1. LEADERSHIP AND MANAGEMENT FOR SAFETY

1.1. Leadership for safety

How are leadership activities developed within the organization? How are managers trained, coached and assessed to improve leadership skills? [GSR Part 2 Requirement 2; 3.1]

How do leaders communicate the safety policy - and associated safety objectives and goals - to staff and interested parties? [SSR-2/2 Requirement 5; 4.2] [GSR Part 2 Requirement 2; 3.1] [GS-G-3.1; 5.26, 5.27]

How is it ensured that managers are regularly in the field to assess and discuss conduct of work and compliance with management expectations and objectives? [NS-G-2.4; 6.33] [GS-G-3.1; 2.16, 3.6, 6.12]

How are managers at all levels involved in field activities? [GSR Part 2 Requirement 14; 5.4] [SSR-2/2 Requirement 9; 4.35] [GS-G-3.1; 2.36, 3.6] [GS-G-3.5; 2.15, Appendix I(2)(d)]

How do managers and leaders demonstrate shared values and expectations, and support attitudes and behaviours that result in a sustainably strong safety culture? [SSR-2/2 Requirement 5; 4.1, 4.2] [GSR Part 2 Requirement 2; 3.1] [GS-G-3.1; 2.35, 3.2, 3.3] [GS-G-3.5; 2.15, 2.33, 3.12(b), 3.23]

How are managers and leaders using feedback on safety performance within their area of responsibility, and sharing this information across the organization to ensure continuous improvement? [SSR-2/2 Requirement 5; 4.4]

How are managers and leaders encouraging an open reporting culture and a readiness to challenge acts or conditions that are adverse to safety? [GSR Part 2 Requirement 2; 3.2, 3.6] [GS-G-3.1; 2.18, 2.36, 2.46, 3.10, 4.3, 6.9, 6.15, 6.34, 6.53, 6.61, 6.62, 6.69] [GS-G-3.5; 2.4, 2.26, 2.29(k), 3.13, 3.14(e), 3.21(e), 3.22(d)(e)]

How do management respond to constructive criticism and feedback from plant staff? [GS-R-3; 6.17, 6.18] [GS-G-3.1; 2.18, 2.36, 3.17, 6.59, 6.78, 6.82] [NS-G-2.4; 6.68, 8.1, 8.3] [INSAG-15; 3.4, 3.6]

How are managers and leaders developing a shared understanding of risks to safety, and supporting employees to achieve safety and improve safety performance? [GS-G-3.1; 2.5, 2.11, 2.13, 2.34, 4.12] [GS-G-3.5; 2.8, 2.11, 2.12, 2.19, 2.34, 3.15(d), 3.19]

How do senior managers show that they are committed to establishing a strong nuclear safety policy? [SSR-2/2 Requirement 5; 4.2] [NS-G-2.4; 5.6-5.11] [GS-R-3; 2.1-2.3] [GS-G-3.1; 3.1, 3.12] [INSAG-15; 3.1]

How do managers support and reinforce the safety policy, goals and objectives in day-to-day activities? [SSR-2/2 Requirement 5; 4.3] [NS-G-2.4; 5.6-5.11]

How do managers lead by example and demonstrate a motivation to improve plant performance and achieve the established safety goals and objectives? [SSR-2/2 Requirement 5; 4.2] [NS-G-2.4; 3.10, 3.20, 3.21, 5.11, 5.20, 8.1] [GS-G-3.1; 3.3, 3.6, 3.12]

How are decisions that are important to safety reviewed before being made? [SSR-2/2 Requirement 1; 3.2(c), Requirement 8; 4.32] [GSR Part 2 Requirement 7; 4.10] [GS-G-3.1; 2.8, 6.10] [GS-G-3.5; 2.10]

1.2. Integrated management system

How does the organization ensure that safety is the overriding priority? [SSR-2/2 Requirement 5; 4.1-4.5] [GS-R-3; 2.2] [GS-G-3.1; 3.10-3.24] [NS-G-2.4; 5.6-5.11]

How are arrangements for legal or regulatory requirements defined, understood and implemented? [SSR-2/2 Requirement 1; 3.3] [GS-G-3.1; 3.9] [GS-G-3.5; 3.6]

How is it ensured that all aspects of the plant programme for safe operation are covered in administrative procedures? [SSR-2/2 Requirement 8; 4.26] [NS-G-2.4; 3.1, 3.2] [INSAG 15; 3.2] [GS-R-3; 2.8-2.10, 5.11-5.13] [GS-G-3.1; 2.1-2.6]

1.2.1. Generic aspects

How is it ensured that all elements of management - including safety, health, environmental, security, quality, social and economic elements - are integrated in the management system? And how is it ensured that safety is not compromised? [SSR-2/2 Requirement 2; 3.4-3.6, Requirement 17; 5.1] [GS-G-3.1; 2.1-2.6, 2.36 2nd to last bullet point, 2.38, 2.46, 3.10, 3.11, 4.27, 5.3] [GS-G-3.5; 2.17, 3.20, 5.6(2)(e)]

How is the management system developed, implemented and kept up-to-date? [GS-R-3; 6.7-6.10] [GS-G-3.1; 2.22-2.24, 3.2, 3.18-3.20] [GS-G-3.5; 3.29, 3.30, 5.4-5.6]

How do managers foster and encourage the involvement of all individuals within the organization in the implementation and continuous improvement of the management system? [GS-G-3.1; 2.18, 4.2, 6.15, 6.54, 6.69] [GS-G-3.5; 6.66(b)]

How do managers demonstrate commitment to the establishment, implementation, assessment and continuous improvement of the management system? [SSR-2/2 Requirement 2, Requirement 5; 4.5] [GS-G-3.1; 3.6, 3.7, 4.3, 5.8, 6.1-6.10, 6.17, 6.18] [GS-G-3.5; 3.9, 3.13, 3.14, 3.22(d)(e), 6.66]

How is the management system reviewed and monitored? Which aspects are covered, and which measurement tools are applied? [GS-G-3.1; 6.4, 6.7-6.10, 6.17, 6.18, 6.22-6.30] [GS-G-3.5; 6.69]

How is the effectiveness of the management system and its processes monitored and measured, and how are identified issues remedied? How are the risks to safety assessed? [SSR-2/2 Requirement 9; 4.33, 4.34] [GSR Part 2 Requirement 9; 4.31, 4.32] [GS-G-3.1; 2.23, 2.54, 5.9, 5.14, 5.18, 5.51, 5.55, 6.3, 6.30, 6.47] [GS-G-3.5; 5.6, 6.6, 6.9]

How is risk assessment integrated in the management system? [NS-G-2.4; 5.12, 5.13] [GS-G-3.1; 2.21, 2.26, 5.58, 5.63, 5.71] [INSAG-13; 29-33]

1.2.2. Responsibilities of the operating organization

Who has prime responsibility for safety (license holder), and how is this responsibility for safety discharged? [SSR-2/2 Requirement 1; 3.1]

What are the responsibilities of senior managers? [GSR Part 2 Requirement 1; 2.1] [SSR-2/2 Requirement 1; 3.1] [GS-G-3.1; 3.1, 3.2]

1.2.3. Operating organization structure

What is the organization structure? How are responsibilities and accountabilities defined and documented in the management system? [SSR-2/2 Requirement 1; 3.1, 3.2, 3.6, Requirement 3; 3.8, 3.9] [NS-G-2.4; 2.12, 2.14] [GS-G-3.1; 2.14, 2.28, 2.31, 2.54, 2.57, 2.61, 2.62, 3.5] [GS-G-3.5; 2.3]

Does the management system collate information (in organizational charts, etc.) that demonstrates the extent to which the support functions are self-sufficient or dependent upon services from outside the plant organization? [SSR-2/2 Requirement 3; 3.8] [NS-G-2.4; 2.11]

How are the responsibilities and authority of the safety related committees defined? What is the interface between these committees and plant governance functions (e.g. are these interfaces described in the management system/presented in the plant organizational chart)? [GS-G-3.1; 2.28]

1.2.4. Policies, goals and objectives

What are the policies, goals and objectives of the organization? How do they support safety? [SSR-2/2 Requirement 1; 3.2] [GSR Part 2 Requirement 5; 4.3, 4.4] [GS-G-3.1; 2.4, 2.14, 2.52-2.54, 3.10-3.12, 4.11, 4.22] [GS-G-3.5; 3.10-3.24]

How do the policies, goals and objectives of the organization support management efforts to follow safety standards and fulfill expectations? [SF-1 Principle 3] [GSR Part 2 Requirement 5; 4.3]

Are established policies, goals and objectives realistic, measurable, challenging and limited in number to prevent dilution of effort in their achievement? [GS-R-3; 3.8-3.10] [GS-G-3.5; 3.25]

How are relevant policies, goals and objectives established in appropriate departments to support plant management policies, goals and objectives? [NS-G-2.4; 3.19-3.23, 5.6, 5.7] [GS-G-3.1; 2.7, 3.10, 3.11]

How are managers and supervisors held accountable for the achievement of assigned objectives? [NS-G-2.4; 3.24]

How do managers routinely review and record progress towards accomplishment of policies, goals and objectives? [SSR-2/2 Requirement 5; 4.1, 4.2, 4.4] [NS-G-2.4; 3.22, 5.17-5.22, 6.46-6.50] [GS-G-3.1; 3.2, 3.11, 3.13, 6.4, 6.19, 6.45, 6.48]

To what extent do managers at different levels in the organization conduct routine meetings to review progress in achieving goals and objectives? [GS-G-3.1; 3.11, 6.19, 6.45, 6.48]

1.2.5. Resources and staffing

How is it ensured that senior managers have the necessary experience and knowledge to manage the safe operation of the power plant? [SSR-2/2 Requirement 1; 3.2, SSR-2/2 Requirement 4; 3.10] [NS-G-2.8; 3.31]

How and by whom are the necessary staffing, (human and other) resources and capabilities determined and provided in order to carry out the activities of the organization (including outside normal working hours), while taking into account safety priorities? How are resources necessary to maintaining safe operation assessed and provided? [SSR-2/2 Requirement 4; 3.10-3.12, Requirement 7; 4.16-4.18] [GS-G-3.1; 2.23, 2.42, 3.4, 3.5, 3.11, 3.12, 4.1, 4.2, 4.5, 4.26, 5.8] [GS-G-3.5; 2.14, 4.17, 5.43, 6.3(b)(c)] [NS-G-2.8; 2.1, 2.2, 2.5] [NS-G-2.4; 2.3, 3.7, 4.8, 5.10, 6.2, 6.11-6.15, 6.29, 6.30]

How does corporate management ensure that the resources it sets aside for the plant are sufficient to enable it to respond to plant problems and plant requests for assistance? [NS-G-2.4; 2.3, 2.11] [GS-G-3.1; 3.12, 4.1, 4.2]

How does senior management ensure that all individuals, including themselves, are competent to perform their work, knowledgeable of the management system requirements and fully aware of the importance of their activity as regards safety? [SSR-2/2 Requirement 4; 3.10, 3.11, Requirement 7; 4.16-4.18] [GS-G-3.1; 2.11, 2.21, 2.36, 4.8-4.25] [GS-G-3.5; 3.19-3.21] [NS-G-2.8; 3.31-3.35]

How is the staffing policy used in order to retain a pool of experienced and knowledgeable staff? [SSR-2/2 Requirement 4; 3.11] [GS-G-3.1; 4.1, 4.2, 4.6, 4.7, 5.60] [NS-G-2.4; 2.7]

How are the necessary competences identified, developed and maintained in the organization, including for contractors? [SSR-2/2 Requirement 3; 3.10, 3.11, Requirement 7; 4.16-4.18] [GS-G-3.1; 2.61, 4.2, 4.6-4.8, 4.18, 5.60] [GS-G-3.5; 4.17] [NS-G-2.4; 6.16-6.21]

How are long-term staffing policy objectives and succession planning for human resources established and maintained? [SSR-2/2 Requirement 4; 3.10, 3.11] [NS-G-2.8; 2.2, 4.1, 4.4, 4.11] [GS-G-3.1; 4.2, 4.3, 4.7] [NS-G-2.4; 6.11, 6.14]

To what extent is an effective fitness-for-duty policy established and maintained, with appropriate administrative procedures in place? [SSR-2/2 Requirement 4; 3.13, Requirement 8; 4.29] [NS-G-2.8; 2.10, 2.13, 3.12, 3.40, 7.10]

What are the arrangements in the management system regarding the supply of items, products and services? How are they implemented? How does the licensee ensure his responsibility when receiving items, products and services? How are the requirements and principles for

safety-grading communicated to suppliers? [SSR-2/2 Requirement 2; 3.6, Requirement 13; 4.49] [GSR Part 4 Requirement 1; 3.1-3.7] [GS-G-3.1; 5.50, 5.51] [GS-G-3.5; 4.3-4.6, 5.35-5.37]

How is a strong safety culture demonstrated in the procurement process? [NS-G-2.4; 3.13, 3.17, 4.5-4.10] [GS-G-3.1; 2.10]

How are safety related activities analyzed, planned, carried out and controlled to ensure that risks are minimized? How are the results of risk assessments incorporated into work instructions or control documentation associated with planned activities? [SSR-2/2 Requirement 2; 3.5, Requirement 8; 4.25-4.28] [NS-G-2.4; 5.12, 5.16] [GS-G-3.1; 2.21, 2.26, 5.9, 5.58, 5.63, 5.66, 5.71] [GSR Part 2] [GS-G-3.5; 3.21, 5.56, 5.57, 5.62-5.72]

1.3. Non-radiation-related safety programme

How are non-radiation risks and radiation risks integrated in the risk assessment process? [SSR-2/2 Requirement 23; 5.26] [NS-G-2.4; 5.12, 5.13, 6.56]

How are the non-radiation-related safety policy, programme and procedures defined and documented? [SSR-2/2 Requirement 23; 5.26] [NS-G-2.4; 6.2, 6.56] [GS-G-3.5; 5.73-5.77, 5.81]

How are responsibilities assigned for non-radiation-related safety supervision? [GS-G-3.5; 5.73-5.77]

How are the non-radiation-related safety programme and procedures reviewed and evaluated? [NS-G-2.8; 5.40] [NS-G-2.4; 6.56]

How are the organizational structure, duties, responsibilities and lines of authority of the non-radiation-related safety officers described? [GS-G-3.5; 2.3]

How are plant staff and contractors trained on non-radiation-related safety? [SSR-2/2 Requirement 23; 5.26] [NS-G-2.4; 6.56] [NS-G-2.8; 4.27]

How is the non-radiation-related safety programme assessed? [NS-G-2.11; 6.2, 6.4] [GS-G-3.5; 5.75, 6.8(e)]

How do non-radiation-related safety performance indicators align with the organization's objectives, and how are they monitored? [GS-G-3.1; 3.16, 5.17, 5.32, 5.33] [GS-G-3.5; 6.3, 6.6]

How are minor non-radiation-related safety incidents and near-misses captured and analysed? How does the system encourage reporting of industrial safety hazards and violations of non-radiation-related safety requirements? [SSR-2/2 Requirement 24; 5.27-5.31] [NS-G-2.4; 5.5, 6.64, 6.68] [GS-G-3.5; 5.75-5.77]

How are non-radiation-related safety aspects addressed in pre-job briefings? [NS-G-2.6; 5.15] [NS-G-2.14; 4.27, 4.28]

How is the non-radiation-related safety programme integrated with the nuclear and radiation safety programmes? [SSR-2/2 Requirement 23; 5.26]

How are safety rules, procedures and instructions adhered to in the field and other workplaces? [SSR-2/2 Requirement 23; 5.26] [NS-G-2.4; 2.2, 3.6] [NS-G-2.14; 2.19]

How is the material condition of (industrial) safety equipment monitored? How is the surveillance programme for testing all non-radiation-related safety hardware defined and implemented? [SSR-2/2 Requirement 28; 7.10] [NS-G-2.14; 6.21-6.23] [NS-G-2.6; 4.26] [GS-G-3.5; 5.26-5.30]

How is the industrial safety programme documented in the management system? What procedures are in place to support the programme? [SSR-2/2 Requirement 23; 5.26] [NS-G-2.4; 6.56] [GS-R-3; 5.6-5.10]

What system is in place to encourage reporting of industrial safety hazards and violations of industrial safety requirements? [NS-G-2.4; 5.5, 6.61-6.71] [NS-G-2.8; 5.41]

1.4. Document and records management

How is the control of documentation, records and reports established and implemented? [SSR-2/2 Requirement 15; 4.52] [GS-G-3.1; 5.24-5.28, 5.35-5.49] [NS-G-2.4; 6.75, 6.76]

What is the process for issuance, validation, approval, dissemination, review and periodic updating of documentation, records and reports? [NS-G-2.4; 6.75, 6.76, 7.13]

How are documentation, records and reports managed, e.g. by categorization according to their importance to safety, indexation, filing, correcting records or inserting supplements? How are the different storage facilities for safety records appropriate for permanent retention of all the different types of storage media (radiographs, photographs, microfilm and magnetic tapes)? How is this storage organised, e.g. concerning accessibility and periodic checks, to ensure that documentation is not deteriorating or missing? How are retention times identified and controlled? [SSR-2/2 Requirement 15; 4.52] [NS-G-2.4; 6.75, 6.76]

What are the conditions for the storage of safety related records for permanent retention so as to prevent deterioration (fire protection, security, environmental conditions, duplication of records and separate storage, etc.)? [GS-G-3.1; 5.39-5.41, 5.44, 5.47, 5.48]

1. LM

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

2. TRAINING AND QUALIFICATION

2.1. Organization and functions

2.1.1. Functions and responsibilities

How are organizational structure, responsibilities, levels of authority and functions defined and communicated within the training organization? Are they understood by personnel? [SSR-2/2 Requirement 1; 3.2(a)(b), Requirement 3; 3.8, 3.9]

How are the goals, objectives and safety indicators related to training and qualification developed and managed? How are outcomes checked and measured within the organization? [SSR-2/2 Requirement 1; 3.2(a), Requirement 9; 4.35, 4.37]

How are training and qualification policies and programmes kept up-to-date? What internal process is put in place in this regard? [SSR-2/2 Requirement 3; 3.8, 3.9, Requirement 7; 4.21] [NS-G-2.8; 5.3] [GS-G-3.1; 4.8]

2.1.2. Personnel

What is the staffing level, including the use of contractors, in the training area? How does the plant ensure that there are enough resources to implement the plant training policy and programme? [SSR-2/2 Requirement 7; 4.23] [NS-G-2.8; 4.8]

2.2. Qualification and training of personnel

2.2.1. Training policy

How is plant management involved in the development, implementation and evaluation of the overall training policy? How is it ensured that the policy is known, understood and supported by all concerned? [SSR-2/2 Requirement 7; 4.18] [NS-G-2.8; 4.2-4.4]

How is the systematic approach to training used for training plant personnel? [SSR-2/2 Requirement 7; 4.20] [NS-G-2.8; 4.13]

What qualification and competence requirements have been established for plant personnel performing safety related functions? [SSR-2/2 Requirement 7; 4.16, 4.18]

What is the level of participation of managers in determining the training needs of their staff? How do they ensure that production needs do not unduly interfere with the conduct of the training programme? [SSR-2/2 Requirement 7; 4.18] [NS-G-2.8; 4.9, 4.10] [GS-G-3.1; 4.20] [NS-G-2.14; 2.14]

How is classroom training controlled and structured to achieve training objectives in a timely and efficient manner? [NS-G-2.8; 4.15(a)]

What guidelines have been prescribed for on-the-job training (OJT)? How are designated individuals trained to deliver OJT? [NS-G-2.8; 4.15(b), 5.2]

How is the importance of safety and safety culture promoted in training? [SSR-2/2 Requirement 7; 4.19] [NS-G-2.8; 4.6, 5.11, Appendix I, II]

2.2.2. Initial and continuing training

What programmes are in place for initial and continuing training of each group of personnel at the plant? [SSR-2/2 Requirement 7; 4.20] [NS-G-2.8; 4.22, 4.23, 4.25, 4.26]

How are work schedules established to take into account the time necessary for personnel to undergo formal continuous training on a regular basis? [NS-G-2.8; 4.31]

What provisions have been made in training programmes for periodic confirmation of the competence of personnel? What continuing training is provided when an individual has been away from his authorized duties for an extended period of time? [SSR-2/2 Requirement 7; 4.19] [NS-G-2.14; 2.13]

How are trainees evaluated in initial and continuing training? [SSR-2/2 Requirement 7; 4.19] [NS-G-2.8; 4.24]

What specific training is provided to address an employee's deficiencies in performance? [NS-G-2.8; 4.22]

How does the continuing training programme cover recent industry and plant-specific operating experience, identified problems in performance, plant modifications and procedural changes? [SSR-2/2 Requirement 8; 4.29, Requirement 24; 5.27] [NS-G-2.8; 4.26] [NS-G-2.14; 2.13] [NS-G-2.4, 6.69]

Is any specific training conducted in conjunction with modifications to the plant, to ensure that appropriate personnel are familiar with the modified systems, and know how to operate and maintain modified equipment in a safe and reliable manner? [NS-G-2.8; 5.8]

Is any special training provided before commissioning a modified plant or putting plant back into operation? What topics does it cover? Who is responsible for the timely update of all affected documentation? [SSR-2/2 Requirement 11; 4.43]

2.2.3. Training programmes for managers and supervisory personnel

How are supervisory skills, people and work management, interpersonal communications and human behaviour aspects addressed in training? [NS-G-2.8; 5.14]

How is career development of management staff undertaken? [NS-G-2.8; 5.11]

What means are in place to develop skills in team leadership, coaching, mentoring and communication, for managers and supervisory personnel, and for their potential successors? [NS-G-2.8; 5.14]

2.2.4. Training programmes for operations personnel

How is the formal training of operators conducted? [NS-G-2.8; 5.16- 5.21]

How are shift supervisors trained in supervisory techniques and communication skills? [NS-G-2.8; 5.17]

What additional training is provided to improve operational performance for those operations that are critical to safety, for infrequent operations, and for routine operations that are carried out rarely (e.g. start-up of the plant)? [NS-G-2.14; 2.13]

How are control room operators trained on the plant-representative full-scope simulator? How are infrequent and abnormal situations and accident conditions used in simulator scenarios? [SSR-2/2 Requirement 7; 4.24] [NS-G-2.8; 4.18, 4.19, 4.30]

What considerations are given to training control room staff as a crew, so as to develop teamwork skills, team communication and team coordination? [NS-G-2.8; 4.19]

How are simulator training sessions evaluated and documented? What remedial measures can be taken as a result of such evaluations? [NS-G-2.8; 4.21]

What is the scope of the formal training delivered to plant operators? How does it cover theoretical and practical knowledge of plant systems (with emphasis placed on systems that are of safety significance), as well as their functions, layout and operation? [NS-G-2.8; 5.16]

To what extent are the results of PSA used to demonstrate the importance of plant systems in preventing plant damage or severe accidents? [NS-G-2.8; 5.16]

What are the practical and other training methods used during the training process to emphasize the importance of maintaining the plant within operational limits and conditions, of reactivity control and core cooling at all times - including the period when the plant is not in operation - and of the consequences of violating safety limits? [NS-G-2.8; 5.16]

What are the practical and other training methods used during the training of control room operators to ensure their capabilities in plant diagnostics, control actions, administrative tasks and human factors such as attitudes and human–machine and human–human (teamwork) interfaces? [NS-G-2.8; 5.17]

How does the plant ensure that operators are trained to be aware of the locations of radioactive materials in the plant, and of the controls to be applied to them? [NS-G-2.8; 5.18]

How do operator training programmes take account of routines for normal operation of the plant and of the plant response to changes that could cause accidents if not counteracted? [NS-G-2.8; 5.19]

To what extent do the training programmes for operators cover operating procedures for normal operation, for anticipated operational occurrences and, as far as practicable, for severe accident conditions, practiced at the simulator, so that trainees recognize the negative consequences of errors or of violations of procedures? [NS-G-2.8; 5.19]

How does the plant ensure that field operators receive training commensurate with their duties and responsibilities, specifically detailed knowledge of the operational features of the plant, and hands-on experience? [NS-G-2.8; 5.20]

What are the practical and other training methods used during the training process to emphasize the importance to safety of plant activities during shutdown or low-power operating states? [NS-G-2.8; 5.21]

2.2.5. Training programmes for maintenance and technical personnel

How are maintenance and technical personnel trained in ALARA principles, minimization of waste, radiation protection, safety rules, access controls and emergency procedures? [NS-G-2.6; 4.34] [NS-G-2.8, 5.5]

What controls are established to ensure maintenance and technical personnel have the skills required to work on the equipment they are assigned to? [NS-G-2.8; 5.24, 5.29]

What refresher training is provided on activities that are normally performed infrequently? [NS-G-2.8; 4.31]

How are past plant experiences and incidents relating to poor work practices in the nuclear industry and other potentially hazardous industries used in the training of maintenance and technical personnel? [NS-G-2.8; 5.22, 5.25] [NS-G-2.6; 4.30]

How does the plant guarantee the competence of contractor personnel involved in performing maintenance and technical work on site? [NS-G-2.6; 4.32]

How is the concept of just-in-time training used in the training of maintenance and technical personnel? [NS-G-2.8; 5.26, 5.30]

How are training mock-ups and models used for the maintenance and technical work activities that cannot be practiced with the actual equipment? [NS-G-2.8; 5.2, 4.15(d), 6.6]

2.2.6. Training for emergencies

How are plant staff and staff from external emergency response organizations trained in handling emergency conditions? How is continuing training used to maintain proficiency? [SSR-2/2 Requirement 7; 4.17] [NS-G-2.8; 4.28, 4.32, 5.13]

How are training programmes in accident management reviewed and updated to take account of new knowledge, as well as in-house and external experience? [NS-G-2.8; 4.42]

2.2.7. Training programmes for trainers

How are trainers provided with the necessary instructional and assessment skills? [SSR-2/2 Requirement 7; 4.23] [NS-G-2.8; 5.31]

How is the training provided by external organizations evaluated for quality, consistency and usefulness? [NS-G-2.8; 5.34]

How do trainers maintain and update their technical and instructional skills? How often are they seconded/assigned to the operating plant? [SSR-2/2 Requirement 7; 4.23] [NS-G-2.8; 5.31, 5.32]

2.2.8. Review and modification of training programmes

How are training programmes reviewed to take into account both changes in operational documentation and plant modifications? [SSR-2/2 Requirement 11; 4.42]

How is operating experience incorporated in training programmes? [SSR-2/2 Requirement 7; 4.18, 4.22] [NS-G-2.8; 5.37]

How are training programmes reviewed to evaluate their effectiveness? [SSR-2/2 Requirement 7; 4.21] [NS-G-2.8; 4.48, 5.35-5.37] [GS-G-3.1; 4.20]

2.2.9. Training facilities and material

What facilities are available for classroom training, computer-based training and individual studies? [SSR-2/2 Requirement 7; 4.24] [NS-G-2.8; 6.1]

What procedures and principles are applied to ensure consistency between the training facilities and real plant facilities, and between procedures used in the simulator and at the unit? Are the training facilities, computer models, simulators etc. updated in a timely manner to reflect current plant conditions and operating policy? [SSR-2/2 Requirement 7; 4.21] [SSR-2/2 Requirement 10; 4.38]

What are the capabilities of the plant simulator to support training for normal plant operational states as well as for accident conditions? [SSR-2/2 Requirement 7; 4.24] [NS-G-2.8; 4.15(c), 4.37]

2.2.10. Authorization

What procedures are in place to authorize persons whose duties have a direct bearing on safety? [SSR-2/2 Requirement 7; 4.16] [NS-G-2.8; 7.4, 7.5]

How are individuals re-authorized periodically? [NS-G-2.8; 7.12]

2.3. Records and reports

How are various training, qualification and authorization records maintained at the plant? How are they used to support management in monitoring the effectiveness of the training programme? [SSR-2/2 Requirement 15; 4.52] [NS-G-2.8; 4.44-4.46]

2.4. Use of PSA and PSR

How are the results of PSA - or some of its applications - implemented in training programmes? [SSG-3; 10.36] [NS-G-2.18, 4.36, 5.16]

How does the plant use the results from PSR to enhance the training and qualification programme? [SSR-2/2 Requirement 12; 4.44, 4.47] [SSG-25; 3.8, 5.29, 5.41, 5.47, 5.86] [NS-G-2.3; 2.2, 3.8]

2. TQ

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

3. OPERATIONS

3.1. Organization and functions

3.1.1. Functions and responsibilities

How are organizational structure, responsibilities, levels of authority and functions defined and communicated within the operations organization? Are they understood by personnel? [SSR-2/2 Requirement 1; 3.2(b)(d), Requirement 3; 3.8, 3.9] [NS-G-2.4; 2.11] [NS-G-2.14; 2.1-2.5]

How are the goals, objectives and safety indicators related to operations developed and managed? How are outcomes checked and measured within the organization? [SSR-2/2 Requirement 9; 4.33-4.37, 3.2(a)] [NS-G-2.14; 2.16, 2.17]

What is the process for ensuring that operations policies and programmes are kept up-to-date? What internal process is put in place in this regard? [SSR-2/2 Requirement 5; 4.5] [NS-G-2.14; 2.6-2.9]

How are the interface responsibilities with other plant groups/departments defined, e.g. maintenance and fuel management, and how does the plant ensure effectiveness and mutual understanding? [NS-G-2.4; 3.5] [NS-G-2.14; 2.2, 2.26]

3.1.2. Personnel

What is the staffing level, including the use of contractors, in the operations area? How is it ensured that there are enough shift staff to cover workloads during both outages and plant operation, for normal as well as emergency conditions (including multiunit plants)? [SSR-2/2 Requirement 4; 3.11] [NS-G-2.2; 2.1, 6.2] [NS-G-2.4; 6.14, 6.29, 6.30] [NS-G-2.14; 2.11, 3.4, 3.9, 3.11, 4.1, 4.20]

How are operations personnel, including contractors, qualified for their assigned work? What measures have been taken to maintain an adequate level of experience, knowledge and proficiency? [SSR-2/2 Requirement 4; 3.10-3.11] [NS-G-2.8; 2.1, 2.5, 2.7] [NS-G-2.14; 2.10, 2.13]

How are personnel performance reviews undertaken, and are these considered by the plant to be effective? [NS-G-2.8; 3.7, 3.31, 4.21, 4.22, 4.45]

What regular re-qualification training is undertaken by operators, and is there a similar requirement if an operator has been on an extended absence from duty? [SSR-2/2 Requirement 4; 3.12, Requirement 7; 4.19] [NS-G-2.8; 4.22, 4.29, 4.30, 7.12] [NS-G-2.14; 2.13, 3.1]

3.2. Operations equipment

Do the main control room and supplementary control room (sometimes known as the remote shutdown panel) facilities assure habitability and contain the necessary documents? [SSR-2/2

Requirement 27; 7.7, 7.8] [NS-G-2.14; 6.5, 6.6]

Are effective methods in use to indicate system and equipment status? [NS-G-2.14; 3.6, 4.7, 4.16, 4.34, 4.35, 4.49, 4.50, 5.5, 5.49, 5.50, 6.7]

What communication systems are there available for ensuring adequate transfers of information to the operators in the main control room from additional and local control rooms, and how are they periodically evaluated? [SSR-2/2 Requirement 27; 7.7, 7.8] [NS-G-2.1; Table A section 10] [NS-G-2.4; 6.31, 6.61] [NS-G-2.14; 6.13, 6.14]

What is the policy with respect to the number of lit annunciators in the control room and on alarm panels throughout the plant? How are alarms in the control room prioritized? [SSR-2/2 Requirement 27; 7.9] [NS-G-2.14; 6.10]

How does the plant ensure that both the equipment used by the operators and their working environment support safe and reliable operation of the plant, i.e. plant cleanliness, lighting, as well as noise levels and temperatures in the control room? [NS-G-2.4; 6.61] [NS-G-2.14; 6.1, 6.3]

Does the plant information system provide all the safety related plant performance data? [SSR-2/2 Requirement 27; 7.9]

Are there sufficient safety, emergency, first aid and firefighting facilities available? [SSR-2/2 Requirement 23; 5.26] [NS-G-2.4; 7.1-7.3, 7.17, 7.19, 8.8] [NS-G-2.14; 6.22]

3.3. Operating rules and procedures

3.3.1. Operational limits and conditions (OLC)

How does the plant ensure that OLCs cover all modes of normal operation, including shutdown and outage stages? [SSR-2/2 Requirement 6; 4.9]

What controls and procedures are in place to ensure compliance with OLCs? [SSR-2/2 Requirement 6; 4.12] [Requirement 8; 4.26] [NS-G-2.2; 3.3, 3.10, 8.1, 10.2] [NS-G-2.14; 4.55]

How are deviations from OLCs appropriately reported and documented? [SSR-2/2 Requirement 6; 4.13] [NS-G-2.2; 3.5, 3.6, 6.68, 8.3, 10.6] [NS-G-2.4; 6.64] [NS-G-2.14; 4.55, 5.18, 5.49]

Are all entries to and exits from OLCs well documented? [SSR-2/2 Requirement 6; 4.14, 4.15] [NS-G-2.2; 9.6] [NS-G-2.14; 4.55, 4.57]

How frequently are OLCs reviewed and revised? [SSR-2/2 Requirement 6; 4.8]

Does the surveillance programme cover all safety systems? [SSR-2/2 Requirement 6; 4.7, 4.12] [NS-G-2.2; 3.4, 3.5, 3.10, 7.1-7.5, 8.1, 10.6] [NS-G-2.14; 2.3, 5.17, 5.20]

3.3.2. Restart following events or planned shutdowns

What are the plant's requirements and procedures for restart following refuelling or maintenance shutdowns? [SSR-2/2 Requirement 8; 4.31] [NS-G-2.6; 9.38]

What is the policy regarding event investigations following a reactor trip, in order to ensure adequate system reliability for restart? [SSR-2/2 Requirement 8; 4.31] [NS-G-2.14; 5.34]

What management review takes place prior to restart, following refuelling or maintenance shutdowns? [SSR-2/2 Requirement 8; 4.31] [NS-G-2.6; 8.55] [NS-G-2.14; 5.35, 5.36]

3.3.3. Operator aids

Are operator aids clearly understood, authorised and being properly used? [SSR-2/2 Requirement 26; 7.5, 7.6] [NS-G-2.4; 6.61] [NS-G-2.14; 6.15-6.18]

What controls are in place to prevent the use of non-authorized operator aids and other non-authorized material? [SSR-2/2 Requirement 26; 7.5]

3.3.4. Operating procedures

What is the policy for procedure usage? [SSR-2/2 Requirement 26; 7.1] [NS-G-2.14; 2.8, 4.21]

How does the plant ensure that the operating procedures for various reactor states comply with OLCs? [SSR-2/2 Requirement 30; 7.23]

Are procedures clearly identified and readily accessible in the control room and in other operating locations, where necessary? [SSR-2/2 Requirement 26; 7.1]

Are procedures kept up-to-date, and are outdated procedures promptly replaced? [SSR-2/2 Requirement 26; 7.4] [NS-G-2.14; 4.22, 4.24]

Is there an adequate method for reporting and documenting procedure errors and problems? [NS-G-2.14; 2.20, 3.1, 3.5, 4.22, 4.23]

Are there regular reviews to ensure procedures are technically correct? [SSR-2/2 Requirement 26; 7.4] [NS-G-2.14; 5.24]

3.3.5. Normal operating procedures

Are the normal operating procedures clearly written, understood and supported by appropriate references? [SSR-2/2 Requirement 26; 7.1, 7.2] [NS-G-2.14; 2.3, 3.1, 3.3, 3.5, 4.7, 4.21]

3.3.6. Operating procedures for anticipated operational occurrences, and emergency

operating procedures

Are the emergency procedures clearly written, understood and supported by appropriate references? Are they easily accessible? [SSR-2/2 Requirement 26; 7.1, 7.3] [NS-G-2.14; 4.22] [NS-G-2.2; 8.1]

Are symptom-based or event-based emergency operating procedures in use? Are responsibilities clearly defined? [SSR-2/2 Requirement 26; 7.3] [NS-G-2.2; 8.4, 8.8, 8.12-8.14, 9.6, 9.7]

How are the EOPs verified and validated? Were plant specific safety analyses used in the development of the EOPs? [SSR-2/2 Requirement 26; 7.1, 7.3, 7.4] [NS-G-2.14; 4.23]

Do alarm response procedures exist, and are they used? Are they available in the main control room and at relevant remote panels? [SSR-2/2 Requirement 27; 7.9] [NS-G-2.14; 4.25] [NS-G-2.2; 8.3]

3.3.7. Control of changes to procedures

Is there a well understood system for controlling temporary changes to procedures? [GS-G-3.1; 5.24]

Is information on temporary changes distributed to affected users in a timely manner? [GS-G-3.1; 5.27, 5.28]

How promptly are procedures replaced when changes are implemented? [GS-G-3.1; 5.27]

What are the requirements for periodic review and approval of operating procedures and supporting documentation? Are these requirements stipulated in configuration management procedures? [SSR-2/2 Requirement 26; 7.4]

3.4. Conduct of operations

3.4.1. Shift routines and operating practices

In what way are operational issues and status reported and documented? [NS-G-2.4; 4.4, 6.32] [NS-G-2.14; 4.16, 4.42, 4.49, 5.3, 5.5, 5.8, 5.18, 5.26, 5.49, 6.8]

What processes are in place to ensure adequate support to the shift supervisor on a 24/7 basis? [NS-G-2.14; 2.23, 2.24, 3.11, 4.6, 5.9, 7.11]

How does the plant minimize the volume of administrative tasks undertaken by the duty shift crew? [NS-G-2.14; 4.3, 4.6]

How does the plant make sure that activities or emergencies on one unit do not affect the other unit(s)? [SSR-2/2 Requirement 1; 3.2(d)] [NS-G-2.14; 4.11, 7.8, 7.25, 7.28]

3.4.2. Control room

How does the plant ensure and verify that operators are attentive and responsive to plant conditions? [NS-G-2.14; 3.1, 3.3, 3.5, 3.6, 3.10, 4.7-4.10]

How is it assured that shift turnovers and briefings are effective? [NS-G-2.4; 6.32] [NS-G-2.14; 4.13-4.20, 4.27, 4.28]

How are system and component status changes appropriately authorized? [NS-G-2.14; 2.7, 4.43, 5.5, 5.6, 5.38, 5.43, 7.28]

How does the plant ensure that the key locking control system effectively supports system reliability? [NS-G-2.14; 5.6]

Is control room access limited to appropriate personnel? [NS-G-2.4; 6.51] [NS-G-2.14; 4.3, 4.15]

Which verbal communication policy, e.g. 3-way communication, is applied at the plant? [SSR-2/2 Requirement 8; 4.28] [NS-G-2.14; 4.43-4.47]

How are reactivity manipulations planned, controlled and conducted? What is the role of operations management in these activities? [SSR-2/2 Requirement 30; 7.20-7.23] [NS-G-2.14; 5.21-5.25]

How does management support and encourage operations personnel to apply conservative decision-making? [SSR-2/2 Requirement 8; 4.30] [NS-G-2.14; 2.18]

3.4.3. Surveillance testing

How does the plant guarantee that the surveillance test programme is properly executed? [SSR-2/2 Requirement 31; 8.2] [NS-G-2.4; 6.42] [NS-G-2.6; 9.2] [NS-G-2.14; 2.3, 4.4, 4.50, 5.17-5.20]

How are deviations discovered in the course of surveillance tests first evaluated and then rectified?
[NS-G-2.14; 5.18]

How are the results of the surveillance programme made known to operations and on what timescale following the test? How are surveillance testing results trended and analysed for emergent issues? [NS-G-2.4; 6.34, 6.35] [NS-G-2.14; 5.18]

3.4.4. Field operations

How does the plant guarantee that operator rounds effectively verify system and equipment status? [NS-G-2.4; 6.33] [NS-G-2.14; 4.34-4.42, 5.43, 5.50, 6.6]

How does the plant control temporary storage areas? [SSR-2/2 Requirement 28; 7.10]

Is plant cleanliness and good housekeeping evident, and do operator rounds effectively verify plant cleanliness and housekeeping? [SSR-2/2 Requirement 28; 7.10] [NS-G-2.14; 2.3, 3.1, 4.36, 6.1, 6.20, 6.21, 6.26]

Do field operators report industrial safety problems? [NS-G-2.14; 4.36, 7.34]

What is the policy with respect to identification and labelling of safety related equipment? [SSR-2/2 Requirement 28; 7.12]

How are problems communicated between shifts and across departments? [NS-G-2.6; 4.9, 8.46] [NS-G-2.14; 4.35, 4.49, 7.34]

How extensive is the foreign material exclusion programme? [SSR-2/2 Requirement 28; 7.11] [NS-G-2.5; 3.9, 3.19, 4.2, 4.19, 5.19, 6.8] [NS-G-2.14; 4.36, 6.20]

3.5. Work control

How is the shift crew made aware of systems and equipment that are out of service? [NS-G-2.14; 7.5, 7.7]

How does the plant guarantee that sufficient safety equipment is maintained in service or is available? [SSR-2/2 Requirement 31; 8.10] [NS-G-2.6; 7.1] [NS-G-2.14; 7.4]

How is the work process analysed for risk? [SSR-2/2 Requirement 31; 8.6, 8.13] [NS-G-2.6; 7.2] [NS-G-2.14; 7.1, 7.8, 7.10]

What is the level of participation of operations personnel in work planning? [NS-G-2.14, 7.10, 7.11]

What is the independent verification policy with respect to work authorizations? [NS-G-2.14; 4.10, 4.26, 5.36, 7.28, 7.29]

Are equipment isolations clearly identified? [NS-G-2.14; 7.2, 7.6, 7.21-23, 7.25, 7.31, 7.32]

How is the operations department involved in outage activities to ensure proper configuration control and management of risk? [NS-G-2.14; 7.18-7.20]

3.6. Fire prevention and protection programme

3.6.1. Equipment and systems

How does the plant guarantee that portable firefighting equipment is well maintained? [SSR-2/2 Requirement 21; 5.21(c)] [NS-G-2.1; 7.1, 7.2] [NS-G-2.14; 6.22]

How is it confirmed that fire barriers are adequately maintained? [SSR-2/2 Requirement 21; 5.21(c)] [NS-G-2.1; 3.2, 6.1, 7.1-7.3, 9.2(a)(b), Table A-I] [NS-G-2.6; 9.18]

What does the plant surveillance test programme consist of? [NS-G-2.1; 7.2, 8.1] [NS-G-2.4;

6.59]

How does the plant ensure that there is systematic control of combustible materials and ignition sources? [SSR-2/2 Requirement 21; 5.21(b)] [NS-G-2.1; 6.1-6.8] [NS-G-2.6; 4.26, 5.15, 8.33]

3.6.2. Firefighting personnel

How does the plant ensure that there is a fully qualified on-shift fire brigade available at all times? [NS-G-2.1; 8.6, 10.3] [NS-G-2.8; 4.28, 4.34]

How is it confirmed that personnel are suitably qualified and possess experience commensurate with their responsibilities? [NS-G-2.1; 9.3]

What initial and refresher training is undertaken by the plant's fire team? [NS-G-2.1; 9.1-9.6]

What fire control strategies are in place? E.g. restrictions on smoking, limited use of temporary wiring, etc. [NS-G-2.1; 6.9] [NS-G-2.14; 4.36, 6.22]

Are the local civil firefighting groups adequately instructed and trained on site requirements and hazards? [SSR-2/2 Requirement 22; 5.24] [NS-G-2.1; 2.18, 8.2] [NS-G-2.8; 4.34] [RS-G-1.1; 6.14]

What is the scope and frequency of fire drills and exercises? [SSR-2/2 Requirement 22; 5.24] [NS-G-2.1; 3.2, 8.1, 8.6]

What fire training facilities are used to train plant firefighters? [NS-G-2.1; 9.1]

3.6.3. Fire safety analyses

What is the status of the plant's fire hazards analysis and how frequently is it reviewed? [SSR-2/2 Requirement 22; 5.22]

How has the plant determined the adequacy of its fire protection systems? [SSR-2/2 Requirement 22; 5.21] [NS-G-2.1; 6.6, 6.15, 10.1] [NS-G-2.2; I.39]

How does the plant assess the impact of plant modifications on fire safety measures? [SSR-2/2 Requirement 22; 5.21(f)]

3.7. Control of plant configuration

How does the plant configuration control system ensure that changes to operational practices and operational documentation are properly handled, and that operations personnel are using the latest revisions of operational documents? [SSR-2/2 Requirement 10; 4.38] [NS-G-2.14; 4.24]

What is the system for obtaining operations department permission/authorisation for all maintenance activities before they are commenced, in order to keep continued configuration control and to ensure safe operation of the plant? [SSR-2/2 Requirement 31; 8.10] [NS-G-2.6, 4.9] [NS-G-2.14; 7.5-7.7]

How does the system in place ensure that operating procedures remain fit for their purpose and are modified, verified, validated and approved, as necessary? How does the system ensure that all affected personnel use the latest versions of procedures? [SSR-2/2 Requirement 26; 7.1-7.4] [NS-G-2.2; 8.1, 8.6, 8.7] [NS-G-2.14; 4.22-4.24]

3.8. Use of PSA and PSR

What kinds of PSA applications do operators use in their daily activities? Are operators trained to use them? [SSG-3; section 10]

Are operators familiar with PSA results, especially regarding human error as a contributing factor to core damage? Does the operations department use PSA applications for scheduling and planning work? [SSG-3; 5.107-5.111] [NS-G-2.14; 5.15, 7.10]

What areas of plant operations did the last PSR review cover? Were operations personnel informed of the results of the last PSR, as regards operational practices? [SSG-25; 4.1, 8.11]

Did the last PSR identify any deviations from standard practices for plant operation, and were any recommendations prescribed as a result? What corrective measures were implemented? [SSG-25; 5.96]

How does the plant ensure that self-assessment techniques are effectively applied to operations activities? [SSR-2/2 Requirement 9; 4.34] [NS-G-2.4; 6.33] [NS-G-2.14; 2.20, 5.25]

3. OPS

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

4. MAINTENANCE

4.1. Organization and functions

4.1.1. Functions and responsibilities

How are organizational structure, responsibilities, levels of authority and functions defined and communicated within the maintenance organization? Are they understood by personnel [SSR-2/2 Requirement 1; 3.2(b)(d), Requirement 2; 3.5, Requirement 3; 3.8, 3.9] [NS-G-2.4; 2.11] [NS-G-2.6; 3.8, 3.9, 4.11]

How are the goals, objectives and safety indicators related to maintenance developed and managed? How are outcomes checked and measured within the organization? [SSR-2/2 Requirement 9; 4.33-4.37] [NS-G-2.6; 2.7, 2.8, 3.3, 4.4,]

How are maintenance policies and programmes kept up-to-date? What internal process is put in place in this regard? [SSR-2/2 Requirement 31] [NS-G-2.4; 6.2, 6.3, 6.5-6.7, 6.36] [NS-G-2.6; 2.7, 3.1, 3.3] [NS-G-2.11; 7.2]

4.1.2. Personnel

What is the staffing level, including the use of contractors, in the maintenance area? How does the plant ensure that there is enough manpower to cover outage and operation workloads? [SSR-2/2 Requirement 4; 3.10, 3.11] [NS-G-2.6; 3.7, 4.6, 4.11, 4.12, 4.15] [GS-G-3.1; 4.1]

How are maintenance staff, including contractors, qualified for their assigned work? What measures have been taken to maintain adequate levels of experience, knowledge and proficiency? [SSR-2/2 Requirement 4; 3.10, Requirement 7; 4.16, 4.20, 4.21] [NS-G-2.6; 4.30-4.38] [NS-G-2.4; 7.18] [NS-G-2.8; 5.22-5.26, 5.30] [GS-G-3.1; 4.6, 4.17-4.19]

4.2. Maintenance facilities and equipment

How are maintenance facilities promoting safe and efficient completion of works? How does the plant establish that there are enough facilities for all maintenance work? [NS-G-2.6; 8.6-8.20] [NS-G-2.4; 7.19] [NS-G-2.7; 3.56]

What training facilities and mock-ups are available for major activities? [SSR-2/2 Requirement 7; 4.21, 4.24] [NS-G-2.6; 8.15] [NS-G-2.7; 5.4, 5.6]

How are tools and equipment maintained and controlled? Is the quantity of consumable supplies adequate and available when needed? Is there any history of extending the maintenance window for a safety related plant system - that has been taken out of operation - owing to lack of spare parts? [SSR-2/2 Requirement 31; 8.15, 8.16] [NS-G-2.6; 4.26, 8.19, 9.41-9.44, 10.21-10.23] [GS-G-3.5; 5.157, 5.160]

How is measurement and testing equipment calibrated and controlled to ensure accuracy and traceability? [NS-G-2.6; 9.41-9.44] [GS-G-3.1; 5.34] [GS-G-3.5; 5.29] [NS-G-2.4; 7.20]

How are decontamination facilities and remote controlled tools used to minimize radiation doses? [NS-G-2.6; 8.12-8.14, 8.16, 8.20] [NS-G-2.7; 3.11-3.13]

4.3. Maintenance programmes

How are different types of maintenance (preventive, corrective, predictive, etc.) balanced to optimize the maintenance programme? [SSR-2/2 Requirement 31; 8.1] [NS-G-2.6; 2.6, 5.36, 5.37, 8.2]

4.3.1. Preventive maintenance programme

How are the scope and frequencies of preventive maintenance activities determined? How does the plant ensure the completeness of the programme? [SSR-2/2 Requirement 31; 8.5] [NS-G-2.6; 4.5, 8.4]

How are preventive maintenance activities managed and controlled to ensure timely completion? [SSR-2/2 Requirement 31; 8.8] [NS-G-2.6; 2.3]

How is the effectiveness of the preventive maintenance programme evaluated in terms of improving equipment reliability and availability? [SSR-2/2 Requirement 3; 3.2(e)] [NS-G-2.6; 5.34, 5.36]

How is identified equipment degradation managed and corrected? How are priorities established for repairing degraded equipment? [SSR-2/2 Requirement 31; 8.12] [NS-G-2.6; 4.11] [NS-G-2.12; 4.11, 4.22, 4.26, 4.27]

What kinds of predictive maintenance techniques are used? How are new, proven practices incorporated? How are these inputs used for revising the maintenance programme? [SSR-2/2 Requirement 31; 8.5] [NS-G-2.6; 2.3, 2.7, 5.37]

How are risk assessment results used to determine maintenance and inspection requirements? [NS-G-2.12; 4.16]

4.3.2. Corrective maintenance

What process is in place to effectively identify deficiencies? [SSR-2/2 Requirement 31; 8.12] [NS-G-2.6; 8.46] [GS-G-3.1; 6.59-6.62] [NS-G-2.14; 4.34-4.42]

What are the objectives for uncompleted work (maintenance backlog) and how is the latter controlled? What is the current status, and how is its cumulative impact on plant safety assessed and communicated? [SSR-2/2 Requirement 31; 8.12-8.14] [NS-G-2.6; 5.19]

How is the effectiveness of the corrective maintenance programme reviewed? How are improvements made in response to review results? [SSR-2/2 Requirement 31; 8.14] [NS-G-2.6; 5.33, 5.34, 5.36-5.38]

4.3.3. Ageing management

How is equipment degradation identified? What process is in place for this purpose? [SSR-2/2 Requirement 14; 4.50, 4.51] [NS-G-2.12; 4.11, 4.22, 4.23, 4.29, 4.31, 4.32] [NS-G-2.6; 2.12, 7.8, 9.37]

How is information on components susceptible to age-related failures processed and used? [SSR-2/2 Requirement 14; 4.50, 4.51] [NS-G-2.6; 6.12, 9.20] [NS-G-2.12; 4.14-4.17]

How is monitoring of ageing undertaken, and how are corrective actions taken for different inspection results? [SSR-2/2 Requirement 14; 4.50, 4.51] [NS-G-2.12; 4.22-4.45]

4.3.4. In-service inspection

How does the plant ensure that in-service inspection (ISI) inspectors are qualified and knowledgeable of specific ISI techniques? [SSR-2/2 Requirement 4; 3.11] [NS-G-2.4; 7.23] [NS-G-2.6; 10.24-10.34]

How are ISI results being reviewed and analysed in the plant? How are corrective actions being taken? What actions does the plant take based on the output from its reviews of in-service inspections? [SSR-2/2 Requirement 31; 8.4] [NS-G-2.6; 6.7-6.9]

4.4. Procedures, records and maintenance history

How are historical records and files periodically reviewed and analysed to identify the root causes of problems? How are these results used to improve maintenance performance? [SSR-2/2 Requirement 15; 4.52] [SSR-2/2 Requirement 31; 8.4] [NS-G-2.6; 3.3, 6.12, 6.13]

What process is in place to trend safety performance and to analyse the causes of adverse trends in the maintenance area? [SSR-2/2 Requirement 31, 8.4, 8.6] [NS-G-2.11; 6.4, 6.5]

4.5. Conduct of maintenance work

How is maintenance work properly authorized, controlled and documented? [SSR-2/2 Requirement 31; 8.8-8.10] [NS-G-2.6; 4.23, 5.1-5.19, 5.23-5.32] [GS-G-3.1; 2.21]

How is the safety of personnel and equipment ensured when conducting maintenance field activities? [SSR-2/2 Requirement 31; 8.8, 8.9] [NS-G-2.6; 5.15-5.17]

How does the plant guarantee that adequate resources are made available for maintenance activities? Are there any examples of cases where a lack of resources caused unnecessary delays in the completion of maintenance activities? If so, which examples best illustrate this? [SSR-2/2 Requirement 31; 8.12, 8.14, 8.20] [GS-G-3.1; 4.1, 4.2] [NS-G-2.6; 3.7, 4.11, 4.12, 4.15, 5.23, 5.36, 5.37]

How is it confirmed that procedures are followed in the field as prescribed by plant requirements? [SSR-2/2 Requirement 31] [NS-G-2.6; 3.8, 3.9, 5.6, 5.14]

What schemes are in place for monitoring plant conditions, activities and personnel attitudes through systematic walkdowns by managers? How are deviations managed? [SSR-2/2 Requirement 9; 4.35, 4.37] [GS-G-3.5; 6.3]

How are human performance tools used in the field? How are aspects of the working environment, that are impacting human performance, identified and controlled? [SSR-2/2 Requirement 8; 4.28, 4.29, Requirement 31; 8.9] [NS-G-2.6; 2.11, 4.30, 5.36]

How are managers and supervisors effectively coaching and observing field workers to reinforce correct behaviours and plant expectations? [SSR-2/2 Requirement 9; 4.34, 4.35] [GS-G-3.1; 6.19]

How is the work of contractors controlled and monitored? [SSR-2/2 Requirement 5; 4.3, Requirement 7; 4.20] [NS-G-2.6; 3.8, 3.9]

How is post maintenance/modification testing carried out? [SSR-2/2 Requirement 31; 8.10] [NS-G-2.6; 8.50, 8.53-8.55, 9.4] [NS-G-2.14; 5.14]

4.6. Material condition

What standards are in place to promote good material condition? How is plant material condition maintained to a high standard? [SSR-2/2 Requirement 28; 7.10-7.12] [NS-G-2.6; 4.26, 4.29, 8.32-8.37, 10.1]

How is degradation of material condition identified in a timely manner? How are corrective actions taken? [SSR-2/2 Requirement 28; 7.10] [NS-G-2.14; 7.33]

What is the extent of the plant's foreign material exclusion (FME) programme? How is the FME programme implemented, controlled and optimized in the field? [SSR-2/2 Requirement 28; 7.11] [NS-G-2.5; 3.9, 3.19, 4.2, 4.19, 5.19, 6.8]

4.7. Work control

Describe the work control process in place at the plant. How is the effectiveness of the work control process monitored? [SSR-2/2 Requirement 31; 8.8-8.10] [NS-G-2.6; 5.14-5.19, 5.23-5.26]

What approved work authorization documents are in place? [SSR-2/2 Requirement 31; 8.9, 8.10] [NS-G-2.6; 5.1, 5.6, 5.9, 5.14]

How are works being prioritized and how effective is the process in addressing safety-significant issues? [SSR-2/2 Requirement 31; 8.14] [NS-G-2.6; 8.1-8.5] [NS-G-2.14; 7.10] [GS-G-3.1; 5.2]

How are material and manpower requirements considered during work planning? [GS-R-3; 4.1] [GS-G-3.5; 4.8-4.25] [NS-G-2.6; 4.6, 4.11, 4.12, 8.23]

How are temporary modifications minimized? How is the maintenance backlog controlled and analysed? Are there any safety indicators to monitor this backlog? [SSR-2/2 Requirement 9; 4.34, Requirement 11; 4.41, 4.42, Requirement 31; 8.1, 8.12, 8.14] [NS-G-2.3; 6.3]

How is outage planning integrated into the work control process? [SSR-2/2 Requirement 32; 8.18] [NS-G-2.6; 5.20-5.22]

How is it confirmed that interfaces between maintenance and other groups in the plant are effective? [SSR-2/2 Requirement 31; 8.11] [NS-G-2.6; 3.12]

How is the ALARA principle incorporated into the planning and implementation of work activities? [SSR-2/2 Requirement 8; 4.25, Requirement 20; 5.16] [NS-G-2.6; 4.23] [NS-G-2.7; 3.39]

4.8. Spare parts and materials

Who is responsible for procurement and goods-receipt inspections? How are spare parts procured and then inspected upon receipt? What procedures govern the process? [SSR-2/2 Requirement 31; 8.15, 8.16] [NS-G-2.6; 8.21-8.23]

How are the quality and technical specifications of spare parts and materials maintained consistent with plant design? [SSR-2/2 Requirement 31; 8.16] [NS-G-2.6; 8.24-8.26, 8.29]

What controls has the plant implemented regarding the use of commercial-grade spare parts? [SSR-2/2 Requirement 31; 8.16] [GS-G-3.5; 5.35-5.37]

How does the plant guarantee that there are adequate spare parts and material management facilities to meet its needs? [SSR-2/2 Requirement 31; 8.17] [NS-G-2.6; 8.32]

How are appropriate environmental conditions maintained within storage facilities? [SSR-2/2 Requirement 31; 8.15, 8.17] [NS-G-2.6; 8.33]

How are stock levels defined, and what particular attention is paid to critical components? [SSR-2/2 Requirement 31; 8.15, 8.16] [NS-G-2.6; 8.24-8.29]

How are CSFIs (counterfeit, suspect and fraudulent items) prevented from entering the plant for use in systems and components? How are certificates of spare parts from outside-suppliers checked and confirmed? [SSR-2/2 Requirement 31; 8.15, 8.16] [NS-G-2.6; 8.24, 8.27, 8.29] [GS-G-3.5; 5.161, 5.162]

How does the plant guarantee that safety related spare parts and materials are traceable? [NS-G-2.6; 8.39]

How is preventive maintenance performed on spare parts? [GS-G-3.5; 5.153]

What process is in place to deal with repairs and returns of spare parts, and surplus spare parts? [SSR-2/2 Requirement 31; 8.15] [GS-G-3.5; 5.154] [NS-G-2.6; 8.21-8.23, 8.39]

How are obsolete, non-conforming and damaged spare parts controlled? [SSR-2/2 Requirement 31; 8.15] [NS-G-2.6; 8.42, 8.49, 8.50]

Are periodic QA audits and self-assessments performed and, if so, at what frequency? [SSR-2/2 Requirement 9; 4.33-4.35] [GS-G-3.1; 6.12] [NS-G-2.6; 5.33-5.38]

4.9. Outage management

How are the outage organization and associated responsibilities defined? [SSR-2/2 Requirement 32; 8.20-8.22] [NS-G-2.6; 5.20, 5.22]

What continuous outage improvement process is in place to optimize outage performance? [SSR-2/2 Requirement 32; 8.18, 8.24, 5.21]

How is outage preparation conducted? How does this effectively control the milestones of outage preparation and the outage scope freeze date? How does outage preparation take into account past lessons learned as well as external lessons? [SSR-2/2 Requirement 32; 8.24] [NS-G-2.6; 5.21] [NS-G-2.11; 7.2]

How is nuclear safety reviewed during the outage? How is defence-in-depth maintained throughout the outage? What process is in place to review changes to the outage in terms of their implications for outage safety? [SSR-2/2 Requirement 32; 8.19, 8.20] [NS-G-2.6; 5.22]

How is outage execution monitored in terms of safety, quality and schedule adherence? [SSR-2/2 Requirement 32; 8.19] [NS-G-2.6; 5.22, 7.3]

How are contractors managed during the outage? What attention is given to the experience level of contractors present during the outage? [SSR-2/2 Requirement 32; 8.21, 8.23] [NS-G-2.6; 3.8, 3.9] [GS-G-3.5; 5.79-5.83]

How are radiation protection, waste reduction and control of chemical hazards considered in the outage programme? [SSR-2/2 Requirement 32; 8.23] [NS-G-2.6; 4.23] [NS-G-2.7; 4.2, 4.4, 4.6, 4.8]

How are personnel trained in specific aspects related to the outage, such as any infrequently performed activities, specific configurations during the outage, high-risk time windows for the outage, etc.? [SSR-2/2 Requirement 7; 4.16, 4.17, 4.19, 4.20, Requirement 32; 8.20] [NS-G-2.8; 4.1]

What long-term planning and scheduling is undertaken for plant outages? [SSR-2/2 Requirement 32; 8.18] [NS-G-2.6; 4.21]

4.10. Configuration control

How is control of plant configuration ensured during maintenance and prior to the return-to-service of plant equipment? [SSR-2/2 Requirement 10; 4.38, Requirement 11; 4.39, Requirement 31; 8.10] [NS-G-2.6; 5.17, 5.28]

What kinds of administrative procedures and controls are implemented to ensure control of plant configuration during maintenance and surveillance activities? [SSR-2/2 Requirement 31; 8.3] [NS-G-2.3; 7.1-7.3] [NS-G-2.6; 4.26, 9.9]

What system is in place for informing control room operators of all maintenance activities before they are commenced in order to maintain configuration control and ensure safe operation of the plant? [NS-G-2.6; 4.9]

4.11. Use of PSA, PSR and OEF

How does the maintenance department use PSA applications in order to optimize maintenance activities? [SSR-2/2 Requirement 31; 8.5, 8.6, 8.13] [NS-G-2.6; 7.2-7.5] [SSG-3; 10.36, 10.37, 10.52]

How are the results of periodic safety reviews utilized to identify any necessary modifications, with a view to enhancing the maintenance programme? [SSR-2/2 Requirement 12; 4.44, Requirement 31; 8.13] [SSG-25; 3.8, 5.29, 5.41, 5.47, 5.86] [NS-G-2.3; 2.2, 3.8] [NS-G-2.6; 7.7, 7.9] [NS-G-2.12; 5.5, 7.1, 7.9-7.11]

How does the maintenance department use OEF for continuous improvement of its maintenance activities? [SSR-2/2 Requirement 24; 5.27] [NS-G-2.6; 6.11-6.14]

4. MA

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

5. TECHNICAL SUPPORT

5.1. Organization and functions

5.1.1. Functions and responsibilities

How are organizational structure, responsibilities, levels of authority and functions defined and communicated within the technical support organization? Are they understood by personnel? [SSR-2/2 Requirement 1; 3.2(b)(d), Requirement 3; 3.8, 3.9] [NS-G-1.1; 3.28, 3.31] [NS-G-2.3; 3.1] [NS-G-2.4; 2.9-2.12, 2.14, 2.15, 3.2-3.5] [NS-G-2.5; 8.1, 8.2] [NS-G-2.6; 5.23-5.25]

How are the goals, objectives and safety indicators related to technical support developed and managed? How are outcomes checked and measured within the organization? [SSR-2/2 Requirement 9; 4.33-4.37] [NS-G-2.4; 3.21] [NS-G-2.6 2.7, 3.3, 4.4]

How are technical support policies and programmes kept up-to-date? What internal process is put in place in this regard? [SSR-2/2 Requirement 31; 8.1-8.3] [NS-G-2.6 2.7, 3.1, 3.3] [NS-G-2.11; 7.2]

In what way are the interface responsibilities with other plant groups/departments defined, and how is mutual understanding guaranteed? [NS-G-2.4; 3.5, 6.34, 6.35] [NS-G-2.5; 8.5] [NS-G-2.6; 3.12, 5.26]

In what way are the interface responsibilities with corporate organizations and contractors specified, supervised and evaluated? [SSR-2/2 Requirement 5; 4.3] [NS-G-2.3; 3.17] [NS-G-2.4; 4.5, 4.7-4.10] [NS-G-2.5; 8.2] [NS-G-2.6; 3.10, 3.11, 5.26]

How does the plant guarantee that technical support activities are effectively planned and scheduled during normal operation as well as during outages? [NS-G-2.4; 5.20-5.22] [NS-G-2.6; 4.17, 4.18, 4.25, 4.26, 5.14, 5.20-5.22, 5.23, 5.24]

5.1.2. Personnel

How does the plant ensure that it has the necessary in-house or contracted human resources needed to perform all relevant technical support activities? [SSR-2/2 Requirement 4; 3.11] [NS-G-1.1; 2.12, 2.149] [NS-G-2.3; 3.5] [NS-G-2.4; 2.5-2.7, 2.9(1)(5)(15), 2.10] [NS-G-2.5; 8.6, 8.7] [NS-G-2.6; 4.6]

How does the plant ensure that its technical support staff, including contractors, have adequate experience and proficiency? [SSR-2/2 Requirement 4; 3.10-3.11, Requirement 7; 4.16-4.19] [GSR part 4 Requirement 3; 4.2] [NS-G-1.1; 2.14, 3.28] [NS-G-2.3; 3.5] [NS-G-2.4; 2.14, 2.15, 6.16-6.20] [NS-G-2.5; 8.6, 8.7] [NS-G-2.6; 3.8, 3.9, 4.30-4.37] [NS-G-2.8; 2.1, 2.5-2.7, 3.2, 3.17]

5.1.3. Monitoring, control, review and analysis of safety performance

How is the technical support function used in the evaluation of plant safety performance?

How is it ensured that technical support assessments are systematically taken into consideration for activities that may have an impact on safety? [SSR-2/2 Requirement 8; 4.25] [GSR part 4 Requirement 4; 4.4-4.15, Requirement 6; 4.19, Requirement 7; 4.20, 4.21, Requirement 9; 4.24-4.26, Requirement 11; 4.38-4.41]

How does the plant ensure that self-assessment techniques are effectively applied to technical support activities? [SSR-2/2 Requirement 8; 4.34] [NS-G-2.4; 6.48]

5.2. Periodic safety review

What is the extent of the PSR performed on site? [SSR-2/2 Requirement 5; 4.4, Requirement 12; 4.44, 4.46] [SSG-25; 2.5-2.7, 2.12, 2.13, 2.17, 2.18, 4.1] [SSG-2; 8.27] [NS-G-2.4; 6.49, 6.50]

How often does the operating organization conduct a safety review to monitor the cumulative effects of plant modifications on plant safety? [NS-G-2.3, 3.8] [NS-G-2.4. 6.49, 6.50]

How does the plant evaluate the results from its PSR, and how are corrective actions documented and implemented? [SSR-2/2 Requirement 12; 4.47] [SSG-25; 4.21, 4.25-4.28, 5.3, 5.4, 5.9-5.13, 6.1, 6.2, 6.6-6.12]

How does the plant use the PSR to enhance its technical support programmes (e.g. long-term operation, plant modifications and surveillance)? [SSR-2/2 Requirement 12; 4.44, 4.46-4.47] [SSG-25; 1.4, 2.10, 3.1-3.10, 5.28, 5.41, 5.46, 5.153] [NS-G-2.3; 2.2, 3.8] [NS-G-2.6; 7.7, 7.9] [NS-G-2.12; 2.1, 2.17, 5.5, 7.1, 7.9-7.11] [NS-G-2.4, 6.49]

What system is there in place to update the Safety Analysis Report (SAR) as a result of the PSR? [SSG-25; 3.8, 4.14, 9.3, 9.5] [GS-G-4.1; 4.4]

5.3. Programme for long-term operation

[Note: if LTO is reviewed as a separate module, on this particular subject the TS reviewer will support the LTO reviewer, as per the WNO for LTO]

What is the plant policy in the area of long-term operation and ageing management? [SSR-2/2 Requirement 14; 4.50, 4.51] [GS-R-3; 3.7] [GS-G-3.1; 3.10-3.12, 5.10] [NS-G-2.12; 4.2] [SRS No.57; 2.1]

If applicable, how has the plant prepared and justified safe operation beyond the timeframe established in the license conditions, design limits, safety standards and/or regulations? [SSR-2/2 Requirement 16; 4.53, 4.54]

If applicable, to what extent has the plant used periodic safety review results in order to evaluate plant safety for long-term operation? [SSR-2/2 Requirement 16; 4.53] [SSG-25; 3.1-3.10]

If applicable, how is ageing management used to support long-term operation? [SSR-2/2 Requirement 16; 4.53] [NS-G-2.12; 6.1-6.5]

If applicable, how does the plant verify that all SCs within the scope of LTO are covered by appropriate programmes such as Aging Management Programmes (AMPs), revalidation of time-limited ageing analyses or other existing programmes? [SSR-2/2 Requirement 16; 4.54]

If applicable, are staff involved in LTO activities assigned specific job descriptions/task responsibilities? [GS-G-3.5]

If applicable, does the plant have plant-level documentation covering the LTO concept and approach? [NS-G-2.12; 3.2, 3.3, 4.14]

5.4. Ageing management

What system is there in place to ensure that the required safety functions of systems, structures and components are fulfilled over the entire lifetime of the plant? [SSR-2/2 Requirement 14; 4.50, 4.51] [NS-G-2.4; 6.77, 6.78] [NS-G-2.6; 7.7] [NS-G-2.12; 2.3-2.13, 3.1-3.3, 3.15-3.22, 4.1, 4.10-4.45] [GS-G-4.1; 3.166]

What system is there in place to manage obsolescence? [NS-G-2.12; 5.1-5.7]
How are the periodic safety review results utilized in ageing management? [SSR-2/2 Requirement 14; 4.44, 4.50] [NS-G-2.12; 7.9-7.11]

How are the insights from surveillance programme utilized in ageing management? [NS-G-2.6; 7.6-7.8]

5.5. Use of PSA

[Note: if PSA applications are reviewed as a separate module, on this particular subject the TS reviewer will support the PPSA reviewer, as per the WNO for PPSA]

What is the extent of the PSA analysis (Level 1, 2, 3, external, internal events)? How is it used by the plant? [SSR-2/2 Requirement 8; 4.32] [GSR part 4 Requirement 15; 4.53, 4.55] [GSR part 4 Requirement 24; 5.8] [SSG-3, 2.2, 2.3, 2.9, 2.10-2.20, 2.21-2.24, 2.27-2.29, 2.31, 10.6, 10.7]

How often is the PSA analysis updated to account for plant modifications? When was the PSA last reviewed, and how does it confirm that the existing PSA model is valid and reflects current plant configuration? [NS-G-2.3; 3.8] [SSG-3; 2.7, 2.8]

Are any PSA applications implemented and, if so, which ones exactly? To what extent is the technical support function involved in their development? What are the results? What examples can be put forward? [SSR-2/2 Requirement 31; 8.5, 8.6] [NS-G-2.6; 7.10] [SSG-3; 10.36, 10.37, 10.52]

Does the plant use the PSA results to evaluate changes to the allowed outage times [AOT] and to further develop the risk profile of a typical outage? [SSG-3; 2.9, 2.31, 9.66, 10.29]

5.6. Surveillance programme

[Note: TS reviewer should liaise with the OPS reviewer to observe surveillance testing both in the field and in the control room]

5.6.1. Programme requirements

How does the plant ensure that the surveillance programme is comprehensive, adequate, and in compliance with operational limits and conditions? [SSR-2/2 Requirement 31; 8.1, 8.2] [NS-G-2.4; 6.42] [NS-G-2.6; 2.11, 2.12, 9.1, 9.2, 9.5-9.9, 9.10-9.14, 9.15-9.17, 9.18]

To what extent is the safety analysis report used to specify and update the surveillance programme? [GSR part 4 Requirement 24; 5.4, 5.5] [SSG-2; 7.12] [SSG-3; 2.31, 10.30, 10.34]

How does the plant ensure that the surveillance programme does detect an abnormal condition before it can give rise to significant consequences for safety? [SSR-2/2 Requirement 31; 8.2] [NS-G-2.4; 6.42] [NS-G-2.6; 2.11, 2.12, 3.3] [GS-G-4.1; 3.162]

5.6.2. Surveillance scheduling

What is the basis for the selected frequency of surveillance activities? [SSR-2/2 Requirement 31; 8.5] [NS-G-2.6; 9.19-9.30] [GS-G-4.1; 3.162]

5.6.3. Administrative controls and procedures

How does the plant ensure that its administrative procedures for surveillance testing are comprehensive, clear and understood by personnel? [SSR-2/2 Requirement 31; 8.3] [NS-G-2.4; 5.14] [NS-G-2.6; 4.25-4.28, 5.1-5.13]

How is data from the surveillance programme recorded, stored and analysed? [SSR-2/2 Requirement 31; 8.4] [NS-G-2.6; 6.1-6.3, 6.5-6.10, 6.11-6.13, 9.45]

5.6.4. Conduct of surveillance testing

How is it confirmed that the surveillance test programme is properly executed? [SSR-2/2 Requirement 31; 8.2] [NS-G-2.4; 6.42] [NS-G-2.6; 9.2] [NS-G-2.14; 2.3, 4.4, 4.50, 5.17-5.20]

How are deviations discovered in the course of surveillance tests evaluated and rectified? [SSR-2/2 Requirement 31; 8.2] [NS-G-2.14; 5.18]

How are the results of the surveillance programme made known to operations, and on what timescale following the tests themselves? [NS-G-2.4; 6.34, 6.35] [NS-G-2.14; 5.18]

How does the plant ensure that its surveillance activities are properly authorized and are carried out in a safe way, and that results are documented? [SSR-2/2 Requirement 31; 8.7-

8.10] [NS-G-2.6; 4.17-4.24, 5.14-5.19, 9.45]

5.7. Plant modification system

How does the plant ensure that all modifications are properly identified, specified, screened, designed, evaluated, authorized, implemented and recorded? [SSR-2/2 Requirement 11; 4.39, 4.40] [NS-G-2.4; 5.15, 6.72, 6.73] [NS-G-2.3; 2.3-2.5, 2.7-2.13, 4.3-4.7, 4.13-4.18, 7.1-7.13, 8.1-8.3] [GS-G-4.1; 3.167]

What procedures are to be followed during implementation of a plant modification? [NS-G-2.3; 7.2]

How is it confirmed that temporary modification procedures are effectively implemented? [SSR-2/2 Requirement 11; 4.40] [NS-G-2.14; 5.11]

What system is there in place to ensure that temporary modifications are limited in time and number? [SSR-2/2 Requirement 11; 4.41] [NS-G-2.3; 6.1-6.9]

How frequently are checks made of installed temporary modifications to ensure continued applicability? [NS-G-2.2; 10.6] [NS-G-2.14; 5.42]

How does the plant analyse and ensure that the cumulative safety significance of existing temporary modifications is minimized? [SSR-2/2 Requirement 11; 4.41]

How is it confirmed that all relevant plant documents and programmes are in accordance with a modification? [SSR-2/2 Requirement 11; 4.42]

5.7.1. Modifications to computer hardware and software

What specific system is there in place to ensure safety and security when the hardware or software of plant computer systems is modified? [SSR-2/2 Requirement 11; 4.39, 4.42, Requirement 17; 5.1] [NS-G-1.1; 2.11, 3.1, 3.2-3.5, 3.7-3.27] [NS-G-2.3; 4.24-4.29]

5.7.2. Safety assessment of plant modifications

What system is there in place to ensure that the safety of plant modifications is assessed and evaluated with, for example, deterministic and probabilistic methods? [SSR-2/2 Requirement 11; 4.40] [GSR part 4 Requirement 4; 4.6, 4.15, Requirement 24; 5.2] [NS-G-2.4; 6.46] [SSG-2; 8.10-8.14] [SSG-3; 2.22-2.24] [NS-G-2.3; 3.8, 4.8-4.12]

5.7.3. Administrative controls and procedures

How is it ensured that the administrative procedures for plant modifications are comprehensive, clear and understood by personnel? [SSR-2/2 Requirement 11; 4.42] [NS-G-2.4; 5.14] [NS-G-2.3; 3.2, 3.6, 3.7]

How does the plant guarantee that all safety related modifications are reviewed and approved by operating staff? [SSR-2/2 Requirement 11; 4.43] [NS-G-2.2; 3.13-3.16] [NS-G-2.14; 4.4, 4.36, 5.9, 5.38, 5.41]

What is the process for revising normal and emergency operating procedures to reflect modifications in the plant? And how does the operating organization ensure that operations personnel are using the latest and approved versions of controlled documents? [SSR-2/2 Requirement 11; 4.42]

How does the plant ensure that its personnel are trained, and that all relevant documents necessary for plant operation are updated before the commissioning of any modified plant? [SSR-2/2 Requirement 11; 4.43] [NS-G-2.3; 3.9, 7.14-7.20]

5.7.4. Control of plant configuration

What system is there in place to ensure consistency between design requirements, physical configuration and plant documentation? [SSR-2/2 Requirement 10; 4.38, Requirement 11; 4.42] [NS-G-2.3; 11.1-11.6] [GS-G-4.1; 3.167]

How is it ensured that design basis documentation reflects the current status of the plant over its lifetime? [SSR-2/1 Requirement 14; 5.3]

How can it be ensured that all documents relevant to the safe and reliable operation of the plant are kept current? [NS-G-2.4; 6.76],

How does this system ensure that plant procedures remain fit for purpose, and are modified, verified, validated and approved as necessary? How does it ensure that all affected personnel are using the latest versions of procedures? [SSR-2/2 Requirement 26; 7.1-7.4]

Is there a procedure for determination of retention times for operational and maintenance records? [SSR-2/2 Requirement 15; 4.52]

Does the operating organization apply methods of configuration management when modifying OLCs or operational procedures in order to ensure consistency with all other documentation? [NS-G-2.2; 3.14, 8.7, 10.4]

5.7.5. Equipment qualification

How is it ensured that safety related items used in plant modifications are capable of fulfilling their intended functions for all anticipated conditions? [SSR-2/2 Requirement 13; 4.48, 4.49] [GSR part 4 Requirement 7; 4.21, Requirement 10; 4.28] [NS-G-2.3; 4.17, 7.8]

5.8. Reactor core management (reactor engineering)

5.8.1. Handling of fresh fuel

What system does the plant have in place to ensure that fresh fuel has been manufactured and

assembled in accordance with safety requirements? [SSR-2/2 Requirement 30; 7.18, 7.19] [NS-G-2.4; 6.44] [NS-G-2.5; 2.3, 2.24, 2.25, 2.38-2.42, 4.2]

What system is there in place for the handling, receipt and storage of fresh fuel? [SSR-2/2 Requirement 30; 7.26-7.29] [NS-G-2.4; 6.44] [NS-G-2.5; 2.3, 2.25, 3.1-3.31]

5.8.2. Core management

How does the reactivity management programme ensure safe operation of the plant and guarantee that no fuel or core limitations are violated? [SSR-2/2 Requirement 30; 7.20, 7.21] [NS-G-2.4; 6.44] [NS-G-2.5; 2.1-2.3, 2.8-2.10, 2.12-2.15, 2.16-2.23, 2.53]

What system is there in place for monitoring in-core fuel integrity, and how is failed fuel handled? [SSR-2/2 Requirement 30; 7.24] [NS-G-2.5; 2.3, 2.24-2.36, 5.19, 5.20]

5.8.3. Handling of irradiated fuel

What system does the plant have in place to ensure fuel integrity and control of foreign materials during the refuelling, unloading and storage of irradiated fuel? [SSR-2/2 Requirement 30; 7.26-7.29] [NS-G-2.4; 6.44] [NS-G-2.4; 2.3, 2.43-2.52, 4.1, 4.11-4.20, 5.1-5.23]

What system is there in place for safe dispatch of spent fuel? [NS-G-2.5; 7.1-7.6]

5.8.4. Handling and storage of core components

What system does the plant have in place for the handling and storage of core components? [NS-G-2.5; 6.1-6.8]

5.8.5. Administrative controls and procedures

How does the plant ensure that its administrative procedures for core management are comprehensive, clear and understood by personnel? [SSR-2/2 Requirement 30; 7.19] [NS-G-2.3; 3.2, 3.6, 3.7] [NS-G-2.4; 5.14, 6.44] [NS-G-2.5; 2.2, 2.12, 2.14, 2.27, 2.43, 3.2-3.14, 3.29, 4.2, 4.4-4.7, 4.13, 4.17, 4.19, 4.20, 5.2, 5.3, 5.5, 5.9, 5.10, 5.11, 5.15-5.17, 5.19, 5.22, 6.7, 6.8, 7.1-7.3, 8.2, 8.3]

5.9. Use of OEF

How does the technical support function use OEF for continuous improvement of its activities? [SSR-2/2 Requirement 24; 5.27]

5. TS

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

6. OPERATING EXPERIENCE FEEDBACK

6.1. Organization and functions

6.1.1. Functions and responsibilities

How are organizational structure, responsibilities, levels of authority and functions defined and communicated within the operating experience feedback organization? Are they understood by personnel? [SSR-2/2 Requirement 1; 3.2(a)(b), Requirement 3; 3.8, 3.9]

How are the roles, responsibilities, lines of communication and interfaces with corporate organizations as well as other external support organizations (manufacturers, research organizations and designers) defined and understood? [SSR-2/2 Requirement 24; 5.32] [NS-G-2.11; 7.9]

What are the various elements of the Operating Experience programme currently in place at the plant? [SSR-2/2 Requirement 24; 5.27] [NS-G-2.4; 6.62] [NS-G-2.11;2.8]

How are the operational goals/objectives related to OE implemented, communicated, reviewed and assessed? [SSR-2/2 Requirement 1; 3.2(a)]

How does the plant establish and measure the effectiveness of its policies related to operating experience feedback? [SSR-2/2 Requirement 1; 3.2(a), Requirement 5; 4.1, 4.2, 4.4, Requirement 24; 5.33] [NS-G-2.4; 6.62] [NS-G-2.11; 8.1]

How are management expectations regarding the systematic reporting, screening and use of internal and external operating experience defined, communicated (through for example team briefings, pre-job briefings, JIT training, etc.) and reinforced? [NS-G-2.11; 7.2]

What management system and procedures are used to define i) the structure of the system for the feedback of operating experience, ii) the types of information processed, iii) the channels of communication and iv) the responsibilities of the various groups and organizations involved? [NS-G-2.11; 2.12]

What is the involvement of management in establishing a 'just' (non-discriminatory and impartial) reporting system at the plant? [NS-G-2.4; 6.68]

6.1.2. Personnel

How are responsibilities, competence, qualification criteria and training requirements defined for personnel involved in the feedback of operating experience? [NS-G-2.4; 6.67]

What is the involvement of management in establishing a 'just' (non-discriminatory and impartial) reporting system at the plant? [NS-G-2.4; 6.68] [INSAG-15; 3.4(c)]

How are plant personnel held accountable for effective and timely implementation of lessons learned from operating experience information? [NS-G-2.11; 5.2]

6.2. Reporting of operating experience

What criteria and procedures have been established for staff to identify and report operating experience in a timely manner? [NS-G-2.11; 10.2, 10.4]

How are various events identified and reported? This includes low-level events and near-misses, potential problems relating to equipment failures, shortcomings in human performance, procedural deficiencies and inconsistencies in documentation. [SSR-2/2 Requirement 24; 5.31] [NS-G-2.4; 6.64]

To what extent are plant personnel and contractors aware of the reporting process? Is the process user-friendly? [SSR-2/2 Requirement 24; 5.27] [NS-G-2.4; 6.68] [Reference to NS-G-2.11 to be added later]

What encouragement is given to employees to report all events, including low-level events and near-misses? [SSR-2/2 Requirement 24; 5.31] [NS-G-2.4; 6.68]

How is feedback provided to the person reporting an issue? Are any reports rejected, and if so, on what grounds? [GS-G-3.5; 6.53] [Revised NS-G-2.11 reference to be added later]

6.3. Sources of operating experience

What sources of industry operating information are identified, and how is access to these sources formally established and systematically screened? Do these sources include organizations and publications such as: IAEA/NEA IRS, WANO/INPO, SER, SOER, the national regulatory body, Generic Letters, bulletins, notices, owner groups, vendors' and manufacturers' problem notifications, engineering designer problem notifications, utility and industry event reports, results from peer review missions and from benchmarks? [SSR-2/2 Requirement 24; 5.27, 5.32] [NS-G-2.11; 7.5, 7.9]

How are Good Practices used, among other resources, as a basis for improvement? [NS-G-2.11; 3.3]

What sources of in-house operating experience are identified? How is information from and access to these sources formally established and systematically screened? These sources should include: significant events, low-level events and near-misses; quality assurance reports; reports and data from operations activities, maintenance testing and in-service inspections; surveillance reports; results from plant-specific safety assessments; training feedback; no-blame reporting programmes; and performance indicators. [SSR-2/2 Requirement 24; 5.27]

6.4. Screening of operating experience information

How is internal and external operating experience screened to select and prioritise information for further investigation and analysis? [SSR-2/2 Requirement 24; 5.27] [NS-G-2.11; 3.1, 3.7, 3.9]

What are the screening criteria and thresholds for internal and external operating experience? [NS-G-2.11; 3.6, 3.8]

What is the timeframe for performing the screening? Are sources of information and their corresponding frequency of screening defined? [NS-G-2.11; 3.6]

Is screening performed by a multidisciplinary group with broad knowledge of plant design and operation, including knowledge of matters concerning human performance and behaviours? [NS-G-2.11; 3.2, 3.6]

How is trend analysis used for screened internal operating experience data that was initially identified as being less safety-significant? [NS-G-2.11; 3.6]

How is screening of internal and external operating experience recorded for evaluation during subsequent periodic self-assessment or peer reviews? [SSR-2/2 Requirement 24; 5.33] [NS-G-2.11; 3.8]

6.5. Investigation and analysis

What consideration is given to ensuring that events are investigated and analysed in accordance with their level of safety significance (actual as well as potential), severity and recurrence, and that all root causes and contributing factors are identified? [SSR-2/2 Requirement 24; 5.28] [NS-G-2.11; 4.3, 4.10]

What criteria and procedures are in place to specify the type of investigation that is appropriate for an event? Do they include guidelines for performing a full root cause analysis, an apparent cause analysis, and a trend analysis? [NS-G-2.11; 4.2, 4.4, 4.10] [Apparent cause analysis to be covered in revised NS-G-2.11 and then referenced here]

In what way does the investigation of safety significant events cover aspects like identification of direct and root causes, causes relating to equipment design, operation and maintenance, or human and organizational factors? [SSR-2/2 Requirement 24; 5.28] [NS-G-2.11; 4.7] [NS-G-2.4; 6.64]

To what depth are event investigations carried out so as to address both the extent of condition and extent of cause? [NS-G-2.11; Appendix III.13] [Extent of cause and extent of condition to be included in revised NS-G-2.11 and then referenced here]

What level of analysis is specified for low-level events, near-misses and other adverse trends, so that generic implications, precursors to declining performance, and root causes of adverse trends can all be identified? [NS-G-2.4; 6.64] [NS-G-2.11; 4.4]

What type of training is provided to personnel performing event investigations and analyses? What knowledge do they have of plant design, procedures and operation, and what levels of experience and skills do they possess? What training in various root cause analysis techniques have they undertaken? [SSR-2/2 Requirement 7; 4.22] [NS-G-2.4; 6.67] [NS-G-2.8; 5.3] [NS-G-2.11; Appendix III.2, III.6]

In what timeframe are events investigated and interviews conducted to preserve information and physical evidence? [NS-G-2.11; Appendix III.7] [NS-G-2.11; 4.7]

What is the involvement of event investigators in formulating corrective actions? [NS-G-2.11; 5.2]

How does event investigation and analysis take account of previous similar events and precursors from both internal and external sources? [NS-G-2.11; 4.3]

How are event investigations and analysis reports reviewed to ensure that all root causes have been identified? [NS-G-2.11; 3.6] [To be included in NS-G 2.11 revision and then referenced here]

How do event investigations cover various root causes/causal factors, especially those related to human factors and organizations? Can records of recent event analyses be provided as an illustration? [SSR-2/2 Requirement 24; 5.28] [NS-G-2.4; 6.64]

6.6. Corrective actions

Does the investigation of events and the review of other operating experience result in clear and well defined corrective actions? To avoid recurrence of events, do these corrective actions address the fundamental causes of problems, including human and organizational factors, rather than just the symptoms? [SSR-2/2 Requirement 24; 5.30] [NS-G-2.4; 6.64] [NS-G-2.11; 5.2, 5.3, 5.5, Appendix IV.3]

How are corrective actions prioritised, scheduled, and implemented? For safety significant items, how are temporary corrective actions taken before final corrective actions are implemented? [SSR-2/2 Requirement 24; 5.30] [NS-G-2.11; 5.6] [GS-G-3.1; 6.71]

What tracking process has been implemented to ensure that all approved corrective actions are completed in a timely manner? [NS-G-2.11; 5.7]

How are managers held accountable for meeting due dates for corrective actions? How are extensions to due dates for completing corrective actions controlled? [GS-G-3.1; 6.71, 6.74]

How are concerned personnel (individuals who identified the issues) informed of corrective actions that have been taken or are planned? [SSR-2/2 Requirement 24; 5.30] [GS-G-3.5; 6.53]

How does the plant evaluate the effectiveness of corrective actions that have been implemented? Is the list of pending corrective actions constantly reviewed in light of latest developments to confirm that the chosen actions are still relevant and called for? [SSR-2/2 Requirement 24; 5.30] [NS-G-2.11; 5.7] [GS-G-3.1; 6.74]

6.7. Utilization and dissemination of operating experience

What is the involvement and commitment of senior management in promoting and reinforcing the use of operating experience? [NS-G-2.4; 6.63] [NS-G-2.11; 2.9] [GS-G-3.5; 2.18]

How is the use of operating experience encouraged and reinforced by plant management? How are personnel made aware of management expectations regarding the use of OE information? [NS-G-2.11; 7.2]

Is operating experience information, both internal as well as external, made accessible to plant personnel? Is this access user-friendly? Are personnel aware and knowledgeable of how to access it? [NS-G-2.11; 7.2]

How is operating experience used in personnel work activities (i.e. pre-job briefings, work planning, shift briefings, just-in-time information sheets, etc.)? [NS-G-2.11; 7.2]

How are lessons learned from industry and in-house experience communicated to the training department in a systematic manner, and reflected in relevant training material after proper review? How is this information used in initial training and refresher training? [SSR-2/2 Requirement 7; 4.22, Requirement 24; 5.28] [NS-G-2.4; 6.69] [NS-G-2.11; 7.2]

What liaising arrangements are maintained with supporting organizations like manufacturers, research organizations and designers, to feed back information on operating experience so as to obtain the necessary advice as and when required? [SSR-2/2 Requirement 24; 5.32]

How is internal operating experience shared with national and international bodies? [SSR-2/2 Requirement 24; 5.27] [NS-G-2.11; 7.4, 7.5]

6.8. Trending and review of operating experience

How and by whom are trends in operating experience (including for example equipment failures, industrial safety reports, radiological contamination reports, records of maintenance work and of shortfalls in human performance) examined for any precursors to adverse conditions for safety? [SSR-2/2 Requirement 24; 5.29] [NS-G-2.11; 6.3, 6.4, 6.13] [NS-G-2.4; 6.66]

What type of coding system is applied for characterizing various events? How are these codes used to identify adverse trends and the potential for events to recur? [NS-G-2.11; 6.6, 10.3]

Which databases have been set up for events, deficiencies, anomalies and deviations so that information can easily be retrieved to facilitate integrated review and analysis of operating experience drawn from reports on organizational and human factors, equipment failures, work management and maintenance deviations? [NS-G-2.11; 10.12]

Once identified, how is an abnormal trend treated at the plant? What type and level of analysis does it trigger? Is the threshold set low enough, and can a few examples of trending be provided? What follow-up actions are taken to verify that the adverse trend has been corrected? [SSR-2/2 Requirement 24; 5.29] [NS-G-2.11; 6.5, 6.7-6.11, 6.13]

How and at what frequency are event trend reviews presented to plant management? [NS-G-2.4; 6.66]

6.9. Effectiveness review of the operating experience programme

What methods are used to determine the effectiveness of the operating experience programme? Does the methodology involve both self-assessments as well as peer reviews, especially those by external organizations? What are the scopes of the self-assessment and of the peer review, and how often are these performed? [SSR-2/2 Requirement 24; 5.33] [NS-G-2.4; 6.62] [NS-G-2.11; 8.1-8.3, 8.6]

How are the results of the effectiveness review used to identify weaknesses in the OE programme and to make the necessary improvements? [SSR-2/2 Requirement 24; 5.33] [NS-G-2.11; 8.2] [NS-G-2.4; 6.62]

What indicators track the effectiveness of the OE programme? How are these indicators used to make the improvements needed? Are trends in performance indicators analysed and evaluated at regular intervals? [NS-G-2.11; 8.2, 8.7]

What periodic reports are issued on the assessment of the effectiveness of the OE programme? Do these reports cover all stages of the programme? [NS-G-2.11; 8.4, 8.1]

6.10. Use of PSA and PSR

How is PSA used to assess the safety significance of events? [NS-G-2.11; Annex I-12, I-13]

How is internal and external operating experience feedback integrated in the PSR programme? [SSR-2/2 Requirement 12; 4.44] [NS-G-2.10; 4.39, 4.40]

6. OE

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1					
2					
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GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

7. RADIATION PROTECTION

7.1. Organization and functions

7.1.1. Functions and responsibilities

How are radiation protection aspects covered by the plant management system? [SSR-2/2 Requirement 15; 4.52, Requirement 20; 5.10-5.16] [NS-G-2.7; 2.45, 2.46] [RS-G-1.1; 5.105, 5.107, 5.108]

How are organizational structure, responsibilities, levels of authority and functions defined and communicated within the radiation protection organization? Are they understood by personnel? [GSR Part 3 Requirement 4; 2.39-2.46] [SSR-2/2 Requirement 1; 3.2(b)(d), Requirement 3; 3.8, 3.9, Requirement 20; 5.14] [NS-G-2.7; 2.40, 3.69-3.75] [RS-G-1.1; 5.12-5.14]

How are goals, objectives and safety indicators related to radiation protection developed and managed? How are outcomes checked and measured within the organization? [NS-G-2.4; 5.20, 5.21]

How are radiation protection policies and programmes kept up-to-date with industry practices? What internal process is put in place in this regard? [SSR-2/2 Requirement 31; 8.1-8.3] [NS-G-2.11; 7.2]

How is the RP programme reviewed? [SSR-2/2 Requirement 20; 5.10] [NS-G-2.8; 4.27] [RS-G-1.1; 5.110, 5.111]

How is the RP group's performance evaluated? [GSR Part 3 Requirement 9; 3.15(h)] [SSR-2/2 Requirement 9; 4.33] [RS-G-1.1; 5.110, 5.111]

7.1.2. Personnel

What is the staffing level, including the use of contractors, in the area of radiation protection? How does the plant ensure that there is enough manpower to cover outage and operation workloads? [SSR-2/2 Requirement 4; 3.11] [NS-G-2.6; 3.7, 4.6, 4.11, 4.12, 4.15] [GS-G-3.1; 4.1] [NS-G-2.4; 7.4]

How are radiation protection staff, including contractors, qualified for their assigned work? What measures have been taken to maintain adequate levels of experience, knowledge and proficiency? [SSR-2/2 Requirement 4; 3.10, 3.11, Requirement 7; 4.16-4.19] [NS-G-2.7; 5.2] [NS-G-2.8; 3.34, 5.27] [RS-G-1.8; 11.1-11.4]

7.2. Radiation protection policy

How are administrative limits, policies and appropriate radiological goals established? [GSR Part 3 Requirement 5; 2.47] [SSR-2/2 Requirement 5; 4.1-4.5, Requirement 20; 5.10-5.16] [NS-G-2.4; 3.19-3.24, 5.20, 5.21] [NS-G-2.7; 2.30]

How are ALARA principles defined and how are they understood? [GSR Part 3 Requirement 1; 2.10] [NS-G-2.7; 2.4, 2.14, 3.67] [RS-G-1.1; 4.8-4.10]

How is the independence and authority of the RP group ensured? [SSR-2/2 Requirement 20; 5.12] [NS-G-2.7; 2.39, 3.73, 3.74]

In what way is the radiation protection group involved in the development of standards and operational procedures addressing radiological issues? [GSR Part 3 Requirement 4; 2.42, Requirement 5; 2.52, Requirement 9; 3.15(f)(g), Requirement 21; 3.76(d), Requirement 24; 3.94] [RS-G-1.1; 5.32] [NS-G-2.7; 3.73]

How is the health of individuals taken into consideration when assigning work in the RCA? [GSR Part 3 Requirement 21; 3.76(f), Requirement 25; 3.108] [SSR-2/2 Requirement 20; 5.15] [RS-G-1.1; 7.5-7.8]

What special arrangements are in place to protect female workers and those under the age of 18 (who may be undergoing training)? [GSR Part 3 Requirement 28; 3.113-3.116]

What type of counselling could be provided to workers, if needed? [RS-G-1.1; 7.14, 7.15]

What types of interactions are in place with, for example, operations and maintenance groups, etc.? [SSR-2/2 Requirement 31; 8.11, 8.23] [NS-G-2.7; 3.41]

What are the different radiation concerns that have arisen in the past, and how were they resolved? [NS-G-2.7; 2.47, 3.2]

7.2.1. Training and qualification of non-radiation protection personnel

What RP training is provided to site personnel, including contractor personnel? [GSR Part 3 Requirement 21; 3.76(h), Requirement 26; 3.110] [RS-G-1.1; 5.92, 5.93, 5.95, 5.97] [NS-G-2.7; 3.55, 5.1-5.11]

What special training is provided, such as practice on mock-ups and rehearsals of planned work? [NS-G-2.7; 3.42, 5.4, 5.6] [RS-G-1.1; 5.96]

How are RP information and training programmes documented? [GSR Part 3 Requirement 26; 3.110(c)] [RS-G-1.1; 5.100]

7.2.2. Health surveillance

How is the health surveillance programme organized at the plant, and how are responsibilities assigned for making the necessary arrangements to assess and record occupational exposure and to survey the health of workers? [GSR part 3 Requirement 25]

7.2.3. Radiation protection records

Do the responsible organizations maintain a complete set of RP records that are readily available to the regulatory body or other interested parties? What are the retention times? [GSR part 3 Requirement 4; 2.43(e), Requirement 14; 3.38(d), Requirement 16; 3.47, Requirement 17; 3.54, 3.55, Requirement 21; 3.76(i), 3.80, Requirement 23; 3.87(c), Requirement 24; 3.98, Requirement 25; 3.103-3.107, Requirement 26; 3.110(c), Requirement 30; 3.127(g), Requirement 32; 3.135(e), 3.137(b)]

How are records from individual external contamination monitoring maintained and kept? [SSR-2/2 Requirement 15; 4.52] [RS-G-1.3; 8.3-8.10]

7.3. Radiation work control

7.3.1. Radiation work authorization

How is radiologically hazardous work planned? [GSR Part 3 Requirement 24; 3.94] [RS-G-1.1; 5.36, 5.37]

How does the radiation work permit (RWP) programme work? [NS-G-2.7; 3.43-3.47]

What RWP procedures are available, and how are they followed? [NS-G-2.7; 3.43-3.47]

What special provisions are made for exceptional, radiologically hazardous work? [NS-G-2.7; 3.6, 5.4]

7.3.2. Control of designated areas and individual worksites

What are the layout and markings of controlled and supervised areas? [GSR Part 3 Requirement 24; 3.88, 3.91] [NS-G-2.7; 3.14] [RS-G-1.1; 5.28-5.31]

How is access to the RCAs restricted, and what are the measures taken to control workers at the entrances to the RCAs? [GSR Part 3 Requirement 24; 3.90(a)-(f)] [NS-G-2.7; 3.5, 3.9, 3.10]

How does the plant manage visitors to controlled areas or supervised areas? [GSR Part 3 Requirement 24; 3.88, Requirement 30; 3.128]

What are the arrangements at the exits from the RCAs for protecting against the spread of contamination? [GSR Part 3 Requirement 24; 3.90] [NS-G-2.7; 3.11-3.13]

What local rules and procedures, to be followed in controlled areas, are available for the protection and safety of workers? [GSR Part 3 Requirement 24; 3.94(a)]

What are the investigation or authorization levels set in procedures, and what are workers required to do if a level is exceeded? [GSR Part 3 Requirement 24; 3.94] [NS-G-2.7; 3.16, 3.48-3.51] [RS-G-1.1; 4.22]

7.3.3. Workplace monitoring programme

How comprehensive, timely and accurate is the programme for workplace monitoring in the RCAs and supervised areas? [GSR Part 3 Requirement 24; 3.96, 3.97] [NS-G-2.7; 3.3, 3.19, 3.24-3.27]

How is the workplace monitoring programme used in the assessment of external and internal exposures? [GSR Part 3 Requirement 25; 3.100, 3.101] [NS-G-2.7; 3.30]

7.4. Control of occupational exposure

7.4.1. Implementation of the ALARA principle

How does the plant ensure that ALARA principles are followed for all work planning and execution? What ALARA practices do workers apply? [GSR Part 3 Requirement 21; 3.77(a), Requirement 22; 3.83] [NS-G-2.3; 4.11] [NS-G-2.4; 6.37] [NS-G-2.5; 2.28] [NS-G-2.6; 4.23, 4.34, 8.4] [NS-G-2.7; 2.18, 2.19]

What approaches are used in relation to the ALARA principle, and how are dose constraints set? [GSR Part 3 Requirement 1; 2.10, Requirement 21; 3.77(b)] [RS-G-1.1; 4.13-4.16, 4.17-4.21]

What postings, labelling and special provisions are provided to make sure staff are aware of radiation hazards and of the need to keep dose ALARA? [GSR Part 3 Requirement 21; 3.76(d)] [NS-G-2.7; 3.14, 3.42, 3.43, 3.54, 3.57, 3.74]

How are workers motivated to adhere to the ALARA principle? [NS-G-2.7; 2.31, 2.32]

How are supervisors/managers involved in controlling and optimising occupational exposures? [NS-G-2.7; 2.29-2.33]

What are the results and feedback of occupational exposure in terms of application of the ALARA principle? [NS-G-2.7; 2.14, 3.67]

7.4.2. Internal contamination monitoring

How is the internal contamination assessment programme established? [NS-G-2.7; 3.37] [RS-G-1.1; 5.67] [RS-G-1.2; 3.3-3.43]

What measures are used to protect workers from internal contamination? [NS-G-2.7; 3.48-3.51, 3.54, 3.55]

How does workplace monitoring support assessment of internal contamination? [NS-G-2.7; 3.27, 3.29, 3.30]

What methods are used to calculate dose commitments? [RS-G-1.2]

7.4.3. External radiation monitoring

What is the programme for the monitoring of external radiation exposures? [NS-G-2.7; 3.33] [RS-G-1.3; 3.6-3.16, 9.11]

What types of dosimeters are provided to radiation workers for routine monitoring? [NS-G-2.7; 3.34]

What additional dosimeters are available? [NS-G-2.7; 3.36] [RS-G-1.3; 3.38]

What procedures and methods are in place to obtain a formal dose assessment in the event of the loss of a dosimeter and in the event of unexpected or unusual dosimeter readings? [RS-G-1.3; 8.7]

7.5. Radiation protection instrumentation, protective clothing and facilities

7.5.1. Portable, fixed dose rate and contamination measurement instrumentation

What are the inventories and locations of portable and fixed dose rate measurement instrumentation? [GSR Part 3 Requirement 21; 3.76(g)] [NS-G-2.7; 3.23, 3.25, 3.28, 3.29, 3.31, 3.32]

What are the inventories and locations of portable and fixed contamination measurement instrumentation? [GSR Part 3 Requirement 21; 3.76(g)] [NS-G-2.7; 3.23, 3.25, 3.28, 3.29, 3.31, 3.32]

How are instruments calibrated, and what is the schedule for routine calibrations? [NS-G-2.7; 3.22, 3.23, 3.29] [RS-G-1.3; 7.5, 7.6]

What is the procurement system for RP equipment, and how is new equipment tested? [RS-G-1.1; 5.108, 5.109]

7.5.2. Individual dose monitoring equipment

What are the facilities and equipment for internal contamination monitoring and assessment of external exposures? [GSR Part 3 Requirement 21; 3.76(g)] [NS-G-2.7; 3.29, 3.30]

If other laboratories are contracted to provide monitoring services for internal contamination or assessment of external exposures, what are the contractual conditions, and the reporting and quality requirements, for the services supplied? [RS-G-1.2; 9.18] [RS-G-1.2; 1.3; 9.2-9.13; 9.17]

As regards internal contamination monitoring, what checks are undertaken to confirm the reliability of monitoring equipment? How is the performance of this equipment evaluated? [NS-G-2.7; 3.31, 3.32] [RS-G-1.2; 9.13-9.17]

As regards external contamination monitoring, what checks are undertaken to confirm the reliability of monitoring equipment? How is the performance of this equipment evaluated? [NS-G-2.7; 3.31, 3.32] [RS-G-1.3; 9.14-9.16]

7.5.3. Gaseous and liquid effluent monitoring equipment

What type of instrumentation is used, and what is the condition of the installed continuous monitoring system for gaseous and liquid effluents? [NS-G-2.7; 4.52, 4.53]

What is the range of key instrumentation, and is it sufficient for monitoring normal discharges, possible abnormal discharges and accidental releases? [RS-G-1.8; 5.22]

How is monitoring equipment calibrated and how are QA standards applied? [NS-G-2.7; 3.22] [RS-G-1.8; 9.5]

What monitoring equipment is available, and what sampling procedures are in place to detect and to measure releases through normally unmonitored effluent pathways? [NS-G-2.7; 2.3-2.5, 4.2, 4.53, 4.55]

7.5.4. Environmental monitoring instrumentation and equipment

What equipment is available for environmental monitoring? [RS-G-1.8; 5.23-5.25]

How is the equipment calibrated and what QA standards are applied? [NS-G-2.7; 3.22, 2.45, 2.46] [RS-G-1.8; 9.5]

7.5.5. Instrumentation and equipment for emergency situations

What types and numbers of fixed and portable instruments are available for emergency situations, and where are they situated? Can they reasonably cover the needs of all personnel who would be involved in an emergency response? [GSR Part 3 Requirement 21; 3.76(g)] [NS-G-2.7; 2.47, 2.48]

What monitoring ranges are available for emergency purposes? [NS-G-2.7; 3.22]

How are instruments calibrated and maintained? [SSR-2/2 Requirement 18; 5.7]

7.5.6. Protective clothing and equipment

What types and quantities of protective clothing and respiratory protective equipment are available? [GSR Part 3 Requirement 24; 3.95(a)] [NS-G-2.7; 3.48-3.51]

How and where is all personal equipment, including equipment for use in an emergency, maintained and, if necessary, tested? [GSR Part 3 Requirement 24; 3.95(d)]

What instruction do workers receive on the use of protective respiratory equipment? What format does this instruction take? [GSR Part 3 Requirement24; 3.95(b)] [NS-G-2.7; 3.55]

What additional equipment is available for radiological control and how is it maintained? [NS-G-2.7; 3.57, 3.59, 3.60]

7.5.7. Facilities

What are the different plant facilities, necessary for effective radiological control in the operation and maintenance of the plant? [GSR Part 3 Requirement 21; 3.76(e)] [NS-G-2.7; 3.56]

How are change- and shower-rooms, stocks of protective clothing, personnel decontamination facilities and laundry all maintained? [GSR Part 3 Requirement 24; 3.90(h)]

What calibration facilities are available? [NS-G-2.7; 3.22, 3.56, 6.8] [NS-G-2.6; 4.29, 8.6-8.8]

How is the temporary storage of radwaste and contaminated materials, equipment and tools, arranged and maintained? [NS-G-2.7; 3.54, 4.21]

How are decontamination facilities arranged and maintained? [NS-G-2.6; 8.12-8.14] [NS-G-2.7; 3.56]

7.6. Radioactive waste management and discharges

7.6.1. Radioactive waste management

How is the radioactive waste management programme established and implemented? [SSR-2/2 Requirement 21; 5.18] [GSR Part 3 Requirement 9; 3.15(j), Requirement 31; 3.131]

What are the goals and objectives for minimizing radioactive waste? [SSR-2/2 Requirement 21; 5.17] [NS-G-2.7; 4.6, 4.8, 4.15, 4.20]

How is radioactive waste classified and segregated? [NS-G-2.7; 4.9-4.16, 4.22]

What procedures are available for waste to be cleared from regulatory control? [NS-G-2.7; 4.10]

How are storage areas or special storage locations, containers or other provisions, used to ensure that personal exposures are minimized? [NS-G-2.7; 4.21]

7.6.2. Gaseous and liquid effluents

What are the authorized limits for gaseous and liquid releases, and what are the results of monitoring? [GSR Part 3 Requirement 31; 3.133] [NS-G-2.7; 4.46, 4.48]

What is the monitoring programme for gaseous and liquid releases? [SSR-2/2 Requirement 21; 5.19] [GSR Part 3 Requirement 32; 3.137(a)] [RS-G-1.8; 5.15-5.22, 6.2, 6.3]

What are the goals and objectives for gaseous and liquid effluents? [GSR Part 3 Requirement 31; 3.134(a)] [NS-G-2.7; 2.30]

What procedures are in place to control effluent releases? [SSR-2/2 Requirement 21; 5.19]

How are effluent release results reported and records maintained? [SSR-2/2 Requirement 15; 4.52] [GSR Part 3 Requirement 32; 3.137(b)(c)(d)] [RS-G-1.8; 10.2-10.7, 10.12]

7.6.3. Environmental monitoring

How is the environmental monitoring programme established? [SSR-2/2 Requirement 21; 5.20] [GSR Part 3 Requirement 32; 3.137(a)] [NS-G-2.7; 2.13, 4.55] [RS-G-1.8; 5.23-5.30, 6.4-6.7]

What are the methods used for assessment of doses to members of public? [RS-G-1.8; 7.1-7.16]

How are environmental results reported and records maintained? [GSR Part 3 Requirement 32; 3.137(b)(c)(e)] [RS-G-1.8; 10.2-10.5, 10.8, 10.9 10.12]

7.7. Radiation protection support during emergencies

What are the RP department's responsibilities in an emergency, and how are its staff involved in the emergency response organization? [NS-G-2.7; 2.4-2.48, 2.50]

What RP emergency procedures are available?? [NS-G-2.7; 2.4-2.48]

What is the environmental monitoring plan for an emergency exposure situation? [RS-G-1.8; 5.64-5.108]

Which RP personnel are involved in emergency training, and what is the frequency of their training? [NS-G-2.7; 5.10] [RS-G-1.8; 11.1-11.4]

How often are emergency drills and exercises run? [NS-G-2.7; 5.4, 5.5, 5.7]

7.8. Use of PSA, PSR and OEF

How does the radiation protection department use the PSA or some of its applications (e.g. risk monitoring) to optimize radiation protection activities? [SSR-2/2 Requirement 31; 8.5, 8.6] [NS-G-2.6; 7.10] [SSG-3; 10.36, 10.37, 10.52]

How is the PSR used to enhance the radiation protection programme? [SSR-2/2 Requirement 12; 4.44] [SSG-25; 3.8, 5.29, 5.41, 5.47, 5.86] [NS-G-2.3; 2.2, 3.8] [NS-G-2.6; 7.7, 7.9] [NS-G-2.12; 5.5, 7.1, 7.9-7.11]

How does the radiation protection department use the OEF from radiation protection activities to drive continuous improvement? How are radiological events reported and analysed? [SSR-2/2 Requirement 24; 5.27-5.33] [GSR Part 3 Requirement 4; 2.43(c), Requirement 9; 3.15(g), Requirement 16; 3.45-3.48, Requirement 21; 3.80] [NS-G-2.7; 6.12]

7. RP

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

8. CHEMISTRY

8.1. Organization and functions

8.1.1. Functions and responsibilities

How are organizational structure, responsibilities, levels of authority and functions defined and communicated within the chemistry organization? Are they understood by personnel? [SSR-2/2 Requirement 1; 3.2(b)(d), Requirement 3; 3.8, 3.9] [NS-G-2.4; 2.11] [SSG-13; 2.1, 2.2]

How are the goals, objectives and safety indicators related to chemistry developed and managed? How are outcomes checked and measured within the organization? [SSR-2/2 Requirement 9; 4.33-4.37] [GSR Part 2 Requirement 5; 4.3-4.5] [SSG-13; 2.3, 2.5]

How are chemistry policies and programmes kept up-to-date with industry practices? What internal process is put in place in this regard? [SSR-2/2 Requirement 31; 8.1-8.3] [NS-G-2.4; 6.36] [SSG-13; 2.10] [NS-G-2.11; 7.2]

8.1.2. Personnel

How is it ensured that the chemistry function is satisfactorily staffed during both operation and outages, including contracted resources, and has an adequate pool of experience and proficiency? [SSR-2/2 Requirement 4; 3.10, 3.11] [SSG-13; 2.8]

8.2. Chemistry programme

8.2.1. Chemistry staff training

How does the chemistry department monitor the training of its staff, including its managers and supervisors? [SSR-2/2 Requirement 1; 3.2(b), Requirement 7; 4.16, 4.20, 4.21] [SSG-13; 8.8]

8.2.2. Interfaces with other plant groups and organizations

How is it ensured that interface responsibilities are properly defined and understood? [SSG-13; 2.21]

What relations does the chemistry department have with on-site and off-site organizations? [SSG-13; 2.18, 2.24]

How is it ensured that contractor tasks are clearly defined and understood both by the contractors and by plant personnel? [SSG-13; 2.14]

How is it confirmed that chemistry technical specifications are well understood by staff in other departments, especially operations and health physics? [SSG-13; 2.22]

Outside of the plant chemistry department, what technical support is there, for example from the corporate body or the plant manufacturer? [SSG-13; 2.18, 2.24]

How does the chemistry department ensure that there is adequate communication with other laboratories and organizations? [SSG-13; 2.18, 2.23, 2.24]

8.2.3. Monitoring and review

Which chemical operational limits and conditions are established, and how can it be demonstrated that the plant is operated accordingly? [SSR-2/2 Requirement 9; 4.33, 4.34] [SSG-13; 2.3, 2.5]

8.2.4. Chemistry surveillance and control programme

Which procedures govern implementation of the chemistry surveillance and control programme? How is it ensured that the chemistry control programme includes all relevant parameters, specifications, limits and conditions, and sampling frequencies? [SSR-2/2 Requirement 6; 4.6-4.15] [SSR-2/2 Requirement 8; 4.26] [SSG-13; 3.3, 4.31, 5.6, 5.8, 6.10]

How is it confirmed that the chemistry surveillance and control programme is ensuring that the plant is operated in accordance with the design assumptions and intent developed to preserve the integrity of systems, structures and components? [SSR-2/2 Requirement 6; 4.6] [SSR-2/2 Requirement 14; 4.51] [SSG-13; 2.1, 2.6]

How is it ensured that uniform corrosion processes and stress corrosion cracking processes, corrosion product transport and radioactivity build-up, are all properly monitored and minimized? [SSR-2/2 Requirement 29; 7.16] [SSG-13; 3.4]

How is it ensured that the chemistry surveillance and control programme is comprehensive for other chemicals in safety related systems, like diesel fuel for diesel generators, lubricants of emergency systems and lubricants of diesel generators etc.? [SSG-13; 3.3]

How is the chemistry department involved in fresh fuel receipt and storage related activities? How is it involved in the control of fuel cladding for wet fresh fuel? How is it involved in monitoring fuel integrity and storage for irradiated fuel? [SSG-13; 4.10, 5.18, 6.22, 6.23]

How is it ensured that proper procedures and practices are implemented for management of radioactive waste? [SSR-2/2 Requirement 21; 5.19] [GSR Part 3 Requirement 31; 3.131-3.134] [SSG-13; 5.25]

8.2.5. Chemistry surveillance and control for the primary circuit

How can it be demonstrated that chemical parameters are properly monitored, analysed and controlled, e.g. boron, hydrogen, lithium/potassium concentrations, pH and corrosion-inducing contaminants? [SSR-2/2 Requirement 29; 7.14] [SSG-13; 4.3, 4.11, 4.13, 6.17, 6.22]

8.2.6. Chemistry surveillance and control for secondary and condensate polishing circuits

How can it be demonstrated that chemical parameters are properly monitored, analysed and controlled on the secondary side, e.g. pH, corrosion products and reagent levels? [SSR-2/2 Requirement 29; 7.14] [SSG-13; 4.42-4.44]

How is the integrity of the steam generators controlled? What is the quality and quantity of sludge in the steam generators? How is the current trend developing? [SSG-13; 4.45-4.49]

How can it be demonstrated that chemical parameters are properly monitored, analysed and controlled in other relevant systems, e.g. in emergency cooling, auxiliary and raw water systems? [SSR-2/2 Requirement 29; 7.14] [SSG-13; 3.4(d)]

How are organic impurities in raw water controlled to produce demineralized water? [SSG-13; 4.30]

How is flow-accelerated corrosion on the secondary side controlled and minimized? [SSG-13; 4.43, 4.44]

How is it ensured that wet or dry conservation conditions for systems and components are within specifications and effective during outages? [SSG-13; 2.12]

8.2.7. Procedures, schedules and analysis methods

How is it ensured that the procedures, schedules and methods associated with the chemistry control and surveillance programme are all effective, clearly understood and properly followed? [SSR-2/2 Requirement 26; 7.1, 7.2, 7.4, 7.6] [SSG-13; 2.9, 2.10, 6.10]

Where and how have the necessary actions been implemented when specifications have been exceeded? [SSR-2/2 Requirement 6; 4.6, 4.9, 4.13, 4.15] [SSG-13; 3.3, 3.4(n), 4.4, 4.7, 4.46, 5.26(a), 6.2(c), 7.4, 7.8, 7.9]

How does the chemistry department ensure that instrumentation is calibrated on time and remains operable? [SSG-13; 6.11]

How is it ensured that appropriate chemical and radiochemical standards are being applied? [SSG-13; 6.12]

Which arrangements exist for dealing with plant transients or for handling abnormal or demanding workloads? [SSG-13; 3.4(g), 4.7, 6.17, 7.8]

8.2.8. Results of analysis

How is it ensured that the quality assurance programme for chemistry results is well implemented and evaluated? [SSG-13; 2.23, 7.1, 7.2]

How is the quality of chemical analysis results assessed? How is the quality of chemical analysis compared with that of external laboratories, e.g. by means of inter-comparison tests (round robin tests)? [SSG-13; 6.18, 6.38]

How is it ensured that analysis results and quality control measurements are properly trended, evaluated, recorded, documented, archived and retrievable? [SSG-13; 7.6, 7.7, 7.8]

How does the plant ensure that chemistry data are constantly evaluated to identify chemistry control problems and analytical errors, and to remove deficiencies? [SSR-2/2; Requirement 6; 4.12, Requirement 14; 4.51] [SSG-13; 4.6]

How does the chemistry department ensure that chemistry results are appropriately communicated to relevant staff in the plant? [SSG-13; 7.9]

How is it ensured that corrective actions in response to chemistry results are taken when necessary and in a timely manner? How effective is the system for responding to adverse chemical parameter variations in preventing limit values being exceeded? [SSR-2/2 Requirement 1; 3.2(e)] [SSG-13; 2.10, 4.4, 5.26, 6.2(c), 7.4, 7.8]

8.2.9. Chemistry operational history and reports

How are long-term and short-term trends and transients identified and assessed? [SSG-13; 3.1, 3.4(k), 7.3-7.9]

How are responsibilities for reporting and assessment defined and implemented? [SSG-13; 7.9, 7.10]

How are unexpected changes, non-consequential events and near-misses analysed and addressed? [SSR-2/2 Requirement 8; 4.31, Requirement 24; 5.31]

How is it ensured that the results of chemistry analyses are properly recorded? [SSR-2/2 Requirement 6; 4.12, Requirement 15; 4.52, Requirement 29; 7.15] [SSG-13; 7.1]

8.2.10. Facilities, laboratories, equipment and instruments

How is it ensured that facilities and equipment are adequate for use in normal and accident conditions? [SSG-13; 2.7, 2.22, 6.31, 6.43]

How is it ensured that up-to-date equipment is being used? What equipment is currently on order? [SSG-13; 6.36]

How is it confirmed that appropriate manuals and/or supplier handbooks for all chemistry instruments/equipment are available in the laboratory? [SSG-13; 6.37]

How is it ensured that analytical equipment is calibrated on time, using accurate calibration standards and procedures? [SSG-13; 6.10(g), 6.11, 6.12, 6.15, 6.35]

To what degree does the chemistry department have sufficient redundancy of analytical facilities and equipment? [SSG-13; 6.31]

How is the storage, replacement and ordering of hazardous chemicals managed? Which procedures are applied? [SSG-13; 9.7, 9.11]

How is radiological safety (e.g. proper radiation shielding) maintained? [SSG-13; 6.10(f), 6.33]

8.2.11. Post-accident sampling system

How is post-accident sampling performed? How is it ensured that sufficient staff are available for emergency purposes (on-call)? [SSG-13; 6.43]

How is it confirmed that procedures, training and retraining for obtaining, transporting and analysing samples in post-accident conditions are appropriate? [SSG-13; 6.44, 8.8(b)]

To what extent is the operability of the post-accident sampling system well considered, well maintained and periodically tested? [SSG-13; 6.44, 8.8]

8.2.12. Quality control of operational chemicals and other substances

How are chemicals and other substances managed, especially hazardous chemicals? [SSG-13; 3.4(s), 6.33, 8.13(a), 9.7]

What is the policy for preventing the use of chemicals and other substances that could have a negative impact on plant systems or the environment, or endanger the health of staff? What kinds of chemical receipt inspections are conducted? [SSR-2/2 Requirement 28; 7.12, Requirement 29; 7.17] [SSG-13; 9.1]

How is the list of approved chemicals made available and implemented in the field? [SSG-13; 9.4]

How is the shelf life of chemicals and other substances controlled, both in warehouses and in the field? [SSG-13; 9.9, 9.10]

What is the labelling system for chemicals and substances to identify their designated field of use? [SSG-13; 2.9, 9.9, 9.10, 9.12, 9.13, 9.15]

How does the plant ensure that delivered chemicals and other substances are of appropriate quality, especially those intended for safety related systems? [SSG-13; 9.3, 9.6, 9.8, 9.17, 9.18]

How is it ensured that the material safety data sheets for all chemicals are available and up to date? [SSG-13; 9.14]

8.3. Occupational radiation exposure

By what methods/measures does the plant limit dose rates from systems and components, and also limit the build-up of radioactive material? [SSG-13; 5.2-5.21]

8.4. Control of plant configuration

What system is there in place to ensure consistency between the design requirements, physical configuration and documentation related to the plant's chemistry regime? [SSR-2/2 Requirement 10; 4.38, Requirement 11; 4.42] [NS-G-2.3; 11.1-11.6] [GS-G-4.1; 3.167]

8.5. Use of PSA, PSR and OEF

How does the chemistry department use PSA or some of its applications [e.g. risk monitoring] to optimize chemistry activities? [SSG-3; Annex I M13, M14]

How is the PSR used to enhance the chemistry programme? [SSR-2/2; Requirement 12; 4.44]

How does the chemistry department use OEF for continuous improvement of chemistry activities? [SSG-13; 2.4, 3.3, 8.14]

8. CH

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

9. EMERGENCY PREPAREDNESS AND RESPONSE

9.1. Organization and functions

9.1.1. Functions and responsibilities

How are the roles, responsibilities, levels of authority and functions associated with emergency preparedness and response (EPR) clearly defined and allocated within the operating organization? How does the operating organization ensure that they are well understood by all personnel? How is leadership established for emergency preparedness and response? [GSR Part 7 Requirement 2; 4.5-4.9, Requirement 20; 6.5, 6.6, Requirement 21; 6.8, 6.10, 6.11, Requirement 23; 6.17] [SSR-2/2 Requirement 1; 3.2(b)(d), Requirement 3; 3.8, 3.9] [NS-G-2.4; 2.11]

9.1.2. Coordination with off-site authorities

What are the arrangements to ensure adequate coordination with off-site authorities (both in terms of preparedness and response)? What are the respective roles and responsibilities of the operating organization and of off-site authorities? Is this agreed to and accepted by the off-site authorities? Is it documented? [GSR Part 7; 1.6, Requirement 2; 4.10, Requirement 6; 5.3, 5.4, 5.6, 5.7, 5.9, Requirement 20; 6.5, Requirement 21; 6.7, Requirement 22; 6.12-6.15, Requirement 23; 6.17, 6.19, Requirement 24; 6.24] [NS-G-2.4; 6.58(ii)] [GS-G-2.1; 5.2] [SSG-3; 2.30]

9.1.3. Management

How does the management system apply to EPR arrangements? [GSR Part 7 Requirement 1; 4.1-4.4] [GSR Part 3 Requirement 43; 4.1-4.5]

How are the goals, the objectives and the protection strategy related to EPR developed and managed? [GSR Part 7; 3.1, 3.2, Requirement 5; 4.27-4.31] [GSR Part 3 Requirement 44; 4.7-4.11]

What are the internal processes for development, periodic review and update of the on-site emergency plan, procedures and other relevant EPR policies and programmes, based on lessons learned from research, operating experience including current industry practices, drills and exercises? [GSR Part 7 Requirement 23; 6.18, Requirement 25; 6.30, Requirement 26; 6.34, 6.36, 6.38] [SSR-2/2 Requirement 18; 5.2-5.4]

How does the management system ensure that the measurement, evaluation and feedback of outcomes is fully effective within the organization? How does the plant ensure that self-assessment is effectively applied to EPR activities? What indicators are used for the self-assessment? [SSR-2/2 Requirement 9; 4.33-4.37] [NS-G-2.14; 2.20]

How does the operating organization take charge of updating emergency response procedures following modifications to emergency response facilities and equipment? [SSR-2/2 Requirement 11; 4.42]

9.1.4. Hazard assessment

To what extent does hazard assessment cover all possible hazards, including all radiological (e.g. reactors, spent fuel pools, multi-facility events, radioactive sources on site and in-house waste management) and non-radiological (e.g. chemical/bomb threats) hazards, as well as external events (both natural and those caused by neighbouring industries)? What events affecting the facility are considered in the hazard assessment? How is the hazard assessment duly documented (e.g. in the FSAR)? [SSR-2/2 Requirement 18; 5.2, 5.4] [GSR Part 4; 2.6(f), Requirement 8; 4.22(c), Requirement 24; 5.6] [GSR Part 7 Requirement 4; 4.18-4.20, 4.22-4.24] [GS-G-2.1; 3.24-3.26, 3.31, 6.7-6.9]

To what degree is the emergency plan based on this hazard assessment? Does it cover all identified potential emergencies, including low probability ones? [GSR Part 7 Requirement 4; 4.18-4.20, Requirement 23; 6.18]

Has the plant developed a Level 2 PSA? If so, how it is taken into consideration (in view of the results of various events and actions) in the hazard assessment and in the development of the on-site emergency plan? [GSR Part 4 Requirement 24; 5.6] [SSG-3; 2.30] [SSG-4; 8.1(d)(e), 8.2, 8.24-28]

To what extent are the results of the Level 2 PSA used to establish the emergency planning zones? [SSG-4; 8.26]

What change management process is used to review and, if required, revise the emergency arrangements (a) prior to any change in the facility or to any activity that may impact the existing hazard assessment and (b) when new information challenging the existing arrangements become available? [GSR Part 7 Requirement 4; 4.25, 4.26] [SSR-2/2 Requirement 18; 5.4]

9.1.5. Protection strategy

To what extent is the on-site protection strategy consistent and coordinated with the off-site protection strategy? How is an evacuation of on-site personnel factored into the off-site protection strategy? [GSR Part 7 Requirement 5; 4.30, 4.31] [GSR Part 3 Requirement 48; 4.7-4.11]

9.2. Emergency response

9.2.1. Managing emergency response operations

How clearly does the on-site plan describe the emergency response organization, including roles and responsibilities, executive and operational decision-making bodies, and interfaces with external organizations (including off-site emergency management organizations)? How does the operating organization ensure that transition from normal to emergency operations is made effectively, without jeopardizing safety? [SSR-2/2 Requirement 18; 5.2] [GSR Part 7 Requirement 6; 5.2-5.4, 5.7]

9.2.2. Identification, notification and activation

How clearly define does the on-site emergency plan define the triggers for initiating an emergency response? What are they? How are they related to emergency action levels (EAL), plant parameters (critical safety functions) and radiological conditions? To what extent are the triggers clearly incorporated in the emergency operating procedures (EOPs)? [GSR Part 7 Requirement 7; 5.16] [GS-G-2.1; 4.2, 4.4, 4.5, 6.8]

What emergency classification system is in place, and how is the appropriate classification determined during an emergency? Is it based on plant parameters (critical safety functions) and radiological conditions? [SSR-2/2 Requirement 18; 5.2] [GSR Part 7 Requirement 7; 5.14-5.17]

What arrangements are made to promptly alert the off-site notification point? What is the notification process? Who decides to notify the regulator and the off-site authorities? What are the time requirements for classification and notification, e.g. immediately after the transition from EOP to SAMG and EP, or after the event has been classified? [SSR-2/2 Requirement 18; 5.2] [GSR Part 7 Requirement 7; 5.11-5.17] [NS-G-2.4; 6.58(i)] [GS-G-2.1; 6.11, 6.12]

For plants near national borders: what are the arrangements for notifying the appropriate authorities in the neighbouring country? [GSR Part 7 Requirement 7; 5.21]

9.2.3. Taking mitigatory actions

What are the arrangements for taking immediate mitigatory actions during an emergency? This should include damage control, firefighting, and the emergency actions needed to bring the situation under control and reduce any potential radiological consequences. How does the operating organization ensure that the personnel taking mitigatory actions have the right tools to allow them to take these actions effectively? How much time does it take for the on-site response team to be deployed? How long is the on-site response team self-sufficient before off-site support has to be called in? How long does it take for off-site support to arrive? Are there sufficient personnel to carry out mitigatory actions while carrying on with emergency operating procedures and SAMGs (for severe accidents)? How is this determined? Do the arrangements take into account the possible physical disruption to the plant as a result of the emergency? How is technical assistance provided to operating personnel? How is information conveyed to the response team? [GSR Part 7 Requirement 8; 5.23, 5.25, 5.27]

What arrangements are made for obtaining prompt support from off-site emergency services (police, medical and firefighting cover, etc.)? How is it determined when and under what conditions off-site assistance is needed? What arrangements are made to enable off-site support personnel to promptly access the facility, to be informed of on-site conditions and to be provided with the necessary protective equipment? [SSR-2/2 Requirement 18; 5.4] [GSR Part 7 Requirement 8; 5.24, 5.26, 5.27]

What arrangements are in place to ensure that the operating organization is given sufficient authority to promptly take the necessary actions on-site to mitigate the consequences of an emergency? [GSR Part 7 Requirement 2; 4.15, Requirement 8; 5.23]

9.2.4. Taking urgent protective actions and other response actions

How is information about emergency conditions and response actions made available to all those concerned? [GSR Part 7 Requirement 9; 5.34]

What arrangements are made to save human life or to prevent serious injury? What arrangements are made to take other protective actions? [GSR Part 7 Requirement 9; 5.35, 5.37]

What arrangements are in place for ensuring the safety of all persons on site? Such arrangements might include alarms, instructions, accounting, locating those who are unaccounted for, evacuation, decontamination, shelter, respiratory protection, iodine thyroid blocking, first-aid, suitable assembly points, safe escape routes, and monitoring in the on-site assembly areas and shelters. [GSR Part 7 Requirement 9; 5.39] [RS-G-1.1; 6.1-6.6] [GS-G-2.1; 4.28, 4.29]

What arrangements are made to ensure that means and lines of communication on-site are available and reliable under the full range of emergency conditions? [GSR Part 7 Requirement 9; 5.40]

What is the role of the operating organization in protecting the public? What arrangements ensure it can perform this role? [SSR-2/2 Requirement 18; 5.2] [GSR Part 7 Requirement 9; 5.32, 5.34, 5.36] [GS-G-2.1; 4.23-4.26]

What arrangements are there for promptly assessing abnormal conditions at the facility throughout the different stages of an emergency - exposures and releases of radioactive material, radiological conditions on- and off-site, and any actual or potential exposures of the public, workers and emergency workers? Has the operating organization considered the expected response of instrumentation or systems under abnormal conditions? [GSR Part 7 Requirement 9; 5.31, 5.32, 5.34] [GS-G-2.1; 4.27, 6.9]

9.2.5. Providing information, and issuing instructions and warnings to the public

What is the role of the operating organization in alerting the public? How is this role executed? Does the operating organization provide advance information on response preparations and actions to the permanent, transient and special population groups, and to special facilities within the emergency planning zones and perimeters? [SSR-2/2 Requirement 18; 5.2] [GSR Part 7 Requirement 10; 5.42, 5.43] [NS-G-2.4; 6.58(iii)] [GS-G-2.1 4.32-4.36]

9.2.6. Protecting emergency workers

What is the process for ensuring that on-site emergency workers are pre-designated and fit for their intended duty? [GSR Part 7 Requirement 11; 5.46]

What arrangements are made to register and integrate into emergency response operations any emergency workers who were not designated as such in advance of a nuclear or

radiological emergency? Who is in charge of protecting them when they are on-site? [GSR Part 7 Requirement 11; 5.47] [GSR Part 3 Requirement 45; 4.12] [RS-G-1.1; 6.10-6.20]

How does the procedure for deployment and protection of emergency workers take into account all hazards? [GSR Part 7 Requirement 11; 5.48]

What arrangements are made for protecting emergency workers? Such arrangements might cover training; managing, controlling and recording doses received; providing protective and monitoring equipment; iodine thyroid blocking; providing medical follow-up and psychological counselling; and obtaining informed consent for specific duties. [GSR Part 7 Requirement 11; 5.49, Requirement 26; 6.37]

What equipment is available for protecting emergency workers on-site? Is it sufficient for the anticipated number of emergency workers? What are the dose management and control procedures? What are the arrangements for the protection of external emergency workers providing on-site assistance? What are the dose restrictions applied to on-site emergency workers and to those from off-site organizations who are operating on-site? Are there provisions for medical follow-up of emergency workers? [GSR Part 7 Requirement 11; 5.49-5.51, 5.53, 5.55, 5.56]

What arrangements are made to ensure that emergency workers who undertake actions in which the doses received are > 50mSv, do so voluntarily, are clearly and comprehensively informed of associated health risks, and are trained in the actions to take? Is there an established process for decision-making in this regard? [GSR Part 7 Requirement 11; 5.51, 5.52, 5.54] [GSR Part 3 Requirement 45; 4.15-4.17]

How is information on doses received during a response and on associated health risks communicated to emergency workers? What processes are established for assessing workers' fitness for duty following an emergency response? [GSR Part 7 Requirement 11; 5.57, 5.58]

9.2.7. Managing the medical response

What arrangements are provided for medical treatment of those individuals who are contaminated on the site? [GSR Part 7 Requirement 12; 5.61, 5.64]

What arrangements have been made with respect to managing a limited number of contaminated or overexposed individuals, including promptly providing first-aid, dose estimates, and transport to a pre-designated off-site medical facility for further treatment? Do these arrangements comply with the principle that lifesaving takes precedence over decontamination? Is there a medical facility equipped to deal with contaminated patients? What support does the operating organization provide to the medical facility, in preparedness and in response? [GSR Part 7 Requirement 12; 5.62] [RS-G-1.1; 6.6] [GS-G-2.1; 4.45, 4.46]

9.2.8. Keeping the public informed during an emergency

What is the role of the operating organization in keeping the public informed during an emergency? [SSR-2/2 Requirement 18; 5.2] [GSR Part 7 Requirement 13; 5.66]

What arrangements are made for providing coordinated and consistent information to those responsible for informing the public in the event of an emergency? How are these arrangements integrated within public communications arrangements at local and national levels? [GSR Part 7 Requirement 13; 5.67, 5.68] [GS-G-2.1; 4.36]

What arrangements are made for identifying and addressing incorrect information, and for responding to requests for information from the public and from the news media? How are these arrangements integrated within public communications arrangements at national level? [GSR Part 7 Requirement 13; 5.71] [GS-G-2.1; 4.36]

What arrangements are made to handle media enquiries in a timely manner during emergencies? [GSR Part 7 Requirement 13; 5.72]

9.2.9. Managing radioactive waste in a nuclear emergency

What are the arrangements for managing the on-site radioactive waste generated by an emergency? [GSR Part 7 Requirement 15; 5.81-5.84]

9.2.10. Mitigating the non-radiological consequences of a nuclear emergency and emergency response

To what extent do the on-site emergency arrangements consider the non-radiological impacts on all site personnel? Are the arrangements set up to manage this aspect clearly described? [GSR Part 7 Requirement 16; 5.86, 5.87]

9.2.11. Termination of an emergency

What are the arrangements for terminating an emergency on site? Who takes the decision, on what basis, and how is the transition made to a planned exposure situation? [GSR Part 7 Requirement 18]

9.2.12. Analysing the emergency and the emergency response

What arrangements are made to protect, preserve and record the data and information that is generated during an emergency and deemed to be important for analysing the emergency and the response? What measures are in place to carry out such an analysis? [GSR Part 7 Requirement 19; 5.99, Requirement 26; 6.37, 6.38]

9.3. Emergency preparedness

9.3.1. Staffing

How has the minimum shift staff complement been defined in the on-site emergency plan? How has the basis for this requirement been defined? To what degree does it provide sufficient resources for all foreseen emergencies? What is the staffing level, including

contractors, in the EPP area? How sufficient is this staffing level for all emergency preparedness tasks? To what extent do the numbers of designated staff cover all the key positions in the emergency response organization? How is it ensured that at least one person is available at all times for each key position? [SSR-2/2 Requirement 4; 3.10, 3.11] [GSR Part 7 Requirement 21; 6.8-6.11]

9.3.2. On-site emergency plan and procedures

How clear, complete and generally well organized are the emergency response plan and supporting procedures? How familiar are all personnel with their general content and with the portions that apply to them specifically? How is this ensured? How often is it reviewed? Do emergency procedures cover all aspects of the plan and all positions within the emergency response organization, and how are they validated? Are they used during exercises? Are they easily accessible? Are they ergonomic? [SSR-2/2 Requirement 18; 5.3] [GSR Part 7 Requirement 23; 6.16, 6.18-6.21, Requirement 26; 6.36]

To what extent are there arrangements for coordinating the on-site emergency plan for each type of emergency and combinations thereof? What arrangements are there for the on-site emergency plan and procedures to be coordinated with the plans of all the other bodies that have responsibilities in an emergency, and with other plans? [GSR Part 7 Requirement 23; 6.17-6.19] [SSR-2/2 Requirement 18; 5.4]

How is it ensured that emergency plans are in accordance with current safety analyses, accident mitigation studies and good practices? [GSR Part 7 Requirement 26; 6.36] [SSG-25; 5.137]

9.3.3. Emergency response facilities and locations

To what extent are the emergency response facilities and locations that support the on-site response appropriate in terms of the following characteristics? [SSR-2/2 Requirement 18; 5.7] [GSR Part 7 Requirement 24; 6.22, 6.24-6.27] [GS-G-2.1; 5.5, Appendix VIII]

- *Adequate in size, suitably located, operable and habitable under emergency conditions.*
- *Appropriately organized, equipped with adequate and reliable communications systems and backup power supplies.*
- *Supplied with updated copies of all documents and SPDS.*
- *Stocked with adequate personnel protective equipment, food and water, sanitation etc., to sustain response personnel for the expected duration of the event.*

9.3.4. Emergency equipment and resources

What equipment supports emergency functions? Is it sufficient? Will it function adequately under all foreseen emergency conditions? Do people know how to operate emergency equipment? How often is it tested? Is it accessible in all emergency conditions? [SSR-2/2 Requirement 18; 5.7] [GSR Part 7 Requirement 24; 6.22, 6.23] [RS-G-1.1; 6.1-6.5]

How are alternative supplies - such as supplies of water, compressed air and mobile electrical power, and including any equipment necessary for mitigating severe accident conditions - located and maintained in such a way as to withstand and be readily accessible in postulated emergency conditions?[GSR Part 7 Requirement 24; 6.23]

What arrangements are made to ensure that emergency equipment is continuously available and functional for use in an emergency (e.g. inventories, resupply, tests, calibrations)? [SSR-2/2 Requirement 18; 5.7] [GSR Part 7 Requirement 26; 6.34, 6.35]

In what respect are on-site facilities and equipment located in places most suitable for their deployment? [GSR Part 7 Requirement 8; 5.27]

To what extent are on-site facilities and equipment covered by configuration control measures? [SSR-2/2 Requirement 18; 5.7] [GS-G-4.1; 3.200]

9.3.5. Training, drills and exercises

How does the operating organization instruct its employees and all other persons on site regarding the arrangements for notifying them in case of an emergency, and their actions in case of an emergency? [GSR Part 7 Requirement 25; 6.29] [NS-G-2.8; 4.43]

What are the provisions for selecting personnel and for delivering training and any other learning opportunities to ensure that they have the requisite knowledge, skills and abilities to perform their assigned response functions? What is the training programme? Is it tracked? How is it evaluated? [SSR-2/2 Requirement 18; 5.5, 5.6] [GSR Part 7 Requirement 25; 6.28] [NS-G-2.8; 4.32]

How are EPP staff, including contractors, qualified for their assigned work? What measures have been taken to maintain adequate levels of experience, knowledge and proficiency? [SSR-2/2 Requirement 4; 3.10, 3.11] [SSR-2/2 Requirement 18; 5.5] [NS-G-2.8; 4.28, 4.32]

What supplementary training is provided to those staff members who are required to perform specialized duties (e.g. TSC members)? [GSR Part 7 Requirement 25; 6.28, 6.31] [NS-G-2.8; 4.33, 4.36]

What training is provided to support teams entering the plant? [GSR Part 7 Requirement 25; 6.28, 6.31] [NS-G-2.8; 4.32, 4.34]

What is the exercise programme to test response arrangements and capabilities, including organizational interfaces? What arrangements are made for evaluation of exercises and for follow-up actions to be taken based on findings? Is the exercise evaluation methodology documented, systematic and comprehensive? [SSR-2/2 Requirement 18; 5.6] [GSR Part 7 Requirement 25; 6.30-6.33] [NS-G-2.8; 4.34, 4.35]

How does the drills and exercises programme cover the aspects listed below?

- *All elements of the emergency plans are checked for effectiveness. [GSR Part 7 Requirement 25; 6.30] [NS-G-2.8; 4.32]*

- *Full-scale exercises are undertaken involving external organizations. [GSR Part 7 Requirement 25; 6.30] [NS-G-2.8; 4.34]*

- *Exercises and drills are realistic (e.g. exercises without scenarios, drills outside of normal working hours, practice in taking samples while wearing protective clothing and respiratory equipment). [GSR Part 7 Requirement 25; 6.30] [NS-G-2.8; 4.32]*

- *All staff responsible for critical response functions participate in drills and exercises on a sufficiently regular basis to confirm their ability to take on these functions. [GSR Part 7 Requirement 25; 6.31]*

- *Experience feedback from drills and exercises is systematic. [GSR Part 7 Requirement 4; 4.19, Requirement 25; 6.30, Requirement 26; 6.34, 6.36] [NS-G-2.8; 5.33]*

- *All those with a role in the emergency plan regularly participate in drills/exercises. [GSR Part 7 Requirement 25; 6.30-6.32]*

9.4. Use of PSR and OEF

Which areas of EPR did the last PSR cover? Are EPR personnel informed of the results of the last PSR that relate to EPR practices? [SSG-25; 4.1, 8.11]

What were the results of the PSR of on-site and off-site facilities and equipment and emergency procedures and records? Were any issues identified and, if so, were corrective measures proposed and implemented? [SSR-2/2 Requirement 12; 4.44, 4.47] [SSG-25, 5.141-5.145]

How is operating experience information used in order to continuously improve EPR? [SSR-2/2 Requirement 24; 5.27-5.31] [GSR Part 7 Requirement 23; 6.18(d), Requirement 26; 6.36]

9. EPR

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

10. ACCIDENT MANAGEMENT

10.1. Organization and functions

10.1.1. Functions and responsibilities

How are organizational structure, responsibilities, levels of authority and functions defined and communicated within the emergency response organization? Are they understood by personnel? [SSR-2/2 Requirement 1; 3.2(b)(d)] [NS-G-2.15; 2.31, 3.90]

How are the goals, objectives and safety indicators related to severe accident management (SAM) developed and managed? How are outcomes checked and measured within the organization? [SSR-2/2 Requirement 9; 4.33-4.37]

How are SAM policies and programmes kept up-to-date with industry practices? What internal process is put in place in this regard? [SSR-2/2 Requirement 19; 5.8-5.9]

How are the chain of command and decision-making responsibilities defined for severe accident management in order to avoid any delays in critical decision-making? [SSR-2/2 Requirement 19; 5.8] [NS-G-2.15; 3.8(3), 3.78, 3.79, 3.82]

How is the transition of responsibility and authority defined if roles assigned to members of the emergency response organization are different in the preventive and mitigatory domains? [NS-G-2.15; 2.34, 3.81]

Who in the emergency response organization is responsible for execution of the severe accident management guidance? [NS-G-2.15; 2.31]

What are the criteria and responsibilities for mobilisation of the severe accident management team? [NS-G-2.15; 2.31, 3.81]

10.1.2. Personnel

How are SAM staff qualified for their assigned work and tasks? How does the plant ensure that there are enough staff to cope with all identified severe accident situations? What measures have been taken to maintain an adequate level of experience, knowledge and proficiency? [SSR-2/2 Requirement 4; 3.10, 3.11, Requirement 19; 5.8e, 5.9] [NS-G-2.8; 4.28, 4.32] [NS-G-2.15; 3.104]

How does SAMG training incorporate a mix of classroom training, exercises and drills? [NS-G-2.15; 3.109]

How does the plant ensure that training on severe accident phenomena is pitched at the appropriate technical level for individuals with different functions? [NS-G-2.15; 3.104, 3.109, 3.110]

How have personnel who will actually implement the SAMG strategies been trained on the unconventional line-ups that could be proposed? How have personnel who will be expected to use mobile equipment (such as mobile diesels and pumps) been trained on the use of that

equipment to mitigate severe accidents? [SSR-2/2 Requirement 19; 5.8e] [NS-G-2.8; 4.33, 4.34] [NS-G-2.15; 3.104]

To what degree does the scope of training include severe accidents occurring simultaneously on more than one unit, from different initial reactor operating states, and in a spent fuel pool? [NS-G-2.8; 5.21] [NS-G-2.15; 3.104, 3.105, 3.110]

How does training include provisions for periodic confirmation of the competence of personnel? What is the maximum interval between refresher training? [SSR-2/2 Requirement 7; 4.19] [NS-G-2.8; 4.28-4.31] [NS-G-2.15; 3.108]

To what extent are exercises and drills based on scenarios that will require application of a substantial portion of the overall SAMG package? [NS-G-2.15; 3.109]

How do the exercises and drills involve the participation of all individuals and groups engaged in applying SAMGs, be it at local, national and, where appropriate, international level? [NS-G-2.15; 3.104, 3.109]

To what extent does the training process include an evaluation of its effectiveness? How is the performance of drills and exercises assessed? What feedback is obtained on training in order to improve the quality of the training? [NS-G-2.15; 3.106, 3.110]

How is training provided on external hazards relevant to the safety of the plant? [NS-G-2.14; 2.13]

10.2. Overview of the severe accident management programme

What is the general status of implementation of severe accident management, when was the process started and what is the schedule for its completion or update? [SSR-2/2 Requirement 19; 5.8, 5.8d] [NS-G-2.15; 2.4, 2.11]

Was any one of the generic severe accident management approaches (such as PWROG, BWROG, CANDUOG) selected for the development of the plant's severe accident management programme? If so, what are the main plant-specific differences? Failing that, what are the main specific features of the chosen approach? [NS-G-2.15; 3.9]

If the severe accident management documentation was initially developed by a vendor or an external organization, how was it ensured that the transition from a generic to a plant-specific programme was handled appropriately, and how is continued external support ensured (such as from the plant designer, vendor, engineering organizations, etc.)? [NS-G-2.15; 3.9-3.11, 3.89]

What set of documents is available to the plant to support the understanding, development, training and execution of severe accident management actions? [SSR-2/2 Requirement 19; 5.8, 5.9] [NS-G-2.15; 2.8, 2.30, 3.55, 3.90]

For a multi-unit nuclear power plant, how have concurrent accidents affecting all units been considered in the accident management programme? [SSR-2/2 Requirement 19; 5.8a]

How does the plant coordinate interfaces with other components of plant operations, such as off-site emergency preparedness and plant ingress/egress, or interfaces and interactions with other nuclear units on the same site? [SSR-2/2 Requirement 19; 5.8a, 5.9] [NS-G-2.15; 2.31, 3.8(4), 3.93, 3.95]

What contingency measures are included in the accident management programme (e.g. alternative supply of cooling water or electrical power)? How does the plant ensure that equipment is accessible and fully functional when needed? [SSR-2/2 Requirement 19; 5.8c]

10.3. Analytical support for severe accident management

What are the available background analyses and other supporting documentation relevant to the development of the plant-specific severe accident management guidelines? [NS-G-2.15; 2.30, 3.8(7), 3.9, 3.57, 3.115] [GS-G-4.1; 3.143]

Was the supporting documentation developed by a qualified organization, and how was the competence of that organization verified? [NS-G-2.15; 3.130]

When was the last update of the plant-specific analysis performed, and were the computational tools used state-of-the-art? [NS-G-2.15; 3.111-3.113]

How does the supporting analysis cover the progression towards severe accidents in the reactor core as well as in the spent fuel pool? [NS-G-2.15; 2.16]

How does the supporting analysis cover the progression towards severe accidents for non-power reactor states, including shutdown states with open reactor or open containment? [NS-G-2.15; 2.16]

How does the supporting analysis cover the situation with parallel occurrence of severe accidents on a multi-unit site? [NS-G-2.15; 2.12, 3.54]

How does the supporting analysis cover severe accident phenomena that potentially challenge the integrity of fission product barriers, such as high-pressure core melt, production of combustible gases, reactor vessel melt-through, containment base-mat melt-through, and containment over-pressurisation? [NS-G-2.15; 3.14, 3.15, 3.120]

How does the supporting analysis address the progression of a containment by-pass accident? [NS-G-2.15; 2.12, 3.18]

What is the scope of the plant-specific accident analysis that supported the development of the severe accident management guidelines? To what degree was this scope sufficient for identification of differences with the generic documentation (if a generic approach was used), or for comprehensive development of severe accident management guidelines (in case of a plant-specific approach)? [NS-G-2.15; 3.116, 3.124]

To what extent did the results of the analysis identify the positive and negative impacts of severe accident management actions? [NS-G-2.15; 2.25, 3.24, 3.25]

How do the results of the analysis confirm the adequacy of the qualification/survivability of plant equipment used for severe accident management? [NS-G-2.15; 3.122]

To what extent have sensitivity studies been performed and documented that take account of uncertainties when determining the symptoms and timings of phenomena, in order to demonstrate the effectiveness of selected strategies? [NS-G-2.15; 2.15, 3.125, 3.126]

How do the results of the analysis establish that conditions in work spaces occupied by personnel involved in severe accident management will remain acceptable/habitable? [NS-G-2.15; 3.19, 3.53, 3.96, 3.122]

What are the arrangements for updating the supporting analysis? [GSR Part 4 Requirement 24; 5.10] [NS-G-2.15; 2.11, 3.111-3.113]

10.4. Development of procedures and guidelines

To what extent have the plant-specific severe accident guidelines been based on symptoms which are directly measurable? [SSR-2/2 Requirement 26; 7.3] [NS-G-2.15; 2.14, 3.34, 3.45, A-10, A-11]

What are the SAM actions derived from the strategies? Have these actions been properly implemented in procedures and guidelines? [NS-G-2.15; 2.7, 2.8, 3.7]

To what extent is the plant-specific background material readily available? Does it include the following items? [NS-G-2.15; 3.57]

- *The technical basis for strategies and deviations from generic strategies;*
- *A detailed description of instrumentation needs;*
- *The results of the supporting analysis;*
- *The basis for and a detailed description of steps in procedures and guidelines;*
- *The basis for the calculations of set-points.*

How were priorities evaluated and established across the different strategies (for both preventive and mitigatory domains)? [NS-G-2.15; 3.27]

In what manner has the basis for the selection of priorities for SAM strategies been documented? [NS-G-2.15; 3.27, 3.34]

How is it ensured that the strategies used for the severe accident management procedures and guidelines are representative of severe accident phenomena? [NS-G-2.15; 3.24]

To what extent does the accident management programme include instructions for utilization of available safety related and conventional equipment? [SSR-2/2 Requirement 19; 5.8b]

How were the capabilities of the plant, personnel and systems evaluated? [NS-G-2.15; 2.9, 3.7(2), 3.17-3.19, 3.83]

What are the assessment results for the survivability and qualification of equipment and instrumentation? [NS-G-2.15; 2.20, 3.71-3.76]

To what extent have non-dedicated systems, unconventional line-ups and temporary conditions been included in SAM? [NS-G-2.15; 3.17]

To what degree have the potential negative impacts been assessed for all SAM actions? [NS-G-2.15; 2.25, 3.24, 3.25, 3.31, 3.32, 3.38, 3.122]

What guidance has been developed to account for time constraints and pressures in the decision-making process? [NS-G-2.15; 3.29]

What practical impact did the uncertainties in the predictions of the analytical models have on the procedures and guidelines? [NS-G-2.15; 3.28, 3.125]

How were plant-specific vulnerabilities identified, such as degraded regional infrastructure and adverse working conditions, as well as degraded operating conditions for equipment? [SSR-2/2 Requirement 19; 5.8f] [NS-G-2.15; 3.14-3.16]

How were the strategies identified, evaluated for potential effectiveness, and evaluated for potential negative impacts? [NS-G-2.15; 3.24]

If the programme is based on a generic approach, to what extent has an assessment of differences between the actual and generic reference plant designs been made, and applied to an assessment of the applicability of generic strategies? [NS-G-2.15; 3.9]

How is it ensured that instrument data is available to all SAMG users? [NS-G-2.15; 3.71]

To what extent have instrumentation limitations such as ranges and survivability been clearly identified in the guidelines or in other easily accessible documentation? [NS-G-2.15; 3.74, 3.75]

What are the identified needs for computational aids, and how have they been incorporated into the SAM guidelines? [NS-G-2.15; 3.55, 3.77]

If equipment dedicated to SAM has been installed, how has its survivability been checked for the expected accident conditions? [NS-G-2.15; 3.69]

To what extent does the structure of the procedures and guidelines require transition between the preventive and mitigatory domains? If so, is the transition clearly defined? [NS-G-2.15; 2.10, 3.40, 3.43, 3.44]

If EOPs are used in the mitigatory domain, how have the actions they prescribe been assessed to be appropriate? [NS-G-2.15; 2.34, 3.41]

To what extent do the SAM guidelines include all relevant parts of the emergency organization (operators, safety engineer(s), TSC)? [NS-G-2.15; 2.31, 2.34]

How are the long-term implications or concerns of implementing the strategies evaluated? To what degree have exit conditions and a controlled stable state been defined? [NS-G-2.15; 3.42]

What are the local actions required? Have they been included in the guidelines? Have access requirements been considered? [NS-G-2.15; 3.53]

What are the requirements and means for overriding or blocking automatic protection system signals or interlocks? [NS-G-2.15; 3.49]

Does the SAM guidance cover all plant states, including shutdown states, the spent fuel pool and multi-unit events? [NS-G-2.15; 2.16]

Are the procedures and guidelines documented consistently concerning language and the use of specific terms? Is there a writer's guide? [NS-G-2.15; 3.46]

How has the user-friendliness of procedures and guidelines been evaluated? [NS-G-2.15; 3.46]

What is the process for reviewing and revising SAMG when changes are made in the facility or in activities that may impact the existing hazard assessment, or when new information becomes available that challenges existing arrangements? [SSR-2/2 Requirement 18; 5.4, Requirement 19; 5.8] [NS-G-2.15; 2.11, 3.111]

10.5. Plant emergency arrangements with respect to SAM

Are criteria and procedures used by operational staff for classification and activation of the response organization (including the SAM components) adequate for timely implementation of the SAM functions? [NS-G-2.15; 3.88]

Are the criteria, responsibilities and required time responses for mobilisation of the SAMG users realisable? [NS-G-2.15; 2.35, 3.80, 3.81, 3.88]

Is there a technical support centre team available to provide technical support by performing evaluations and recommending recovery actions to a decision-making authority, in both the preventive and mitigatory domains? If not, how such a support is organized? [NS-G-2.15; 2.35, 3.80, 3.81]

Is the team responsible for SAMG execution appropriately staffed and qualified? [NS-G-2.15; 3.90]

What kind of input does the technical support centre provide to the members of ERO responsible for estimation of potential radiological consequences? [NS-G-2.15; 2.35]

Do the assigned severe accident management functions take into account high-stress conditions, behaviours and the reliability of personnel under adverse environmental conditions? [NS-G-2.15; 3.19, 3.46]

Has the accessibility and habitability of the physical locations occupied by the teams of evaluators and implementers under severe accident conditions been checked and maintained? [NS-G-2.15; 3.96]

How are the non-affected units on the same site managed in case of a severe accident? Are there any pre-defined criteria for deciding whether or not the non-affected unit(s) should possibly be shut down or placed in another safe mode? [NS-G-2.15; 3.54]

Has the effectiveness of multiple usages of equipment (or response centres) that is shared by different units been proved for events that may occur simultaneously on several units? E.g. filtered venting shared by two units. [NS-G-2.15; 3.54]

Have emergency arrangements to support the performance of accident management functions been evaluated or tested for a range of potentially adverse conditions and potentially high radiation situations? [NS-G-2.15; 2.17, 2.18, 2.20]

How is the hazard-resistance - including the level of resistance to extreme external hazards - of key equipment used for accident mitigation assessed and taken into account in the SAMG? [NS-G-2.15; 2.17, 2.18, 2.20]

How are facilities, instruments, tools, equipment, documentation and communication systems for the accident management programme kept available, maintained, and tested? What are the inspection (maintenance and testing) procedures for both mobile and fixed equipment referenced in the SAMG? [SSR-2/2 Requirement 18; 5.7, Requirement 31; 8.14a] [NS-G-2.15; 2.20]

Have the methods and responsibilities for communication and coordination between the different parts of the emergency response organization been defined? How can the reliability of communication methods be ensured during severe accidents? [NS-G-2.15; 3.78, 3.93, 3.94]

Has the utilization of off-site emergency services or any other external support for severe accident management been integrated into emergency arrangements? [NS-G-2.15; 3.78, 3.89]

What arrangements are in place to ensure the appropriate flow of information among the various teams within the emergency response organization (on-site and off-site plant emergency)? [NS-G-2.15; 2.32, 3.96, 3.97]

Is the flow of information appropriate to ensure timely implementation of SAM actions which may influence protection of staff and population, or of actions which need external emergency services? [NS-G-2.15; 3.93, 3.94]

What methods are applied for communications among the different parts of the emergency response organization in order to avoid conflicts with other response functions, e.g. rescue, firefighting? [NS-G-2.15; 2.35-2.37]

10.6. Verification and validation of procedures and guidelines

What formal verification has been carried out of the SAM procedures and guidelines? [NS-G-2.15; 3.99]

To what extent were the plant-specific procedures and guidelines fully and independently reviewed during their development, in accordance with the applicable QA programme? [NS-G-2.15; 3.99]

What type of validation programme was implemented, and how were the results and conclusions of the validation documented? [NS-G-2.15; 3.100]

Which scenarios were chosen for use in the validation process, in order to cover the full range of procedures and guidelines? [NS-G-2.15; 3.100]

To what degree did the validation test the organizational aspects of SAM, especially the roles of evaluators and decision-makers? [NS-G-2.15; 3.100]

What was the simulation method chosen for validation (simulators, computer simulations, table-top exercises)? [NS-G-2.15; 3.101]

How have the SAM procedures and guidelines been tested under conditions that realistically simulate the conditions present during an emergency? To what extent did this include simulations of other response actions, hazardous work conditions, time constraints and stress? [NS-G-2.15; 3.101]

How has the onsite severe accident equipment been tested? [NS-G-2.15; 3.101]

How were the findings from validation fed back into the procedures and guidelines? [NS-G-2.15; 3.103]

10.7. Control of plant configuration

What system is in place to ensure consistency between design requirements, physical configuration and plant documentation, and how is this system integrated with severe accident management? [SSR-2/2 Requirement 10; 4.38, Requirement 11; 4.42] [NS-G-2.3; 11.1-11.6] [GS-G-4.1; 3.167]

How is consistency ensured between plant configuration and SAMG documents? [NS-G-2.15; 2.11, 3.111, 3.112]

To what extent is SAMG development associated with hardware plant modifications? How has the process been implemented so as to allow for updates to the SAMGs in response to plant modifications and changes in available mobile equipment? How effective is this process? To what degree does the SAMG package, including the background documentation, reflect current plant configuration and the available mobile equipment designated for accident management? [SSR-2/2 Requirement 10; 4.39, Requirement 19; 5.8] [NS-G-2.15; 2.19-2.22]

How does the process which has been implemented allow for the update of SAMGs when new information on severe accident management becomes available? To what degree does this

either directly or indirectly include contacts with research organizations, e.g. through the vendor or Owners Group? How effective is this process? To what degree does the SAMG package, including the background documentation, adequately reflect the latest available information? [SSR-2/2 Requirement 10; 4.38, Requirement 11; 4.42] [NS-G-2.15; 3.111-3.114]

10.8. Use of PSA, PSR and OEF

To what extent were the Level 1 and Level 2 PSAs used for identification of event sequences that may lead to severe accidents and for development of the SAM programme? [GSR Part 4 Requirement 4; 4.5, 4.12, 4.13, Requirement 14; 4.50, Requirement 19; 4.61] [NS-G-2.15; 3.1-3.4, 3.6, 3.117-3.121] [SSG-3; 3.2] [SSG-4; 2.2, 2.5, 2.15, 3.4]

Was a Level 2 PSA used for evaluation of measures and actions to be carried out for mitigation of the effects of severe accidents? Was it used for determination of the effectiveness of the severe accident management measures? [SSG-4; 8.21, 8.22]

Has the plant performed the update of the Level 2 PSA, and did this have any influence on the progression of severe accidents? If so, what were the corrective measures taken, and were the procedures and guidelines updated accordingly? [SSG-4; 5.11-5.13]

What are the results of the last PSR review, and were any issues identified with regard to severe accident management, e.g. hazards analyses or other supporting analyses? What SAM activities did the plant initiate as a result of the PSR? [SSR-2/2 Requirement 12; 4.44, 4.47] [SSG-25, 5.63, 5.77, 5.78, 5.83, 5.125]

What operating experience is reflected in the severe accident management guidance? What were the specific actions taken to update the SAMG and improve relevant plant provisions? [SSR-2/2 Requirement 24; 5.27] [NS-G-2.15; 2.11, 3.113]

How does the plant ensure that self-assessment techniques are effectively applied to SAM activities? [SSR-2/2 Requirement 9; 4.34]

10. AM

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

11. HUMAN-TECHNOLOGY-ORGANIZATION INTERACTION

11.1. Interfaces and relationships

11.1.1. Interfaces within the operating organization

How are the interfaces within the operating organization defined in the management system? [GS-R-3; 3.6] [GS-G-3.1; 2.10, 2.30, 2.31] [GS-G-3.5; 5.6(3)(d), 5.49(c), 5.82(c), 5.85(b)(f), 5.91(f), 5.95(b), 6.6(f)]

What are the arrangements in the management system for considering the safety impacts of the whole range of between human-technology-organization interactions that play out within the operating organization? [GSR Part 2 Requirement 2, Requirement 14; 5.4] [GS-G-3.5; 2.32, 2.35-2.37]

How do managers across departments, hierarchies and functional areas meet to exchange information that is relevant to safety? [SSR-2/2 Requirement 5; 4.2, 4.3, 4.28, 5.7, 8.23] [GS-G-3.1; 2.10, 2.29, 2.56, 5.52-5.55] [NS-G-2.4; 2.7, 2.9(14), 2.12; 6.31, 6.53, 8.1-8.4]

How are new processes, changes to existing processes/projects/organizations, or the cumulative effects of a series of organizational changes, analysed with regard to their real or potential impact on safety, and how are they managed? How are the final changes communicated and monitored? [SSR-2/2 Requirement 3; 3.9, Requirement 11; 4.39] [GS-G-3.1; 2.22, 2.46, 3.16, 5.56-5.71, 6.5, 6.25, 6.77] [GS-G-3.5; 3.23, 5.40-5.72, 6.68] [NS-G-2.3; 3.13, 5.3, 5.5, 7.1, 8.1-8.3] [NS-G-2.4; 5.15] [NS-G-2.8; 2.2]

What is the plant policy with respect to contractors, taking into account the primary responsibility of the operating organization for the safety of the plant? How are on-site contractor activities effectively specified, monitored, controlled and coordinated by the plant? [SSR-2/2 Requirement 1; 3.1, Requirement 2; 3.6] [NS-G-2.4; 4.8, 4.9] [NS-G-2.6; 3.6-3.9, 4.32, 5.24] [GS-G-3.1; 2.18, 2.31, 2.49, 5.18-5.23, 6.10]

How are multifunctional tasks identified to avoid conflicting demands? [SSR-2/2 Requirement 1; 3.2] [NS-G-2.4; 6.35, 6.56] [GS-R-3; 5.5] [GS-G-3.1; 5.2, 5.58]

How is coordination maintained between different plant groups, between the site organizations and contractors, and between different nuclear facilities? [NS-G-2.4; 3.2(5)(9), 4.5-4.10] [GS-R-3; 5.5, 5.7] [GS-G-3.1; 2.31, 6.3]

How are departmental interfaces analyzed to evaluate and improve the efficiency of the entire organization? [NS-G-2.8; 5.3, 5.17] [NS-G-2.6; 4.23] [NS-G-2.4; 2.9(11), 6.64, 7.5]

11.1.2. Interfaces with the corporate organization

How are the interfaces with the corporate organization defined and understood at the plant? [SSR-2/2 Requirement 3; 3.8] [NS-G-2.4; 7.1-7.10] [GS-G-3.1; 2.28-2.31]

How is the clear division between the responsibilities and authority of the corporate entity and those of the plant managed and documented? [SSR-2/2 Requirement 3; 3.8] [NS-G-2.4; 3.2, 3.3, 3.18] [GS-G-3.1; 2.28-2.31]

How does the plant get support from the corporate organization? How does the corporate operating organization monitor the plant operating and support functions, review the safety performance of the plant and provide assistance to the plant? [NS-G-2.4; 3.2, 3.21, 3.22, 5.5, 5.17-5.20] [GS-G-3.1; 6.6]

11.1.3. Interface with external organizations/interested parties

How are process sequences and interfaces with external organizations (stakeholders/interested parties) defined in the management system? [GS-R-3; 3.6] [GS-G-3.1; 2.10, 2.30, 2.31] [GS-G-3.5; 5.6(3)(d), 5.49(c), 5.82(c), 5.85(b)(f), 5.91(f), 5.95(b), 6.6(f)]

What is the scope of staff services provided from outside the operating organization, and where are they defined in the management system? To what extent is there a clear division of responsibilities and authority between all parts of the operating organization and relevant outside organizations? How are the materials and services supplied by external organizations assessed to ensure they are fit for purpose? [SSR-2/2 Requirement 1; 3.2, 3.6, 3.8, Requirement 5; 4.3, Requirement 7; 4.20, Requirement 24; 5.32] [GS-G-3.1; 2.28, 4.2]

How does the organization ensure that suppliers demonstrate commitment to safety, and that the work practices and standards of the supplier are in line with those at the plant? [GS-G-3.5; 4.7]

How does the plant interact with the regulatory body? [SSR-2/2 Requirement 2; 3.7] [NS-G-2.4; 4.1-4.4] [GS-G-3.1; II.13]

What arrangements are in place to ensure that regular discussions are held between the regulator and plant management on plant safety related issues? [SSR-2/2 Requirement 2; 3.3, 3.7] [NS-G-2.4; 4.3, 8.4] [GS-G-3.1; 3.9] [NS-G-2.4; 4.3]

How is senior management ensuring effective and timely communication with the public and other interested parties about the operation of its facility or the conduct of an activity? [GSR Part 2 Requirement 2; 3.3] [GS-G-3.1; 5.52-5.55, 5.64] [GS-G-3.5; 3.7]

How and by whom is the public informed on plant status and hazards, if any such communication is needed? To what degree is commitment to safety publicly declared? [NS-G-2.4; 3.2(4), 8.4]

What are the arrangements for getting interested parties to provide feedback that is relevant to safety, in order to take appropriate actions and monitor the effects of their implementation? [GS-G-3.1; 6.47] [GS-G-3.5; 3.8, 3.9]

11.1.4. Communication

Is an effective communication system established at all levels of the operating organization? [GS-R-3; 5.26, 5.27] [SSR-2/2 Requirement 1; 3.2, Requirement 3; 3.8] [GS-G-3.1; 2.10, 2.29, 2.36, 2.56, 4.10, 4.15, 5.52-5.55] [NS-G-2.4; 2.7, 2.9(14), 2.12, 6.31, 6.53, 8.1-8.4]

How are the safety policy and associated policies, goals and objectives communicated to staff and interested parties? [SSR-2/2 Requirement 5; 4.2, 4.3] [GSR Part 2 Requirement 2; 3] [GS-G-3.1; 5.26, 5.27]

Has the organization identified 'interested parties'? How are senior managers ensuring effective and timely communication and dissemination of relevant information to these interested parties? [SSR-2/2 Requirement 5; 4.3] [GSR Part 2 Requirement 2; 3.3, Requirement 6; 4.6-4.8] [GS-G-3.1; 3.16, 4.7, 5.26, 5.52, 5.54, 5.55, 5.64] [GS-G-3.5; 3.5, 3.7, 3.8, 3.21, 5.44]

Which types of communication are used at different levels of the operating organization, and what is communicated? [SSR-2/2 Requirement 5; 4.2, 4.3, 4.28, 5.7, 8.23] [GS-G-3.1; 2.10, 2.29, 2.56, 5.52-5.55] [NS-G-2.4; 2.7, 2.9(14), 2.12, 6.31, 6.53, 8.1-8.4]

In what way is the effectiveness of communications monitored, assessed and continuously improved based on information collected? [GS-G-3.1; 5.55] [NS-G-2.4; 8.5]

How does management ensure that its expectations are clearly understood? [SSR-2/2 Requirement 5; 4.2] [NS-G-2.4; 5.9, 8.1]

What are the mechanisms for plant staff to report safety concerns to plant management? [GS-G-3.1; 2.18, 2.36, 4.3, 6.1, 6.15, 6.53, 6.55, 6.59, 6.61, 6.62, 6.69] [GS-G-3.5; 2.4, 2.26, 2.29(k), 3.14(e), 3.21(e)] [NS-G-2.4; 8.3]

How are approved changes communicated to those affected? [GS-G-3.1; 5.55] [NS-G-2.4; 8.5]

11.2. Human factors management

How is human performance analyzed, and how are results applied to improve the efficiency of the organization? [NS-G-2.8; 5.3, 5.17] [NS-G-2.6; 4.23] [NS-G-2.4; 2.9(11), 6.64, 7.5]

How are human performance tools used to enhance safe performance? [SSR-2/2 Requirement 8; 4.29]

How does management monitor and reinforce expected personnel behaviours? [GS-R-3; 1.3, 3.2, 3.3] [GS-G-3.1; 2.17, 2.34-2.36, 3.6-3.8, 4.14, 6.7]

How does the individual performance appraisal system contribute to the achievement of established safety goals and objectives? In what way does the performance appraisal system include assessments of behaviours? [NS-G-2.4; 2.9(12), 3.24] [GS-G-3.1; 4.3]

11.3. Continuous improvement/learning organization (monitoring and assessment)

How are senior managers involved in the monitoring of safety performance? [SSR-2/2 Requirement 9; 4.35] [NS-G-2.4; 3.8, 3.10, 3.20-3.22, 5.17] [GS-G-3.1; 6.16]

Does management have a clear and consistent understanding of the most important strengths and weaknesses of the plant? [GS-G-3.1; 6.2, 6.6, 6.17-6.19, 6.25, 6.72]

How do managers monitor activities in their areas, and what responsibilities do they have for corrective actions and achievement of high quality performance? [NS-G-2.4; 6.16, 6.61] [GS-R-3; 6.2, 6.14] [GS-G-3.1; 3.18, 6.14, 6.19, 6.32, 6.50-6.58, 6.66-6.75] [GS-G-3.5; 6.3, 6.19, 6.23, 6.42]

Which indicators are in place to provide a clear picture of safety performance? How are they documented, reviewed, trended, communicated and evaluated in order to continuously improve plant safety performance? [SSR-2/2 Requirement 9; 4.34, 4.37] [GS-G-3.1; 2.36, 5.31-5.33, 6.4, 6.8, 6.9, 6.69] [NS-G-2.4; 5.20, 5.21] [GS-G-3.5; 6.21-6.23]

How does the audit and review system monitor and evaluate safety performance? [SSR-2/2 Requirement 9; 4.33, 4.34] [NS-G-2.4; 5.17-5.20] [GSR Part 2] [GS-G-3.1; 6.3, 6.18, 6.23-6.25, 6.32]

How is the self-assessment programme established and implemented to continuously improve safety performance? [SSR-2/2 Requirement 9; 4.34] [GS-R-3; 6.2] [GS-G-3.1; 6.1-6.30, 6.32] [GS-G-3.5; 6.1, 6.2, 6.4-6.23, 6.26-6.39] [NS-G-2.4; 5.17-5.22, 6.48]

How are external/independent assessments applied to improve safety performance? [SSR-2/2 Requirement 9; 4.34] [GS-G-3.1; 6.1-6.30] [GS-G-3.5; 6.4, 6.6-6.23, 6.26-6.39] [NS-G-2.4; 5.17-5.22]

To what extent is the safety performance of the operating organization regularly compared with that of similar organizations? [GS-G-3.1; 6.19, 6.47] [GS-G-3.5; 3.30, 6.27-6.30]

What opportunities are given to managers and plant personnel to look outside their organization in order to learn from best practices? [GS-R-3; 6.8, 6.16] [GS-G-3.1; 6.8, 6.16] [GS-G-3.5; 3.30, 4.12, 6.23] [NS-G-2.11; 2.5, 3.9, 7.6]

How are non-routine activities assessed, approved and carried out? [SSR-2/2 Requirement 8; 4.27]

How are ad-hoc review groups established to manage specific safety related issues or problems? [NS-G-2.4; 6.46, 6.47]

How does the organization ensure that managers are aware of the results of audits and oversight monitoring activities, and use the results of those activities to improve safety? [SSR-2/2 Requirement 9; 4.33] [GS-G-3.1; 6.8, 6.39]

How are the causes of non-conformances and other safety issues identified and analyzed for their potential consequences? How are corrective and preventive actions taken? How is the effectiveness of these preventive and corrective actions monitored and reported? [SSR-2/2 Requirement 9; 4.37] [GSR Part 2 Requirement 9; 4.33] [GS-G-3.1; 6.11-6.16] [GS-G-3.5; 6.44-6.60] [NS-G-2.4; 5.22]

How does the operating organization retain "corporate memory" of why and how improvements have been made, e.g. in case of major plant modifications? [NS-G-2.3; 11.6]

How are new or emergent management and performance concerns taken into account? [GS-G-3.1; 6.22]

How does the organization learn from internal and external operating experience? [GSR Part 2 Requirement 13; 4.50] [GS-G-3.1; 2.46, 4.13, 6.2] [GS-G-3.5; 6.61, 6.62]

What mechanisms are in place to involve staff in contributing ideas for improvement? [GS-R-3; 3.4, 6.17, 6.18] [GS-G-3.1; 6.1, 6.14, 6.51, 6.52, 6.82, 6.83] [GS-G-3.5; 2.26, 3.1]

How are managers and supervising personnel trained to recognize and diagnose problems, to formulate and implement solutions, and to make adjustments as required by experience? [GS-G-3.1; 4.10-4.25, 6.50-6.77] [NS-G-2.8; 5.11-5.15]

How are plant personnel encouraged to share ideas with their peers and to carry out evaluations of their own working practices and performance? [GS-G-3.1; 4.3, 6.1, 6.3, 6.12-6.19] [GS-G-3.5; 6.8-6.20]

What mechanisms are provided to enable experience and ideas to be transferred within the operating organization? [GS-G-3.1; 6.45, 6.82, 6.83] [GS-G-3.5; 2.18, 2.26, 4.14]

Is a knowledge management system established and does it include identified information and data that need to be collected, processed and made available for the management of safety? [NS-G-2.4; 5.17, 5.18] [GS-R-3; 6.3] [GS-G-3.1; 6.3, 6.18, 6.23-6.25, 6.32]

11.4. Safety culture

How does the organization ensure that safety is the overriding priority? [SSR-2/2 Requirement 5; 4.1-4.5] [GS-G-3.1; 3.10-3.24] [NS-G-2.4; 5.6-5.11]

How do all individuals in the organization contribute to promoting and fostering a strong safety culture? [GSR Part 2 Requirement 14; 5.2] [GS-G-3.1; 3.2-3.5, 3.7] [GS-G-3.5]

How are desired and expected attitudes and behaviours supported by the management system? [GSR Part 2 Requirement 14; 5.1, 5.2] [GS-G-3.1; 2.32-2.36] [GS-G-3.5; 2.15, 2.29, 2.33, 2.34, 2.36]

How are the following developed: shared values for safety, behavioural expectations, and an acceptance of responsibilities for safety? [SSR-2/2 Requirement 5; 4.1-4.5] [GSR Part 2 Requirement 2; 3.1] [GS-G-3.1; 3.2]

How does the organization ensure that its managers and workforce understand and discharge their responsibility for safety? [SF-1 Principle 1] [GSR Part 2 Requirement 2; 3.1] [GS-R-3; 3.1]

How is safety culture assessed? How are assessments analyzed, communicated to staff and acted upon? [GSR Part 2 Requirement 15; 5.5-5.7] [GS-G-3.1; 6.3, 6.7-6.11] [GS-G-3.5; 6.35-6.39]

What authority and responsibility is given to each individual or team to stop and review safety before starting a piece of work or beginning to carry out a procedure? [INSAG-15; 3.3] [GS-R-3; 3.12-3.14] [GS-G-3.1; 2.15, 2.31]

How are plant staff encouraged to challenge potentially unsafe practices and identify deficiencies, wherever and whenever they encounter them? [GS-R-3; 2.5] [GS-G-3.1; 2.15-2.19]

How are personnel encouraged to acknowledge errors and seek help when needed? [SSR-2/2 Requirement 24; 5.31] [GS-G-3.1; 2.18, 6.51-6.54, 6.59]

How is conservative decision-making used as a common approach to safety related matters? [INSAG-15; 3.3] [GS-G-3.1; 2.5, 2.36, 4.10, 5.2]

11. HTO

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

12. LONG TERM OPERATION

12.1. Organization and functions

12.1.1. Functions and responsibilities

How are organizational structure, responsibilities, levels of authority and functions defined and communicated within the organizational entity responsible for LTO? Are they understood by personnel? [SSR-2/2 Requirement 1; 3.2(b)(d)] [NS-G-2.12; 4.2-4.7, 4.36] [GS-G-3.1, 3.10]

Has the plant established a special LTO-oriented project team - or similar organizational arrangements governing such activities - with responsibilities and duties, as well as lines of authority, defined within an overall organizational policy and management system (including control of contractors and TSOs)? [NS-G-2.12; 4.3-4.7]

How are the goals, objectives and safety indicators related to LTO and AM (ageing management) developed and managed? How are outcomes checked and measured within the organization? [SSR-2/2 Requirement 9; 4.33, 4.34]

12.1.2. Personnel

What is the staffing level, including the use of contractors, in the organizational entity responsible for LTO? How does the plant ensure that there is enough manpower to cover all activities linked to LTO? [SSR-2/2 Requirement 4; 3.10, 3.11] [GS-G-3.1; 4.1, 4.2] [NS-G-2.12; 4.2, 4.8]

How are LTO staff, including contractors, qualified for their assigned work? What measures have been taken to maintain an adequate level of experience, knowledge and proficiency? [SSR-2/2 Requirement 4; 3.10, 3.11]

12.1.3. Plant policy for LTO

Does a clear policy exist in the area of long term operation and ageing management? How are LTO policies and programmes kept up-to-date? What internal process is put in place in this regard? [SSR-2/2 Requirement 9; 4.33-4.35, 4.37, Requirement 14; 4.50, 4.51] [GS-G-3.1; 3.10-3.12, 5.10] [NS-G-2.12; 4.2] [SRS No. 57; 2.1, 2.2]

Is the plant policy consistent with related IAEA Safety Standards, and does it meet their intent? [GS-R-3; 2.8-2.10]

Does the plant have plant-level documentation covering the LTO concept and approach? [NS-G-2.12; 3.2, 3.3, 4.14] [SRS No. 57; 4.1, 4.2]

Are plant personnel familiar with the policy and do they understand it? [GS-R-3; 2.8, 2.9]

12.1.4. Related regulatory requirements, codes and standards

Has a complete and consistent set of regulatory requirements, codes and standards been identified related to LTO and ageing management? [NS-G-2.12; 3.4]

What are the regulatory requirements, codes and standards, are they consistent with IAEA requirements and recommendations, and if applicable, are gaps addressed by the plant through the LTO programme? [SSR-2/2 Requirement 16; 4.53] [SRS No. 57; 2.1]

Does the principal approach and basic concept of the plant's LTO programme meet the intent of the applicable IAEA requirements and recommendations? [NS-G-2.12; 3] [SRS No. 57; 2.1, 2.2]

12.1.5. LTO implementation programme

How did the plant established (a) programme(s) or action plan(s) for the resolution of issues identified during the review of AMPs, EQ and time-limited ageing analyses? [SSR-2/2 Requirement 16; 4.54] [SRS No. 57; 7]

Does the plant have a programme for major modifications, reconstructions and replacements? [NS-G-2.3; 7.1-7.3] [SRS No. 57; 7]

Has an evaluation been performed of existing programmes and documentation? Are evaluation results used as a basis for developing the foundations for successful LTO and will they remain effective for the planned period of LTO? Does this evaluation determine if modifications and/or new programmes are necessary to ensure that SSCs are available and qualified to perform their intended function for the planned period of LTO? [SSR-2/2 Requirement 16; 4.53] [SRS No. 57; 5.3]

How has the plant applied the measures taken in connection with identified issues, and how have these measures been incorporated into a relevant programme? Does the plant implementation programme for LTO cover activities such as modifications, major reconstructions and scheduled replacements, and other plant commitments needed to guarantee safety during LTO? [NS-G-2.12; 4.36]

How and to what extent is the programme supported by safety analyses and, if applicable, by business evaluations, and how are plant activities coordinated in respect of an overall programme for LTO? [SRS No. 57; 3.1]

How are relevant operating experience and research findings taken into account? [NS-G-2.12; Table 2] [SRS No. 57; 5.3(i)]

How are recommendations and other suggestions arising from different types of reviews incorporated into LTO programme? [SSR-2/2 Requirement 12; 4.47] [NS-G-2.12; 7.11] [SSG-25, 9.1-17]

12.2. Scoping and screening, and plant programmes relevant to LTO

Does the plant have a clear policy on the scope of LTO, which includes:

- *A link to the safety classification system;*
- *Criteria for scoping, including boundary conditions;*
- *A definition of SCs that do not have safety functions within the scope.*

[SRS No. 57; 2.2, 4.0, 4.1]

Does the plant include SCs to prevent/ mitigate design extension conditions in the scope of LTO? [SRS No. 57; 4.1]

What kind of method has been used for identifying SCs within the scope of LTO, especially for identifying SCs that are not important for safety? [SSR-2/2 Requirement 16; 4.54] [NS-G-2.12; 4.14-4.16] [SRS No. 57; 2.2, 4.1]

Are the scoping method and SCs within the scope properly documented, and is the relevant data accessible (indicating e.g. intended function, safety class, other scoping criteria, etc.)? [NS-G-2.12; 4.10-4.13] [SRS No. 57; 2.2, 4.1, 7]

Does the plant clearly set apart those SCs that require interfaces between different areas (mechanical, electrical, I&C and civil structures), such as control valves? [SRS No. 57; 4.2]

What is the procedure for screening those SCs that fall within the scope of LTO? [NS-G-2.12; 4.14-4.16] [SRS No. 57; 4.2]

How have SC commodities groups (group of components/structures which have similar functions, are made of similar materials or are located in similar environments) been defined? [SSR-2/2 Requirement 16; 4.54] [SRS No. 57; 4.0]

How are the results of the scoping and screening processes documented? [SRS No. 57; 2.2, 4.0]

Has the plant verified if SCs within the scope of LTO are subject to appropriate programmes such as AMPs, revalidation of time limited ageing analyses or other existing programmes? [SSR-2/2 Requirement 16; 4.54]

How does the plant use risk-based information (e.g. PSA) to extend the scope for LTO? (PSA results should not be used to exclude SCs from the scope of LTO) [NS-G-2.12; 4.16]

12.3. Review of ageing management and ageing management programmes, and revalidation of time limited ageing analyses

12.3.1. Area-specific scoping and screening of SSCs for LTO

Is a master list of plant SCs available? Which items are in-scope for LTO and out-of-scope for LTO? [SRS No. 57; 4.1, 4.2, 5.5]

Is the scope of SCs for LTO complete and documented? Does it fulfil scoping criteria? [SSR-2/2 Requirement 16; 4.54] [SRS No. 57; 4.1, 5.4]

Are SCs which may impact on safety functions included in the scope? [NS-G-2.12; 4.14] [SRS No. 57; 4.1]

12.3.2. Ageing management review

Assessment of the current physical status of the plant

How have appropriate ageing management reviews and condition assessments been performed for SCs subject to AMPs? [SSR-2/2 Requirement 16; 4.53, 4.54] [NS-G-2.12; 4.22, 4.26, 4.28-30, 4.32, 4.41], [SRS No. 57; 4, 5]

Are all the important input design data - such as design descriptions or design bases, including loads and other parameters necessary for safety evaluations - available or accessible to the plant? [NS-G-2.12; 4.10, 4.11, 4.28, 4.38, Annex II] [SRS No. 57; 5.1]

How is information on maintenance history - starting at the time of commissioning with basic data derived from the fabrication of components, including the properties of materials and service conditions - kept and managed in a proper manner? [NS-G-2.12; 4.10, 4.11, 4.38, Annex II] [SRS No. 57; 5.1]

How does the review and assessment of the operating and maintenance history for the structure or component form part of the analyses accounting for such parameters as operational transients, past failures, or unusual conditions that affected the performance or condition of the structure or component? Is an examination of repairs, modifications or replacements relevant to ageing considerations included in the analysis of the SCs? [NS-G-2.12; 2.7, Table 2, Annex I I-3, Annex II, Annex III]

How is operational data collected with a focus on transients, events and generic operating experience? Does it also include information such as power uprates, modifications and replacements, surveillance and any trend curves that are important for the overall assessment? [NS-G-2.12; 4.12, Annex II]

Identification of ageing effects and degradation mechanisms

How does the plant assess degradation effects in detail for each structure, component or commodity grouping? [NS-G-2.12; 2.2-2.12, Table 2]

How does plant ageing management contain identification of the following: possible ageing effects/mechanisms; critical locations/parts; materials; environments; and ageing management programmes addressing these subjects for SCs that fall within the scope of LTO? [NS-G-2.12; 2.3] [SRS No. 57; 2.2, 6.1.2]

How have the materials, environments and stressors associated with each structure, component or commodity grouping been considered during the process of identifying the effects of ageing degradation? [NS-G-2.12; 4.20, 4.21, 4.34] [SRS No. 57; 5.2]

How have operating experience and research findings, and corresponding results, been adequately considered? [NS-G-2.12; 1.2, 3.8, 6.11] [SRS No. 57; 5.2, 5.3]

Can selected examples be put forward, demonstrating consistency with IGALL AMR tables? [SRS No. 82]

Documentation of the evaluation and of the demonstration to management of ageing effects

How has it been demonstrated that the effects of ageing will continue to be identified and managed such that the intended function of the SC will be maintained throughout the planned period of LTO? [NS-G-2.12; 1.3, 2.3, 3.1, 3.5, 4.26, 6.1, 6.3]

How has the plant demonstrated that the identified ageing effects cannot result in a loss of the intended function of the SCs? [SRS No. 57; 5.4, 5.5]

How does the plant develop and maintain in an auditable and retrievable form all information and documentation necessary for effective management of ageing effects? [NS-G-2.12; 4.10-4.13, 6.5] [SRS No. 57; 2.2, 4.0]

What data collection and record-keeping systems are in place so that trend analyses can readily be performed to predict SSC performance? [NS-G-2.12; 3.1, 4.28-4.30]

Is the following information available in the documents demonstrating management of ageing effects?

- *Clear identification of the ageing effects requiring management;*
- *Identification of the specific programmes or activities that will manage the effects of ageing for each structure, component, or commodity grouping listed;*
- *Description of how the programmes and activities will manage the effects of ageing;*
- *List of substantiating references and source documents;*
- *Discussion of any assumptions or special conditions used in applying or interpreting the source documents; and*
- *Description of existing and new programmes for LTO.*

[NS-G-2.12; 2.14, 2.15, 4.10-4.13, 4.25-4.27, 4.30, 6.5, Fig. 4] [SRS No. 57; 5.0, 5.4, 5.5]

12.3.3. Review of ageing management programmes

How have existing and proposed plant programmes that support LTO been reviewed to confirm they meet the nine attributes? [NS-G-2.12; Table 2] [SRS No. 57; 2.2, 5.3]

Can the plant provide specific samples of existing and new AMPs to demonstrate consistency with IGALL AMPs with respect to meeting the intent of IGALL AMPs? [SRS No. 82]

After reviewing existing plant programmes and/or ageing management programmes, how does the plant conclude that the management of ageing effects is not adequate in some cases? If so, how does the plant modify the existing programme or develop a new programme for the purpose of LTO? [SSR-2/2 Requirement 16; 4.54] [NS-G-2.12; 2.3, 6.4]

How are operation, inspection/monitoring and maintenance programmes coordinated by AMPs? [SSR-2/2 Requirement 14; 4.50] [NS-G-2.12; 2.5, 4.22]

12.3.4. Obsolescence management programme

How have the appropriate technological obsolescence management reviews and assessments been performed for SCs? [NS-G-2.12; 5.1-5.7]

How has it been demonstrated that the effects of obsolescence will be continuously identified and managed such that the intended function of SCs will be maintained throughout the planned period of LTO? [NS-G-2.12; 5.1-5.7]

How does the plant review the efficiency of existing obsolescence programmes on a regular basis? [NS-G-2.12; 5.1-5.7]

Which system is in place for the management of technological obsolescence of SSCs such as I&C equipment and systems, sensors, medium voltage cables, and uninterruptable emergency power supplies? [NS-G-2.12; 5.1-5.7]

12.3.5. Existing time limited ageing analyses

How are the existing time limited ageing analyses (e.g. from FSAR) documented in the current safety analysis report or other licensing basis documents? Do they clearly and adequately describe the current licensing basis or the current design basis requirements for plant operation? [SRS No. 57; 3.2, 6.1.4, 7]

How has the plant established a list of existing time limited ageing analyses? [SRS No. 57; 6]

How has the plant identified missing time limited ageing analyses based on the results of screening? [SRS No. 57; 6]

How has the plant launched time limited ageing analysis reconstitutions if needed? [SRS No. 57; 6]

12.3.6. Revalidation of time limited ageing analyses

Are the necessary design basis information, applicable codes and regulatory requirements, fabrication records, operational and maintenance history, and results of inspections, all accessible? [SRS No. 57; 6]

How are these calculations/analyses documented? [NS-G-2.12; 6.3] [SRS No. 57; 3.2, 6, 7]

What methods and criteria are used for revalidation of time limited ageing analyses? [SRS No. 57; 6]

Do the reviewed time limited ageing analyses justify safe LTO? [SSR-2/2 Requirement 16; 4.54] [NS-G-2.12; 6.3] [SRS No. 57; 2.2, 6]

How are the implications of revalidation considered in the plant operational limits and conditions? [NS-G-2.12; 6.3] [SRS No. 57; 6]

How has the qualification of SCs covered by the EQ programme been satisfactorily established and maintained for LTO? [SSR-2/2 Requirement 16; 4.54]

What corrective or compensatory measures are taken, if the analyses cannot be revalidated?

What evaluation has been done to demonstrate that the safety analyses meet one of the following criteria:

- *The analysis remains valid for the intended period of LTO;*
- *The analysis has been projected to the end of the intended period of LTO;*
- *The effects of ageing on the intended function(s) of the structure or component will be adequately managed for the intended period of LTO. [SRS No. 57; 6]*

How is the revalidation of time limited ageing analyses documented in an update to the plant safety analysis report? [SRS No. 57; 3.2]

Are typical time limited ageing analyses part of the plant safety analyses, such as: [SRS No. 57; 6.1.3]

- *Irradiation embrittlement of the reactor pressure vessel;*
- *Thermal and mechanical fatigue;*
- *Thermal ageing;*
- *Loss of preload;*
- *Loss of material.*

Are plant TLAAs consistent with IGALL TLAAs and do they meet their intent? [SRS No. 82]

How have the stressors set out in the design specifications or current licensing basis been used for assessment of SCs and their supports? [SRS No. 57; 6.1.1]

How was data from surveillance programmes and diagnostic systems applied in the analyses; similarly, how was data from surveillance programmes and diagnostic systems applied in the analyses? [SRS No. 57; 6.1.1]

How were limits established in the design specifications or in the licensing basis currently in force? [SRS No. 57; 6.1.1]

How does the plant develop and maintain in an auditable and retrievable form all information and documentation necessary for revalidation of time limited ageing analyses? [SRS No. 57; 6.1, 7]

12.4. Use of PSR and OEF

When was the last periodic safety review performed? Were any needs identified for changes or upgrades to the LTO programme? [SSR-2/2 Requirement 16; 4.44, 4.50, 4.53] [NS-G-2.12; 2.2, 2.17, 7.9-7.11] [SSG-25, 5.37-5.51]

Did the last PSR reveal any findings regarding ageing management and, if so, what were the prescribed corrective actions, and have they been either implemented or scheduled for implementation? [NS-G-2.12; 7.9] [SSG-25; 3.1, 3.2]

Are relevant operating experience and research findings taken into account in order to further improve the LTO programme? [NS-G-2.12; Table 2] [SRS No. 57; 5.3(i)]

12. LTO

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

13. COMMISSIONING

The different topics in the Commissioning module are normally covered by the reviewers of other modules, as appropriate. A lead reviewer for each respective subchapter is designated at the beginning. The OPS1 reviewer usually has the responsibility to summarise the results of the Commissioning module review.

13.1. The commissioning process

LM

What arrangements are in place to ensure that the commissioning process is a progressive transition from construction to operation of the plant? [SSG-28; 2.1]

How is good coordination and communication (awareness by all participants of all the pertinent decisions) ensured among all the different participants in the commissioning process? [SSG-28; 2.2]

13.1.1. Commissioning programme

LM

What is the scope of the commissioning programme? [SSR-2/2 Requirement 25; 6.1] [SSG-28; 2.4, 2.28]

What arrangements are in place within the plant's commissioning programme to ensure adequate consideration of tests performed off-site? [SSG-28; 2.5]

What arrangements are in place within the plant's commissioning programme to ensure adequate consideration of chemical preconditioning and/or passivation of the plant prior to active commissioning? [SSG-28; 2.6]

How is it ensured that all commissioning activities are identified, and responsibilities for implementing and reporting those activities are clearly specified, for all participant organizations? [SSG-28; 2.7]

What arrangements within the commissioning programme are in place to ensure that in planning for commissioning, all the responsibilities for safety at different milestones of the commissioning programme are allocated appropriately? [SSG-28; 2.8]

What process(es) are in place for the review and approval of the commissioning programme? [SSG-28; 2.10]

What arrangements, within the plant's commissioning programme, are in place to ensure that operating procedures are verified and validated during the commissioning process? [SSG-28; 2.12]

Within the plant's commissioning programme, what arrangements are in place to ensure that operating personnel, maintenance personnel, designers and other relevant staff, all participate in commissioning activities? [SSR-2/2 Requirement 25; 6.6] [SSG-28; 2.13]

How does the plant ensure the correct scheduling of tests and related activities, the availability of suitable personnel and equipment, and the timely production of all necessary documentation? [SSG-28; 2.14]

How does the commissioning programme correspond to the existing management system? [SSG-28; 2.15]

13.1.2. Stages of commissioning

LM

What milestones are defined within the commissioning programme? How are respective results examined and progressive decisions made? [SSR-2/2 Requirement 25; 6.2, 6.3] [SSG-28; 2.17-2.19]

How is the sequence of testing planned, and how are potential adjustments to the specified sequencing managed? [SSG-28; 2.20, 2.21]

What arrangements are in place at the plant to ensure that relevant safety system settings and alarm settings, including those of instruments for radiological protection, are specified at the appropriate commissioning stages or sub-stages? [SSG-28; 2.22]

13.1.3. Execution of the commissioning programme

OPS

What limitations (limiting conditions) related to various operating modes or plant configurations are established at the plant when conducting tests that need to take account of, and be assessed for, potential risks? [SSG-28; 2.23, 2.24]

What prerequisites have been established at the plant for determining the sequence of testing? [SSG-28; 2.25, 2.26]

What documentation is there in place in support of the commissioning programme? [SSG-28; 2.27]

What provisions are there to ensure that neighbouring units (either under construction, commissioning or operation) at a site are managed safely? [SSG-28; 2.29]

13.1.4. Role of the operating organization

LM

What arrangements are in place to ensure that the operating organization is properly and effectively discharging its responsibilities with regard to the commissioning programme? [SSG-28; 2.34-2.36]

13.2. Organization and management of commissioning

13.2.1. Management system for commissioning

LM

What administrative arrangements are developed and implemented within the operating organization to define the overall provisions for the management, performance and assessment of activities at the nuclear power plant during commissioning? [SSG-28; 3.1-3.4]

What is the scope of the plant's management system with regard to commissioning? [SSG-28; 3.5]

How does the management system describe the structure, content, extent and means of control of commissioning documents? [SSG-28; 3.7]

How does the management system support the development and enhancement of a safety culture in various commissioning activities? [SSG-28; 3.9]

What provisions are put in place within the commissioning programme to ensure that the safety, health, environmental, security and quality requirements for commissioning are met by all organizations participating in commissioning activities, including contractors? [SSG-28; 3.10]

By what means are commissioning activities on site controlled so as to ensure compliance with the commissioning programme? [SSG-28; 3.11]

How does the plant ensure adequate and, where necessary, independent oversight and control of the quality of commissioning activities? [SSG-28; 3.12]

13.2.2. Organizational arrangements for commissioning

LM

What organizational arrangements are in place to achieve the safety objectives of the commissioning programme? [SSG-28; 3.13]

What are the principal tasks performed in commissioning, and how are the personnel performing these tasks defined in commissioning activities? [SSG-28; 3.14]

How is it ensured that the ultimate responsibility for commissioning and for safety is under the control of the plant organization? [SSG-28; 3.15]

What working arrangements are there to ensure that operating personnel become familiar with the plant and its facilities during commissioning? [SSG-28; 3.16]

How is it guaranteed that the responsibilities of participants in the commissioning programme remain clear at all times, even if construction, commissioning and operating activities overlap? [SSG-28; 3.17, 3.18]

13.2.3. Operating organization

LM

What are the responsibilities of the operating organization during commissioning? [SSG-28; 3.22]

How does the operating organization discharge these responsibilities? [SSG-28; 3.19-3.21, 3.23]

What is the organization and what are the attributes of the commissioning group at the plant? [SSG-28; 3.24-3.28]

13.2.4. Functions and responsibilities in commissioning

LM, OPS

How is it ensured that a body (organization or individual) responsible for commissioning maintains accountability to the organization (or an individual) responsible for compliance with the licence? What is the scope of this accountability? [SSG-28; 3.29]

How is the transfer of responsibilities guaranteed when structures, systems and components of the plant are handed over between groups involved in the overall commissioning? [SSG-28; 3.30]

What are the responsibilities of the construction group during the commissioning period? [SSG-28; 3.32]

What are the responsibilities of the commissioning group during the commissioning period? [SSG-28; 3.33]

What are the responsibilities of the operating group during the commissioning period? [SSG-28; 3.34]

What are the responsibilities of the other participants such as designers, manufacturers, etc., regarding commissioning activities? [SSG-28; 3.35]

13.2.5. Interfaces in commissioning

OPS

How are the interfaces between commissioning activities managed to ensure the safety of the plant and the protection of personnel? [SSG-28; 3.37-3.40]

What interfaces between construction activities and commissioning activities are considered within the commissioning programme? [SSG-28; 3.40, 3.42]

How is adequate commissioning of the integrated system ensured, when some systems have been partially installed and, as a consequence, have been only partially commissioned? [SSG-28; 3.43]

What interfaces between commissioning activities and operating activities are considered within the commissioning programme? [SSG-28; 3.44]

What organizational and practical arrangements are in place to ensure that operating staff become familiar with, and gain experience of, operating the plant? [SSG-28; 3.45]

What inter-organizational arrangements are in place to ensure that procedures, including operating, maintenance and surveillance procedures, are adequately validated during the commissioning stage? [SSG-28; 3.46]

How is it ensured that personnel adhere to normal operating rules during the commissioning stage? [SSG-28; 3.47]

13.2.6. Transfer of systems and handover of the plant in commissioning

OPS

What procedures for handover of the plant are established and used by the operating organization? [SSG-28; 3.50, 3.51]

How is it ensured that all systems are under the control of the operating group before the start of nuclear testing? [SSG-28; 3.52]

What administrative arrangements are in place to ensure the correct and timely transfer during the handover process of documentation corresponding to different systems? [SSG-28; 3.53]

What documentation is included in the acceptance package for each system in the handover process? [SSG-28; 3.54]

What administrative and organizational arrangements are in place in the operating organization to review and accept the handover package? [SSG-28; 3.55]

13.2.7. Resources for commissioning

LM, TQ

What administrative and organizational provisions are in place to ensure that human resources and other resources are adequate during commissioning? [SSG-28; 3.56-3.59]

How is it ensured that personnel engaged in commissioning activities are suitably qualified and experienced for their designated level of responsibility, and for the relative importance to safety of their work? [SSG-28; 3.60-3.65]

13.2.8. Measurement, assessment and improvement

LM, MA

What administrative and organizational provisions are in place to ensure the management of non-conformances during commissioning? [SSG-28; 3.67]

What administrative and organizational provisions are in place to ensure that the plant is adequately monitored and maintained during commissioning? [SSG-28; 3.70]

What organization is in place to ensure adequate maintenance during commissioning? [SSG-28; 3.71]

13.2.9. Arrangements for emergency preparedness and response in commissioning

EPR

What administrative and organizational provisions are in place to ensure adequate emergency preparedness and response during commissioning? [SSG-28; 3.72-3.76]

13.2.10. Management of unexpected events in commissioning

OPS

What administrative and organizational arrangements are in place to ensure adequate management of unexpected events during commissioning? [SSG-28; 3.77]

How do commissioning test procedures identify the specific limits and conditions applicable to each test, and what actions are taken when these limits are approached? [SSG-28; 3.77]

13.3. Implementation of the commissioning programme

TS

What arrangements are in place to formally authorize/license personnel involved in the implementation of commissioning activities? [SSG-28; 4.1]

How is it ensured that arrangements for contractors involved in the commissioning process correspond with the licensee's management system? [SSG-28; 4.3]

How is it ensured that tests performed off-site on structures, systems and components demonstrate the validity of the tests performed for current, as-installed conditions? [SSG-28; 4.4]

What administrative and organizational arrangements are in place within the operating organization to ensure that the commissioning process is adequately documented, and that appropriate records on testing and on results, analyses and deviations, if any, are safely kept? [SSG-28; 4.5]

How is it ensured that design, operational and safety documentation for the nuclear power plant is updated during the commissioning process, in accordance with test results and the resolution of deviations? [SSG-28; 4.6]

13.3.1. Commissioning tests

TS

How is it ensured that the purpose and objectives of the commissioning tests are clearly defined and linked with safety criteria and characteristics mentioned in the (preliminary) safety analysis report? [SSG-28; 4.7]

How is it ensured that i) the scope of the tests is specified in terms of functions, parameters and requirements and ii) the use of in-factory tests is justified? [SSG-28; 4.8]

How is it ensured that first-of-a-kind principal design features are taken into account in the final test design? [SSG-28; 4.8]

How is it ensured that acceptance criteria are clearly specified and consistent with the safety objectives and requirements, the design intent and the results of previous testing? [SSG-28; 4.9]

How is it ensured that acceptance criteria are linked to the expectations, performance and requirements for safety and/or design? [SSG-28; 4.10]

To what extent are acceptance criteria clearly specified and justified to ensure first, that they demonstrate the achievement of test objectives for safety and secondly, that they are finally appropriately documented? [SSG-28; 4.11]

What provisions are in place to establish and verify a set of acceptance criteria linked to safety requirements, and to implement further review and authorization of these acceptance criteria? [SSG-28; 4.12]

13.3.2. Preparation for testing

TS

How does the plant apply a graded approach for the preparation of test procedures, including their verification and approval? [SSG-28; 4.13]

How is it ensured that the commissioning programme presents the objectives and principles of commissioning in relation to the entire plant, the different systems and the different stages? [SSG-28; 4.14]

How is it ensured that test procedures specify in detail how each item of equipment, system or component will be commissioned? [SSG-28; 4.15]

What management and organizational provisions are in place to ensure that test procedures are subject to a thorough verification that involves the operating organization, designers and the regulatory body? [SSG-28; 4.16]

How is it ensured that test procedures correspond to normal plant operating procedures, covering operational states (normal operation, anticipated operational occurrences) and accident conditions? [SSG-28; 4.17]

What arrangements are in place to ensure that where possible a simulator or computer codes are used in the development, verification and validation of commissioning test procedures? [SSG-28; 4.18] [SRS No. 65; 3.3.1]

What provisions are in place for managing deviations from and/or changes to the normal plant operating configurations and associated compensatory measures, if applicable? [SSG-28; 4.19]

What techniques and methods of data analysis (including uncertainties in measurements) are used in test procedures? [SSG-28; 4.20]

What management and organizational provisions are in place during the commissioning process to manage precision tools, calibrated tools, and measuring and testing equipment? [SSG-28; 4.21-4.24]

13.3.3. Prerequisites for testing

TS

What prerequisites for testing are taken into account before the start of a test? [SSG-28; 4.25]

What administrative controls and organizational provisions are in place to ensure a safe transition from one commissioning stage/sub-stage to another in the commissioning programme? [SSG-28; 4.26, 4.27]

13.3.4. Testing stages and sequences

TS, OPS

What aspects are taken into account when determining the sequence of testing? [SSG-28; 4.28]

What aspects are addressed before the commencement of initial testing of any structure, system or component? [SSG-28; 4.29-4.31]

How is it ensured that pre-service inspections are performed during or at the end of cold/hot performance tests? [SSG-28; 4.32]

What is the scope of the cold performance tests? [SSG-28; 4.33, 4.34]

What is the scope of the hot performance tests? [SSG-28; 4.35-4.37]

What arrangements are in place to ensure that operating personnel use and validate operating procedures during the commissioning process? [SSG-28; 4.38]

What arrangements are in place to ensure that the reactor is in a suitable condition to have fuel loaded and go critical? [SSG-28; 4.39]

What is the scope of the performance tests that need to be performed with the core loaded with fuel and with the reactor maintained in a subcritical condition? [SSG-28; 4.40]

Are various prerequisites for initial fuel loading met? [SSG-28; 4.41, 4.42, 4.44, Appendix - Fuel loading A.1 - Prerequisites for fuel loading A.2]

What administrative, organizational and technical arrangements are in place to ensure safe and correct fuel loading? [SSG-28; 4.43-4.49, Appendix - Fuel loading - Test conditions and procedures A.3]

What are the prerequisites for reactivity to be increased ('inserted') to approach initial criticality? [SSG-28; 4.50, 4.51]

What provisions are in place to ensure that startup proceeds in a safe and orderly manner? [SSG-28; 4.52-4.54]

What low power tests are performed? What aspects must be addressed and taken into account to authorize/permit power testing? [SSG-28; 4.55, 4.56]

What reviews are arranged at the end of each stage to confirm that operational limits and conditions are adequate? To what extent do these reviews identify any constraints on plant operation that the commissioning tests have shown to be necessary? [SSG-28; 4.60]

13.3.5. Review, evaluation and reporting of test results

TS

What reviews and evaluations are undertaken after each test? [SSG-28; 4.61-4.64]

What administrative and organizational arrangements are in place to ensure that the commissioning programme proceeds in an orderly manner, and to ensure that the stage-completion-and-approval documents can be produced in accordance with the schedule? [SSG-28; 4.65-4.67]

What arrangements are in place to ensure that the commissioning group comprehensively reports the test results to relevant participants in the commissioning programme? [SSG-28; 4.68]

13.3.6. Handling of deviations during commissioning

LM

What provisions are established for dealing with situations when changes are to be made to the plant design, to the programmes or to the tests? Also when unexpected results are obtained and when incidents occur? [SSG-28; 4.69]

What administrative and organizational arrangements are in place for dealing with modifications to plant systems or components during commissioning? [SSG-28; 4.70-4.75]

What administrative and organizational arrangements are in place for i) dealing with unexpected test results or occurrences during commissioning and ii) assurance that adequate consideration is given to such occurrences? [SSG-28; 4.76]

13.4. Documentation for commissioning

OPS, TS

What arrangements govern the documentation for commissioning? [SSG-28; 5.1-5.4]

What is the scope of the documentation for commissioning? [SSG-28; 5.5] [SRS No. 65; 3.3.1]

What is the scope and content of the commissioning manual or similar document regulating the commissioning process? [SSG-28; 5.6-5.9]

What commissioning programmes and procedures are in place to ensure that the commissioning of the plant fulfils the provisions of the commissioning programme? [SSG-28; 5.10-5.14]

What administrative and organizational arrangements are in place to ensure that commissioning activities are performed in accordance with specific, approved written procedures? [SSG-28; 5.15-5.18]

What requirements are established for the test procedures used during execution of the commissioning programme? [SSG-28; 5.19-5.32]

What special procedure is there for the preparation, review and approval of test procedures and other procedures? [SSG-28; 5.33]

What administrative, organizational and technical provisions ensure that formal reports for each test are prepared and approved in accordance with the processes under the management system? [SSG-28; 3.54, 5.2, 5.33-5.40]

13.5. Control of plant configuration

TS

How does plant management ensure that, during commissioning of the plant, configuration management principles are incorporated in the management system (with regard to document control and records management, plant modifications and conformance of physical configuration to design requirements)? [SSR-2/2 Requirement 25; 6.1, 6.4, 6.7, 6.10, 6.14, 6.15] [SSG-28; 3.5-3.7, 3.22, 3.32-3.35, 5.3, 5.4] [SRS No. 65; 3.3.1]

How are operating, maintenance and test procedures reviewed, verified and updated to reflect current plant configuration? [SSR-2/2 Requirement 25; 6.5, 6.9] [SSG-28; 5.15, 5.16]

How are modifications documented during the commissioning period? [NS-G-2.3; 7.10]

What special procedure is there for treating temporary plant modifications during commissioning? How are temporary modifications treated and documented? [SSG-28; 3.54, 4.74]

How is it ensured that modifications made during commissioning are consistent with design requirements? [SRS No. 65; 2.1.1]

13.6. Use of OEF

OE

How does the commissioning department use OEF for continuous improvement of its commissioning activities? [SSR-2/2 Requirement 24; 5.27-5.31] [SSG-28; 3.68, 3.69]

How is the operational experience gained during commissioning fed back into the training programme? [SSG-28; 3.68]

13. COM

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

14. TRANSITIONAL PERIOD FROM OPERATION TO DECOMMISSIONING

14.1. Organization and functions

14.1.1. Functions and responsibilities

How will the organizational structure reflect organizational changes during the transitional period, such as changes of internal interfaces and external interactions, as well as changes in the roles and responsibilities of plant personnel? [WS-G-2.1; 7.10]

What set of performance indicators exists to monitor and assess organizational performance against the new goals and objectives? [WS-G-2.1; 7.8-7.11]

How are policies and programmes kept up-to-date with industry practices? What internal process is put in place in this regard? [SSR-2/2 Requirement 31; 8.1-8.3]

14.1.2. Personnel

How does the plant ensure the availability of adequate resources (including funds, people, equipment and time) to properly manage the plant transition from operation to decommissioning? [SSR-2/2 Requirement 33; 9.2] [GSR Part 6 Requirement 6; 3.4, Requirement 9; 6.1] [GS-G-3.5; Appendix II.22] [WS-G-2.1; 5.11(e), 5.23, 5.24]

What methods does the plant intend to use to keep staff motivated and to retain the required pool of skilled and experienced personnel? [SSR-2/2 Requirement 33; 9.2]

How is it ensured that the human resources management policy is alert and sensitive to changes in the minds of site personnel in relation to plant shutdown and career uncertainties? [SSR-2/2 Requirement 33; 9.2]

What contingencies are in place within the human resources management policy, should key personnel leave the plant? [WS-G-2.1; 7.2-7.7]

What is the strategy for knowledge management and retention of knowledge, skills and abilities before, during and beyond the transitional period? [SSR-2/2 Requirement 33; 9.5] [GSR Part 6 Requirement 7; 4.4] [WS-G-2.1; 7.10]

How do training programmes address operational challenges such as the new organization and responsibilities, and the new configuration(s) of the plant? I.e. does the simulator reflect the current state of the plant? [SSR-2/2 Requirement 7; 4.21] [GSR Part 6 Requirement 6; 3.4]

14.2. Management policies and activities

What is the policy with regard to ensuring that all necessary supply systems will be available for the entire transitional period, including uninterrupted power, and steam and cooling water supplies? [GSR Part 6 Requirement 6; 3.4]

What are the goals and objectives for the transitional period, and how are these communicated to stakeholders and integrated into plant procedures? [GSR Part 6 Requirement 7; 4.1, 4.6, Requirement 11; 7.16] [GS-G-3.5; 3.3-3.9, 6.3(c)]

What are the stated management policies and directives for the transitional period, especially those focusing on the new priorities of the plant? [WS-G-2.1; 5.6-5.7]

How is it ensured that management decisions adequately consider national and international experience, as well as proven and novel technologies and solutions? [WS-G-2.1; 5.8]

How adequate are management directives in ensuring continued focus on safe operations and existing radiological and conventional hazards? [WS-G-2.1; 5.21]

What integrated management system is established and implemented for the transitional period? What part of the system covers the supervision and management of services provided by contractors? [GSR Part 6 Requirement 6; 3.4, Requirement 7; 4.1]

14.2.1. Planning

How is it confirmed that the transitional plan is comprehensive, and identifies and addresses all safety related issues expected during the transitional period? [GSR Part 6 Requirement 6; 3.4, Requirement 10; 7.8]

To what extent does the plan include, inter alia: an overall schedule of activities; consideration of all changes in the interactions between and modifications to safety related systems and standby systems, including their removal from operational service; all SSC isolations during the transitional period; new facilities required for the decommissioning phase; plant configuration at each stage of the transitional period (e.g. defueling stages) and operational configuration of SSCs at the start of decommissioning; and changes to the spent fuel and waste management arrangements for the transitional period. [SSR-2/2 Requirement 33; 9.6] [GSR Part 6 Requirement 10; 7.8, Requirement 14; 8.10]

What is the status of the decommissioning plan, and what is included? [SSR-2/2 Requirement 33; 9.1] [GSR Part 6 Requirement 6; 3.4] [GS-G-3.5; Appendix VIII]

14.2.2. Documentation

How does the documentation management system ensure timely changes whilst also maintaining document validity over the transitional period? [GSR Part 6 Requirement 7; 4.6]

To what extent is the document storage and archive system designed to ensure easy retrieval of documents and records necessary for the transitional period? [SSR-2/2 Requirement 15; 4.52]

14.3. Conduct of operations

14.3.1. Operational procedures

How were operating procedures, operator aids and drawings reviewed and modified to respond to operational changes during the transitional period? How are they kept up-to-date? [GSR Part 6 Requirement 7; 4.6]

How were the operational limits and conditions updated, including surveillance activities? [GSR Part 6 Requirement 12; 8.4]

14.3.2. Surveillance programme

How are changes to the surveillance programme and relevant functional tests justified to ensure that they safely correspond to the current plant status? [GSR Part 6 Requirement 12; 8.2] [WS-G-2.1; 2.14]

How have changes in surveillance/switchover frequencies of SSCs been controlled and analysed (if applicable)? [SSG-25; 5.41]

14.3.3. Control of plant configuration

What system is there in place to ensure consistency between design requirements, physical configuration and plant documentation? [SSR-2/2 Requirement 10; 4.38, Requirement 11; 4.42] [NS-G-2.3; 11.1-11.6] [GS-G-4.1; 3.167]

How is this system tailored to the transitional period, and how will the plant ensure it is implemented appropriately (i.e. the functional requirements are identified and fulfilled)? [SSR-2/2 Requirement 33; 9.3] [GSR Part 6 Requirement 6; 3.4, Requirement 8; 5.3]

What does the configuration management policy state for the transitional period? For a multi-unit site, how are conflicts of configuration with other units at the same site effectively managed? [WS-G-2.1; 4.5(b)]

How does plant management ensure that throughout the lifetime of the facility, the decommissioning plan is kept up-to-date, reviewed periodically and updated in case of changes? [GSR Part 6 Requirement 10; 7.1, 7.5]

Is the decommissioning plan revised in accordance with modifications to the facility and its operating history? [GSR Part 6 Requirement 10; 7.7]

How does the management system ensure that all relevant records are kept for appropriate retention times? [WS-G-2.1; 4.5, 5.5, 7.33, Annex II 9]

14.3.4. The plan for drainage of systems during the transitional period

What is the schedule for plant system isolation and drainage, and does it consider the resulting impact on the availability and operability of remaining systems? [WS-G-2.1; 5.11(m)] [SRS No. 36; 4.4]

14.3.5. Marking systems

What is the system for marking to indicate the current status of SSCs? I.e. a system for clear marking when SSCs are withdrawn from service; can be isolated; can be drained/filled; can be released for dismantling or be protected from inadvertent dismantling. [GS-G-3.5; 5.163, 5.164]

14.3.6. Fire protection

How is it confirmed that the fire prevention and protection system is updated and maintained, and that the system is appropriate for the current status of the plant? [NS-G-2.1; 2.12-2.15]

14.4. Work management and housekeeping

14.4.1. Maintenance programme

How does the maintenance programme ensure safe and reliable operation in the transitional period, and how is it kept up-to-date with the status of the plant? [WS-G-2.1; 6.21]

How does the plant control both extensions of the time periods between surveillances, and the curtailment of established preventive maintenance routines? I.e. proper engineering justification is undertaken. [WS-G-2.1; 6.11]

What controls are there in place to manage maintenance work backlogs? [NS-G-2.6; 5.14]

14.4.2. Work planning and control

How is it confirmed that work management procedures are appropriate for systematically performing and recording all activities? [GS-G-3.5; 5.62-5.64]

How is it confirmed that the removal of SSCs from operation is performed according to an approved procedure? [SSR-2/2 Requirement 10; 4.38] [NS-G-2.3; 11.1]

14.5. Technical support activities for the transitional period

For this chapter, the Transitional Period reviewer should work in conjunction with the Technical Support reviewer.

What plant technical documents, such as operational limits and conditions (OLCs) or operational procedures and alarm set-points, are being or have been revised to reflect the transitional status of SSCs and the current operational mode of the plant? [NS-G-2.2; 10.6, 10.7] [NS-G-2.14; 3.5]

How is it confirmed that any configuration change is based on an engineering approach using calculations, testing and measurements, and considers decreasing demands in flow rates,

temperatures regimes, etc.? [SSR-2/2 Requirement 33; 9.3]

How is it confirmed that system links - common auxiliary systems shared with the other nuclear facilities on the same site, particularly between twin units - are analysed? [SSR-2/2 Requirement 33; 9.4]

What method is used to confirm that radiological and conventional hazards are analysed, specifically those applicable to the transitional period, and that measures are taken for the prevention and control of these hazards? [GSR Part 6 Requirement 6; 3.4]

14.6. Special safety assessments and risk analyses required

How were the operational modes for the transitional period - new plant configurations, retirement of equipment and systems, staffing levels, modifications to OLCs, surveillance requirements and twin-units dependences (if applicable) - incorporated into the safety analysis report? [SSG-25; 5.27-5.29]

What risk management system was used for identification and analysis of nuclear, radiological and conventional hazards? [SSG-25; 5.75, 5.88]

Is the decommissioning plan supported by a safety assessment that includes identification and analysis of accidents that may occur or situations that may arise during decommissioning? [GSR Part 6 Requirement 3; 2.6]

14.7. Use of operational experience

How was OEF used in the development of both the decommissioning plan and the transitional plan? How does the OEF programme ensure that lessons learned are shared and used to prevent the events that may be specific to this stage of plant operations? [GSR Part 6 Requirement 10; 7.5, Requirement 11; 7.15]

How is it confirmed that operational experience arising from the transitional phase is being recorded, evaluated and reported? [WS-G-2.1; 4.5, 5.8, 5.11, 6.1]

14.8. Radiation protection requirements for the transitional period

14.8.1. Radiation protection requirements

How has it been confirmed that the radiation protection measures, possibly already undertaken, cover the whole of the transitional period? [GSR Part 6 Requirement 1; 2.1]

How do the radiation protection procedures consider issues that are specific to the transitional period? Give examples. [GSR Part 6 Requirement 1; 2.2] [WS-G-2.1; 5.11(g)]

How have new solid and liquid waste treatment and storage facilities been reviewed for their site radiological impact? [GSR Part 6 Requirement 6; 3.4] [GS-G-3.5; 5.165-5.169]

What specific radiation protection measures have been developed to protect staff and contractors during the transitional period? [GSR Part 6 Requirement 1; 2.1, Requirement 6; 3.4]

14.8.2. Radiological characterization

How are potentially contaminated and/or activated materials - including radioactive waste on site - properly identified and documented? [GSR Part 6 Requirement 14; 8.9]

How is it confirmed that radiation levels, after changes in plant conditions, are frequently checked and recorded? [WS-G-2.1; 7.16, 7.17, 8.1, 8.2]

How are rooms in radiation controlled areas re-categorized to reflect changes in radiation conditions and contamination levels? [GSR Part 6 Requirement 6; 3.4]

14.8.3. Waste management

What consideration has been given to increases in the volume and variety of radioactive waste? [WS-G-2.1; 7.21, 7.23]

What arrangements are there for radioactive waste management? [GSR Part 6 Requirement 6; 3.4, Requirement 14; 8.7, 8.8] [WS-G-2.1; 7.20]

14.9. Emergency planning and preparedness

How has the site emergency plan been reviewed, and how has it been confirmed that the emergency plan corresponds to the current plant configuration and staffing arrangements? [GSR Part 6 Requirement 6; 3.4]

How has it been confirmed that both events arising from on-site storage of spent fuel and fuel transport events have been considered in the Emergency Plan and in Procedures for Emergency Response? [WS-G-2.1; 7.29]

14.10. Core management and fuel handling

What procedures will be used for the removal, storage and shipment of fuel? [WS-G-2.1; 6.5]

14.11. Chemistry

What water chemistry strategy has been adopted for the transitional period, and what is the scope of monitoring and control of chemistry for the current plant status? What preparations are being made for decommissioning/conservation, relevant to chemical conditioning, including operations on the opening of the vessel, removal of contaminated items, etc.? [SSG-13; 4.7, 6.20]

What provisions have been made for the storage and use of hazardous chemicals? [WS-G-2.1; 4.3, 6.1-6.3]

14. TRAD

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1					
2					
3					
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6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed

15. USE OF PSA FOR PLANT OPERATIONAL SAFETY IMPROVEMENTS

15.1. Organization and functions

15.1.1. Functions and responsibilities

How are organizational structure, responsibilities, levels of authority and functions defined and communicated within the organizational entity responsible for PSA? Are they understood by personnel? [SSR-2/2 Requirement 1; 3.2(b)(d), Requirement 8; 4.32] [GSR Part 4 Requirement 3; 4.1, 4.2]

How are the goals, objectives and safety indicators related to PSA developed and managed? How are outcomes checked and measured within the organization? [SSR-2/2 Requirement 9; 4.33, 4.37]

15.1.2. Personnel

How does management ensure that the PSA analysis is performed by an experienced team, with active participation of plant specialists, and that results are used by experienced plant professionals in a manner that complements deterministic analyses, in compliance with applicable regulations and plant license conditions? [SSR-2/2 Requirement 8; 4.32] [SSG-3; 3.3] [NS-G-2.8; 5.27]

15.2. PSA project management

How does plant management ensure that safety is taken into account in decision-making by using the PSA (and/or its applications)? [SSR-2/2 Requirement 8; 4.32] [GSR Part 2 Requirement 3; 4.3] [INSAG-25; 20,50]

To what extent does management take the initiative to communicate the results of the probabilistic safety assessment to other interested parties like designers, the regulatory body and a wide range of professionals? How is this information communicated? [GSR Part 4 Requirement 24; 5.9]

To what extent does the plant have a fully-developed PSA project organization, management scheme and schedule? [SSG-3; 3.3]

What is the composition of the PSA team and the suitability of the team members' qualifications? If the PSA team is composed of external experts, are enough plant personnel involved in the development of the PSA (providing input data for operational experience)? [SSG-3; 3.4]

What is the training given to plant personnel engaged in PSA analysis and review? To what degree is plant management also involved in the training programme? [SSG-3; 3.12] [NS-G-2.8; 5.27]

15.3. Development of PSA

15.3.1. Objectives and scope

How are the objectives and scope of the PSA to be undertaken correlated with national safety goals or criteria? How are the results of the PSA used to verify compliance with safety goals or criteria, which are usually formulated in terms of quantitative estimates of core damage frequency, frequencies of radioactive releases of different types, and societal risks? [GSR Part 4 Requirement 4; 4.14] [SSG-3; 2.2]

What is the scope of PSA analyses? Which stages of the plant's life are covered (design, operation)? What initiating events are considered (internal events, internal hazards, external hazards)? What PSA levels are treated (1, 2, 3)? Which operational modes does the analysis encompass (full power, low power, shutdown, start-up, refuelling)? Which radioactivity sources are considered (reactor core, refuelling pool, spent fuel handling facilities, waste storage tanks?) [GSR Part 4 Requirement 2, Requirement 7; 4.20, Requirement 14] [SSG-3; 1.12, 1.13, 6.8] [SSG-4; 2.8-2.11] [INSAG-12; 62]

To what extent is the full range of possible radiation risks associated with the facility identified and analysed? [GSR Part 4 Requirement 6; 4.19]

How does the plant ensure that the full list of external and internal events that could arise is addressed in the safety assessment, and that adequate levels of protection are provided against their consequences? [GSR Part 4 Requirement 10; 4.31, 4.32, 4.50, 4.51] [SSG-3; 5.13, 5.14]

What are the safety goals for each of the analyses performed? [SSG-3; 2.11, 2.15]

To what degree are human interactions adequately addressed in the safety assessment? Do the procedures and safety measures required in response to anticipated occurrences have a sufficient level of detail, and do they adequately reflect current plant status? [GSR Part 4 Requirement 11]

15.3.2. Documentation

To what extent are the guidelines and procedures for PSA development in compliance with international and national requirements, and in accordance with state-of-the-art PSA methodology? [SSG-3; 3.8]

How is it verified that the PSA team is familiar with governing guidelines and procedures? [SSG-3; 3.8, 3.12]

What form of quality assurance (QA) programme is there either in place or under development? To what extent does it include provisions for peer reviews? [SSG-3; 3.13, 3.14]

How do the QA procedures provide for control of the constituent activities associated with PSA in the areas of organization, technical work and documentation? [SSG-3; 3.14]

How complete, comprehensive and up-to date is the PSA documentation? How easy is it to follow, review and update? To what degree does it comply with international and national requirements? [SSG-3; 3.7, 3.16, 3.17-3.22]

What is the level of detail of the report issued as a result of the PSA analysis? To what extent does it allow plant management to justify the decisions based on the analysis? To what degree does it provide adequate input for performing independent verifications and regulatory reviews? To what extent is the information provided detailed enough to facilitate updating? [GSR Part 4 Requirement 20; 4.62, 4.64] [SSG-3; 3.20]

How is it ensured that all assumptions, exclusions and limitations are clearly documented and justified? [GSR Part 4 Requirement 20; 4.63, 4.64]

By what means are internal review process records maintained and documented so as to allow later extensions or reconstructions of the results of the study? [SSG-3; 3.6, 3.17]

Are the insights and conclusions of the analysis presented in sufficient detail to support decision-making? Which failure sources are the main contributors to the dominant sequences, and to what degree is their contribution justified by a presentation of relevant engineering insights? [SSG-3; 9.64, 9.65]

To what extent is consideration given to using the results of uncertainty and sensitivity studies? [SSG-3; 5.153, 5.157, 5.160]

15.3.3. Validation and review of the PSA - independent verification

What computer codes were used to support analytical methods? How were they validated as adequate for the purpose and scope of the analysis? How does the operating organization oversee improvements to the calculation tools and data that are used to carry out the analysis? [GSR Part 4 Requirement 4; 4.14, Requirement 18; 4.60], [SSG-3; 2.5] [SSG-25; 5.67]

To what degree is an internal PSA review process established and followed in accordance with the QA procedure? [SSG-3; 3.13]

When was the last external review performed? To what extent do the guidelines for the review process comply with international state-of-the-art review practices? [GSR Part 4 Requirement 21] [SSG-3; 2.6]

How independent from the developers are the experts composing the external review team? [GSR Part 4 Requirement 21; 4.67] [SSG-3; 2.6]

To what degree does the independent review confirm that the input assumptions are valid, that the derived limits and conditions are implemented, and that the analysis reflects the actual status of the facility at any time? [GSR Part 4 Requirement 24; 5.2-5.4]

15.3.4. PSA updating programme

How often does management require PSA analyses to be updated, and what are the typical reasons for a PSA update? [GSR Part 4 Requirement 4; 4.8, Requirement 20; 4.65, Requirement 24; 5.2, 5.10]

To what extent does the plant maintain a so-called Living PSA model? If this is not the case – how often are the PSA model and associated documentation updated (i.e. due to modifications in the design of safety systems or in the operation of the plant)? [SSG-3; 2.7, 10.3] [SSG-25; 5.72]

When was the last PSA update performed, and what were the objectives of this update? How was this documented (in a PSA update plan or other relevant document)? [SSG-3; 2.7]

How does the PSA update plan and schedule provide for periodic updates (even if no major design or operational changes have taken place) to keep the PSA model in line with state-of-the-art methodology (i.e. in response to new versions of the software used for the analysis, new data on operational experience, or more sophisticated analysis methods)? [SSG-3; 2.7, 2.8]

If the PSA team is made up of experts from external organizations, are the interfaces with the plant PSA experts sufficiently well established for all information on changes in the plant to be effectively communicated? [SSG-3; 3.4]

To what extent are the resources allocated by management sufficient to keep the PSA model updated and maintained? [GSR Part 4 Requirement 1; 3.2, 3.5, Requirement 5; 4.18, Requirement 24; 5.2]

How is it ensured that the plant has a pool of capable personnel who can both advise plant management on the implementation of potential PSA applications and assist plant management in the decision-making process? [SSG-3; 2.7, 2.9]

If the plant is using a Living PSA model – to what degree are the organizational and structural activities established so as to maintain the model in accordance with plant modifications? [SSG-3; 2.7, 2.8]

15.4. Use of PSA in PSA applications

15.4.1. PSA application programme

Which PSA applications, if any, have been developed and implemented at the plant? Are they used for decision-making, who is using them (management and engineering, operations, maintenance personnel, regulatory bodies, designers or vendors) and how? [GSR Part 4 Requirement 24; 5.8] [SSG-3; 2.22]

How clearly are the objectives of the PSA application programme and each PSA application established? To what degree is there a formal framework in support of the decision-making process (i.e. specific PSA application guidelines developed for each PSA application)? [SSG-3; 2.23]

How is the scope and level of detail of the PSA adjusted so as to be commensurate with the practiced or intended PSA application(s)? [SSG-3; 5.8, 10.1-10.3] [SSG-4; 8.2-8.4]

To what extent are the changes in PSA models, data, assumptions, etc. that are required for specific applications, made in a controlled manner (information control; configuration control; documentation control; verification and validation; review)? How is it ensured that all changes are documented in a clear manner that provides a possibility to repeat the analysis when needed and to perform external reviews? [SSG-3; 3.16, 3.17]

How is the PSA analysis used for different maintenance, surveillance and inspection activities to be planned? [GSR Part 4 Requirement 24; 5.5]

How are the PSA analysis results used for planning of off-site and on-site emergency response and accident management? [GSR Part 4; Requirement 24; 5.6]

How do the results from the PSA ensure that the safety systems contain an adequate level of redundancy and diversity, and that the overall design is balanced? [SSG-3; 2.31]

How is the coordination between PSA applications and PSA updates performed? How does the PSA application programme ensure that changes at the plant that impact on the PSA applications are introduced in the PSA model and supporting documentation in a timely manner? [SSG-3; 2.7]

To what extent is an internal review procedure set and followed for all PSA applications? How is the external review process organized for PSA applications? How is the national regulatory authority involved in the review of PSA applications? [SSG-3; 2.6]

15.4.2. Applications in connection with design and plant modifications

Is the scope of the PSA suitable for implementation of the PSA application (to be confirmed separately for each application)? [SSG-3; 10.1, 10.11]

Is the PSA model suitable for implementation of the PSA application (to be confirmed separately for each application)? [SSG-3; 10.2]

At what stage of the plant lifetime was the first PSA developed, and was it updated to provide insights about the proposed design of the safety systems and layout of the plant? Are there any examples of when the PSA was used to identify weaknesses in design and operation, and to assess options for improvements to the design and operation of the plant? [SSG-3; 10.8, 10.9]

How are the results from the PSA used to determine whether the proposed design and/or operation will ensure a sufficiently low level of risk (core damage frequency versus risk criteria)? [SSG-3; 10.13-10.15]

What are the weaknesses in the design and operation of the plant (derived from a review and analysis of the minimal cutsets to identify the initiating events and the safety functions that make the greatest contribution to the CDF or LERF)? [SSG-3; 10.16] [SSG-4; 8.15]

How does plant management analyse and use the importance values to identify areas of the design or operation of the plant where improvements need to be considered (components and systems that significantly contribute to risk)? [SSG-3; 10.20]

How has the PSA been used for comparison of options proposed for modifications? When design changes are reflected in the PSA model – to what degree are they correctly and sufficiently documented? Are data for new equipment used in the updated model? [SSG-3; 10.25] [SSG-4; 8.20]

15.4.3. Applications in connection with plant operation and accident mitigation

How are the insights from deterministic safety analysis taken into account for the PSA application (to be confirmed separately for each application)? [SSG-3; 10.6]

How are PSA results used to optimise the maintenance programme? What is the scope of the programme? How does the programme ensure that maintenance activities do not reduce plant safety or heighten risk through increased equipment unavailability? [SSR-2/2 Requirement 31; 8.13] [SSG-3; 10.33, 10.66] [NS-G-2.4; 6.37]

How does the PSA represent operator actions that refer to specific EOPs? Are HRA methods used in the PSA, and are they capable of evaluating/predicting the impact of procedure changes in order to support this application? [SSG-3; 5.98, 5.101, 7.38]

Has the plant developed a full-scope Level 2 PSA and, if so, how does it use the analysis to support NPP accident management? [SSG-4; 8.2]

How is the full-scope Level 2 PSA used to address severe accident mitigation strategies? [SSG-4; 8.2, 8.16-8.18, 8.21]

To what extent does the PSA explicitly represent operator actions that refer to specific AMPs? Are the HRA methods used in the PSA capable of evaluating/predicting the impact of procedure changes in order to support this application? [SSG-4; 8.21, 8.22]

15.4.4. PSA-based evaluation and rating of operational events

Does the plant use the PSA for evaluation and rating of operational events? If so – what consideration is given to ensuring that events are investigated and analysed in accordance with their level of safety significance? What are the most highly ranked events, and what are the contributors to these risks? [SSG-3; 10.78, 10.80]

Can the plant present examples of using PSA to analyse particular events (modelling of the impact of an unavailability of one or more SSCs, and/or failures to perform specific operator actions for the operational events under consideration)? [SSG-3; 10.79, 10.81]

15.4.5. Risk monitoring

Has the plant implemented a risk monitor tool and, if so, is the tool used to assess and manage the risks associated with maintenance activities? [SSG-3; 10.37]

How is the PSA model used in the risk monitor tool or other configuration control programmes? [SSG-3; 3.2, 5.82, 10.1, 10.39-10.41, 10.45]

To what extent has the PSA model been modified for use in risk monitoring? [SSG-3; 10.40-10.45]

Does the plant use validated software for the risk monitor application? [SSG-3; 10.48]

What types of personnel use the risk monitor application? Give examples of use. [SSG-3; 10.51-10.53]

Do plant personnel use the risk monitor application to provide an indication of plant safety performance? Which safety performance indicators use information directly from the Level 1 PSA? [SSG-3; 10.76]

Is the risk monitor tool available in the main control room and maintenance department, and does it allow for both on-line and off-line use? [SSG-3; 10.46, 10.50, 10.51]

15.4.6. Risk-informed operating limits and conditions (OLC)

To what extent does the plant use the PSA for temporary relaxation or strengthening of some of the OLC requirements? If so – what is the scope of the programme? What results can be shown to support this statement? Does the PSA explicitly model the areas affected by the OLC change? [SSG-3; 10.29-10.32, 10.35, 10.68, 10.69, 5.82, 5.102]

15.4.7. Risk-informed in-service inspection (ISI)

Has the plant implemented RI-ISI and, if so, what changes have been made to the PSA model to make it suitable for this application? [SSG-3; 10.58-10.60]

To what degree is the PSA model capable of estimating the consequences of pipe failures, including loss of function, secondary flooding, pipe whip, and other consequences of pipe breaks? [SSG-3; 10.59]

To what extent is the PSA model capable of supporting estimates of conditional core damage probability (CCDP) and conditional large early release probability (CLERP) for any assumed failure mode, within the scope of the piping systems selected for the RI-ISI programme? [SSG-3; 10.61]

Which changes to the in-service inspection programme are based on the PSA applications? [SSG-3; 10.64]

15.5. Use of PSR and OEF

How and to what extent is relevant operating experience feedback used in order to improve PSA models and applications? [GSR Part 4 Requirement 10; 4.27, Requirement 14; 4.52, Requirement 19; 4.61] [NS-G-2.4; 6.70]

What, if any, were the findings of the last PSR regarding PSA? What were the prescribed corrective actions and have they been implemented? [SSG-25; 5.124, 5.125, 9.3]

How does the plant use PSR in order enhance the PSA programme? [SSR-2/2 Requirement 12; 4.44] [SSG-25; 3.8, 5.29, 5.41, 5.47, 5.86] [NS-G-2.3; 2.2, 3.8] [NS-G-2.12; 5.5, 7.1, 7.9-7.11]

15. PPSA

No.	***Issue summaries:*** (Brief five-line maximum description, neutral in tone, in order to present the subject of issues under development to the Plant Manager)	***CI***	***CA***	***PMI***	***PMA***
1					
2					
3					
4					
5					
6					
GP1	***Good Practices***: *[brief description]*				
GP2					

CI = Counterpart informed, CA = Counterpart agreed, PMI = Plant manager informed, PMA = Plant manager agreed