U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

EM Commissioning Activities

Waste Management 2015

Chip Lagdon, EM
March 18, 2015

Agenda

- Challenges
- Groups collecting lessons learned and best practices
- Overview of lessons learned
- Path forward

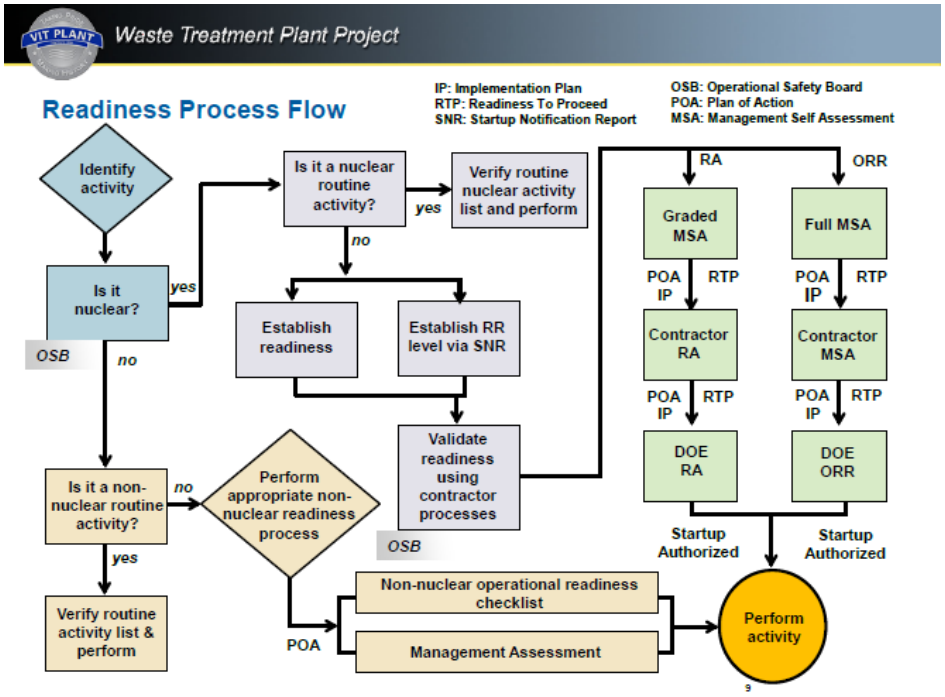
EM's Challenge

Upcoming Readiness Reviews:

Description:	Type	Estimated Start Date:
PFP Glovebox Foaming	*TBD*	January 2015
Paducah Deposit Removal	DOE RA	March 2015
IWTU	STARTUP	April 2015
TWPC (SWSA 5 not Sludge Buildout)	ORR	June 2015
WIPP	ORR	Sept. 2015
K Basins Sludge Removal	ORR	Mid 2017
SWPF	ORR	Late 2018
DFLAW	ORR	Late 2019
LAWPS	ORR	~2020
Padcuah/Ports D&D	ORR	TBA

Nuclear Project Challenges

- Design Authority
- Project Management Order Requirements at CD-4
- Sufficiently Trained & Experienced Technical Resources
  - Contractors
  - Federal Oversight
- DOE Certification and Verification Plan
- Defining what is acceptable readiness and how to achieve it.



Objectives

- Bring 20 years of Startup and Commissioning Experience to ensure early planning for successful startup of complex nuclear facilities.
- Work across the Projects to begin preparing the approach to achieving readiness and successful operations in a consistent and results oriented approach.
- Need consistent oversight and collaboration in addition to clearly define roles, responsibilities, accountabilities and authorities (R2A2).
- Relevance of Facility Commissioning
  - Bridges capital construction completion (CD-4) and operations
  - Always high management interest and attention
  - Relatively rare event in EM
  - Minimal documented institutional knowledge

"Errors in earlier phases unobtrusively cumulate, only to emerge during startup - and often with a vengeance" (Rand Report)

Sources of Lessons Learned

- DOE corporate lessons learned data base
- Completed initial reviews of the following:
  - Integrated Waste Treatment Unit (IWTU)
  - Depleted Uranium Hexafluoride Facility (DUF6)
  - West Valley Demonstration Project (WVDP)
  - Actinide Removal Process / Modular Caustic Side Solvent Extraction Unit (ARP/MCU)
  - Advanced Mixed Waste Treatment Facility (AMWTP)
  - Transuranic Waste Processing Center (TWPC)
  - Waste Isolation Pilot Plant (WIPP)
  - UK Nuclear Decommissioning Authority
  - Atomic Energy of Canada Limited
- Possible other facilities to be reviewed:
  - *Defense Waste Processing Facility (DWPF)*
  - *Fuel Cold Vacuum and Drying Facility*
  - *Highly Enriched Uranium Material Facility (HEUMF*)

Overview of Lessons Learned (1 of 3)

- Successful Operating Plants are characterized by the following:
  - Operationally focused
  - Exceptional equipment performance
  - Used training to continuously improved performance
  - Strong leadership
  - Engaged workers
  - Self-critical evaluations
- Don’t focus on the ORR, focus on the facility operating with excellence
- Extensive testing to find design shortfalls using an integrated test team
- Understand the expectations early for a successful commissioning. Define clear definitions for success and roles/responsibilities
- Clearly define the end goal of commissioning early and stress the importance of staying inside those constraints.
- Do not take shortcuts to implement DOE Order 425.1D (ORR)
- Don’t build unrealistic cost and schedule baselines – be realistic for first of a kind facility
- Contract misalignment causes many inconsistencies at many levels of the project

Overview of Lessons Learned (2 of 3)

- Prototype testing
  - Lab scale correlates with design and construction success
  - Pilot or full scale correlates with commissioning success

- Vendor inspections and QA records were critical for all projects
- Early and extensive involvement of process operations and maintenance personnel correlates with commissioning success
- Management System Assessment (MSA) approach for ORR success
  - More detailed and comprehensive
  - Extended over longer period, rather than 'review before ORR' approach
- ORR is only one component of a comprehensive commissioning effort

Overview of Lessons Learned (3 of 3)

- Commissioning is a major component of the facility lifecycle
  - Can be as long as construction period, especially if no prototype experience
  - Testing phase based on solid logic and parameters is vital
  - Commissioning rigor correlates with operations success
- Institutional knowledge gap for commissioning
  - Extensive information for ORRs; limited for balance of commissioning
  - No “Lessons Learned” reports for commissioning
  - Perspective that commissioning flows naturally from construction
  - Perspective that commissioning is easier than construction

Path Forward

- Current Activities
  - Monitoring Startup and Commissioning efforts on Peer Reviews
  - Developing resolution to the issues identified in June Meeting:
    - Define “achieving readiness”
  - Evaluating approaches for Startup and Commissioning
- Convene the next Startup and Commissioning meeting at one of the major projects or TWCB meeting
- Begin formulating EM HQ strategy and guidance for Startup and Commissioning approaches
  - Successful transition to operations
  - Field well qualified and prepared ORR teams for successful reviews
- Provide periodic reports on progress

Conclusion

- Increased focus on commissioning is necessary to compliment capital project completion (CD-4) and operations activity emphasis
- Commissioning will increase in importance
  - Shrinking budgets
  - Greater scrutiny
  - Critical projects – SWPF, WTP
  - Complex startups