Otázky a odpovědi k Národní zprávě ČR 2021
(Questions and Answers to the National Report of the Czech Republic 2021)

Bělorusko (Belarus) – CG1

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
BY-CZ-1	Article 15	Section 8.5	What international requirements were the basis for the calculations and what software was used for them? / Section 8.5 gives the values of predicted doses in case of emergencies.	Effective dose calculations are based on the assessment of different emergency scenarios derived for the RAW management facilities at both NPPs. Scenarios were derived from PIE as defined in IAEA GSG-3 on The Safety Case and Safety Assessment for the Predisposal Management of Radioactive Waste. The assessment of the impact of gaseous RAW release has been performed with the help of HAVAR-DET computer code. Assessment of liquid RAW release did not require specific software products and was based on in-hand calculations (both screening and detailed one) using DCF as published in Decree No. 422/2016 Coll. and in IAEA TECDOC-1380. Missing DCF for external irradiation were calculated with the help of MicroShield code. (answer by SÚJB/ONRV)
BY-CZ-2	Article 25	Section 6.5/ p. 71	1. Have estimates been made of the amount of RW generated in the event of a beyond design basis accident (including a severe beyond design basis accident) during NPP operation? 2. Is there a plan for the characterization of such waste? 3. What methods of handling RW generated in case of a beyond design basis accident are envisaged before burial? / The report provides information on the management of emergency radiation events, but there is no information on measures to ensure safe and effective management of RW generated in the event of a beyond design basis accident at nuclear power plants and RW storage sites.	The management of RAW generated in the event of radiological emergency will be based on approach defined in national Policy; i.e. in the case of release of radioactive substances into the environment the emergency plan of affected nuclear installation will be initiated. Existing technologies for the management of RAW are capable of managing foreseeable quantities of RAW from a radiological emergency. These technologies will process generated RAW to meet WAC for disposal e.g. in disposal facility Dukovany, which has about 75% of its capacity still available. If a situation arises where RAW does not meet WAC for the existing disposal facilities, it will be stored in the nuclear facility or newly build storage facility and later disposed in the DGR. (answer by SÚJB/ONRV and ČEZ)
BY-CZ-3	Article 32	Section 4.2.1-4.2.2. p. 28, 31	What are the procedures for further handling of this type of waste? / The report indicates that liquid organic RW is stored (packaged) in 200 liter metal drums.	Details on the management of liquid RAW – used sorbents are provided in chapter 8.2.1.2. This category of RAW is conditioned using aluminosilicate matrix and then disposed at disposal facility Dukovany. If a situation arises where RAW does not meet WAC for the existing disposal facilities, it will be stored in the nuclear facility or newly build storage facility and later disposed in the DGR. (answer by SÚJB/ONRV and ČEZ)

BY-CZ-4	Article 32	Section 4.2.1-4.2.2, p. 27, 31	1. Are there plans to switch from bituminization to safer methods of conditioning liquid RW? 2. Are additional processing procedures required for this type of waste to bring it into compliance with the RW disposal eligibility criteria? / At Dukovany and Temelín NPPs, a bituminization process is used to condition liquid RW, with the resulting bitumen being packed into 200-liter drums.	Bituminization is considered as safe, reliable and effective method for conditioning of operating low level waste at both NPPs. Therefore, there are no plans to replace them by other method. WAC for disposal of bituminized RAW restrict among others the leaching rate of bituminized RAW. (answer by SÚJB/ONRV)
BY-CZ-5	Article 32	Section 4	Please provide information on the presence / absence of trends for a decrease / increase in the values of this value over the past 5-10 years. / Tables 4.5, 4.8 present data on radioisotope activity in RW management facilities as of December 31, 2019.	Question unclear. Both tables contain information on the radioactivity of RAW disposed in disposal facilities Dukovany (table 4.8) and Richard (table 4.5). Radioactivity of disposed RAW increases or remains unchanged for longer lived radionuclides, depending on the amount of RAW disposed. If the activity decreases, it is due to radioactive decay and no or limited amount of newly disposed RAW. (answer by SÚJB/ONRV)
BY-CZ-6	Article 32	Section 2.2.2/ p. 18	1. Is there a project for an underground research laboratory? 2. Has the source of funding for the construction of this laboratory been identified? / The report states that the safety of the future deep disposal facility will be confirmed by experiments in an underground research laboratory.	Yes, URL is a part of DGR project (see Table 7.1). As the whole DGR it will be funded from nuclear account. (answer by SÚJB/ONRV)

Řecko (Greece) – CG1

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
GR-CZ-1	General	Appendices Table 12.6/ p. 147	Does the column Volume/weight refer to raw or conditioned waste?	These values refer to the amount of conditioned RAW, majority of which is suitable for disposal to operating disposal facilities. (answer by SÚJB/ONRV)
GR-CZ-2	General	General	The JC report focuses on the management of spent fuel and radioactive waste at the nuclear facilities. The management of RAW originated from other practices is not fully covered in the report. Although it is well known that the RAW management falls within licensee responsibilities, please consider commenting on the management of such RAW, especially from non-nuclear facilities conducting practices such as isotope production, therapies with radionuclides, etc.	The Czech national report contains details on the management of institutional RAW, especially in ÚJV Řež, which is the largest company managing this type of RAW in the Czech Republic (more than 90% of total amount of institutional RAW). The management of RAW in ÚJV Řež is focused on the management of institutional RAW originating from own facilities and from external RAW generators. RAW in disposal facilities Bratrství (not declared as nuclear installation) and Richard and some RAW in disposal facility Dukovany is of institutional origin, as stated in the report. The whole chapter 10 is dedicated to the management of disuses sources as one type of institutional RAW. Details on the management of institutional RAW are provided in chapters 2.2.1, 4.1.4, 4.2.3, 6.2.2, 6.2.4, 8.2.3, 8.2.4, 8.3.3, 8.3.4, 8.4.3, 8.4.4, 8.5.3, 8.5.4, 8.6.3, 8.6.4, 10 of the National Report. (answer by SÚJB/ONRV)

GR-CZ-3	Article 14	pages 111-115	Several parts of these pages state that “A concept has been approved for the disposal facility’s decommissioning and closure.” Considering that these sections concern disposal facilities, please clarify which would be the decommissioning process and what the decommissioning concept includes.	Disposal facilities will be decommissioned (auxiliary buildings, laboratories, RAW acceptance area, some security installations,…) and closed (disposal areas with RAW). (answer by SÚJB/ONRV)
GR-CZ-4	Article 14.2	8.4.3.1./ p.113 & 8.4.3.2., 8.4.3.3./ p.114	It is mentioned: A concept has been approved for the disposal facility’s closure and decommissioning. What decommissioning of the facilities means? Is the retrieval of waste foreseen?	See the answer above. Disposal facilities are facilities for permanent placement of RAW without the intention of its retrieval. (answer by SÚJB/ONRV)
GR-CZ-5	Article 24	Page 20, 68, Sections 6.4, 4.2, and elsewhere	The authorized dose limits due to discharges (in terms of delivered effective dose to representative person) do not appear harmonized for all facilities (NPP) and considered pathways. Indicatively, authorized limits for discharges into surface waters of 6 μSv per year and 3 μSv per year are set for the NPP Dukovany and NPP Temelin, respectively; 40 μSv per year is set for discharges into the air; an authorized effective dose limit of external irradiation and the effective dose rate per representative person is set at 40 μSv per year for NPP Temelín. Please consider commenting on this issue and on how these authorized dose limits are linked to 10 μSv per year.	Paragraph 6.4.2.1 of the National Report contains general dose limits for workers and public. The purpose of setting authorized limits of effective dose is the optimization of radiation protection. According to the Section 82 para 1 of Atomic Act “Anyone who performs an activity involving radiation shall ensure that, as a result of this activity, including in the case of accumulation of a radioactive substance discharged from the workplace, the dose constraints for the representative person of 0.25 mSv per year and, in the case of an energy-generating nuclear installation, simultaneously 0.2 mSv for discharges into the air and 0.05 mSv for discharges into surface waters, were implemented in the optimisation of radiation protection.” Authorised limits derived on the basis of an optimisation study and calculation of the dispersion of radioactive substances in the environment are set out in the site-specific discharge licence. These calculations take into account site specific properties, such as the prevailing wind direction or the interconnection of local water sources with discharge sources. Matching of authorized limits for gaseous discharges at both NPPs is just coincidental. An effective dose to a member of the public below 10 μSv per year is the criterion (dose constraint) used for the clearance of radioactive substances from the workplace. (answer by SÚJB/ONRV and SÚJB/SRO).
GR-CZ-6	Article 25	Page 72, Section 6.5	Please consider clarifying if and how the on-site internal EPR plans of the nuclear facilities link to the national EPR system (beyond SUJB approval).	Yes, the licensee is obliged to verify, through exercises and tactical exercises in cooperation with the relevant public authorities and the components of the integrated rescue system, the accuracy, effectiveness and coherence of the on-site emergency plans and the off-site emergency plans and their compliance with the National Radiation Emergency Plan. The off-site emergency plans are being drafted by the relevant regional authorities while the licensee is obliged to provide input and cooperation and they are approved by the head of the region. The National Radiation Emergency Plan is being drafted by SÚJB and is approved by the government of the Czech Republic. The

				period of said verification is set to 1x4 years by the Czech Republic's atomic legislation. (answer by SÚJB/OMKŘ)
GR-CZ-7	Article 28	Page 136, Section 10	The RAW management facility "Richard" stores radioactive sources, some of which with long-lived radionuclides (Table 10.1). Please clarify if all these sources are considered for disposal. In addition, in case that the acceptance criteria for disposal are not met, which are the plans and the strategy for their final management?	Yes, the majority of stored sources will be disposed in DGR, as they do not comply with WAC for disposal in operating disposal facilities. (answer by SÚJB/ONRV)
GR-CZ-8	Article 32.2.2	4.2.3.1./ p.32 & p.33	Table 4.5 presents the Inventory of RAW disposed in the Richard disposal facility while Table 4.6 Inventory of RAW stored in the Richard disposal facility. Do you mean that some disposal chambers have already been filled and sealed and others are still in use?	Yes, disposal chambers fully loaded with RAW suitable for disposal are backfilled and sealed. Disposal chambers in use and storage chambers are opened and accessible for RAW placement into them. (answer by SÚJB/ONRV)
GR-CZ-9	Article 32.2.2	4.2.1.1.1./ p.26	It is mentioned: If RAW cannot be disposed in a RAW disposal facility due to its high specific activity of radionuclides it is stored in an organized manner in a storage area for radioactive items while their final treatment and disposal will be addressed within the NPP decommissioning process. Do you consider using generic WAC in the meantime for this waste?	No, this RAW has to comply with WAC for storage. Once DGR is in operation it will comply with WAC of this facility. (answer by SÚJB/ONRV)
GR-CZ-10	Article 32.2.1	4.1.4./p.25	It is mentioned: As part of rehabilitation efforts to remove the old environmental liabilities and in the scope of the preparation for transport of high-enriched SF to the Russian Federation for reprocessing (RRRFR project is a part of the GTRI initiative declared on May 26, 2004), the HAW …… Will the waste be returned after the SF reprocessing in the Czech Republic?	Yes, the return of HLW produced by SF reprocessing in RF is under preparation now. (answer by SÚJB/ONRV)

Polsko (Poland) – CG1

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
PL-CZ-1	Article 24		How many regulatory inspections are performed at radioactive waste and spent fuel management facilities every year?	There are about 10 – 15 inspections dedicated to the RAW and SF management, covering both NPPs, three disposal facilities and smaller predisposal RAW management facilities. Additionally 2-4 inspections of SF transports, 2-4 of radiation protection at disposal facilities and 2-3 of security arrangements at disposal facilities are performed annually. (answer by SÚJB/ONRV)

Švýcarsko (Switzerland) – CG1

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
CH-CZ-1	Article 9	p. 58-59	The annual contributions to the nuclear account in order to make provision for decommissioning of nuclear installations is based on the electricity production of a facility (CZK 55.00 per MWh). How can you ensure that there are sufficient means for the later decommissioning? How do you verify the costs? How are the annual contributions calculated for storage and zero-power facilities? Which international accounting standards do you use?	Table 1.2 on page 12/152 provides general information about decommissioning funding, SF waste management and management of individual categories of RAW. Licensees are obliged to create financial reserves for the future decommissioning of their nuclear facilities or other facilities containing significant or very significant ionising radiation sources. Even the zero-power facility reactor LR-0 has an approved decommissioning program and associated cost estimate and creates an appropriate reserve for this activity on a dedicated account. All these contributions to this account are audited on an annual basis by an independent state body – SÚRAO. Funds must be accumulated for future decommissioning purposes in the required amount and in a timely manner in compliance with timetables approved by the SÚJB and according to the decommissioning technology to be utilised. Decommissioning cost reserves must be verified by SÚRAO, as stipulated by the Atomic Act and licences are obliged to update their estimates every five years. Annual contribution to the decommissioning fund is calculated on legal bases. The methodology is specified in the Decree No. 250/2020 Coll. on the method of establishing a reserve for the decommissioning of a nuclear installation and category III and category IV workplace. This decree provides details of the calculation of annual provisions/reserves for the decommissioning of NPPs, storage and zero-power facilities. It should be stated that decommissioning cost estimate of all nuclear installations is reviewed every five years. Not only technical issues but economic aspects are reflected in the relevant cost estimate. The cost estimate provides: - details on the cost structure, - data on the relevant cost items and - information on the input prices used, which contributes to a transparent cost estimate and facilitates cost verification. Moreover, the international guidance on developing a cost estimate for decommissioning of a nuclear facility is applied (i.e., methodology described in the OECD/NEA document “International Structure for Decommissioning Costing (ISDC) of Nuclear Installations“, 2012. Licensee's (ČEZ, a. s.) accounting is maintained in accordance with the requirements of the Accounting Act in accordance with International Financial Reporting Standards (IFRS) as adopted by the European Union. The provision created in accordance with IAS 37 corresponds to

				the best estimate of expenses for settling the current liability at the balance sheet date. International Financial Reporting Standards (IFRS) No. 37 are used to express further decommissioning liabilities; in the company annual report are reported as the restricted financial assets. A substantial proportion of payments into the nuclear account are intended for covering the costs of future radioactive waste and spent fuel disposal activities. The methodology for determining the level of charges is based on current prices and takes into consideration estimates of future costs, risks and other relevant factors (e.g. the expected development of the national economy, interest rates and inflation) and respects the Policy. The accumulation of funds in the nuclear account is compared at appropriate intervals, at least every five years, with expected future expenditure and, if the amounts are found to differ substantially, the relevant Government Regulation is amended. The costs of the development, construction, operation and closure of the future deep geological repository, the processing of SNF into a form suitable for disposal and the final disposal of SNF and high-level waste will be covered from the nuclear account. Basic technical and economic data used in the evaluation of the costs of a deep geological repository in the Czech Republic was provided in the DGR reference project of 1999 which was updated in 2011. Costs were further updated in 2021. Total costs are roughly in accordance with similar estimates in other countries. Detailed verification was performed in 2021 by comparison with POSIVA cost estimate. Activities conducted prior to radioactive waste disposal are performed by waste producers or by specialised organisations. In both cases the costs incurred are met by producers. No contribution to nuclear account is required. SÚRAO is authorised to manage state property and consequently maintains the relevant accounts in pursuance of Act No. 563/1991 Coll. on accounting and Decree No. 410/2009 Coll. that implements certain provisions of Act No. 563/1991 Coll., and according to Act No. 218/2000 Coll., on budgetary rules. SÚRAO does not apply IAS. (answer by ČEZ, CV Řež and SÚRAO)

CH-CZ-2	Article 9	6.2.2/ p. 59	Based on the projected lifetime of the High Active Waste (HAW) Storage Facility in ÚJV Řež, it will be decommissioned in 2047. The joint-stock company of ÚJV Řež makes provision for the decommissioning of the HAW Storage Facility. According to the National report, the requirement for subsequent storage of the High Active Waste (HAW) currently stored in the HAW Storage Facility in ÚJV Řež shall be addressed by construction of a new facility or reconstruction of the existing storage facility, if DGR is not available when the HAW Storage Facility is decommissioned. The start of operation of the DGR is planned in 2065, according to Art 7.7. Are the costs for construction or reconstruction of a new storage facility considered in the financial provision for the decommissioning?	The cost for reconstruction of existing or construction of a new HAW Storage Facility is not considered in the financial provision for the decommissioning. The initial decommissioning plan covers only decommissioning of existing facility. However, the safety of any nuclear installation, incl. HAW Storage Facility, is periodically reviewed every 10 years. Depending on the results of periodic safety review the facility may be in operation substantially longer than initially expected; i.e. after 2047. If it will be not the case a new storage facility will be erected. (answer by SÚJB/ONRV and ÚJV)
CH-CZ-3	Article 10	7.7/ p. 98	The program of DGR development started back in 1992. Starting from 30 potential sites for a DGR the number of considered DGR sites has been gradually reduced to currently four in 2020. When have the site selection criteria for the site selection process been established and are they available to the public?	The site selection criteria have been developed by SÚRAO and are publically available on SÚRAO web site (https://www.surao.cz/wp-content/uploads/2019/02/kriteria.pdf) in document MP.22 (Requirements, Suitability Indicators and Site Selection Criteria for DGR siting, Rev. 3, 2017). This document is regularly updated during each phase of site selection process. However first criteria of the geological properties of the DGR host rock have already been proposed in 1993. (answer by SÚJB/ONRV and SÚRAO)
CH-CZ-4	Article 11	8.2.1.2/ p. 103 8.2.2.2/ p. 105	According to Art. 4.2 of the National report, organic liquid radioactive wastes (oils) from the NPPs Dukovany and Temelin are stored in 200 l metal drums. How are these wastes conditioned for final disposal? Are they treated the same way as the other liquid wastes, by using the bituminization technology?	Organic, liquid RAW is collected, segregated, stored, processed by distillation and extraction, and then treated by incineration at external supplier's facility. The conditioning methods used are bituminization or conditioning to the aluminosilicate matrix. Finally, conditioned RAW is disposed at near surface RAW Disposal Facility Dukovany. (answer by SÚJB/ONRV)
CH-CZ-5	Article 14	7.7/ p. 98	According to the National report, the DGR is expected to accommodate all RAW that cannot be disposed in near-surface disposal facilities, SF declared as RAW and, if needed, also HLW from potential reprocessing of SF from NPP Dukovany and NPP Temelín and SF and HLW from other nuclear installations. Who will be in charge of the realization and operation of the DGR. Does the Czech Republic already have a concept of the future DGR, that is used in the safety case of the DGR? If yes, does this concept already include preliminary WAC for the disposal of the expected wastes, like a conceptual design of disposal containers for SF?	SÚRAO has been established by MPO to provide for activities associated with RAW disposal, incl. development and operation of DGR. The concept of the DGR is continually under development since the beginning of the project, in early 1990s. The definition of preliminary WAC is premature, but the facility shall accommodate all SF and RAW which does not comply with WAC of existing disposal facilities. The detailed design of SF disposal casks relies on long-term performance of carbon steel/stainless steel, which are the main construction materials of casks. (answer by SÚJB/ONRV)
CH-CZ-6	Article 22	p. 90	Are the proposed Installations required to have a concept on how to deal with human and organizational factors, such as for example safety culture, ergonomics, etc.?	Human and organizational factors have to be considered in line with the requirements on management system defined in Decree No. 408/2016 Coll. The concept on how to deal with these factors is provided in safety

				policy of each licensee, which is a part of licensee's management system, containing a description of 1. the objective of the management system, 2. the objective leading to ensuring and improving the quality of management of processes and activities and their results, 3. the measures to meet the objective pursuant to points 1 and 2 and its monitoring. Except safety policy, the management system documentation shall include: - a description of the management system containing a description of 1. the organisational structure of the subject implementing the management system, 2. the rights and responsibilities of personnel who plan, manage, perform, and evaluate processes and activities and their mutual relationships, communication methods, and decision-making methods at every level of management, 3. the method of communication between the subject implementing the management system and a product or service supplier, another subject that participates in ensuring nuclear safety, radiation protection, technical safety, radiation situation monitoring, handling radiological emergencies, and security, and with the Office; 4. processes and activities, their results and their mutual effects, based on the safety policy and containing information on their preparation, review, verification and validation, performance, evaluation, and improvement, and recording of data applicable to processes and activities and their results; and 5. managing records, - records 1. of the manner in which a process or activity is performed, 2. of the achieved results upon fulfilment of requirements for the management system and results of processes and activities and 3. fulfilment of the requirements for other management system documentation; - requirements for the processes and activities performed by a product or service supplier and - other documentation of the subject implementing a management system that is used to manage processes and activities, especially contracts, programmes, lists of selected equipment, limits and conditions, safety reports, and internal regulations. (answer by SÚJB/ONRV)
CH-CZ-7	Article 22	6.2/p. 56	How is the development of the market situation assessed with regard to whether there will continue to be enough interested and qualified	Concerning RAW management, education of chemistry and physics has a strong and long tradition in the Czech Republic and there is

			personnel on the market in the next 10-20 years, who can be recruited for work in spent fuel and radioactive waste management activities?	currently no expectation that it will significantly deteriorate in the near future. The ÚJV and ČEZ, a.s.has long-term cooperation with universities in the field of education in order to create personnel reserves suitable for nuclear activities. In the field of RAW management and decommissioning processes, the study programme of Decommissioning of Nuclear Facilities was created at the Czech Technical University. The aim of the study programme is to educate qualified workers who can be used in the process of safe decommissioning of nuclear facilities and other workplaces or in the management of sources of ionizing radiation. Graduates can also focus on science, research and industry and, if necessary, find the use of acquired knowledge and skills in public administration. Research centres of ÚJV and CV Řež cooperate with the Czech Technical University in the form of creating an environment for internships of these students, the possibility of technical visits, the provision of professional guarantors and other general educational support and possibilities of part-time jobs. The operator of NPPs, ČEZ, a. s., is also very interested in recruiting and retaining qualified staff specialised in SF and RAW management activities despite the fact that the number of qualified applicants is decreasing, and applicants from abroad with inappropriate qualifications are also applying for vacancies. It organizes many activities for young students to promote technical education. Special activities like excursions, workshops and presentations help to make nuclear field more attractive. Thanks to these activities ČEZ, a. s. is able to find qualified personnel at technical universities in the Czech Republic. Additionally the employment in regions with NPPs is still very attractive. The company will try to keep this trend in the future to meet the personnel needs. To make RAW management known and possibly recruit young specialist for work in SÚRAO, the Authority organizes annual summer school focused on specific issues of RAW disposal or DGR development program. Experts from SÚRAO also participate on seminars in universities. (answer by ČEZ, ÚJV, CV Řež and RAO)
CH-CZ-8	Article 22	p. 12, 56-57	Are all nuclear installations (NPP, RR, FCF, storage facilities) obliged to have a preliminary decommissioning plan that is reviewed on a periodical basis?	Yes, initial decommissioning plans of all nuclear installations are reviewed every five years (see Table 1.2; p 12/152, chapter 6.6.1 on p. 82/152, chapter 8.6.1 on p. 124/152, …). Part of the required documentation for granting an operational licence is a decommissioning plan and a validated estimate of decommissioning costs. Both documents must be regularly updated, at least once in five years.

				(answer by SÚJB/ONRV and CV Řež)
CH-CZ-9	Article 22	6.2/p. 56	Besides technical qualifications and personnel training programs for employees; what are the methods used to assure knowledge transmission from one generation to the other?	ČEZ, a. s. is strongly aware that the transfer of knowledge is essential to ensure the safe and effective operation of the company. Knowledge management (KM) is integrated into the corporate culture and is integrated into IMS on the level of processes. One of KM objectives is to gather, maintain and transfer professional knowledge and skills to younger generations. Strategy and methodology for knowledge management is determined and regularly updated. ČEZ, a. s. has a KM team and set of KM tools. The most often KM tools used by leaders to assure the knowledge transition to new generation are: succession plan and talent management, communities of practice, temporary training and mentoring positions, use of best practice, experience reports, knowledge duplication, debriefings, coaching and mentoring and others. If possible ČEZ, a. s. uses the overlap of leaving and future generation at one working position for 2 years. In addition, personnel in training is participating in projects, mentoring activities and works in professional-technical groups, inter-site exchange groups etc. Research centres, such as ÚJV and CV Řež, within the framework of their strategic plans also include a basic assessment of personnel requirements and a basic plan of the necessary recruitment to ensure personnel capacities. To minimize the risk of knowledge loss, specific positions filled by selected specialists are shaded in advance before reaching retirement age in order to implement joint projects for practical training in the field for junior workers. The area of RAW disposal (SÚRAO) is very limited in terms of available human resources. Only good knowledge management applied in the organization ensures that the internal knowledge transfers across the generations (employees of different generations work together at the same workplace thus they pass their knowledge to each other). (answer by ČEZ, ÚJV, CV Řež and SÚRAO)
CH-CZ-10	Article 24	F4/p. 69-70	What requirements exist to ensure the enclosure of radioactive material in facilities? How do the facilities prevent uncontrolled releases?	Legal requirements on the design of RAW and SF storage facilities and RAW management facilities and management of RAW are provided in Decree No. 329/2017 Coll., on the requirements on NI design (see https://www.sujb.cz/fileadmin/sujb/docs/legislativa/vyhlasky/329_2017.pdf; in Czech only) and in Decree No. 377/2016 Coll. on the requirements for the safe management of RAW and on the decommissioning of NIs or category III or IV workplaces (see https://www.sujb.cz/fileadmin/sujb/docs/legislativa/vyhlasky/377_Radioactive_Waste.pdf). The enclosure of radioactive substances and the prevention of their release is provided e. g. by the design and

				operation requirements of RAW and SF storage facilities, which shall ensure that (a) the priority is given to the use of SSCs with a passive function, (b) damage to RAW storage packages during RAW management is prevented, (c) the leak tightness of RAW packages can be regularly controlled, (d) there is a reserve storage capacity created for relocation, repackaging, control, maintenance, and retrieval of RAW for the entire duration of the storage facility's operation, etc. Additional requirements are defined for the design and operation of storage facilities for liquid RAW, such as: (a) the corrosion resistance of storage tanks, (b) placement of storage tanks into impermeable protective vaults, which can accommodate the full content of storage tanks, availability of reserve storage tank with a volume corresponding to the largest tank in the system, (c) in the case of RAW storage in containers, the floor and walls of the store shall be impermeable to such a height, which in the case of a leak of the maximum amount of stored liquid radioactive waste would prevent its uncontrolled release into the environment etc. For the storage of SF in dry cask facilities the cask types have to be authorized by the Office. These casks have defined leak tightness criteria so that the release of their radioactive content to the environment is prevented. (answer by SÚJB/ONRV)
CH-CZ-11	Article 24	F4, 6.4.2.3/ p. 70	What requirements exist for the “workplace monitoring program” to be approved? Does the “workplace monitoring program” include any aspect about setting up radiation protection measures/provision? If so, which aspects?	The requirements for the content of the monitoring programme are set out in Decree No. 422/2016 Coll., in Article 66 Monitoring Programme. The monitoring programme specifies the monitoring levels and the actions to be taken when they are exceeded. When so called investigation levels are exceeded, then the causes of the elevated values are investigated and, in addition, when the intervention levels are exceeded, predetermined measures are applied to prevent the undesirable development of the resulting state or to remedy the resulting state. (answer by SÚJB/ONRV and SÚJB/SRO)
CH-CZ-12	Article 25	6.5.2.5/ p. 79	What are the arrangements of SÚJB for notifying the citizens in case of an emergency or for instructing the population for protective actions?	In the case of an emergency, population is warned through a unified early warning and notification system managed by the Fire Rescue Services. In such a situation, SÚJB convenes its crisis staff and, on the basis of received information about the event, or performed monitoring of the radiation situation, prepares a proposal for the introduction of urgent protective measures, which it forwards to the relevant crisis management bodies. The crisis management bodies on the basis of

				mentioned proposal introduces urgent protective measures. SÚJB also informs the population about the event through its press releases. (answer SÚJB/OMKŘ)
CH-CZ-13	Article 26	p. 81-83	Is it allowed to begin with some preparatory measures for decommissioning before the decommissioning license has been granted? Do you have to remove spent fuel first before starting dismantling activities?	Yes, it is expected that e.g. NPPs after they stop the power production will be still in operation for about 10 years. During this period: - decommissioning studies will be performed and decommissioning works will be prepared, - all units will be shut down and unnecessary on-site connections will be closed, - new necessary site links will be created, - SF will be removed from reactors and placed into the SF storage pools, - once SF is cooled down it will be removed from the SF storage pools to the dry AFR SF storage facilities, - treatment and conditioning of operational RAW incl. water from the SF pools will be performed. Decommissioning will start, based on decommissioning license, after all preparatory works are finished. Atomic acts also stipulates that licensee shall transport all spent fuel to another nuclear installation prior entering the first decommissioning phase. (answer by SÚJB/ONRV and ČEZ)
CH-CZ-14	Article 27	I /p. 132-135	Does the SÚJB (regulatory body) conduct any inspections in the transport of radioactive substances?	Yes, it does. SÚJB regulates all licensed transports of radioactive substances and annually performs about 4-6 inspections of the FF, SF and large radiation sources transports. (answer by SÚJB/ONRV)
CH-CZ-15	Article 27.2	I /p. 132-135	We found that Czech Republic have acceded to the Antarctic Treaty. This should be mentioned in your next national report.	Thank you for the reminder. We will consider the comment by the preparation of the next JC national report. (answer by SÚJB/ONRV)

USA – CG1

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
US-CZ-1	Article 19	5.3.4/ p. 51	The report states, "Since 2011 funding of science and research has been transferred to agencies and to the Ministry of Education, Youth and Sports." Please discuss any mechanisms the regulator, SÚJB [State Office for Nuclear Safety (Statni uřad pro jadernou bezpečnost)], has to direct nuclear or radioactive waste-related research through government agencies or ministries. For example, is SÚJB able to propose research areas for agencies or ministries and to seek government funding for university waste-related research projects?	SÚJB has several options how to direct R&D projects. For example within the scope of the BETA2 project of TA ČR (Technological Agency of the Czech Republic) 156,97 mil. Kč, what is 9,6 % of the funds available for this project, were allocated for the R&D projects of the Office. The project will last till 2024. The Office is also involved as so called “application warrantor” in another TA ČR project – THETA. The Office provides application warranty for 12 programmes, 4 of them related to the development of DGR (Methods for verifying the safety criteria of a geological repository

				of HLW and SF, The impact of radiolysis and bacterial extremophiles on DGR disposal cask lifetime, Optimization of disposal cask spacing and preliminary temperature calculation of DGR, Representation of fault zones and discontinuities in hydrogeological models for DGR safety assessment). Several universities are involved within these programmes (Czech Technical University in Prague, University of Chemistry and Technology Prague, Technical University of Ostrava, Technical University Liberec). Other R&D projects (security research, detection and management of CBRN substances, radiation protection) are managed by SÚJB's TSO – SÚRO and by SÚJCHBO, both established and funded from SÚJB budget. In limited scope SÚJB can fund R&D projects as a part of contracts with external supplier. In this way SÚJB signed a contract on independent initial safety assessment of DGR sites with CV Řež in 2015-2017. (answer by SÚJB/ONRV)
US-CZ-2	Article 32	2.2/p. 16	The report states, "The public will be fully involved in the RAW [radioactive waste] and SF [spent fuel] geological disposal facility development process and will be invited to actively participate in the fulfilment of the individual stages of the process." Please elaborate on any framework that SÚRAO [the Authority] has in place to involve the public, including examples of types of activities that will include public participation.	The public involvement in site selection process is based on voluntary principle and is specific for each phase of DGR project. The ultimate responsibility for the selection of final and backup site is on the Government of the Czech Republic. The Authority is responsible only for technical part of the whole process. The public involvement started in early stages of the site selection process (2010), when a "Working Group for Dialogue" has been established. The outputs of the work of this Working Group were the principles and proposal of new act on site selection process. In mid-November 2019, the "Advisory Panel of Experts" (MPO, MŽP, SÚRAO, SÚRO, ČVUT, MUNI and nominees of site representatives), which wass the advisory body of the Director of SÚRAO, has launched his work to guarantee the professional level, objectivity, openness and transparency of the site reduction process, including the evaluation and analysis of the outputs from this process. One expert and two observers representing each of potential DGR sites were invited to contribute to the work of the Advisory Panel (see technical report https://www.surao.cz/wp-content/uploads/2020/06/závěrečná-zpráva-exp.-panel.pdf; in Czech only). The Advisory Panel ended its work in June 2020 with selection of four of originally nine considered sites for next phases of DGR development. SURAO is currently preparing the creation of two main expert groups: - Expert group which will continue with the work started by the Advisory Panel. This expert group will advise and supervise the continuation of DGR site selection process from technical point of view. The Authority will invite the members of public (as observers)

				and independent experts to the work of this group. Local councils of potential sites will be asked for nomination of one expert. - The second group called “Local Working Group” will serve as a communication platform with local public. The representatives of potential DGR sites may ask for technical question and give a technical suggestion to the DGR project. (answer by SÚRAO)
US-CZ-3	Article 32	4.1.1.3, 2.2.2, 7.7/ p. 18, 22, 98	The report indicates that the Interim Spent Fuel Storage Facility at Dukovany is at full capacity, and the Spent Fuel Storage Facility at Dukovany will be able to store spent fuel from Dukovany Nuclear Power Plant in a dry storage configuration until around 2030. The report also indicates that a deep geologic repository for disposal of spent fuel is expected to become available in 2065. What plans are in place to manage spent fuel discharged from Dukovany Nuclear Power Plant between 2030 and 2065?	Licensees “Strategy of ČEZ, a. s. in the Back End of the Fuel Cycle of NPPs, RAW Management and NPPs Decommissioning” from 2020 considers, that additional SF storage capacity will be needed, depending on the fuel campaign duration (12 vs 16 months) and expected duration of NPP operation (2035-37 or 2045-47). Additional storage capacity ranges from 11 to 45 casks (864 to 3744 fuel assemblies) after 2041 or 2044. This strategy is in compliance with national RAW and SF management policy and strategy from 2019 (Policy for Radioactive Waste Management and Spent Fuel Management in the Czech Republic approved by the Czech government Resolution No. 487 of 15 May 2002 and its updates, approved by the Czech government Resolutions No. 852 of 29 November 2017 and No. 597 of 26 August 2019). In practice, 2030 is the last year of introduction of the fresh fuel into the reactor core for that the storage capacity is available in the current Spent Fuel Storage Facility Dukovany. So, the facility will be at full capacity around 2044. The need for additional storage capacity will depend on expected NPP operation lifetime. (answer by SÚJB/ONRV and ČEZ/EDU).

Bulharsko (Bulgaria) – (CG2)

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
BG-CZ-1	Article 24	6.4.	The report states: "Monitoring within the SUJB network of environmental and the food chain sampling is completely independent of the NPP operator's monitoring system. Now it is newly governed by the National Monitoring Program, which is effective from 1 January 2019". Question: What is the formal statute of this new National Monitoring Program?	The establishment of the National Monitoring Programme is required by Czech legislation. The National Monitoring Programme is developed on the basis of the requirement of Article 149 letter a) of Act No. 263/2016 Coll., the Atomic Act. The National Monitoring Programme is prepared by SÚJB in accordance with Article 209 letter a) of Act No. 263/2016 Coll., the Atomic Act. On the basis of the above-mentioned legal authorization, the SÚJB issues a document, which is approved by the SÚJB chairwoman. Once approved, it is submitted to administrative authorities as defined also in Atomic Act. (answer by SÚJB/ONRV and SÚJB/OMKŘ).
BG-CZ-2	Article 24	6.4.	The report states: "SUJB provides its own independent monitoring of discharges from the workplace. Collected samples are handed over for analysis to SURO laboratories. As a part of its planned inspections on the fulfillment of the discharge monitoring program, SUJB compares the results of operator monitoring and independent monitoring results". Question: What is the percentage of the samples that are taken for the independent monitoring purposes compared to the operator's monitoring program samples number ?	It is very difficult to express the percentage of samples that are taken for the independent monitoring purposes. In the area of liquid discharges monitoring, the amount of samples for independent monitoring is the same as taken by the licensee at the plant outlet. As to control tanks the licensee samples each control tank separately prior to the controlled release of its content, while independent monitoring analyses a composite sample from the control tanks collected within a month. For the monitoring of gaseous discharges, all aerosol samples and some iodine, tritium, C-14, and noble gas samples are analysed as part of the independent monitoring. (answer by SÚJB/SRO)
BG-CZ-3	Article 24	6.4.	The report states: "An authorized limit 40 μSv per year is set for discharges into the air and 6 μSv per year for discharges into surface waters for NPP Dukovany. For NPP Temelin the authorized limit is 40 μSv per year for discharges into the atmosphere and 3 μSv per year for discharges into surface waters. Authorized limits were established based on the optimization study and calculation of the dispersion of radioactive substances in the environment under conservative conditions using a computer program accredited by the SUJB." Question: Are these limits established by the legislation or by the particular licences?	These limits are proposed by the applicant for a license to discharge radioactive substances from the workplace and reviewed by the regulatory body within the licensing process. Authorised limits are derived on the basis of an optimisation study and calculation of the dispersion of radioactive substances in the environment. These calculations take into account site specific properties, such as the prevailing wind direction or the interconnection of local water sources with discharge sources. Once the outcomes of the regulatory review confirm compliance with legal requirements, the regulator issues a license. (answer by SÚJB/ONRV and SÚJB/SRO)

Francie (France) – (CG2)

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
FR-CZ-1*	Article 32	Page 27 – Section 4	Czech Republic indicates about Intermediate-level solid RAW managed in Dukovany Facility that the anticipated storage time is until NPP decommissioning. Czech Republic indicates about intermediate-level solid radioactive waste managed in the Dukovany facility that the anticipated storage time is until Nuclear Power Plant decommissioning. Intermediate-level waste contain long-lived radionuclides that requires a greater degree of containment and isolation. Dukovany's Nuclear Power Plant started operating in 1985-87 for an initial period of 40 years. The lifetime of Dukovany's Nuclear Power Plant will probably be extended to 50 or 60 years. Thus, the end of operation and decommissioning of Dukovany's Nuclear Power Plant should occur around 2045. At that time, intermediate-level solid radioactive waste will naturally still need to be safely contained and isolated. Could the Czech Republic specify the types of disposal to be used for these waste after Dukovany's Nuclear Power Plant decommissioning? After the long storage period, does Czech Republic anticipate difficulties for the waste retrieval?	It is expected that all operational RAW not complying with WAC for disposal in operated disposal facilities will be placed in DGR. Until that time (2065 and later) they will be safely stored, what in the case of NPP Dukovany means in storage installations of this NPP, which will be available also during decommissioning phase. The initial decommissioning plan, however, considers the construction of new storage premises once the existing ones are no more available and decommissioned. As this RAW consist mainly on irradiated components such as activated measuring sensors, thermocouples, cartridges containing material coupons, absorbers, internal reactor parts, serpentinite concretes and backfills, etc., no difficulties with their retrieval is expected. (answer by SÚJB/ONRV)
FR-CZ-2	Article 9	Page 58 - Section 6	Czech Republic defined new milestone for deep geological repository development following the updated policy. In this framework, the selection of two candidate sites is planned for 2022 and the final site selection will be decided in 2025. Could the Czech Republic elaborate on the process and associated technical and socio-environmental selection criteria?	SÚRAO is responsible for technical part of the process. Based on the Policy, SURAO will elaborate the socio-economical studies of potential sites and give a results to further decision together with technical evaluation. The whole process contains three important phases/ milestones: I. Preparatory phase In this phase the monitoring of the sites is established as well as all the technical preparations for site characterization works II. Site characterization phase This phase is related to the acquisition of site exploration license. Performed works include all activities that are essential for creation of site descriptive models and preliminary safety case analyses. III. Site evaluation phase In this phase the main reports and studies are performed based on site specific data from exploration activities (eg. preliminary design of DGR, preliminary safety case, preliminary EIA study for each site). Based on this studies the sites are compared with the help of safety, technical feasibility and environmental criteria. The site selection criteria, incl. technical and socio-environmental criteria, have been developed by SÚRAO and are publically available on SÚRAO web site (https://www.surao.cz/wp-content/uploads/2019/

				02/kriteria.pdf) in document MP.22 (Requirements, Suitability Indicators and Site Selection Criteria for DGR siting, Rev. 3, 2017). Site selection criteria are grouped into four categories: 1) Design (technical) criteria assessing site characteristics in terms of the feasibility of a DGR at a given location. 2) Safety criteria assessing site characteristics in terms of safety. 3) Environmental criteria assessing the environmental characteristics of the sites. 4) Socio-economic criteria assessing the DGR sites in terms of their impact on socio-economic factors and the life preferences of the local population. Design criteria include the minimum size of the host rock, thermal and hydrogeological properties of host rock, parameters influencing the method of underground excavation and mechanical properties of host rock, available infrastructure, etc. Socio-economic criteria are assessing the level of general public consent to build the DGR. The basis for comparison of the sites under consideration will be the EIA studies. (answer by SÚJB/ONRV and SÚRAO)
FR-CZ-3	Article 26	page 81 - Section 6	The Czech Republic national report indicates the current legislation and regulation regarding decommissioning. Decommissioning concepts or plans are mentioned for Nuclear Power Plants and several nuclear facilities. However, the report does not mention nor a national strategy for decommissioning nor a concerted approach of the different stakeholders.	Misleading question. There is no requirement related to the "national decommissioning strategy" in Article 26 of JC. The Czech Republic does not see any reason for this kind of strategic document as the decommissioning process: - is regulated from the first phase of nuclear installation's lifetime (siting), - is further developed in decommissioning plans and their revisions, - has to be considered in licensee's RAW and SF strategy, and - is captured in national RAW and SF policy and strategy (Policy) as the RAW generated during decommissioning is considered in it Table 1.2 on page 12/152 provides information on the selected decommissioning strategies for research reactors and other nuclear installations that express the views of different stakeholders. (answer by SÚJB/ONRV and ČEZ)
FR-CZ-4	Article 12	Page 14 – Section 2	During the updating process of the National Radioactive Waste Management and Spent Fuel Management Policy, Czech Republic performed a strategic environmental assessment. In this framework, a public debate was held in Prague on June 28, 2017. Could the Czech Republic indicate how the main conclusions of this public debate were integrated into its national policy? What are the next steps in the decision-making process associated with the national policy on radioactive waste and spent fuel management?	All questions from SEA process were answered or discussed directly during public debate. SURAO is responsible for technical part of the process. Based on the Policy, SURAO will elaborate the socio-economical studies of potential sites and give a results to further decision together with technical evaluation. The whole process contains three important phases/ milestones: I. Preparatory phase In this phase the monitoring of the sites is established as well as all the technical preparations for site characterization works II. Site characterization phase

				This phase is related to the acquisition of site exploration license. Performed works include all activities that are essential for creation of site descriptive models and preliminary safety case analyses. III. Site evaluation phase In this phase the main reports and studies are performed based on site specific data from exploration activities (eg. preliminary design of DGR, preliminary safety case, preliminary EIA study for each site). Based on this studies the sites are compared with the help of safety, technical feasibility and environmental criteria. (answer by SÚRAO)

*Questions ID 24081 and 24082 are identical

Maďarsko (Hungary) – CG3

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
HU-CZ-1	Article 10	page 84	Are there any other ways of informing the public (e.g. social media)? / From the report: "The obligation to inform the general public about management of RAW is imposed on SÚJB directly also in Section (§) 208, letter o) of the Act No. 263/2016 Coll. The information shall include the quantity of generated RAW, the quantity of RAW stored in the existing disposal facilities and the number RAW transports (both within the country and international) performed in one calendar year. The information is made public once a year at the SÚJB website."	Yes, SÚJB has its own Facebook (https://www.facebook.com/pages/sujb/129692543846872) and Twitter (https://twitter.com/SUJBofficial) accounts, where the Office informs the public on its activities. (answer by SÚJB/ONRV)
HU-CZ-2	Article 10	page 84	How is the involvement of the public in decision-making performed in practice? / From the report: "The general public is involved in the decision-making process concerning management of RAW and SF during the assessment of environmental impacts of installations for SF and RAW management (EIA) under the Act No. 17/1992 Coll., on the environment, as amended by the Acts No. 123/1998 Coll. and No. 100/2001 Coll., and by the Act No. 93/2004 Coll., on assessment of impacts of development concepts and programs on the environment."	The EIA process will start after selection of final and backup site. Public is involved in process voluntarily via local working groups and via Expert Advisory Board (under preparation). The further process will be specified by new law that is under preparation by government. (answer by SÚRAO)
HU-CZ-3	Article 15	page 121	What kind of conservative estimate or method was used to decide in favour of closing the disposal facility? How were the occurring uncertainties handled? / From the report: "The performed analyses have implied that the risks associated with reprocessing and transport of the RAW into another location would be significantly higher than those associated with the existing disposal facility. The disposal facility has been filled with a concrete mixture and closed."	The decommissioning and closure program for a disposal facility is a part of documentation submitted to SÚJB within the process of licensing the operation of a disposal facility. In regular intervals SÚRAO prepares and updates these programs for all operational disposal facilities considering requirements of Decree No. 377/2016 Coll. This document is further developed and submitted to the regulatory body within the licensing of the closure of a disposal facility. The decision to close the disposal facility Hostim has been made in early 1990´s. The used method and filling materials were selected on the basis of RAW inventory (disused sealed sources with low activity) and actual technical knowledge. The main criteria, except protection of

				the environment, was to avoid the access of unauthorised persons into the closed facility. (answer by SÚRAO)
HU-CZ-4	Article 10	page 99	From a legal point of view, what are the phases of licensing a storage facility (spent fuel, radioactive waste) for the new reactor unit? At which stage of licensing of the new NPP should it be performed at which licensing phase of the SF and RW facilities? / From the : "Further, the development of two new units in the NPP Temelín site and one new unit in the NPP Dukovany site, would increase the total quantity of SF by about 5010 t of heavy metals. Based on the current estimates the demand for the disposal capacity of DGR may be about 10 000 t HM."	Licensing phases of a storage facility (SF, RAW) for the new reactor unit are the same as for existing facilities (currently, according to the Act No. 263/2016 Coll., siting, construction, commissioning, operation, decommissioning and if needed, safety relevant modifications). Licensing of new SF and RAW management facilities will be performed in due time, depending on the selected design of new NPP units, expected detailed timetable of their development and their operational schemes. (answer by SÚJB/ONRV)

Slovensko (Slovakia) – CG3

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
SK-CZ-1	Article 3	3/p. 19	Is there keeping of the possibility of taking the spent fuel from repository in case reprocessing will become economically feasible in future (retrievability)?	Yes, it is expected that during the operational period of the DGR the disposed SF will be retrievable. (answer by SÚJB/ONRV).
SK-CZ-2	Article 5	7.2.1.3/ p. 87	The storage capacity of SFSF Dukovany has been designed for the expected 40-year operation of the NPP Dukovany. What is the strategy for SNF long-term storage management in the case of long term operation of the NPP Dukovany (beyond 40 years)?	The storage capacity of available dry cask stores will be extended to accommodate all SF generated during the extended period of NPP Dukovany operation (60 years). The nuclear fuel cycle back-end strategy of ČEZ, a. s. company does not exclude to use synergies with planned new builds what means a construction of a SF storage facility for both operational and planned new units. (answer by SÚJB/ONRV)
SK-CZ-3	Article 10	7.7/p. 99	Which company or institution funded the costs of developing all the necessary projects, geological surveys and planning?	SÚRAO has been established by MPO to provide for activities associated with RAW disposal, incl. development of DGR. As stated in the National Report, chapter 6.1 “Activities of SÚRAO are funded from the state budget from the so called nuclear account which is funded by generators of radioactive waste”. (answer by SÚJB/ONRV)
SK-CZ-4	Article 10	6.7/p. 84	Regarding the statement from page 84, that four of originally nine considered sites for next phases of DGR development were selected, could you briefly describe what was the main reason of reduction in the number of possible DGR sites?	There is a need to identify one main and one back-up site until 2030 (see the draft of updated Policy from 2021). To reach this milestone the potential sites have to be properly characterized and analysed. Therefore, in mid-November 2019, the “Advisory Panel of Experts” has launched his work to guarantee the professional level, objectivity, openness and transparency of the site reduction process, after almost 30 years from the initial launch of DGR project (further details see chapter 6.7 of the National Report under JC). To reduce the cost of geological works consecutive on-site geologic works will be performed at four selected sites only.

				(answer by SÚJB/ONRV)
SK-CZ-5	Article 10	6.7/p. 84	Have you implemented any communication strategy to address concerns expressed by public living around proposed sites?	During the whole DGR site selection process SURAO permanently communicates with public living around proposed sites. From 2014 to 2020 SURAO organized or was involved in following activities : 1) Working Group for Dialogue 2) Local presentation of site characterization techniques (regular meetings with local stakeholders on 9 sites) 3) Local presentation of site characterization results (regular meetings with local stakeholders on 9 sites) 4) Occasional public discussions 5) Advisory Panel of Experts 6) National and local media presentation and discussion SÚRAO as an active player is responsible to stakeholders for explaining the technical outputs and providing the information via different communication platforms. Different strategies are implemented for different stakeholder end-groups. (answer by SÚRAO)
SK-CZ-6	Article 10	7.7/p. 99	On page 99, it is stated written that the number of considered DGR sites has been reduced from nine to four in June 2020. According to Tab 7.1 “Anticipated timetable for DGR preparation, construction and operation according to the Policy (2019)”, in 2022 is expected selections of two candidate sites based on the preliminary characterization of the sites, including the standpoint of the communities concerned. Is there a communication strategy of Authority or/and Ministry of Industry developed in order to reach a positive approach of the professionals and general public of potential sites?	SÚRAO as a technical organization submits all information and feedback to local stakeholders at potential sites. SÚRAO approach is to give all stakeholders relevant information to support their decision. SÚRAO is establishing local working groups and Advisory Panel of Experts to ensure transparency and fairness of the site selection process. It is important to stress out that the site selection process has already started in early 1990´s and it is extremely difficult to give new inputs to the communication with stakeholders. (answer by SÚRAO)
SK-CZ-7	Article 13	8.3/ p. 110	Regarding of general intergovernmental agreement about exchange of information with Slovak Republic, is there any plan to extend cooperation with other neighbouring states to ensure, that harmonized approach and appropriate coordination across national borders will be in place during emergencies?	As stated in chapter 8.3 of the National Report under JC similar intergovernmental agreements are in force with remaining neighbouring countries - the Federal Republic of Germany, Austria, Poland, and also with Hungary. (answer by SÚJB/ONRV and SÚJB/OMKŘ)
SK-CZ-8	Article 20	5.3.6/ p. 54	Is there any plan to invite another IRRS mission in near future?	Yes, next IRRS mission is planned for April 2023. In September 2023 back-to-back ARTEMIS mission will follow.
SK-CZ-9	Article 23	6.3.2.1/ p. 64	Why there is no legal requirement for the SÚJB to approve the management system of the license holder (ČEZ)? Is there only a notification obligation?	This question is partly incorrect. The management system documentation of the licensee is a part of the safety case and as such the regulatory body reviews it. However, the regulator does not formally approve this documentation. (answer by SÚJB/ONRV)
SK-CZ-10	Article 24	6.4.2.2/ p. 70	Did SÚJB record any exceeding of the allowed doses for the representative person from general population in the vicinity of ETE and EDU in recent history? Are there sufficient margins in average values of discharges compared to the limits?	The licensee monitors the compliance with authorised limit throughout the year and provides an annual report with the monitoring results to the regulatory body (SÚJB). These reports are archived. These authorised limits are set with sufficient margin so that they do not cause excessive constraints for the licensee and at the same time the

				exposure of persons in the vicinity of the nuclear installation is sufficiently controlled. No exceeding of any authorized limits has been recorded yet. (answer by SÚJB, SRO)
SK-CZ-11	Article 25	6.5.2.6/ p. 80-81	In light of the pandemic situation what measures have been taken to assure emergency exercises? Where these exercises postponed or other arrangements have been taken by the licensee and approved by the competent authorities?	A large part of the planned emergency exercises for 2020 were either practiced in a reduced form and in compliance with hygienic measures, or postponed and included in the exercise plan for 2021. All postponed exercises were performed during 2021. In 2022, all exercises will be carried out in standard form and on schedule. (answer by SÚJB/OMKŘ)
SK-CZ-12	Article 28	10/p. 137	What were the most common types of sources of sealed sources of radiation?	According to the Register of Sources operated by the SÚJB, the most common sealed radiation sources used in the Czech Republic are Cs-137, Co-60 and Ir-152, followed by Am-241. Ra-226, Se- 75, Kr-85, Am-241/Be, Sr-90 and others. As far as source categories are concerned (according to IAEA categorisation) following number of sources are currently in use in the Czech Republic: - 120 pcs of Category 1 sources (all Co-60), of which 84 pcs in industry and 28 pcs in medicine, - 184 pcs of Category 2 sources (Co-60, Cs-137, Ir- 192), of which 127 pcs in industry and 39 pcs in medicine, - 161 pcs of Category 3 sources, of which 123 pcs in industry, - 875 pcs of Category 4 sources, of which 759 pcs in industry, and - 2095 pcs of Category 5 sources, of which 1483 pcs in industry. (answer by SÚJB/SRO)
SK-CZ-13	Article 32	4.1.1.1/ p. 21	Can you provide a short explanation of damage to the existing fuel (how it happened, how extensive it is)? How was calculated the estimate of 17 positions for the damaged fuel containers?	Both questions are outside the scope of JC. The amount of damaged (potentially damaged) fuel is very low. Due to the low amount and a difficult access to fuel pins under FA shroud no inspection of the damage origin has been performed. The original design of SF pools considered more positions for leaking fuel containers. In 1990s, new racks with only 17 container position were installed (this is just one shortest line of the rack). Probably there was requirement for the maximal fuel storage capacity for the following dry storage, and low probability of fuel damage occurring. (answer by SÚJB/ONRV, ČEZ/EDU)
SK-CZ-14	Article 32	4.1.1.2/ p. 21	Were there any issues or difficulties identified during the operation of spent fuel storage facilities at NPP Dukovany and NPP Temelín which were not considered in the project? (mainly with decay heat sink using natural aeration and seismic risk of facility structure).	No, all SF storage facilities are operated without any (beyond) design basis accidents since mid 1990s. Only several operational occurrences were reported. (answer by SÚJB/ONRV)
SK-CZ-15	Article 32	2.2.2/ p. 18	In the light of recent earthquakes in Croatia, are there any plans to modify Czech Republic approach to long term radioactive HLW	No, the site selection process of DGR already considers the option of seismic events on selected sites. However only the NW part of the Czech Republic is seismically active.

			management or reassessment of possible sites for deep geological repository construction?	(answer by SÚJB/ONRV)
SK-CZ-16	Article 32	4.1/p. 20	Is it possible to store all types of spent nuclear fuel assemblies with regard to enrichment and burnup (limit) in the dry storage facilities in Dukovany and Temelín? If not, what are the plans for long-term storage of SNF assemblies of higher burnup?	Yes, it is. Dry storage and transport casks are licensed (type approved) by the regulatory body in such a way that they can safely accommodate all undamaged fuel that will be used in both NPPs within approximately next decade. (answer by SÚJB/ONRV)

Rakousko (Austria) – CG4

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
AT-CZ-1	Article 12		Please describe what the review of past practices looks like. For example, are there campaigns to detect radium-containing or thorium-containing waste from past industrial applications?	There are no campaigns to search for waste containing radium or thorium from past industrial applications; we do not see the need for them. (answer by SÚJB/SRO)
AT-CZ-2	Article 13	6.7. Transparency, p. 84	What are the lessons learned following feedback from the meetings with the general public and RAW and SF management licensees that SÚJB attends?	Meetings with general public are organised by current or future licensees for RAW and SF management activities. The regulatory body usually attends these meetings and contributes to the discussion. But the feedback to SÚJB regulatory activities (regulatory review, licensing process, inspections, …) is received mainly from the RAW and SF management licensees during regular meetings with them. General public shows only limited interest in ongoing RAW and SF management activities in the country; their focus is on the development of future DGR. (answer by SÚJB/ONRV)

Slovinsko (Slovenia) – CG4

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
SL-CZ-1	Article 28	J	Do you in your country collect consumer goods and products containing radioactive substances? Do you have any restrictions on the available disposal options at the end of their useful lifetime? If yes, what are the basis for such decision?	Yes, the manufacturer or distributor of products containing radioactive substances is obliged to take back these product at the user's request (see Article 68 para 1 letter k) of Atomic Act). Then these used products are cleared in accordance with Article 76 of Atomic Act. If the clearance levels are exceeded and at the same time the dose to each member of the public does not exceed 0,01 mSv/y for the relevant clearance scenario, SÚJB has to be notified. In other cases, a SÚJB license is needed. (answer by SÚJB/SRO)

Rusko (Russia) – CG5

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
RF-CZ-1	Article 4	Section 4.1.1.1	The Report indicates that at NPP Dukovany "SF pool also contains 17 positions for hermetically sealed containers for damaged SF storage. Damaged SF will be managed during the decommissioning of the NPP" and "there are 5 FAs declared as damaged (1 mechanically, 4 leaky) in SF pools". For NPP Temelín, the Report indicates that "in the future, in the period of operation of the NPP Temelín, the leaky FAs (at the end of 2019 88 pcs) will be gradually taken out of SF pools and after type approval of relevant casks will be loaded into them and then transported and stored in SFSF Temelín". The reasons that could explain why different strategies were selected to manage damaged SNF for NPP Dukovany and NPP Temelín are not clear. The report does not indicate the reasons for which such a mass-scale leakage involving 88 pcs of FAs did occur, the type of damage and the methods for their removal from the NPPs.	The reason of different strategies for the management of damaged SF at both NPPs is the amount of damaged SF. The performance of SF at NPP Dukovany is substantially better than at NPP Temelín. Unfortunately the change of fresh fuel supplier for NPP Temelín, which has occurred in 2010 (from Westinghouse to Rosatom), did not bring any substantial improvement of the amount of yearly generated leaky SFAs. Only from 2018, after the delivery of new fresh fuel generation TVSA-T mod. 2 to the second unit of NPP Temelín, some improvement of fuel performance is observed (no leaky SF identified by on-line sipping controls). (answer by SÚJB/ONRV)
RF-CZ-2	Article 4	Section 4.1.2.2	Description of the SFSF at Temelín NPP does not indicate any possibilities for damaged SNF acceptance and storage. If such a possibility is available, which method is going to be used to enable the acceptance and safe storage of leaky SNF?	No damaged or leaky SF can be stored in AFR storage facilities of both NPPs. (answer by SÚJB/ONRV)
RF-CZ-3	Article 11	8.7.4. RAW Disposal Facility Hostim	Do the national regulations set forth any criteria allowing to terminate the monitoring at the post-closure stage (for example, following the expiration of a 50-years long period mentioned in p. 8.6.3.4)?	Yes, the monitoring of any closed disposal facility will be terminated based on the conclusions of safety assessment submitted to the regulatory body as a part of safety case for closure of disposal facility Section 3 letter b of Atomic Act. These conclusions are then used by the preparation of closure and institutional control timetable of disposal facility (see Annex No. 1, chapter 3 letter b item 1.5 of Atomic Act). (answer by SÚJB/ONRV).
RF-CZ-4	Article 11	8.7.1. RAW Disposal Facility Richard	Do the national regulations set forth any requirements regarding the characteristics and the service life of the buffer material (bentonite- or cement-based mixture)?	Requirements regarding the characteristics and the service life of the buffer material are facility specific and are included in OLCs and WAC of disposal facilities. (answer by SÚJB/ONRV)
RF-CZ-5	Article 8	Section 6.4.2.2	It is mentioned on page 70 of the Czech Republic NR that the SÚJB also sets, within the licence for discharge of radioactive substances from the workplace, so-called authorized limits of effective dose of a representative person for each workplace with a nuclear facility. Could you please clarify what is the purpose of setting authorized limits of effective dose for a representative person, and how these limits correlate with the dose limits specified in paragraph 6.4.2.1 of the NR?	Paragraph 6.4.2.1 of the National Report contains general dose limits for workers and public. The purpose of setting authorized limits of effective dose is the optimization of radiation protection. According to the Section 82 para 1 of Atomic Act "Anyone who performs an activity involving radiation shall ensure that, as a result of this activity, including in the case of accumulation of a radioactive substance discharged from

				the workplace, the dose constraints for the representative person of 0.25 mSv per year and, in the case of an energy-generating nuclear installation, simultaneously 0.2 mSv for discharges into the air and 0.05 mSv for discharges into surface waters, were implemented in the optimisation of radiation protection." Authorised limits derived on the basis of an optimisation study and calculation of the dispersion of radioactive substances in the environment are set out in the site-specific discharge licence. These calculations take into account site specific properties, such as the prevailing wind direction or the interconnection of local water sources with discharge sources. (answer by SÚJB/ONRV and SÚJB/SRO).
RF-CZ-6	Article 8	Section 6.4.2.4	As follows from page 71 of the Czech Republic NR, environmental monitoring consists of regular measurements of surface water samples. from streams and water reservoirs (ponds), atmospheric fallout, aerosols and iodine from the air, soil and food chain. Does Czech Republic have any regulator-approved Regulations or Guidelines providing guidance on scope of such monitoring? If there are such documents, could you please outline their key provisions?	Radiation situation monitoring in the Czech Republic is carried out in accordance with the National Monitoring Programme. The main provisions are listed in Article 16 of Decree No. 360/2016 Coll., on the monitoring of the radiation situation, which is developed on the basis of the requirement of Article 149 letter a) of Act No. 263/2016 Coll., the Atomic Act. National Monitoring Programme is available on SÚJB webpage https://www.sujb.cz/en/radiation-situation-monitoring. (answer by SÚJB/OMKŘ)
RF-CZ-7	Article 15	Section 8.4.3.3	It is mentioned on page 114 of the Czech Republic NR that the engineering barriers in RW disposal facility are represented by the waste form itself (bitumen, aluminosilicate…) Could you briefly describe the acceptance criteria set for bituminous radioactive waste at the Dukovany RW disposal facility? How the fire hazard of this waste is taken into account?	Bituminization is considered as safe, reliable and effective method for conditioning of operational, low level waste at both NPPs. WAC for disposal of bituminized RAW restrict among others the leaching rate of bituminized RAW. The fire hazards of disposed bituminized RAW is taken into account in safety assessments of disposal facility Dukovany (fire in open disposal vault due to e.g. airplane crash). (answer by SÚJB/ONRV)

Rumunsko (Romania) – CG6

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
RO-CZ-1	Article 11	8.1	Does exist in the legal and regulatory framework provisions on the existing of strategy for management of RW from emergency? The licensee is obliged to develop and to implement a strategy for management of RW from emergency?	The licensee's strategy has to follow the national RAW and SF policy and strategy (Policy), which defines how to manage RAW from radiological emergencies In the case of release of radioactive substances into the environment first the emergency plan of affected nuclear installation will be initiated. Existing technologies for the management of RAW are capable of managing foreseeable quantities of RAW from a radiological emergency. In the period after the implementation of emergency plan these technologies will be used to process generated RAW to meet WAC for disposal e.g. in disposal facility Dukovany, which has about 75% of its capacity still available. If a situation arises where RAW does not meet WAC for the existing disposal facilities, it will be stored in the nuclear facility or newly build facility and disposed later in the DGR. (answer by SÚJB/ONRV)
RO-CZ-2	Article 19	5.2.1	Please briefly describe the process of verification of the compliance with regulatory requirements regarding the employer of outside workers. What kind of document the regulatory authority does grant for the employer of outside workers?	Question unclear (who are outside workers?) In case of subcontractors the licensee shall, in his management system, lay down the requirements for the selection and qualifications of suppliers of products or services and manage and monitor these supplies. Among other obligations, the licensee shall make contractual arrangements with suppliers of products or services concerning requirements for the qualifications of the personnel conducting processes and activities within the supplier's management system. Further details on the management system are provided in Sections 29 and 30 of the Atomic Act and Decree No. 408/2016 Coll. ČEZ, a. .s does not use external workers for SF handling and only core staff is used for this kind of work.As far as technical support only proven companies experienced in RAW and SF management are contracted (EGP, ŠKODA JS etc). The conditions of subcontractors' activities are specified in contracts in compliance with legal framework. (answer by SÚJB/ONRV and ČEZ/EDU)

Německo (Germany) – CG7

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
GE-CZ-1	General	p. 12	It is reported that the strategy of deferred decommissioning will be followed for NPPs while immediate decommissioning will be applied to research reactors and other nuclear installations. What is the time horizon for differed decommissioning of NPPs? What are the main reasons for choosing deferred decommissioning for NPPs rather than immediate decommissioning as for research reactors?	Factual error in the report. Initial decommissioning plans of both NPPs consider both, immediate and deferred decommissioning options. The updated table 1.2 on page 12/152 will list in the item "Decommissioning liabilities" two decommissioning options for Czech NPPs. This is in line with decommissioning plans (initial and ongoing ones) for NPPs, which also consider immediate and deferred decommissioning options. Table 1.2 will be updated in the next national report. Thanks! (answer by SÚJB/ONRV and ČEZ)
GE-CZ-2	Article 32	p. 21, 23	It is reported that there are 5 fuel assemblies declared as damaged in the spent fuel pools at Dukovany (1 mechanically and 4 leaky) which will be managed during decommissioning. Regarding spent fuel pools of Temelin, it is reported that 10 of 25 positions in hermetically sealed containers are occupied (which presumably contain damaged fuel assemblies). Further, it is said that at the end of 2019 there were 88 leaky fuel assemblies in the spent fuel pools in Temelin, which will be managed gradually in the period of operation of the NPP. It seems that the leaky spent fuel assemblies at Temelin are not declared as damaged spent fuel and are not stored in the hermetically sealed containers, since only 10 of 25 positions are occupied there. Why are there so many leaky spent fuel assemblies at Temelin compared to Dukovany and could it be a systematic effect? How are those leaky fuel assemblies stored (since only 10 of 25 positions in the sealed containers are occupied)? What measures are taken or planned to avoid or reduce the contamination of the cooling water in the spent fuel and in the storage building (released aerosols)?	The performance of fuel assemblies (FAs) at NPP Dukovany is substantially better than at NPP Temelín. The majority of leaky SF at NPP Temelín are stored in reactor pools. Unfortunately the change of fresh fuel supplier for NPP Temelín, which has occurred in 2010 (from Westinghouse to Rosatom), did not bring any substantial improvement of the amount of yearly generated leaky SFAs. Only from 2018, after the delivery of new fresh fuel generation TVSA-T mod. 2 to the second unit of NPP Temelín, some improvement of fuel performance is observed (no leaky SF identified by on-line sipping controls since then). (answer by SÚJB/ONRV)
GE-CZ-3	Article 22	p. 59	Provisions are made for decommissioning of the HAW Storage Facility which started operation in 1995 with a projected lifetime of 50 years. "It means that the HAW Storage Facility would be decommissioned in 2047 when its radioactive content (stored RAW or SF) will be removed to a disposal facility – if fulfilling the waste acceptance criteria of existing disposal facilities or planned DGR. If DGR is not available, the requirement for subsequent storage shall be addressed by construction of a new facility or reconstruction of the existing storage facility." Since the DGR is not scheduled to become operational until 2056 subsequent storage will be required. Has the decision been already made, whether a different type of storage facility or a reconstruction of the existing storage facility will be realized?	Both options are opened. The safety of any nuclear installation, incl. HAW Storage Facility, is periodically reviewed every 10 years. Depending on the results of periodic safety review the facility may be in operation substantially longer than initially expected. If it will be not the case a new storage facility will be erected. (answer by SÚJB/ONRV)

GE-CZ-4	Article 12	p. 106, 126, 144	In section 8.2.3.1 it is reported: "The total volume of adapted underground premises exceeds 17 000 m^3, while the capacity for waste disposal is about a half of the volume and the rest are service galleries." However, in Tab. 8.1 and 12.2 the volume of the disposal facility Richard is reported to be 18.900 m^3 and the capacity 10.248 m^3 which are probably the accurate values. Consistency in the reported values would be much appreciated.	Thank you for the comment. The text of next national report will be updated. (answer by SÚJB/ONRV)
GE-CZ-5	Article 32	p. 23	The inventory in the SF pools of NPP Temelín is reported to be 432 FAs and 25 stand-alone fuel rods at unit 1 and 404 FAs and 24 stand-alone fuel rods at unit 2. The total weight is given as app. 379.309 kg HM. Compared to the National Report for the 6th Review Meeting of the Joint Convention the inventory in the SF pool of NPP Temelín has increased by 8 FAs while the total weight decreased by approx. 6 tHM. Please provide some explanation for the discrepancy.	The increase of number of SFAs in NPP Temelín SF pools and at the same time the decrease in their total mass was due to the different types of fuel stored in the reactor pools at declared dates. At the end of 2016, the reactor pools of NPP Temelín stored mainly VVantage6 SFAs from Westinghouse. One of the design features for this fuel type is the use of a full fuel pellets with no internal hole. At the end of 2019, most of FAs in the reactor pools of NPP Temelín were replaced by TVSA-T fuel assemblies from JSC TVEL with pellets with internal hole. Briefly, it can be said that the old fuel type with higher weight of fuel pellets was removed from reactor pools to SFSF Temelín (228 pcs) and replaced in reactor pools by a newer type (TVSA-T) with lower mass of fuel pellets (236 pcs). (answer by ČEZ/ETE)
GE-CZ-6	Article 32	p. 24, 145	While in chapter 4.1.3.1 on p. 24 the inventory of the wet tank is reported to be 73 FAs of IRT-4M type with the initial enrichment of 19.7 % wt. 235U in Tab. 12.3 on p. 145 it is 23 FAs. Please provide clarification.	Typographical error – footnotes 8 and 9 swapped. Thanks! (answer by SÚJB/ONRV)
GE-CZ-7	Article 10	pp. 83/84, Section 6.7	Regarding the geological disposal facility, the public will be fully involved in the development process and "will be invited to actively participate in the fulfilment of individual stages of the process" (p. 16). Are the measures described (public discussions, workshops) part of an ongoing process? Are there measures foreseen to involve the neighbouring foreign population?	In the current stage of DGR site selection process the establishment of local working groups and other stakeholders' fora and expert groups is currently under process. The public discussions and workshops will be performed under the framework of these groups. The precondition for performing of such activities is the voluntarism. The neighbouring countries are informed via standard communication channels (e.g. bilateral meetings). (answer by SÚRAO)

Kanada (Canada) – CG8

Q/C No.	JC Article No.	Sect./ page	Question/Comment	Answer
CA-CZ-1	Article 32.2.1	Section 4.2.3.1	What is the difference between Tables 4.5 and 4.6? They appear to both present the inventory as of December 31, 2019, but have different numbers.	The difference between these two tables is obvious from their description - Tab. 4.5 Inventory of RAW disposed in the Richard disposal facility … vs. Tab. 4.6 Inventory of RAW stored in the Richard disposal facility … (answer by SÚJB/ONRV)
CA-CZ-2	Article 9	Section 8.6.3.2	Table 8.2 lists 1,200 m^3 volume for disposal, 954 m^3 is filled volume of disposal chambers, but there is 0 volume still available. Can Czech Republic please clarify where the other 250 m^3 is?	The total volume of the repository is 1,200 m^3 including transport corridor. The volume of 954 m^3 represents disposal capacity of the facility. In the future it is planned to modify the transport corridor for additional disposal segments. This plan, however, is subject of regulatory review and approval. (answer by SÚRAO)
CA-CZ-3	Article 28	Section 10	Table 10.2. What does it mean when a long-lived radionuclide is listed as having related sealed sources, but a zero total activity? Notably Cl-36. Is there an activity level that is considered effectively zero for purposes of this table?	Yes, it is. The table represents the list of spent sealed sources (radionuclides) received for disposal or storage during more than 50 years of disposal facility operation. Any sealed source with activity below 1 Bq is considered as zero activity source and it is recorded in the list to keep the information about this source. (answer by SÚRAO)