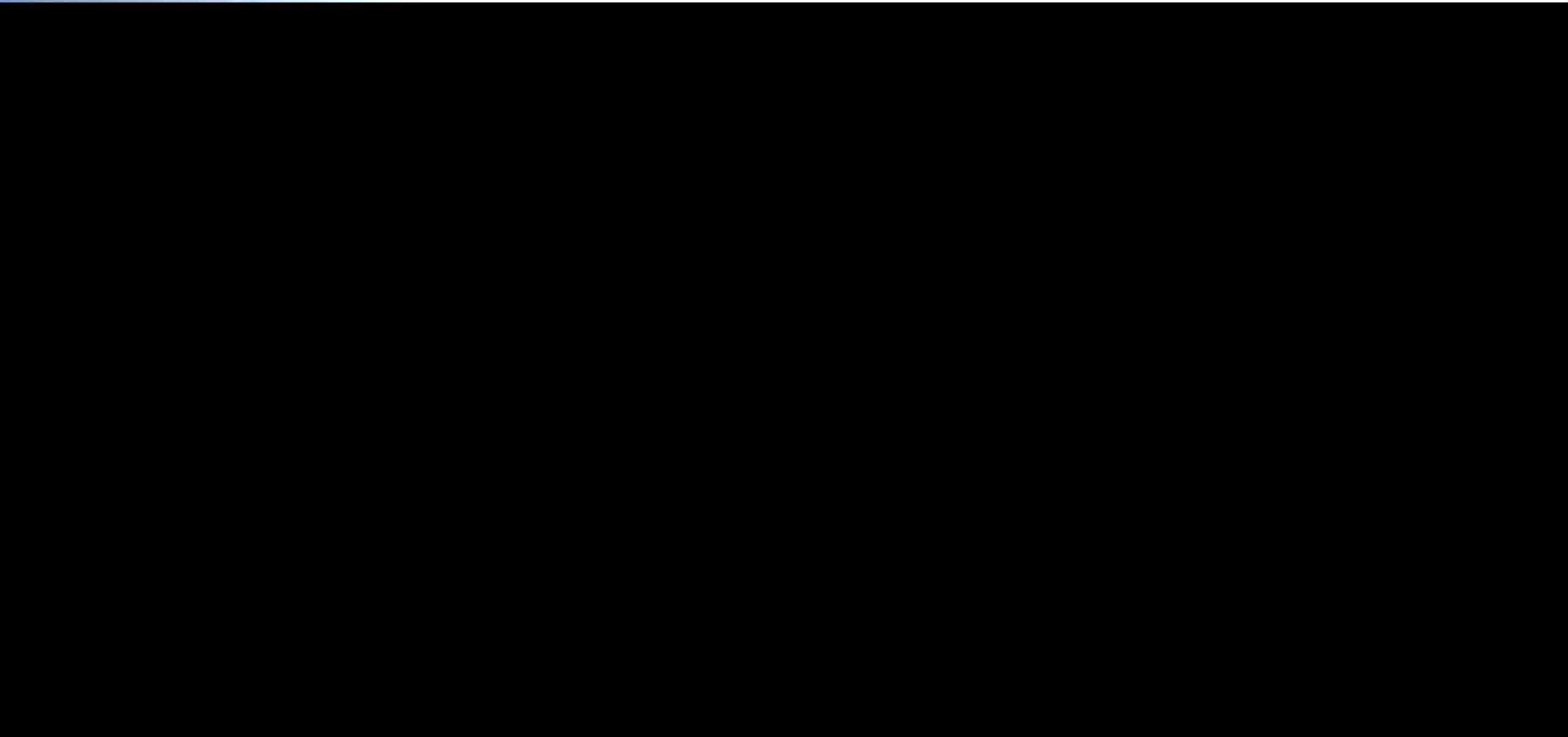
CD-4:	February 2018
TPC:	\$60.5M

Concrete Batch Plant



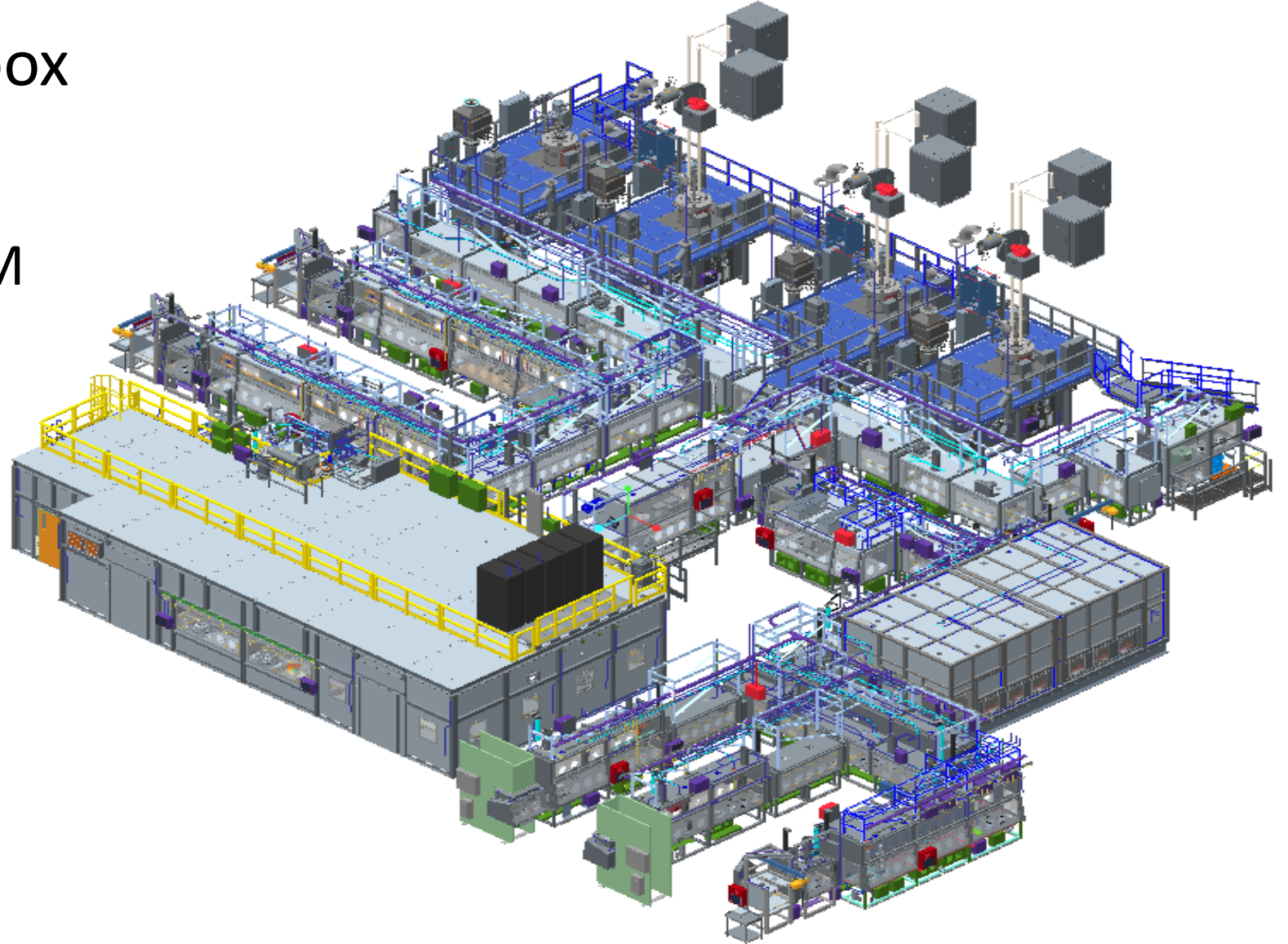


Site Preparation



Long Lead Procurements

- Main Casting Glovebox
 - Two procurement packages
 - Award value: \$115M
 - Size:
 - 100 ft. X 125 ft.
 - 12,500 sq. ft.
 - Fabrication and Delivery time:
 - 2 years





Road to CD-2 and CD-3



- Pre CD-2 Estimates
 - Develop interim estimates to validate CD-1 range
 - UPF updated estimates on an annual basis
 - DOE / NNSA conducted formal review of these estimates
 - Conduct Independent estimates and reviews
 - Validate estimating practices early in project execution
- Project Reviews
 - Annual Peer Reviews by NA-APM
 - External Independent Review and Independent Cost Estimate
 - Planning started one year in advance of on site review
 - External Reviews by Independent Organizations
 - Office of Enterprise Assessments
 - Defense Nuclear Facilities Safety Board
 - Reviews by Congressional Stakeholders



Design Requirements on Major System Projects



- Design Code of Record (COR)
 - Approved by the FPD at CD-1
 - Under NNSA Configuration Control
- Senior Management Change Control Board
 - Chaired by UPF FPD
 - Participation by Field Office, Project Office, and Program Management





Constructing UPF



OCTOBER 2018



OCTOBER 2019



OCTOBER 2020



OCTOBER 2021



OCTOBER 2022



2025



Ongoing Construction Progress Photos



Potable Water Line Fusion
Welding (MEB Subproject)



Erection of A-Frames
(Substation Subproject)



UPF – fully operational by 2025





Questions

