	Country	Vastaajat	Article		Reference	Question	Comment	Answer
12926	Canada	Pia/AT	Article 12	18,72		The report notes a leak to the environment from the gypsum waste water pond at theTalvivaara mine site in 2012. What was the nature of the failure at the pond such that the bottom gave way and leaked waste water resulting in uranium contamination to the surroundings? Please provide details regarding the design of the pond, for example, did it include a synthetic or natural liner? Please also comment on the lessons learned.		Heavy rains resulted in a situation that all reserve waste storage capacity was used. The company could not release the excess water due to environmental permit limitations and they decided to store low pH process liquid in the gypsum ponds. This caused dissolution of precipitated gypsum, both weakening the bottom structure and remobilization of metals including Uranium. The pond structure was designed for precipitates and not for the storage of such an amount and low pH liquid. The relatively weak bottom, consisting of sand, an HDPE liner and one m thick (0-200 mm) gravel layer gave away and the underlying permeable crushed rock layer conducted the water outside of the pond. Most important lessons learned are: mining activities need more regulatory control and more defined regulatory cooperation. In the beginning of this event the regulatory responsibilities were not clear. The Ministry of Environment, Regional state administrative agencies and Centres for economical development are the regulators in mining activities and STUK is only involved in cases where there is a risk for radiation exposure.
12927	Canada	RP	Article 19.2.6	36		Please provide the status of developing the amendments that the Integrated Regulatory Review Service peer review recommended to the Finnish legislation concerning the independence of STUK. What was done to achieve greater independence?		An amendment in the Nuclear Energy Act was passed in the Parliament in March 2015. The modifications included: - STUK responsibilities in environmental monitoring around nuclear facilities and mines were extended - STUK was given the right to give binding technical requirements (previously given by the Government) in radiation and nuclear safety - the licensing authority of nuclear facilities is required to take into account the license conditions proposed by STUK.
12928	Canada	Jhe	Article 19.2.2	39		The licensing process described in the report refers to the issuance of three licences for a major nuclear facility, that is, a Decision-in-Principle, a Construction Licence and an Operating Licence. What licensing process is used for decommissioning a nuclear facility? What type of authorization is issued to allow start of decommissioning of a nuclear facility and to close a site? Please clarify.		Finnish legislation does not have specific decommissioning license. Facility entering to decommissioning phase shall apply renewal of operational license since the conditions of license will change. This is the licensing process that will be used for licensing the research reactor decommissioning.
12929	Canada	Jhe	Article 9.6	65		Operational experience feedback is required to be collected and assessed for the purpose of improving safety. Were the recent incidents at WIPP assessed and if so, what (if any) enhancements were identified?		Recent WIPP incidents have been assessed in Posiva as part of operational experience feedback process. The fire incident was assessed to be similar incident that Posiva had analysed in 2012 and taken actions based on that. The radioactive release incident experiences will be taken into consideration when developing operational limits and conditions for disposal operations. STUK formal operation experience assessment process focuses on reports in IRS database. STUK is not a member of FINAS and therefore is not formally assessing events reported in that system. This has been seen as place for improvement and STUK will in future follow also FINAS events. The WIPP incident has been however studied in STUK and it is not seen to require immediate actions since the waste types and condition processes are quite different.
12930	Canada	Jhe	Article 28	86		TVO has leased to the state a cavern in the LILW disposal facility for interim storage of non-nuclear radioactive waste (i.e., disused sealed sources). Based on the revised operation conditions of the Olkiluoto LILW disposal facility most of this waste can now be disposed of here. Please describe how was the community consulted in making this change?		The community was originally consulted in year 1994 before the interim storage of non-nuclear waste started in Olkiluoto LILW disposal facility. During the operational license application review process in 2011-2012 Ministry on Employment and the Economy asked statement from Eurajoki municipality and also several other communities and organizations. MEE also announced the Operational license application so that everyone willing had the possibility to express opinions or give statements.

13907 China	AI, TS	Article 32	B, p19-p20	(1) It is mentioned that mass and surface concentration based activity constraints for general clearance are given in YVL D.4. One set of constraints is for unlimited amounts of material and the constraints are taken from IAEA Safety Guide RS-G-1.7. Another set of constraints are applied for limited waste quantities not exceeding 100 tones per year for one NPP or other nuclear installation. In case-specific clearance the activity concentrations are determined on a case-by-case basis but care has to be taken that they do not exceed the exemption limits given e.g. in the Council Directive 96/29/Euratom and Guide ST 1.5 in Section B. Have some practices of RW clearance been carried out by nuclear power plants or other nuclear facilities in Finland? Please give 1~2 examples if some practices have been carried out. (2) Waste classification method is introduced in Section B. Are the forms (such as gas, liquid and solid) and origin of radioactive waste considered in predisposal waste classification? It is mentioned that RW is classified as short-lived and long-lived waste according to the disposal purpose which can not correspond with displayed in Fig.3. Please describe the disposal options for the short-lived waste and long-lived waste, respectively. Radioactive waste is classified to five categories in accordance with the disposal requirements in GSG-1 issued by IAEA in 2009. Was the GSG-1 referenced in Finland?	(1) Radioactive waste is routinely cleared from the NPPs to be recycled or disposed of as conventional waste using the clearance levels provided in the Guide YVL D.4. In the specific clearance the nuclide specific levels are set based on the dose constraint 0.01 mSv/y. For example, maintenance waste is cleared from the Olkiluoto NPP to be disposed of in the industrial landfill on the plant site using case-specific clearance levels. (2) The physical form of the waste is taken into account during the operational waste management. Liquid waste is collected and treated separately. The solid waste is sorted as compressible and non-compressible waste. The containment period of the disposed waste depends on the longevity of the waste. For the short-lived waste it is at least 500 years (cf. Guide YVL D.5). Currently only short-lived waste is disposed. After decommissioning of the NPPs, the long-lived waste (for example, highly activated metal waste) will be disposed of in the same facilities into rooms with appropriate engineered barriers. The classification of the waste is not exactly the same as in GSG-1, but the principles used in the classification do not contradict with GSG-1.
13908 China	JHE	Article 32	B, p21	Are there the related concentration limits and the total amount limits of radionuclide for liquid effluent and gas effluent discharge of the nuclear facility in Finland? It is mentioned that the dose constraint for NPPs is 0.1 mSv per year and 0.01 mSv per year for nuclear waste facilities. Which facilities are nuclear waste facilities? Are the treatment and storage facilities affiliated to NPP, LLW disposal facility and HLW disposal facility categorized as nuclear waste facilities? And are there any other types of facilities expect NPPs and nuclear waste facilities? If so, please give more information about the dose limits of these facilities.	Nuclear waste facility refers to a separate nuclear facility used for the encapsulation of spent nuclear fuel or conditioning of other nuclear waste for disposal, and to a disposal facility for spent nuclear fuel or other nuclear waste. The nuclear waste treatment and storage facilities attached to NPPs are treated as part of the nuclear power plant and not as separate nuclear waste facility. LILW disposal facilities are categorized as nuclear waste facilities. Finland has a research reactor that has dose limit 0,01 mSv. STUK has not set nuclide specific limits, but requires nuclear facility licensee to define limits to all important radionuclides so that dose constrain is fulfilled (YVL C.3).

13909	China	TS, AI	Article 32	B, p27; H, p68	(1) It is mentioned that the plant uses an innovative selective ion exchange method to reduce the volume of liquid radioactive waste. The commissioning of a solidification facility was expected in early 2014. About the LILW management of Loviisa NPP£¬how the boron within the evaporator deposits was treated and managed after removing of radioactive nuclides from them with the selective ion exchanger£¿What is the solidification process of the solidification facility which expected to commissioning in early 2014? (2) It is mentioned that the average annual accumulation of LILW to be disposed of has been fairly low about 85 m©ø per plant (each having two operational reactor units). What types of wastes were comprised in the 85 m3? In the early period of the operation of NPPs in Finland, what was the average amount of waste generated for per unit every year? Which measurements were taken to decrease the amount of waste? Whether a target value was set to constrain the amount of waste produced from NPPs in Finland? (3) It is mentioned that waste minimization-such as radiochemical treatment of liquid waste, campaigns for removal of very low level waste from control, and compaction	(1) The boron is not separated from the evaporator concentrates. The purpose of the selective ion exchange is to separate the part that can be discharged from the NPP. The remaining part of the concentrate will be processed at the solidification facility. The solidification facility will use cementation. (2) All the waste classified as LILW resulting from plant operation. The annual accumulation of the LILW varies considerably depending on the amount of fuel leaks, duration of the annual outage etc. For example, in the late 1980's the annual accumulation at Loviisa NPP varied between 40 – 250 m3 and at Olkiluoto NPP 140 – 240 m3. Waste minimization techniques used include e.g. compaction, crushing, cutting and chemical treatment. Additionally plant modifications have reduced the accumulation of waste, like condensate polishing and renewal of the steam separator at Olkiluoto NPP. Also sound working methods, like avoiding transfer of unnecessary material, e.g. package material, to the controlled area reduces the waste accumulation. There are no target values to constraint the waste volumes. (3) Yes. Radiochemical treatment means selective ion exchange.
13910	China	TS, AI	Article 32	B, Para. 2, p29	It is mentioned that the disposal of sealed sources and other small user radioactive waste is included in the renewed operating licence for Olkiluoto LILW repository, which was granted by the Government in 2012. The disposal operations for these radioactive wastes have not been started and the more detailed planning for sorting, packaging and emplacement operations is ongoing. Has the disposal acceptance criteria been established about spent sealed sources which would be disposed in the Olkiluoto LILW repository? What is the content of the disposal acceptance criteria of spent sealed sources? Please give more information about the conditioning process and experience of spent sealed sources before they are disposed of in the Olkiluoto LILW repository?	There are criteria for nuclides and activity. Certain long living nuclides, for example Ra-226, are not yet accepted for disposal into the currently operating repository silos. Also there are limits for the source activity. The sealed sources are dismantled when possible to minimize volume in the disposal. They are packed into the steel boxes or into the barrels, which are then placed into the concrete boxes used in the disposal facility. Experience has been that packaging, sorting and storage have been worked well. There has not been any major difficulties.
13911	China	JHE	Article 26	F, p55	(1) Please give more information about the considerations or requirements on sufficient and appropriate methods for arranging the decommissioning of a nuclear facility before the construction license is granted as in The Nuclear Energy Act (Section 19). (2) Guide YVL D.4 has been published in December 2013 in Finland, which makes specifications on decommissioning plan. Please give more information about the contents of this guide. If it is possible, the English version is expected to be offered. And it is helpful for further understanding on decommissioning policy in Finland. (3) Please give more explanation on the consideration that decommissioning financial resources are covered by Nuclear Waste Management Fund in Finland? What is the procedure of the collection and utilization of Nuclear Waste Management Fund? And how to regulate the utilization of Nuclear Waste Management Fund?	English translations of STUK YVL guides can be found on STUK webpage. Before construction license is granted license applicant shall for example prepare a decommissioning strategy and one design principle is to limit decommissioning waste amount and workers radiation dose during dismantling work. This can be contributed for example with material selections. The funding system that covers also decommissioning is described in Finland's joint convention report (section F, article 22).

13912 China	TS, AI	Article 11	H, p69	It is mentioned that this new waste type is planned to be interim stored at the site before disposal into Olkiluoto LILW-repository. What are the disposal acceptance criteria of the new waste packages produced by in-drum dried process in Olkiluoto 3 NPP that will be disposed of in Olkiluoto LILW-repository? How to characterize the drum drying waste form produced from NPP in Finland?		The LILW repository in Olkiluoto is expected to be extended in the 2030's. The in-drum-dried waste will be disposed of in the planned extension. The waste acceptance criteria for disposal will be developed at that time.
13913 China	JHE	Article 13	H, p73	(1) For underground rock characterization facility (ONKALO), how dose STUK regulate in the stages of sitting, construction, operation of ONKALO? (2) At present, the spent fuel disposal facility is in the stage of construction review and will be operated in 2022. Which measures will be taken to ensure that the facility will be operated in 2022? And please give more information about the detail construction plan and R&D of disposal facility for the spent fuel during 2015-2022.		(1) STUK as regulated the Onkalo underground rock characterization facility construction with same principles as nuclear facility. After construction license is granted the oversight continues following STUK normal regulatory approach that is adapted to underground facility. Oversight is described for example in YVL A.1. (2)Development of spent fuel disposal is following the Government decision from 1983. MEE is steering the overall spent fuel disposal development. At this coming construction phase the main importance is to assure that facility will be safely designed and constructed. The main plans for coming years will be presented in review meeting and parts can also be found in latest nuclear waste management RD&D programme (YJH2012).
13914 China	STO	Article 28	J, p85	(1) It is mentioned that a safety license is granted by STUK upon written application. How long is the validity of safety license? (2) It is mentioned that the annual fee for holding a license depends on the number of sources possessed by the licensee. Except the number of sources, whether the annual fee for holding a license is related with the activity of sources?		(1) According to the Radiation Act (592/1992), Section 20, a safety license can be granted until further notice or for a fixed period. In most cases licenses are granted until further notice. However, when the applicant indicates in the application that the practice is to exipire within a certain timeframe, the license will be grated accordingly for a fixed time period. (2) Yes, the source specific fee is higher for a HASS-source (High Activity Sealed Source, as defined by the EU Directive 2003/122/Euratom) than for other sources.
11071 France	KLH	General	Executive summary		According to the new Guidelines regarding the Form and Structure of National Reports (INFCIRC/604/Rev.3 Draft 3), Finland's National Report should include an overview matrix to be used by the Rapporteur during the Country Group review.	This is true, however, we uploaded the matrix to the IAEA Joint Convention webpage on the 31st Dec 2014 and it is available for all contracting parties.
11072 France	KLH	General	Section K: p. 87		According to the new Guidelines regarding the Form and Structure of National Reports (INFCIRC/604/Rev.3 Draft 3), Finland should change the title of section K into "General Efforts to Improve Safety".	SUMMARY REPORT of the Second Extraordinary Meeting of the Contracting Parties, 12–13 May 2014, Vienna, Austria: 9. The Contracting Parties agreed on a number of changes to the Rules of Procedure and Financial Rules for the Joint Convention, INFCIRC/602/Rev.5, the Guidelines regarding the Review Process, INFCIRC/603/Rev.6 and the Guidelines regarding the Form and Structure of National Reports, INFCIRC/604/Rev.3, as set out in Annexes 2 to 4, respectively, of this report. While all of the agreed changes to the three INFCIRC documents would take effect immediately, it was agreeable to all Contracting Parties that, for the Fifth Review meeting, Contracting Parties may choose to stay with previous practice concerning the preparation of National Reports (INFCIRC/604/Rev.2) or to use the newly established procedures (INFCIRC/604/Rev.3). Finland chose the previous option.

11073 France	HENRI	General	Executive summary - p. 4	About the progress made in spent fuel management, it is noticed that there are two options for spent fuel management of the research reactor FiR 1: the first one is to return the fuel to the United States as defined in the current contract; the second option is interim storage and later disposal to the Olkiluoto spent fuel disposal facility, which would require a new licensing process for the disposal facility. Could Finland give information on when a decision should be made?	The decision should be made by the VTT during 2016, since the spent fuel return optior to the US will be available not later than 2019.
11074 France	TEM	General	Executive summary - p. 5	About the technical support and competence developed, it is mentionned that at the end of January 2013 the Ministry of Employment and the Economy set up a working group to prepare a research and development strategy. The results of this work (7 recommendations) have been published (in Finnish) at the end of April 2014. Could Finland indicate which organization is in place to follow the implementation of these recommendations and their results?	The implementation of the "Nuclear Energy Research Strategy" (published in English in September 2014) is under the Ministry of Employment and the Economy, which is responsible of the Nuclear Competence Building in Finland. The report of the strategy working group and also contact information is found from: http://www.tem.fi/en/current_issues/publications/energy_and_climate/nuclear_energy_research_strategy.98132.xhtml
11075 France	TS, RP	General	Executive summary: p. 6 / Sec. K: p.88	About the challenges for future work, it is mentionned that while most radioactive waste streams have a disposal solution, a small quantity of the small user waste – consisting of nuclear material and a few high activity sources – cannot be disposed of in the Olkiluoto LILW disposal facility due to inventory restrictions. An alternative disposal route for these wastes is currently being negotiated. Coul Finland give more information about this issue?	A few high activity sealed sources need a disposal route and few nuclides causing the highest dose rates, such as C-14, Ra-226 and Am-241, need to be packaged so that their release is slower. This consist of waste packages (about 14 m^3). Action have been started to find a disposal solution. Possible options to be negotiated include disposal in future extension of current disposal facilities.
11076 France	RP, HENRI	General	Section A: p.15	It is mentionned that the plans for the decommissioning of nuclear facilities and the regulation and management of radioactive waste generated outside the nuclear fuel cycle are discussed as appropriate. Could Finland explain what types of nuclear facilities are concerned? Could Finland indicate if, for these facilities, in-situ decommissioning (i.e. entombment) is considered as a possible decommissioning strategy and endorsed in the legal and regulatory framework on decommissioning or waste management? In addition, could Finland indicate if entombment is explicitly excluded or not for decommissioning in the legal and regulatory framework?	The current nuclear facilities include four reactors, two away-from-reactor spent fuel storage facilities and a research reactor. According to current decommissioning plans immediate and deferred dismantling are selected strategies for Loviisa and Olkiluoto NPP's, respectively. The reactor operators are responsible for presenting a choice of decommissioning strategy and plan which is reviewed and approved by the regulatory body. The current plans include waste disposal in on-site facilities. In-situ decommissioning and entombment are not considered in Finland.

11077 France	KLH, EE (POSIVA, TEM)	General	Section K - p.87	Three main R&D-programmes concerning spent nuclear fuel disposal are mentionned. Could Finland provide more information about the content, intended duration and expected results of these programs?	Pursuant to the regulations of the Nuclear Energy Decree Posiva publishes every three years a programme for the future nuclear waste management activities of the Loviisa and Olkiluoto nuclear power plants, including the activities by Posiva aimed at spent fuel disposal. The current programme "YJH-2012" is available in English on http://www.posiva.fi/en/databank/publications/nuclear_waste_management_plans_and_annual_reports_(yjh_reports)#.VPVpf508Lcs and covers the years from 2013 to 2015. The programme for the period 2016 - 2018 ("YJH-2015") is in preparation and will be available in Finnish on Posiva's web site in September 2015 and somewhat later also in English. Finnish Research Programme on Nuclear Waste Management (KYT) 2011-2014 is based on the Nuclear Energy Act (990/1987) according to which the aim of research is "ensuring that the authorities have such sufficient and comprehensive nuclear engineering expertise and other facilities at their disposal that are needed for comparisons of the various ways and methods of carrying out nuclear waste management". KYT programmes have been going on for several years and their emphasis is on nationally central research topics. The long-term aim of KYT-programmes is, for its part, to maintain national knowhow in nuclear waste management and to promote collaboration between authorities, nuclear industry, and scientists.
11088 France	AT	General	Section K - p.88	Regarding uranium mining, it is mentionned that Talvivaara Sotkamo Ldt, a subsidiary of Talvivaara Mining Company Plc producing primarily nickel and zinc by bioheapleaching method, submitted an application to recover uranium from the leaching solution in 2010. The process decreases the (small) concentration of uranium in the waste of the metal recovery facility and the company aims to produce about 350 to 500 tonnes or uranium per year. Could Finland provide information about the future of this uranium? Is it considered as waste or is it intended to be reused?"	The uranium is planned to reuse (as raw material for nuclear fuel)
11089 France	JHE	General	Document	Regarding the lessons learned from the Fukushima nuclear accident, and the issue of managing large amount of waste (solid and liquid) for this kind of situation, could Finland present the provisions made in anticipation of a potential nuclear accident in terms of: • Objectives and strategy for recovery and waste management (waste characterization and segregation ; volume reduction)? • Dedicated waste management facilities during the post-accidental phase?	In case of nuclear or radiological emergency, instructions for waste management in intermediate and recuperative phases are presented in Guide VAL 2 (protective measures in recuperative phase). Waste that contains radioactive substance may be generated in decontamination activities or from discarded products. These wastes cannot necessarily be processed via the normal waste management. Waste may need processing in order to reduce volume and/or mass. Radioactive wastes are divided roughly into four waste management categories according to the activity concentration. The first category waste requires encapsulation and isolation from the living environment, the second category waste requires controlled waste management to reduce radiation dose, the third category requires assessment of waste management to reduce radiation dose and the fourth category is waste management without risks.
13693 Germany	JARKKO	Article 19	p. 38(Section E)	Revision of YVL Guides in the field of spent fuel management It is reported that in the process of revising YVL Guides the requirements concerning spent fuel storages were updated to take account of the lessons from the Fukushima accident. Could Finland please briefly summarise the main modifications that were introduced into these requirements to reflect experience gained from the Fukushima accident?	Main modifications to requirements for spent fuel storages due to Fukushima were additional requirements on availability of cooling water at site, accident classifications, control and verification of integrity of storage pools, and measurements for temperature and water level.

13694	Germany	KLH, MIKKO	Article 22.1	p. 48(Section F)	Training It is reported that special training courses for young experts have been started in order to address competence maintenance also in the field of nuclear waste management. Are there any plans or activities beyond these courses that aim at meeting the specific long-term challenges on competence maintenance in the field of waste management, like e.g. degree programs in cooperation with universities?	Education is within the realm of the Finnish state and the rights to establishing it are given by the educational authorities within the context of the national legislation and budgets. Establishment of a degree program is within the realm of the educational authorities (in the case of higher education, the Ministry of Education) who grants the permits to organize education leading to a degree/s. The Finnish university and higher education system is able to provide a solid basic education that enables further specialization that is required for nuclear waste management after the basic degree. Training is an activity that companies and organizations generally implement themselves. The different type of organizations in waste management cooperate on a continuous basis with the universities by providing e.g. thesis work topics to degree students and using the universities as research suppliers. An individual can have his/her professional development courses recognized (e.g. using ECTS) as part of a degree based on the authority and autonomy of an individual professor, however, degrees need to based on the right given by the authorities. There is no financial or demand based justification in Finland for a degree that would specialize only in nuclear waste management as the amount of students and potential number of jobs in this field would not be sufficient for justifying a state investment into such a degree. All
13695	Germany	HENRI	Article 32.1.2	p. 26(Section B)	Management of spent fuel from the research reactor FiR It is mentioned that the first option for spent fuel management is to return the fuel from the research reactor FiR 1 (TRIGA Mark II, 250 kW) to the United States. Another option is interim storage and later disposal at the Olkiluoto spent fuel disposal facility. This would require a new Decision-in-Principle and licensing of the Olkiluoto disposal facility for research reactor spent fuel. Is it necessary to adapt the current design of disposal canisters that had been notably developed for loading of BWR and WWR-fuel elements to the fuel design of the research reactor? If so, what time period is assumed for the realisation of this cask modification? Could the new licensing of the Olkiluoto disposal facility for the emplacement of FiR-spent fuel in copper containers lead to a delay regarding the initial operation of the repository?	If the secondary option for the research reactor spent fuel management will be implemented, it is necessary to adapt the current design of disposal canister suitable for FiR 1 spent fuel. More research will be needed for sure. It is challenging to present any time period estimates. However, this has not effect to initial operation of the repository.
13696	Germany	JHE/PM	Article 32.1.2	p. 23(Section B)	Safety requirements According to the report the extension of the Olkiluoto storage capacity finalised in early 2014 includes the construction of three new storage pools which requires among other things that the design has to withstand a large airplane impact. Which airplane type has been considered for this purpose? What are the further requirements that have to be met by the new pools? With regard to the Loviisa wet storage facility: Is the technical safety of the separate integrated pool type storage facility comparable to the safety level reached by the storage pools in the reactor? Have the safety requirements regarding Loviisa been increased when starting the application of high density racks thus increasing the amount of spent fuel per pool m^3 in order to ensure sufficient storage capacity? If so, what safety requirements had to be fulfilled and what technical measures have to be taken for this purpose?	The Government Decree 717/2013 states that the design of NPPs shall take account of external hazards that may challenge safety functions. A large commercial aircaft crash is one of those external hazards and the Olkiluoto spent fuel interim storage enlargement is designed accordingly. The further requirements are the seismic hazards and external cooling water supplies and connections. Loviisa wet storage facility's technical safety is comparable to the safety level reached by the storage pools in the reactor. The safety requirements for high density racks are the same as for original racks.

13697	Germany	TS, JOUKO	Article 32.1.4	p. 27(Section B)	Management of LILW from nuclear facilities It is mentioned that the commissioning of a solidification facility was expected in early 2014, but is postponed due to problems encountered in waste packages used for pre-operational tests. What problems with the waste packages have to be solved and what is the expected period of time to be needed for it?	The facility's systems operated as planned in connection with the solidification test runs, but some leaks were detected in contain¬ers (waste packages) manufactured from reinforced concrete. It was noted in inspections after the solidification that there were dark spots on the walls of the contain¬ers. These were identified as cracks in further stud¬ies. The fact that the outer surface of the concrete structure seemed wet in the area where there were such cracks suggested leaks through the container wall. The Loviisa power plant discontinued the trial runs to study why the containers had been damaged. The study performed, reveled the root causes of the damages. The root causes were connected to the manufacturing process and the storing of the packages. The licensee has manufactured in 2014-2015 new waste packages e.g. using new concrete formula. The new packaged have been accepted for operation by the licensee and STUK in 2015. According to the updated commissioning schedule the facility will be in operation in the beginning of 2016.
13698	Germany	JAAKKO	Article 11	p. 68(Section H)	Criticality and removal of residual heat The report states: "The canisters are planned to be emplaced in disposal holes in tunnels with a minimum separation between 7.5 and 10.5 meters depending on the fuel type inside the disposal canisters." Does this mean that the distance between the disposal holes vary depending on the inventory of the disposal canisters? If yes, please give the reason why you choose this approach instead of for instance determining one maximum distance based on the maximum allowable surface temperature of the copper canister. Is a presorting of copper canisters with distinct inventories suitable for a special distance foreseen during routine disposal operation?	The dimensioning criterion is the maximum temperature on the canister/buffer interface. The maximum allowable temperature on the bentonite clay canister interface is set to 100 degrees celsius. Canisters including different fuel types have different average decay heat powers. The distance between deposition holes is determined by the initial decay powers for canister including certain fuel type and properties of the near field rock.
13699	Germany	JHE	Article 16	p. 81(Section H)	Operation of facilities The report says: "An investigation and monitoring programme shall be implemented during the operational period of the disposal facility to obtain confirming information on the long-term performance of the barriers". Could you please specify the underlying criteria for the long-term performance of the barriers, such as the methodological approach, the number of inspections and the time intervals?	The criterion for disposal system performance is developed by Posiva, the implementer. The criteria and methodological approach for safety assessment can be found for example in document POSIVA 2012 Safety case for the disposal of spent nuclear fuel at Olkiluoto – synthesis 2012. The monitoring programme for operational period is currently developed and such details like number of inspections can't yet be provided.

13700 Germany	JUSSI (POSIVA)	Article 10	p. 101(Annexes, Section L.2)	Programme for spent fuel disposal It is stated that as part of the work on disposal processes prototype systems of a few essential systems have been developed, such as canister and backfill material installation machines for the repository and that the prototype testing will start in spring 2014 and continue until the end of 2015. Is it foreseen that the capabilities of the machines or essential systems will be proven not only in consideration of normal operating conditions but also under conditions of operational disturbances? If so, what disturbances are taken into account? Based on the estimated total quantity of 9,000 tU for the Olkiluoto repository, how many copper casks will be needed and how many cycles (in case that one emplacement of a copper canister into a borehole is a cycle) will be repeated in order to demonstrate feasibility and reliability of the emplacement technology?	Prototype machines for canister, buffer and backfill installation have been developed and manufactured. Testing of the machines is ongoing and will be continued at least till the end of 2015. The first objective of these tests has been to demonstrate the mechanical functioning of the installation concepts developed. Control systems of the machines will be developed further when the mechanical functioning has been verified. Quality assurance aspects of installation will also be demonstrated and suitable QA measures will be assessed after tests. Current tests are based on current installation requirements (i.e. installation tolerances). After the tests the relevance of these requirements will also be assessed. Among operational disturbances for canister installation, single failure criteria have been taken into account in components and functions which are directly related to disposal canister handling. In the buffer installation possible failures in clay blocks have been taken into account so that there are ded on the authority and autonomy of an individual professor, however, degrees need to based on the right given by the authorities. There is no financial or demand based justification in Finland for a degree that would specialize only in nuclear waste management as the amount of students and potential number of jobs in this field would not be sufficient for justifying a state investment into such a degree. All education leading to a degree is free of charge. The specialization after a degree is generally acquired through professional development activities. The training courses in nuclear waste management serve this purpose. An area where the different stakeholders (companies, regulators, research institutes and universities) have found it fruitful to cooperate is scientific doctoral education networking (EQF level 7-8): the YTERA doctoral programme is such an example. Partly due the demand factors this programme encompasses the whole of nuclear in Finland, not only waste management. The reason is that the competence requirements in the nuclear field go beyond the Bachelor or Master's level (EQF 5-7) after the basic degree education and this is a well justified focus for the use educational inputs. e report
13522 Japan	TEM	General	p17	Jointly established by two nuclear power companies (e.g. TVO), Posiva is Finland's disposal agent for high-level radioactive waste (used fuel). If Fennovoima initiates nuclear power generation in the future, will it become a co-owner of Posiva? Or will another final repository be selected and constructed in the future for the sake of Fennovoima's power plants? If the policy is undecided, please inform us about how you are scheduled to make your decisions.	In Finland nuclear power companies are responsible for nuclear waste management including the planning implementation and costs. The plans of nuclear waste management have to be approved by the authorities. Fennovoima has two alternatives on nuclear waste management. Fennovoima can co-operate with other power companies in Finland or it could plan its own repository.
13523 Japan	TEM	General	-	After a high-level radioactive waste repository is shut down, ownership of the radioactive waste should be transferred to the state. The state then becomes fully responsible for radioactive waste. At that stage, which state organization will control the repository after its shutdown?	According to the Nuclear Energy Act, disposal is considered to be implemented when STUK has approved both disposal and closure of the repository. For this, disposal needs to be proven to be safe as such and no future control is needed.
13524 Japan	RP/TEM	General	-	In the control of geological disposal and near surface disposal of radioactive waste, must markers be installed as a means of preventing human access? If not, what measures are you considering?	Markers are not considered in current regulations. Currently, only requirement for STUK to notify the land use registers of the disposal site. Finland has participated in international project on this matter, but as yet we do not have any further regulation.

13525	Japan	RP	General	p5	On page 5 of the National Report, the 2012 IRRS review mentions the independence of STUK. Did this mentioning mean regulation did not separate from promotion in Finland? Or did it come from legal status of STUK?	It was concluded by the IRRS review team that the current practice of the licensing process in Finland is in practice (*de facto*) in line with IAEA requirements and guidance. But the team considered that in law (*de jure*) the role of the nuclear safety regulator in the process was not secured completely and unambiguously. To remove the ambiguousness indicated, an amendment to the Nuclear Energy Act was made (in March 2015) in the Parliament in March 2015. The modifications introduced included: - STUK was given the right to give binding technical requirements (previously given by the Government) in radiation and nuclear safety - the licensing authority of nuclear facilities (Ministry of Employment and the Economy) is required to take into account the license conditions proposed by STUK.
13526	Japan	JAAKKO	Article 17	P81	Guide YVL D.5 assumes that human access possibly affecting a repository and its neighbouring base rocks can be prevented for up to about 200 years by land use restriction and/or other indirect institutional management. What considerations did you note when assuming the period "for up to about 200 years"?	According to Guide YVL D.5, unlikely events caused by human actions to be considered shall at least include the boring of a medium-deep water well at the disposal site and core drilling or boring hitting a disposed waste package. In such a case, it is assumed that the existence of the disposed waste is not known and that the incident may only occur 200 years following the closure of the disposal facility at the earliest.
14067	Korea, Republic of	AI, TS	Article 24	F, 51	Operational radiation protection is described in Section F.4(Article 24). - What is the amount(TBq) of the liquid radioactive effluent released from nuclear power plants? - What is the amount(TBq) of the gaseous radioactive effluent released from nuclear power plants? - Is there the limit of total amount of the liquid or gaseous effluents discharge from the nuclear power plant?	Radioactive releases into the environment from the Loviisa nuclear power plant remained well below the authorized annual limits in 2013. Releases of radioactive noble gases into the air were approximately 6.5 TBq (as Kr-87-equivalent activity), which is approximately 0.05% of the authorized limit. The releases of radioactive noble gases were dominated by argon-41, the activation product of argon-40 originating in the air space between the reactor pressure vessel and the main radiation shield. Releases of iodine into the air were approximately 25 MBq (as I-131-equivalent activity), which is approximately 0.01 % of the authorized limit. Emissions through the vent stack also included radioactive particulate matter amounting to 0.8 GBq, tritium amounting to 0.2 TBq and carbon-14 amounting to approximately 0.5 TBq. The tritium content of liquid effluents released into the sea was 16 TBq, which is approximately 11% of the release limit. Total activity of other nuclides released into the sea was about 1.2 GBq, which is 0.1% of the plant location-specific release limit. Radioactive releases into the environment from the Olkiluoto nuclear power plant remained well below authorized annual limits in 2013. Releases of noble gases into the air were approximately 0.2 TBq (as Kr-87-equivalent activity), which is approximately 0.002% of the authorized limit. Releases of iodine into the air were approximately 91 MBq (as I-131-equivalent activity), which is approximately 0.09% of the authorized
14068	Korea, Republic of	RP, KLH, MIKKO	Article 22	F, 47	It is stated that competence development program for young generation is implemented as the rate of retirement is rising. - Do you have also have HRD program that retirees-to-be transfer their experience and knowledge to younger generation?	STUK's internal guidance describes general principles regarding competence development related to retiring. The aim is to identify and maintain critical needs for competence. The annual development discussion between an employee and her/his manager include also possible plans for retiring (if current). These plans are taken into account when preparing HR-plans for the coming year and for longer term. In addition, at STUK's nuclear waste department, the retiring persons have been asked to work together with the younger ones and introduce them to their specific areas.
14070	Korea, Republic of	~~TS, JOUKO~~ → STO	Article 32	B, 21	Section B describes that solid wastes satisfying nuclide specific limit can be loaded into incineration facility. - Then, what is the nuclide specific limit of the radioactive waste incineration facility? And, what is the regulatory requirements on the waste acceptance criteria of the radioactive waste incinerator?	The Guide ST 6.2 prescribing these limits and the conditions was revised on 3.10.2014. The revised radiological limits and conditions for delivering small amounts of solid waste to an incineration plant are: a) the activity in a delivered waste package shall not exceed the nuclide specific exemption level (values same as in IAEA GSR Part 3, Schedule I, Table I1) but not exceeding 100 MBq, b) the total activity delivered from one practice per month shall not exceed ten times the exemption level, and the total activity per year shall not exceed 100 GBq. The packages shall be such that radioactive material is not dispersed out side the package during transport. In case of bulk materials, the nuclide specific exemption/clearance levels given in Table I2 of the above mentioned IAEA Safety Standard are used for releasing materials from any regulatory requirements or conditions including delivering such material to an incineration plant.

14071	Korea, Republic of	JHE	Article 32	D, 33	Section D describes the radioactive waste management facility. - What is the status, including features and so on, of the radioactive waste incineration facility operated in Finland?	Finland doesn't have radioactive waste incineration facility.
14072	Korea, Republic of	RP, TS	Article 28	J, 86	It is stated that a few high activity sealed sources will need a different disposal route, which is not yet determined. - Is there any plan or policy to make a decision on the disposal option for the high activity sealed sources?	A few high activity sealed sources need a disposal route and few nuclides causing the highest dose rates, such as C-14, Ra-226 and Am-241, need to be packaged so that their release is slower. This consist of waste packages (about 14 m^3). Action have been started to find a disposal solution. Possible options to be negotiated include disposal in future extension of current disposal facilities.
14075	Korea, Republic of	RP, STO	Article 32	B, 20, 22	It is state that if this, to return disused sealed sources to supplier or manufacturer, is not feasible, a disused sealed source or other small user waste can be delivered to an installation licensed to receive condition and transfer radioactive waste to a central storage operated by the Radiation and Nuclear Safety Authority (STUK). - Does STUK operate its own central storage facility? Where is it located, and what is the capacity of waste stored in the facility? Is the facility the same 'central storage' as shown in the bottom left of Figure 3? - Does STUK charge for waste management of disused sealed sources or waste? Especially if they need to be disposed of?	The department of Environmental radiation at STUK has the waste management obligation for the storage which is in the Olkiluoto repository (figure 3 and 8) . The competent authority is the Nuclear Waste and Material Regulation department. The roles of the bearer of the waste management obligation and the regulatory authority are strictly separated from each other at STUK. Suomen Nukliditekniikka, which is licensed to receive condition and transfer radioactive waste to a central storage, charges the costs including the disposal.The Central storage is operated by STUK on behalf of the State. It is located in a cavern of the LILW disposal facility in Olkiluoto (the cavern is leased to the State). The capacity is 100 m3 and indeed, it is the one indicated in Figure 3. However, the activities related to receiving disused sources from the users, repacking the sources to containers suitable for storage and transferring these containers to the central storage are conducted by a private installation licensed for these practices. This installation bills the licensees for its services. STUK does not collect any fees from the licensees regarding the disused sources. Once the waste containers have been transferred to the central storage the State carries the responsibility over the waste including its disposal.
14076	Korea, Republic of	JHE	Article 32	B, 19	It is stated that there are two classification schemes of RW, one is for predispoal management and the other is for disposal purpose. - Could you explain how these two schemes apply to the predisposal management and disposal purpose?	As describe in YVL D.4 categorization into LLW and ILW is used during predisposal to determine operational radiation protection measures. Categorization between short-lived and long-lived is used to determine disposal system performance requirements. However the short-lived and long-lived categorization includes also limits for activity concentration.
14078	Korea, Republic of	AI, SÄT	Article 11	H, 70	According to the former Guide YVL 8.1, the radiation protection criteria is stipulated as e.g. expectation value of the annual effective dose to any member of the public is constrained to 0.1 mSv and according to the present Guide YVL D.5, it is stipulated as e.g. the annual dose to the most exposed individuals remains below the value of 0.1 mSv. - Is there any special reasons to change expectation value of the annual effective dose to the annual dose?	The Decision of the Council of State on the General Regulations for the Safety of a Disposal Facility for Reactor Waste and the Decision of Council of State on the Safety of Disposal of Spent Nuclear Fuel were integrated into the Government Decree on the Safety of Disposal of Nuclear Waste in 2008. Accordingly the Guides YVL 8.1 and 8.4 set in the accordance with Decisions of the Council of State were integrated into the Guide YVL D.5. The annual dose constraint 0.1 mSv was set in the Decision of Council of State on the Safety of Disposal of Spent Nuclear Fuel and repeated in the Guide YVL 8.4. The use of annual dose constraint was extended to cover also the disposal of low and intermediate level waste and the use of expectation value of the annual effective dose was expelled.
14080	Korea, Republic of	AI	Article 15	H, 77	As regards the sentence that the licensee shall carry out a periodic safety review for the disposal of nuclear waste at least once in every 15 years, - Is the period of 15 years for PSR stipulated in the Finnish regulation?	According to the Section 16 of the Government Decree on the Safety of Disposal of Nuclear Waste the safety case shall be updated at 15 year intervals unless otherwise provided in the license conditions. The Guide YVL D.5 further requires the licensee shall carry out a periodic safety review for the disposal of nuclear waste at least once every 15 years, unless otherwise provided in the conditions of the operating license. The periodic safety review shall include assessments of the disposal facility's safety status and the long-term safety of disposal as well as potential development targets in view of maintaining and enhancing safety.

14082	Korea, Republic of	RP, AI	Article 17	H, 81	According to Guide YVL D.5 it can be assumed that human activities, affecting the repository or the nearby host rock, are precluded for 200 years at the most by means of land use restrictions and other passive controls. - Does it mean that the period for institutional control is stipulated as 200 years in VYL D.5?	As stated in the Guide YVL D.5, the period of the institutional control can be assumed to be 200 years. This means that that the implementer of disposal does not have to assume human intrusion during that period in safety assessment of the disposal facility. The regulator (STUK) is responsible for taking care that passive control measures including land use restrictions marked in registers etc. are taken and it is probable that these measures assure continued passive institutional control that is effective in preventing human intrusion at least the period of 200 years.
14083	Korea, Republic of	TS, RP	General	K, 88	As regards the sentence that a small quantity of small user waste consisting of nuclear material and a few high activity sources cannot be disposed of in the Olkiluoto facility, - Please explain more detailed information on the actions which have been started to find an alternative disposal route for those wastes.	A few high activity sealed sources need a disposal route and few nuclides causing the highest dose rates, such as C-14, Ra-226 and Am-241, need to be packaged so that their release is slower. This consists of about 70 waste packages (about 14 m^3). Action have been started to find a disposal solution. Possible options to be negotiated include disposal in future extension of current disposal facilities.
14084	Korea, Republic of	JAAKKO	Article 24	F.4, 40	- What is the process to derive the transfer coefficients and bioaccumulation factors used in the radiological environmental impact assessment? - What are the transfer coefficient and the bioaccumulation factor applied to each radionuclide?	During the operation, dose constraints are based on the principles of the ICRP, 2007. The 2007 Recommendations of the International Commission on Radiological Protection. ICRP Publication 103. Ann. ICRP 37 (2-4), but the dose constraints have been selected at national level. Long-term dose constraints are based on the ICRP, 1998. Radiation protection recommendations as applied to the disposal of long-lived solid radioactive waste. ICRP Publication 81. Ann. ICRP 28 (4).
14086	Korea, Republic of	HENRI	Article 26	F.5, 55	Section F.5 states that "The first decommissioning project in Finland will be the decommissioning and dismantling of the research reactor FiR 1. The decommissioning is planned to take place during the next reporting period. Guide YVL D.4 has been published in December 2013. This Guide replaces the earlier Guide YVL 8.2 and includes more specific requirements for decommissioning." - Is public participation required in the process of licensing the decommissioning of nuclear facilities? - If so, how does the public participate in the process?	The public participation is a part of environmental impact assessment (EIA) which has been already carried out during 2013-2014 by the Ministry of Employment and the Economy together with the operator VTT for the decommissioning project of the FiR1. Two public hearings was included in the EIA. The EIA is a legal procedure and the first step on decommissioning project. Stakeholders and the public have also possibility to be involved in the coming licensing process by giving opinions or statements to the Ministry of Employment and the Economy.
14171	Netherlands	JHE	Article 20	E, 43	Between the first design and the closure of the disposal facility lies decades. During these decades the disposal concept develops. Does Finland involve the public in these developments? If yes, how is this foreseen?	Disposal implementer and regulatory authority have regular informal interaction with the public where also development of disposal concept can be discussed. Formally public has had possibility to be involved in environmental impact assessment process and in all licensing steps (DiP, CLA, OLA) and they can continue to be involved in operational license application renewals that are foreseen to take place in future.
14172	Netherlands	KAH	Article 4	G, 58	Your report does not mention retrievability in the disposal concept. Is retrievability considered? If yes, how is this considered? If no, why not?	According to the Government decision-in-principle made in 2001 concerning the disposal of spent fuel, the organisation responsible for the project shall present specified, sufficiently detailed reports concerning the opening of the disposal facility as well as factors which may affect the opening of the facility, in addition to the technology and safety criteria of opening the facility, before obtaining a construction licence. An up-to-date estimate of the costs of opening the facility is also required. The plans must ensure that post-closure safety shall not be impaired as a result of enabling opening and retrievability. The disposal is meant to isolate the spent fuel from living species, and the aim is not to facilitate opening the facilities. The Government decision concerning the disposal of spent fuel (478/1999) which was valid at the time of making the decision-in-principle required that the disposal facility can be opened if the option becomes expedient as a result of technical progress. The Government decision has been replaced with the Government Decree on the safety of disposal of nuclear waste (736/2008), which does not impose requirements related to opening the disposal facility. In the design of the disposal, Posiva has taken the requirement of the decision-in-principle concerning re-openability and the retrievability of the nuclear waste that has been disposed of into account.

14174	Netherlands	RP, KLH	Article 20	E, 43	In your report you state that there is a challenge in maintaining continuity of knowledge and also in attracting new competent personnel. How do you guarantee the necessary expertise at the regulatory body for evaluating the disposal safety case independently from the spent fuel disposal implementer?	There have been several approaches for to maintain expertise at the RB. These include the National courses related to nuclear energy sector (YK-course, YJH course), committee set up by the Ministry of Employment and Economy in 2010 to prepare steps for ensuring suffiecient nuclear sector competence, a working group set p by the Ministry of Employment and the Economy in 2013 to prepare a research and development strategy including required knowledge base, and the National KYT-prgrammes, which are based on the Nuclear Energy Act (990/1987) according to which the aim of research is "ensuring that the authorities have such sufficient and comprehensive nuclear engineering expertise and other facilities at their disposal that are needed for comparisons of the various ways and methods of carrying out nuclear waste management". We have been able to get the required expertise, but with it is stil a challenge and often we have to do the development of competense within our organisations.
14176	Netherlands	TS	Article 32	B, 27	In your report you state that waste below clearance levels can be reused, recycled or disposed at landfills. What are the specific routes for reuse and recycling of this waste?	Operational waste is disposed at landfills. Metal waste is delivered to scrap metal business and further to the recycling as raw material for the industry. The big metal components have been transported for treatment to Studsvik facility in Sweden. Active parts that have been separated from the metal are transported back to Finland for disposal and the metal has been recycled. Waste oil is delivered to Ekokem Oy (toxic waste disposal plant) and after cleaning process oil is mixed for proper use such as chain oil.
14177	Netherlands	RP, JHE	Article 17	H, 81	"STUK shall organize the storing of the information on the disposal facility and the disposed waste in a permanent manner. At the time of the closure of the repository, the records of the disposed waste and the relevant information in the FSAR will be converted into a form for long-term deposition approved by the national archive." Storing the information in a permanent matter is a challenge. What are Finland's plans and ideas for the form for long-term deposition of this information?	The permanent storage of information on the spent nuclear fuel to be disposed of has been specified as the task of the Radiation and Nuclear Safety Authority (STUK) in the Government decree. Because the duties of the National Archives Service include receiving and storing documents released by the authorities (Decree on the National Archives Service 832/1994), the permanent storage of the information is implemented in cooperation with the Radiation and Nuclear Safety Authority (STUK) and the National Archives Service. More specific plans for the permanent storage of the information have not been made yet, since active work related to waste management is planned to continue until the 2100s.
14347	Poland	RP, TS	Article 32	p. 33	According to Table 2 one storage facility (in Roihupelto) is operated by two operators: Suomen Nukliditekniikka and STUK. As can be understood, STUK is an owner and regulatory body for this storage facility. How does STUK perform controls in that facility?	Suomen Nukliditekniikka operates the storage for sealed radioactive sources, while the department of Environmental radiation at STUK is owner of the storage for small user waste containing nuclear material and for which the regulatory authority is the department of Nuclear Waste and Material Regulation. The roles of bearer of the waste management obligation and the regulatory authority are strictly separated from each other at STUK.
12448	Russian Federation	KLH, MIKKO	Article 20	Section E	What measures are undertaken in order to engage young specialists in STUK for work?	STUK does co-operation with universities and hires students for summer trainees, gives topics for theses and doctoral thesis. STUK also takes part in organizing the national YJH- ja YK- courses, which provide good opportunity introduce STUK's work. STUK is also open for school and universitys student visits. There is a future plan to develop STUK's employer image systematically in nuclear sector.
12449	Russian Federation	RP, AT	Article 20	Section E	Whether the reorganization of STUK is in progress in the accordance with the plan of atomic energy development? If so, what measures are implemented to reorganize STUK?	STUK is responsible for the environmental surveillance of radiation in Finland. In addition, STUK is providing radiation monitoring services to the licensees in the environment around the nuclear power plants and mining and milling facilities. A proposal was sent to the Parliament to modify the Nuclear Energy and Radiation acts in such a way that STUK will carry this activity as a regulatory activity and that the independence of STUK is increased. Reorganization of STUK is currently going on and should be finalized on the 1st of May, 2015.
12450	Russian Federation	JHE, PM	Article 9	Section G	Are there any challenges on extension of the storage capacity for SNF at NPPs, for example, due to more compact storage (at Loviisa NPP) or due to extension of the interim storage facility (at Olkilouto NPP)?	For the extension of the interim storage facility one challenge is to plan the extension construction phases carefully and synchronizing them with the implementation of system modifications and at the same time considering the safety of the spent fuel already stored in the original pools.

12452	Russian Federation	JARKKO	Article 22.2	Section F 2, pp. 49-50	Could you please elaborate on the way the waste producers evaluate the cost of radioactive waste disposal? What is the procedure for calculating the annual fees paid by each waste generator into the Nuclear Waste Management Fund?	The Report says that "The producers of nuclear waste are obliged to present every three years justified estimates of the future cost of man-aging their existing waste, including spent nuclear fuel disposal and decommissioning of facilities. The Ministry of Employment and the Economy (MEE) confirms annually the assessed liability and the proportion of liability the Nuclear Waste Management Fund has to reach (the fund target). The tasks of the Nuclear Waste Management Fund are described in detail in the Government Decree on the State Nuclear Waste Management Fund (161/2004). The waste generators pay annually the difference between the fund target and the amount already existing in the Fund, but can also be reim¬bursed if the funded amount exceeds the liabilities. The waste generators shall provide securities to MEE for the portion of financial liability that	The capital of the fund is composed of annual payments that the fund has deemed liable for nuclear waste management and of the fund's profits. The Ministry of Employment and the Economy makes decisions, using the information provided by the parties liable for nuclear waste management, on liability for outstanding payments concerning nuclear waste management interventions according to current price levels, and it enforces the annual payment obligations based on these calculations. The Ministry sends the cost estimates provided by the licensees for review to STUK and external consultants. The cost estimates are based on the costs of actual waste management operations performed and future cost estimates that are based on current costs and estimated waste accumulation. The costs of decommissioning are estimated based on the decommissioning plans of each licensee. The cost estimates include an estimation of the future costs of spent fuel disposal.
14221	Slovenia	MM/STO	Article 28	J, 85	You briefly mentioned that e.g. »some low-activity radioactive sources, such as calibration sources…« are not individually registered in STUK's database. Is there any (regulatory or legislation-based) limit for »low-activity« sources?	The limit is the exemption level (values same as IAEA GSR Part 3, Shedule I, Table I1). The case where the sum activity of many small sources exceeds the exemption level without any individual source doing so, is registered as "small sources" without particularizing each individual source. Any source exceeding the exemption level is registered individually.
13075	Spain	PM	Article 32	Section B, Page 23 ad 24	Regarding the extension of the Olkiluoto interim storage capacity. The text indicates that the extension has been carried out according to the updated safety requirements, which requires among other things that the design has to withstand a large air plant impact. Could Finland provide additional information on how this event has been taken into account in the corresponding safety assessment?	The spent fuel interim storage structures are designed to withstand the large air plane impact. The design of the structures have been analyzed. In the analyses structural strenght, debris caused by the impact, radioactive releases and doses are considered. The radioactive dose analyses confirm that the dose limit set for the DEC cases are not reached in these analyses.
13076	Spain	JHE	General	Subsection L.2, page 92	About regulatory approach for Posiva´s RD&D activities. STUK reviews the RD&D periodic plans for radioactive waste management published by Possiva and gives a statement to the Goverment. Could Finland provide a list of the main review areas as well as the main safety criteria used in the review? Since these reports could be interesting for other countries, could Finland provide the reference of the last review plan and/ or the location where it can be found?	Last RD&D plan YJH2012 can be found for example from Posiva's webpage (http://www.posiva.fi/files/3056/YJH-2012eng.pdf). STUK evaluates the progress in nuclear waste RD&D against safety requirements (YVL D.3, D.4 and D.5) and implementers overall waste management plans. In general areas that are reviewed are: SF management, storage and disposal, LILW management and disposal and decommissioning

13077 Spain	KLH, TEM, POSIVA	Planned Activit	Section K, page 88	Last point of this Section K about planned activities on education and training. This paragraph addresses the importance of a competent personnel in achieving a high level of safety in waste management and mentions a "pilot project for enhanced education a training concerning spent fuel disposal for new staff launched in 2010". Could Finland provide a short description of the mentioned pilot project and provide information on the achieved practical experience and lessons learned? Which institution in charge of this project?.	The results of the first National YJH course organized in 2010 were evaluated encouraging and since that this course has been going on annually. The 6th National YJH course will be organized by eleven participating organizations in 2015. The training content is produced and developed jointly by the participating organizations based on their needs and the Ministry of Economy and the Employment chairs planning of the course. Feedback from the students is collected after each course and used for planning the next course. Based on the feedback the National YJH course has been found very useful. A short description of the National YJH course can be found in Finland's report on p. 48.
14653 Sweden	RP	Article 19	Section E	On p.36 and 40 it is mentioned that amendments to the Nuclear Energy act relating to IRRS-recommendations on independence of regulatory authority were under preparation during 2013. Can anything be said about the progress of this work? Are there any changes foreseen in response to the IRRS recommendations regarding STUK's indepence and mandate to issue binding regulations and license conditions?	It was concluded by the IRRS review team that the current practice of the licensing process in Finland is in practice (de facto) in line with IAEA requirements and guidance. But the team considered that in law (de jure) the role of the nuclear safety regulator in the process was not secured completely and unambiguously. To remove the ambiguousness indicated, an amendment to the Nuclear Energy Act was passed in the Parliament in March 2015. The modifications introduced included: - STUK was given the right to give binding technical requirements (previously given by the Government) in radiation and nuclear safety - the licensing authority of nuclear facilities (Ministry of Employment and the Economy) is required to take into account the license conditions proposed by STUK.
14654 Sweden	RP/TEM	Article 19	Section E	The ministry of economy and Employment (MEE) is responsible for formulating a national energy policy (p. 41) and is involved in devloping a policy for waste disposal (p. 22). At the same time MEE prepares authorization decisions for the government (p. 40). Does MEE have any other regulatory related functions, e.g. related to the development of decrees in the nuclear safety area and, if so, how is independece of the promoting and regulatory roles assured?	The Ministry of Employment and the Economy prepares also lower-level regulation within the Ministry's mandate, i.e. Government and Ministry Decrees. An example of the lower-level regulation related to the nuclear safety area is the Government Decree on the Safety of Disposal of Nuclear Waste 736/2008. STUK, as a safety regulator, has a great role in preparing the national regulations. In addition, In the preparation of these types of decrees working groups of safety experts assist and hearings are arranged. These decrees are approved by the Government. Independence of MEE is confirmed by the work of all these stakeholders.
14655 Sweden	AT	Article 19	Section E, p.40	Please explain the role of the Ministry of the Environment (if any) in a licensing process for a nuclear (waste) facility and its relation to STUK (see figures 10 and 11).	According to the Section 23 of the Nuclear Energy Act a statement concerning the licence application shall be requested from the Radiation and Nuclear Saftey Authority (STUK) and from the Ministry of the Environmen, unless, owing to the nature of the operations in hand, this is manifestly unnecessary. STUK is independent from the Ministry of the Environment.
14656 Sweden	EE	Article 20.2	Section E, P.43	In support of STUK's review of the construction license application for an encapsulation facility and a spent nuclear fuel repository, STUK has procured a group international experts. Please elaborate on the criteria used for this procurment to ensure indepence of the experts in relation to Posivas development of the application.	In the call for tender it was stated that "the expert(s) named in the tender shall be independent and impartial related to activities reviewed. A person who has participated in the planning or execution, or was otherwise involved in the activities related to Finnish nuclear waste disposal business during the last three (3) years before the deadline of the receipt of the tender, can not be accepted for providing services for STUK". STUK looked/checked carefully that the experts fulfil the requirements for independence and impartiality based on the documents provided. If any suspect should have arisen the issue would be taken into account during the discussions between STUK and the potential service provider before acceptance any agreements / the Framework Contracts. Such experts would have been rejected.
14657 Sweden	JHE, JOUKO	Article 20	Annex L1, p.91	On p.91 it is explained that STUK conducts "inspections on the licence applicant and the organizations responsible for the nuclear facility's design, and also on any organizations involved in the project whose work can be deemed to have major implications on safety". Please elaborate on what this mandate comprises. For example, does STUK have a legal mandate impose a regulatory decision on a third-party organization?	STUK's mandate is describe in NEA 63 §. Regarding nuclear facilities the licensee, or in this case applicant, has the prime responsibility of safety including subcontracting organizations. STUK imposes requirements to the licensee or license applicant if deviations or safety issues are found during inspections on third-party organization.

14658 Sweden	KAH	Article 15	Annex L1	During 2015 STUK is expected to make (or have made) a historical statement to the Ministry of Employment and the Economy concerning the Posivas's construction license application for a spent fuel repository and an encapsulation plant. If possible, please provide some feedback from the review process; What were the challenges? Any good practices? Have any overarching common issues been identified that could be presented at the review meeting?		Encapsulation plant and disposal facility are the first this type of facilities in the whole world and the level of acceptability in the construction license phase was one of the challenges. The renewal process of regulatory guidance for nuclear facilities (YVL-guides) was finished during the review. New guides were used for the review and application of the new guides, especially the ones written mainly for nuclear power plants was also challenge. One key issue for the success of the review process was dialogue between contact authority, regulator and license applicant. STUK had working communication with Posiva and with Ministry of Employment and Economy on all levels (management, project management and review). Another good practice was the inspection program which was introduced in the very beginning of the review process and it was continued for 1,5 years. Topics for the inspections were decided for the next half year period and as a whole STUK made 17 inspections focusing on different aspects of Posiva's management system. This gave good point of view on Posiva's organization, management and future plans and it was considered as good practice. Overarching issues identified in the review will be introduced in the review meeting presentations.
14659 Sweden	JHE, RP	Article 15	Annex L1	Has the limited time period for the review, defined by the Government, had any impact on the comprehensiveness of the licensing review?		The Ministry of Employment and the Economy requested STUK to review the license application by June 30, 2014 (in 1.5 years). STUK sent its statement and safety assessment in February 2015. The Ministry does not define the period for the review (nor does legislation) and STUK has the freedom to review the application until it is satisfied with the depth and quality of the review.
14660 Sweden	TEM	Article 22	p. 47-49		Impressive programme for analyzing and and addressing the long-term need for competence and human resources in the nuclear safety area. Candidate for good practise.	
12893 Ukraine	AI	Article 11	Í, p. 72,73	Please specify, whether the waste containing uranium is considered as a nuclear waste under the Finnish law or are they enhanced sources of natural origin? How much precipitation can be stored in geotubes and what is the lifetime of these geotubes?		According to the Section 3 of the Nuclear Energy Act nuclear waste means radioactive waste in the form of spent nuclear fuel or in some other form generated in connection with or as a result of the use of nuclear energy. The waste in question is considered as NORM waste. The geotubes used in Talvivaara are commercially available products tailored for the needs of the company. The capacity of the geotubes depends on the need. At Talvivaara they are several meters wide and tens of meters long. The geotubes are used to filtrate water. Resulting sludges are stored within geotubes on site until they can be safely stored on site. The durability of the geotubes is sufficient for the temporary storage.
12894 Ukraine	AI, JHE	Article 32.1.2	B, page 22	Please provide more detailed information on how you plan to conduct the long-term radiological monitoring during long-term storage and disposal of spent fuel.		According to the Section 36 of the Nuclear Energy Decree when applying for an operating license, the applicant shall provide STUK with a programme for radiation monitoring in the environment of the nuclear facility. When applying for the permanent closure of the disposal facility the licensee shall provide STUK with a closure plan including plans for the potential post-closure monitoring measures. Detailed requirements for the radiological monitoring during the operation of a nuclear facility are set in the Guide YVL 7.7 (to be superseded by YVL C.7). Since the closure of the disposal facility is decades away the detailed requirements are not set yet.

12895 Ukraine	HENRI	Article 32.1.1	B, page 22-23	Please provide the information on the concept of handling leaky FAs during NPP decommissioning?	The Guide YVL D.3 provides the information about the handling and storage of nuclear fuel, including the detection and handling of leaky fuel assemblies. At the moment there is only a few leaking fuel assemblies. The planned encapsulation facility that is used to encapsulate spent fuel to disposal canisters is designed to handle also leaking fuel assemblies. At the moment of NPP decommissioning all spent fuel assemblies are in AFR storages or has been encapsulated and disposed. According to this plan leaking FAs are not a problem during decommissioning.
12896 Ukraine	JOUKO, (KLH)	Article 23	F, page 50-51	Please, explain the criteria for assessing the staff's adherence to the safety culture principles and how often this assessment is to be performed.	STUK's Safety and Quality Policy includes the main policy statements of STUK that are based on the characteristics of good safety culture, recognized in IAEA guidelines. Fulfilment of these criteria at departments is assessed by each director in management review annually. The status of safety culture is also a topic to be considered in the long term audit and assessment plan which is updated annually. Each employee's personal result objectives are agreed in the result and development discussions held with the line manager. The objectives include also the STUK's values presented in the strategy. The values are based on STUK's long-term operating culture. The achievement of the set objectives is assessed annually in the result and development discussions. Employees' adherence to the safety culture principles is one of the topics in the discussions. The discussions are arranged so that each unit manager holds the discussions with the employees in their unit. STUK's Safety and Quality Policy includes the main policy statements of STUK that are based on the characteristics of good safety culture, recognized in IAEA guidelines. Fulfilment of these criteria at departments is assessed by each director in management review annually. The status of safety culture is also a topic to be considered in the long term audit and assessment plan which is updated annually.
12897 Ukraine	AI, SÄT	Article 24	F, page 52	What is the basis (including radiation factors) for the establishing of the constraints in terms personnel collective dose for the Finish NPPs?	The requirement has been made in order to meet the general principles of Finnish regulation: • The safety of nuclear energy use shall be maintained at as high a level as practically possible. • For the further development of safety, measures shall be implemented that can be considered justified considering operating experience, safety research and advances in science and technology. The target value for a new NPP (0.5 manSv per 1000 MWe as an average over the whole lifetime of the plant) is in line with the recommendations of European Utility Requirements for LWR Nuclear Power Plants. Even though the collective doses of the existing Finnish NPPs have decreased during the last years and are low in international comparisons, this value is at the moment extremely strict. By setting a NPP-unit specific target values for operating NPP-units, it is considered that he general principles to improve safety will be met. The same philosophy is with individual doses. Even though the individual doses are wel below dose limits it is important to implement dose constraints in order to achieve the ALARA –principle.
12898 Ukraine	JAAKKO	Article 4	G, page 57	Please, provide the information what research work/safety substantiations and analysis has been conducted to study the FA cladding's behavior during SF disposal.	The fuel assembly cladding is consider to act as one component of the source term and a conservative release rate has been applied. Data for release rates (corrosion) of cladding (zirconium-based alloys) under repository conditions are available in the literature.

12899	Ukraine	TS	Article 11	H, page 68	Please, clarify what amounts of radioactive waste (yearly average) are cleared from regulatory control. Also, please, specify what part of the cleared material is metal after decontamination. How is the metal, cleared from regulatory control, further used (at a later stage)?	For instance last year 46 tons of waste was cleared from regulatory control during 2014 at Olkiluoto NPP. The part of the operational waste was 54.1 %, scrap metal 29.5 %, waste oil 13.8 % and fluorescent lamps 2.6 %. The volumes and parts of the waste vary from one year to another and depend on the repair actions and extent of the annual outages. The big metal components have been transported for treatment to Studsvik facility in Sweden. Active parts that have been separated from the metal are transported back to Finland for disposal and the metal has been recycled. Active parts are 8 % from the total weight.
12900	Ukraine	JAAKKO	Article 13	H, page 73-76	What is the design lifetime of SF containers intended for the ONKALO geological repository? Is the opportunity of the retrieval of SF canisters from the ONKALO geological repository foreseen?	The spent fuel canister are designed for long-term integrity and therefore the canisters have design lifetime of hundreds of thousands of years.
12901	Ukraine	JHE	Article 13	F, page 73-76	Is it envisioned to have passive cooling systems intended for cooling SF containers emplaced within the ONKALO geological repository?	During the spent nuclear fuel disposal operation it is planned that maximum 30 disposal canister waiting for disposal could be stored in underground interim storage. In this storage adequate cooling can be assured with passive air flow, however also active ventilation is also planned. After disposal canister cooling will take place passively through bentonite buffer to surrounding host rock.
12902	Ukraine	MM, STO	Article 28	J, page 85	Please provide the information concerning the procedure for the renewal of a sealed radioactive source use after the long-term storage.	Before a source is transferred to the long term storage it is repacked and conditioned as waste suitable for long term storage and ultimately for final disposal. After this phase it is no longer possible to retrieve any source back to use.
13254	United Kingdom	AT, PIA	Article 12	H, 72	Please provide information on the future restoration of uranium mine/milling sites where leakage has occurred or restoration is not satisfactory. How are these issues being addressed by the regulator?	We will provide more information about the restoration in the national presentation. This issue will e.g. have effects on the Environmental Act.
13255	United Kingdom	RP, TS	Article 28	Exec Summary and Section J	What options are being considered for those wastes which are not suitable for disposal in the LILW repository?	A few high activity sealed sources need a disposal route and few nuclides causing the highest dose rates, such as C-14, Ra-226 and Am-241, need to be packaged so that their release is slower. This consists of about 70 waste packages (about 14 m^3). Action have been started to find a disposal solution. Possible options to be negotiated include disposal in future extension of current disposal facilities.
13256	United Kingdom	HENRI, SÄT	Article 26	F, pg 86	How will the lessons learned from decommissioning of the research reactor be captured for future benefit and what about decommissioning of the other facilities (e.g. hot cells)?	VTT, the licensee of research reactor, is planning the decommissioning phase. The actual dismantling work could start in 1-2 years and take 2-3 years. The research reactor will be the first nuclear facility to be decommissioned in Finland and it is important to capture experiences about that and also develop Finnish competences as far as possible. STUK has planned to review decommissioning related safety requirements after research reactor decommissioning. VTT is discussing about co-operation with Finnish nuclear power companies, but since the decommission is just in the initial planning phase, a formal decision about this has not yet been made. Another possibility to capture experiences and improve competences would be for example to have research project in national nuclear waste management research programme (KYT).
12704	United States of America	TS, RP	Article 16	K, pg. 88	The report states that small quantities of radioactive waste and sources are unsuitable for disposal at the Olkilouto facility. What waste characteristics make the waste unacceptable for disposal?	The main reason for not being suitable is that those sources contain radionuclides whose inventory is so large that it could restrict the use of the Olkiluoto disposal facility for the disposal of the wastes of the operator (Olkiluoto NPP)
12705	United States of America	AT	Article 22	F, pg. 47	The responsible manager and his/her deputy at a NPP are approved by STUK. Does this create a potential conflict of interest? Please elaborate.	STUK evaluates and approves, in response to an application filed by the licensee, the responsible manager and his/her debuty. They are nominated by the licencee.

12706	United States of America	TEM	Article 22	F, pg. 49	The Finnish initiative for knowledge management by the January 2013 Ministry of Employment and the Economy working group is laudable. What progress has been made in Finland in implementing the 7 recommendations from that group? Please address this during your National Country Presentation at the Fifth Review Meeting.		The implementation of the ”Nuclear Energy Research Strategy” (published in English in September 2014) is under the Ministry of Employment and the Economy, which is responsible of the Nuclear Competence Building in Finland. The Ministry reported first time of the implementation of the Strategy and the national Competence to the Finnish Community in the Finnish annual Nuclear Safety seminar in November 2014 and is continuing the communication in the future. The new Finnish safety research programs started new programs SAFIR2018 (Safety research) and KYT2018 (Waste research) with implementing the recommendations of both national Committees to their framework plans. One example is that the scientific level will be higher than in preceding programs with more publications in the international scientific journals. New openings in the international field has also been taken to have the national program cooperate with each other and with Euratom programs. New Research Strategy also stresses bilateral cooperation with Sweden, Russia, France, Great Britain, the United States and China as well as possible other Asian countries.
12707	United States of America	jhe (klh)	Article 25	L, pg. 111	During your National Country Presentation at the Fifth Review Meeting, please provide details on the applications of the Fukushima event lessons learned to the two spent fuel storage facilities (Loviisa and Olkiluoto sites). Please provide lessons learned applicable to the storage facilities that are not directly relevant to the associated NPPs. Note: We were unable to access the documents cited using the weblinks provided in L.6 and L.7.		We have taken a note on this and will provide details on the applications of the Fukushima event lessons learned to the spent fuel storage facilities at Loviisa and Olkiluoto. The weblinks you were unable to open were probablydamaged due to the hyphenation athe the webpage. However, correct links have been sent to the Joint Convention National Point of Contact USA, and Finland's national report can be found also in STUK's webpage: www.stuk.fi/julkaisut/stuk-b/stuk-b180.pdf
12708	United States of America	RP, MM	Article 32	None		The U.S. commends Finland on a comprehensive report and program for the management of disused sources.	Finland thanks for this acknowlegement.