



Operating License Application Supplement Related to Phased Startup Operations of the SHINE Facility

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Agenda



- Overview of Phased Startup Operations
- Approach to Developing Operating License Application Supplement
- Licensing Basis Impacts of Phased Startup Operations
- Preferred Approach for Issuance of Operating License
- Detailed Impacts on FSAR-Described Systems and Analyses (Closed Session)

Overview of Phased Startup Operations

- Phase 1:
 - Facility structure (FSTR) and nitrogen purge system (N2PS) structure
 - Irradiation units (IUs) 1 and 2, including IU-specific instances of the subcritical assembly system (SCAS), neutron flux detection system (NFDS), target solution vessel (TSV) off-gas system (TOGS), primary closed loop cooling system (PCLS), light water pool system (LWPS), and radiological ventilation zone 1 (RVZ1) equipment located in the cooling room
 - Tritium purification system (TPS) train A
 - Auxiliary and support systems, with the exception of IU-specific instances of PCLS, LWPS, and RVZ1 equipment located in the cooling room
 - Radioisotope production facility (RPF) systems, with the exception of iodine and xenon purification and packaging (IXP) and radioactive liquid waste immobilization (RLWI) selective removal capabilities

Overview of Phased Startup Operations

- Phase 2:
 - IUs 3, 4, and 5, including IU-specific instances of the SCAS, NFDS, TOGS, PCLS, LWPS, and RVZ1 equipment located in the cooling room
 - TPS train B
- Phase 3:
 - IUs 6, 7, and 8, including IU-specific instances of the SCAS, NFDS, TOGS, PCLS, LWPS, and RVZ1 equipment located in the cooling room
 - TPS train C
 - RLWI selective removal capability
 - Material staging building
- Phase 4:
 - IXP capability

Approach to Developing Operating License Application Supplement

- The SHINE supplement documents new or different information than that considered in the full facility description provided in the FSAR.
- For those Chapters/Sections affected by phased startup operations, the supplement describes the impacted system configurations or impacted analyses resulting from phased startup operations.
- For those Chapters/Sections not affected by phased startup operations, the supplement explicitly states the Chapter or Section is not affected by phased startup operations and provides a basis for the statement.

Licensing Basis Impacts of Phased Startup Operations

	Affected by Phased Startup Operations	Not Affected by Phased Startup Operations (IU-Specific Instances or Trains Installed)	Not Affected by Phased Startup Operations (Installed Prior to Phase 1 or No Change)
Chapter 1 – The Facility	✓		
Chapter 2 – Site Characteristics			✓
Chapter 3 – Design of Structures, Systems, and Components			✓
Chapter 4a2 – Irradiation Facility Description		✓	
Chapter 4b – Radioisotope Production Facility Description	✓		
Chapter 5a2 – Irradiation Facility Cooling Systems		✓	
Chapter 6a2 – Irradiation Facility Engineered Safety Features		✓	
Chapter 6b – Radioisotope Production Facility Engineered Safety Features	✓		
Chapter 7 – Instrumentation and Control Systems	✓		
Chapter 8a2 – Electrical Power Systems			✓
Chapter 9a2 – Irradiation Facility Auxiliary Systems	✓		
Chapter 9b – Radioisotope Production Facility Auxiliary Systems	✓		

Licensing Basis Impacts of Phased Startup Operations

	Affected by Phased Startup Operations	Not Affected by Phased Startup Operations (IU-Specific Instances or Trains Installed)	Not Affected by Phased Startup Operations (Installed Prior to Phase 1 or No Change)
Chapter 10 – Experimental Facilities			✓
Chapter 11 – Radiation Protection Program and Waste Management	✓		
Chapter 12 – Conduct of Operations			✓
Chapter 13 – Accident Analysis	✓		
Chapter 14 – Technical Specifications			✓
Chapter 15 – Financial Qualifications			✓
Chapter 16 – Other License Considerations			✓
Chapter 17 – Decommissioning and Possession-Only License Amendments			✓
Chapter 18 – Highly Enriched to Low Enriched Uranium Conversion			✓

Licensing Basis Impacts of Phased Startup Operations

- Technical Specifications – Affected by phased startup operations
 - Revision to Technical Specifications incorporating phased startup operations considerations to be submitted before end of month
- Environmental Report Supplement – Affected by phased startup operations
 - Revision to Environmental Report Supplement incorporating phased startup operations considerations submitted November 16, 2021
- Material Control and Accounting Plan – Not affected by phased startup operations
- Emergency Plan – Not affected by phased startup operations
- Licensed Operator Training Programs – Not affected by phased startup operations
- Quality Assurance Program Description – Not affected by phased startup operations
- Physical Security Plan – Not affected by phased startup operations

Preferred Approach for Issuance of Operating License

- SHINE intends to request the NRC issue a single operating license covering the eight utilization facilities and the production facility at the time of substantial completion of the structures, systems, and components (SSCs) required for Phase 1 operations of the SHINE facility.
 - To address those utilization facilities which will not be substantially complete prior to Phase 1 operations, SHINE intends to request the NRC condition the SHINE operating license to require authorization by the NRC prior to SHINE operating the remaining utilization facilities.
- The single issuance of the SHINE operating license, conditioned to require authorization prior to operating subsequent phases, is viewed as the more efficient path (vs. amending the operating license to include additional utilization facilities).