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## SMR-160 Operational Programs



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## Agenda

- Introductions
- Purpose & Outcome
- Method
- List of Operational Programs
- Open Forum

## Purpose & Outcome

### ■ PURPOSE

- ✓ To provide SMR's understanding of the operational programs required for SMR-160

### ■ OUTCOME

- ✓ To obtain feedback and gain alignment with the NRC staff on the technical content threshold and implementation milestones of various operational programs for a future CPA.

## Method

- Reviewed relevant SRP content, 13.4 Operational Programs
- Reviewed recently approved designs (NuScale, Vogtle)
  - ✓ Not directly applicable given differences between DCA/COLA and CPA.
- General Question – Are SMR's anticipated PSAR content threshold and implementation milestones for each program aligned with NRC expectations?



# Inservice Inspection Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.55a(g)	5.2.4 – Class 1 SSCs	High level overview of the program including discussion on expected inspections per the ASME BPVC for the different SMR Class components	Prior to Commercial Service	Not planning to discuss inspection techniques or procedures until FSAR
ASME BPVC Section XI IWX 2400, 2017 edition	5.4.2 – Class 1 SG tubes			
	6.6 – Class 2/3 SSCs			



# Preservice Inspection Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.55a(g)	5.2.4 – Class 1 SSCs	Similar to Inservice Inspection Program, high level overview of the program including discussion on expected inspections per the ASME BPVC for the different SMR Class components	Completion prior to initial plant startup	If necessary, considering potential commitment in CPA to deliver full scope with sufficient time for NRC review and completion of program prior to initial plant startup
ASME BPVC Section XI IWX 2200, 2017 edition	5.4.2 – Class 1 SG tubes			
	6.6 – Class 2/3 SSCs			



# Inservice Testing Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.55a(f)  ASME OM Code, 2017 edition	3.9.6 – Pumps, valves, dynamic restraints	High level overview of the program including discussion on expected testing per the ASME OM Code for the different SMR Class components	Prior to Commercial Service (after main generator online on nuclear heat)	Not planning to discuss testing techniques or procedures until FSAR
	5.2.4 – Class 1 SSCs			
	5.4.2 – Class 1 SG tubes			
	6.6 – Class 2/3 SSCs			



# Preservice Testing Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.55a(f)  ASME OM Code, 2017 edition	3.9.6 – Pumps, valves, dynamic restraints	Similar to Inservice Testing Program, high level overview of the program including discussion on expected testing per the ASME OM Code for the different SMR Class components	Completion prior to initial fuel load	If necessary, considering potential commitment in CPA to deliver full scope with sufficient time for NRC review and completion of program prior to initial plant startup
	5.2.4 – Class 1 SSCs			
	5.4.2 – Class 1 SG tubes			
	6.6 – Class 2/3 SSCs			



# Motor Operated Valve Testing



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.55a(b)(3)(ii)  GL-89-10	3.9.6	Similar to Inservice Testing Program, high level overview of the program including discussion on expected testing per the ASME OM for the different SMR Class components	Prior to initial fuel load	Not planning to discuss testing techniques or procedures until FSAR



# Initial Test Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.34(b)(6)(iii)  10 CFR 50.34(f)(2)(xxvi)  RG 1.68, Rev. 4	14.2	High level overview of the Initial Test Program to be performed following construction	Prior to the first construction test being conducted for the Construction Test Program  Prior to the first preoperational test for the Preoperational Test Program  Prior to initial fuel load for the Startup Test Program	If necessary, considering potential commitment in CPA to deliver full scope with sufficient time for NRC review of program prior to initial plant startup



# Environmental Qualification Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.49(a)	3.11	High level overview of the EQ program including general scope	Prior to initial fuel load	



# Reactor Vessel Material Surveillance Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.60  10 CFR Part 50, App. H  ASTM E-185 – 2021	5.3.1.6	High level overview of program	Prior to initial criticality	Per previous discussions regarding concerns predicting RPV neutron embrittlement, SMR intends include discussion on how to use Reactor Vessel Material Surveillance Program data in the PSAR. Full details of the program may not be developed.



# Containment Leakage Rate Testing Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.54(o) 10 CFR 50, App. A, GDC 32 10 CFR 50, App. J	6.2.6	Containment will be described including anticipated leakage rates to be verified in testing program	Prior to initial fuel load	App J has two options to follow, specific details will be included in the FSAR



# Fire Protection Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.48  RG 1.189, Rev. 4  Also: 10 CFR 30.32 10 CFR 40.31 10 CFR 70.22	9.5.1	FP Program definition, design basis, general system(s) overview, codes and standards; programmatic controls / administration; quality assurance; general FP design features for key plant areas; safe-shutdown capability; RG 1.189 conformance	Prior to receipt of fuel onsite (to support receipt and storage of fuel on site);  Prior to initial fuel load (to support fuel load and plant operation)	Portions applicable to radioactive material will be in place to support materials licensing (10 CFR Parts 30, 40, 70)



# Process and Effluent Monitoring and Sampling Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 20.1301 and 20.1302	11.4 – Process Control Program	Description of the preliminary design of equipment to be installed to maintain control over radioactive materials in gaseous and liquid effluents produced during normal reactor operations, including expected operational occurrences. Also identify the design objectives, and the means to be employed, for keeping levels of radioactive material in effluents to unrestricted areas ALARA.	Prior to initial fuel load	Guides on design objectives set forth in 10 CFR 50, App. I, Sect. II may be used by an applicant for a construction permit. Guides on limiting conditions for operation for light-water-cooled nuclear power reactors set forth in 10 CFR 50, App. I, Sect. IV may be used by an applicant for Part 50 License.
10 CFR 50.34a				
10 CFR 50.36a				
10 CFR 50, App. I, Sect. II and IV				
	11.5 – Radiological Effluent Technical Specifications / Standard Radiological Effluent Controls		Prior to initial fuel load	
	11.5 – Offsite Dose Calculation Manual		Prior to initial fuel load	
	11.5 – Radiological Environmental Monitoring Program		Prior to initial fuel load	



## Radiation Protection Program (including ALARA principle)



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 20.1101	11.4	Information presented in the PSAR provides reasonable assurance that the applicant will comply with the requirements in 10 CFR Part 20 (Radwaste and Effluent Control)	<ol style="list-style-type: none"> <li>1. Radioactive source control (assignment of RP supervisor); Minimization of contamination prior to receipt of by-product, source, or SNM</li> <li>2. Personnel dosimetry; Radiation monitoring and surveys; Radiation work permits prior to receipt of fuel on site</li> <li>3. Assignment of RP manager; Respiratory protection; Bioassay prior to initial fuel load</li> <li>4. Effluents and environmental monitoring and assessment; Job coverage; Radioactive waste shipping prior to first shipment of radioactive waste)</li> </ol>	
10 CFR 20.1406	12.1			
10 CFR Part 37	12.5			



# Non-Licensed Plant Staff Training Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.120  10 CFR 50.34(a)(6)  Also: 10 CFR 30.32 10 CFR 40.31 10 CFR 70.22	13.2.2	A preliminary plan for the applicant's training of personnel	18 months prior to scheduled date of initial fuel load  Prior to initial receipt of byproduct, source, or special nuclear materials (excluding Exempt Quantities as described in 10 CFR 30.18)	Portions applicable to radioactive material will be in place to support materials licensing (10 CFR Parts 30, 40, 70)



# Reactor Operator Training Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 55.13	13.2.1	Preliminary plan for the applicant's training of personnel	18 months prior to scheduled date of initial fuel load	
10 CFR 55.31				
10 CFR 55.41				
10 CFR 55.43				
10 CFR 55.45				
10 CFR 50.34(a)(6)				



# Reactor Operator Requalification Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.34(b)	13.2.1	Preliminary plan for the applicant's requalification of personnel	Within 3 months after the issuance of an operating license	
10 CFR 50.54(i)				
10 CFR 55.59				
10 CFR 50.34(a)(6)				



# Emergency Planning



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.47  10 CFR Part 50, App.E  10 CFR 50.34(a)(10)	13.3	Discussion of the applicant's preliminary plans for coping with emergencies as set forth in 10 CFR 50 App.E	Full participation exercise conducted within 2 years of scheduled date for initial loading of fuel  Onsite exercise conducted within 1 year before the schedule date for initial loading of fuel  Applicant's detailed implementing procedures for its emergency plan submitted at least 180 days prior to scheduled date for initial loading of fuel	



# Security Programs



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.34(c)  10 CFR 73.1 10 CFR 73.67	13.5.2.2.8, 13.6 – Physical Protection Program	Design of physical security systems – plans, training and quals, safeguards contingency plans, CAS, comms, power sources	Prior to initial receipt of SNM	
10 CFR 73.55(b) 10 CFR 73.55(c)(3) 10 CFR 73.56 10 CFR 73.57	13.6 – Physical Security Program	Access authorization	Prior to receipt of fuel onsite	
10 CFR 73.55(c)(5) 10 CFR 73.55(k) 10 CFR Part 73, App.C	13.6 – Safeguards Contingency Program		Prior to receipt of fuel onsite	
10 CFR 73.55(c)(4) 10 CFR 73.55(d)(3) 10 CFR Part 73, App.B	13.6 – Training and Qualification Program		Prior to receipt of fuel onsite	



# Physical Security Program (Cat 1 and 2 Quantities of Radioactive Material)



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 37 Subparts A, B, C, D, F	11.4	High level summary	Prior to possession of aggregated category 1 or category 2 quantity of radioactive materials	
	13.5.2.2			
	13.6			



# Quality Assurance Program - Operation



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.54(a)	17.5	QAPD	30 - 90 days prior to initial fuel load	
10 CFR Part 50, App. A, GDC 1				
10 CFR Part 50, App. B				



# Maintenance Rule



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 50.65	17.6	High level overview of the program including discussion on expected scope of RAP in MR program	Within 3 months after the issuance of an operating license	



# Fitness for Duty Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 26.4(f)  10 CFR Part 26, Subpart K	13.7 - Fitness for Duty Program (FFD) for Construction (Workers and First-Line Supervisors)	Full description of FFD Program required for portions required prior to initiating 10 CFR Part 26 construction activities.	Prior to initiating 10 CFR Part 26 construction activities	
10 CFR 26.4(e)	13.7 – FFD Program for Construction (Management and Oversight Personnel)		Prior to initiating 10 CFR Part 26 construction activities	
10 CFR 26.4(a)(5) or (e)(1)  10 CFR Part 26, Subparts A – H, N, and O	13.7 – FFD Program (Security Personnel)		Prior to initiating 10 CFR Part 26 construction activities  Prior to the earlier of: A. Licensee’s receipt of SNM in the form of fuel assemblies, or B. Establishment of a protected area, or C. Operating License Issuance	



## Fitness for Duty Program (cont)



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 26.4(g)  10 CFR Part 26, Subparts A, B, D – H, N, O, and C per licensee’s Discretion	13.7 - FFD Program (FFD Program Personnel)	Full description of FFD Program required for portions required prior to initiating 10 CFR Part 26 construction activities.	Prior to initiating 10 CFR Part 26 construction activities	
10 CFR 26.4(c)  10 CFR Part 26, Subparts A – I, N, and O, except for §§ 26.205 – 209	13.7 – FFD Program (TSC EOF Emergency Responders)		Prior to the conduct of the first full-participation emergency preparedness exercise under 10 CFR Part 50, App. E, Section F.2.a	
10 CFR 26.4(a) and (b)  10 CFR Part 26, Subparts A – I, N, and O, except for individuals listed in § 26.4(b), who are not subject to §§ 26.205 –209	13.7 – FFD Program (Operations)		Prior to the earlier of: A. Establishment of a protected area, or B. Operating License Issuance	



# Cyber Security Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 73.54(b)	13.7	High level summary	Prior to receipt of fuel onsite	
10 CFR 73.55(b)(8)				
10 CFR 73.54(c)(6)				



# SNM Material Control and Accounting Program



Requirements/Guidance	PSAR Section(s)	PSAR Technical Threshold	Implementation Milestone	Remarks
10 CFR 74, Subpart B (§§ 74.11 – 74.19, excl. § 74.17)	13.5.2.2	High level summary	Prior to initial receipt of special nuclear material	



## Open Forum

