

Decommissioning Appraisal Matrix for Nuclear Power Plants

Topic No. and Topic	WS-R-5 Requirements for decommissioning	Informed by other IAEA documentation		
		WS-G-2.1*	SRS 45	Other
1. Government and regulatory policy and requirements				SF-1, GS-R-1
1.1. The national policy and legal framework for decommissioning	3.2, 3.3, 3.4, 6.1			
1.2. Regulatory framework, requirements and criteria for decommissioning: (includes decommissioning, clearance for materials and buildings, site release criteria, waste management and other related issues)	2.1, 3.1, 3.5, 3.6	2.8-2.11	3.4.1	SS 115-1
1.3. Regulatory oversight of decommissioning	3.5, 8.9, 9.5			
2. General requirement for a Decommissioning Plan	1.12, 3.8, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.10, 5.12, 5.14, 7.7, 8.2	2.15-2.16, 4.1-4.4, 5.1-5.13	2.3, 3	
3. Facility Description			3.2.1, 3.2.2	
3.1. Buildings and system description				
3.2. Facility/project boundary				
3.3. Site attributes, e.g.: location: surrounding population and land use: meteorology, geology, seismology, hydrology and natural resources				
3.4. Radiological baseline survey	5.8			
3.5. Facility operating history	5.9	4.5-4.7	3.2.4,	
4. Decommissioning Strategy	3.8, 4.1, 4.2, (4.3, 4.4, 4.5)	3.1-3.4, 5.18-5.20		SRS26, SRS50, TRS375, Tecdoc1478

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4.1. Description of selected strategy (including start point, end point and key phases)	see above			
4.2. Alternatives considered	see above		3.3.1	
4.3. Rationale for chosen strategy	4.2	3.11	3.3.2	
4.4. Planned use of facility and site during and after decommissioning	see above			TRS444
4.5. Multi-facility site interactions	4.8			
5. Transition from operations to decommissioning	4.3, 4.4, 4.5, 8.2	6.4-6.8		SRS31, SRS36, TRS420
6. Stakeholder involvement and socio-economic considerations		3.11		
6.1. Stakeholder involvement	5.13	2.7	4.5	#1
6.2. Socio-economic considerations		3.11	4.5	#2
7. Radiological characterization	5.11	5.15-5.16, 6.1-6.3	4.1, 4.2	TRS389
7.1. Identification, location and qualification of contamination: structures, systems and equipment, surface soil, sub-surface soil, surface water, ground water			3.2.3	
7.2. Measurements made and analysis performed; nuclide vectors and fingerprinting				
7.3. Statistical approaches				
7.4. Comparison with guideline values				
7.5. Conclusions and summary				
8. Funding	1.12, 3.7, 6.2, 6.4, 6.5	5.2	3.8	
8.1. Cost estimation	6.3	3.9, 5.23	3.8.1	Tecdoc1476, NEA/IAEA/EC (1999)
8.2. Funding sources and mechanisms (including approaches to project contingencies and long term financial risk/security)	See Topics 8 and 8.1 above	5.24, 5.25	3.8.2	
9. Decommissioning approach, technologies and techniques				
9.1. Decommissioning approach: key stages and outline schedule				

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9.2. Decommissioning techniques: containment, dismantling, decontamination (for structures, systems and components, soil and underground and surface water as appropriate)	3.8, 8.4, 8.5, 8.6	6.9-6.20	3.5	TRS395, TRS440
9.3. Decision-making methods in the selection of decommissioning techniques	8.6			
10. Materials management during decommissioning	3.8, 4.6, 8.8	2.20, 3.8, 7.19-7.28, 7.34	3.7	TRS401, TRS441, #3
10.1. Identification of radioactive waste types, waste streams and associated quantities, and radiological, chemical and physical properties		see above	3.7.1	
10.2. Pretreatment (including segregation and options for re-use/re-cycle), treatment and conditioning, handling and storage, transport and disposal of radioactive wastes: application of disposal acceptance criteria	4.6, 8.8	7.25, 7.27	3.7.2, 3.7.3, 3.7.4	WS-R-2, WS-G-2.5*, WS-G-2.6, WS-G-6.1, TRS421
10.3. Application of clearance values and clearance of material from control (strategy and demonstration of compliance)	4.7	7.21, 7.25-7.26	3.11.8	RS-G-7.1, SRS44
10.4. Management of non-radioactive hazardous materials	1.12	6.3		
11. Safety assessment	3.8, 5.2, 8.5	2.12-2.14, 3.6-3.7, 5.3, 5.14, 5.21-5.22, 7.4	3.9	
11.1. Safety assessment framework				
11.2. Hazard analysis: identification, screening and evaluation	1.12, 5.2, 5.3, 8.5			
11.3. Engineering analysis				
11.4. Identification of safety measures	8.5	3.7, 5.22		
12. Availability of support services				TRS399
12.1. On site services: infrastructure, engineering, waste management, etc				
12.2. Other external specialist services			3.4.7	
13. Management organization	3.8, 7.1, 7.8			TRS399, Tecdod1394
13.1. Project management organization, roles, responsibilities and interfaces		2.6, 7.1, 7.8-7.11	3.4.2, 3.4.3	
13.2. Resources to plan, implement and monitor decommissioning (including staffing and recruitment plan)	5.9	3.10, 7.10		TRS399

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13.3. Work planning and scheduling, task management, cost monitoring and control			3.4.4, 3.4.8	
13.4. Management of contractors and contracted services	7.2	7.5		
13.5. Skills assessment, experience, qualification and training	2.4, 3.8, 7.3, 8.4	7.2-7.7, 7.10, 7.28	3.4.6	
13.6. Regulator interface	3.8, 8.2, (8.3), 8.4, (8.6), 8.7, (9.3, 9.6)			
13.7. Performance indicators				
14. Management for safety and environment				
14.1. Responsibilities for safety and environment	3.7, 7.1, 7.2, 8.1			
14.2. Safety culture	2.4, 7.4		3.4.5	
14.3. Nuclear safety programme			3.11.2	
14.4. Radiation protection programme (including optimization of protective measures)	2.2, 3.8, 5.2,	2.17, 3.5, 5.17, 7.12-7.16	3.11.1, 3.11.6, 3.11.7	
14.5. Industrial safety programme	1.12	3.6, 5.21	3.11.3	
14.6. Environmental Impact Assessment			3.10	
14.7. Environmental protection and monitoring programme (on and off site)	1.12, 2.5, 3.8, 5.2	2.18, 7.17-7.18	3.10	
14.8. Emergency arrangements	2.3, 3.8, 8.7	7.29	3.13	
15. Management system	5.10			
15.1. Quality management system and programme	3.8, 7.7	7.11, 7.31	3.12.1, 3.12.2	GS-R-3
15.2. Application of national and international technical standards (ISO etc)				
15.3. Procedures	7.5, 8.4	7.9	4.6	
15.4. Document control and records (including long term provisions)	3.8, 7.6, 7.7	7.32, 8.1	3.11.5, 3.12.3, 3.12.6	TRS411, #4
15.5. Control of measuring and test equipment			3.12.4	
15.6. Corrective action programme			3.12.5	
15.7. Lessons learned programme (decommissioning and general)			3.12.8	
15.8. Audit, review and surveillance			3.11.4, 3.12.7	
16. Surveillance and maintenance	5.10	5.12, 6.21	3.6	

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16.1. Equipment and systems requiring surveillance and maintenance		6.11	3.6.1	
16.2. Schedule for surveillance and maintenance			3.6.2	
16.3. Continued surveillance and institutional control (for deferred stages)	8.3	5.12, 7.33		SRS26, TRS375
17. Physical security and safeguards		7.30	3.14	
17.1. Organization and responsibilities			3.14.1	
17.2. Physical security programme and measures		7.30	3.14.2	
17.3. Safeguards programme and measures		7.30	3.14.3	
18. Completion and final survey			3.15	
18.1. Final survey and report	2.5, 3.8, 9.1, 9.2, 9.3, 9.4	2.19, 6.22-6.24, 8.2	3.11.9, 4.3, 4.4, 4.7	WS-G-5.1, TRS444
18.2. Restricted release measures and their implementation	2.5, 9.6			

Technical Reports awaiting publication

- #1 An overview of stakeholder involvement in decommissioning
- #2 Managing the socio-economic impact of the decommissioning of nuclear facilities
- #3 Managing the large amounts of decommissioning material of low radioactivity
- #4 Long term preservation of information for decommissioning projects

* **Note: Equivalent standards and documents apply to facilities other than nuclear power plants;**

* WS-G-2.2, WS-G-2.4, WS-G-2.7, TRS386, TRS414