Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
4	Australia	Article 26.2	p.115	1		**What activities are being and will be undertaken in the clean-up/decommissioning of the ATUE Cadarache uranium processing site?**	The decree authorizing the final shutdown and dismantling of the ATUE published in February 2006 was based on the final end-state of the facility proposed by the licensee and it stipulated that dismantling works should be finished within 5 years (i.e. 2011). The dismantling phase for the process equipment was completed in 2006. After 2006, the civil engineering structural dismantling and clean-out phases continued, in spite of a few stoppages due to technical and economic difficulties associated with the clean-out operations of the structures. The clean-out of some of them was not easily feasible so that the licensee proposed to demolish the structures instead of keeping them in place. This will lead to a different final end-state of the building associated with a significant increase of waste. These modifications as well as the need for a five-year extension of the time scale for the works require a new authorization with a new decree according to the article 29 of the Decree of 2 November 2007. Consequently the licensee will have to comply with the authorization procedure laid down in the law and as a first step he shall submit a complete application file to the MSNR and ASN. For the time being, the only ongoing works on site are those authorized by the decree of February 2006.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
4	Australia	Article 26.4	p.108-116	2		**What measures are in place to ensure companies retain records of decommissioning activities and relevant information for a required period?**	The licensee has to indicate in his dismantling plan the measures taken to: - keep the history of the facility and data availability; - maintain competencies and the knowledge of the facility. (see annexe 1 of the ASN's guide n°6 available in French on the ASN's website). A first version of this plan is required by the Decree of 2 November 2007 in the framework of the authorization procedure for creation of any facility. It is periodically revised notably at the time the operator applies for the authorization of final shutdown and dismantling of his facility. For facilities created before 2007 for which no dismantling plan has been already submitted, a first version of this document has to be submitted with the first periodic safety assessment or the first major modification of the facility Maintaining information records for dismantling is required by the ministerial order of 7 February 2012 (http://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000025338573&dateTexte=&categorieLien=id, see article 8.3.4). Previously this type of requirement was in the "quality order" issued in 1984.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
1	Belgium	Article 20	E.3.1.4, p. 77	1		In order to prepare its most important resolutions, the French Nuclear Safety Authority (ASN) relies on the opinion and recommendations from seven Advisory Expert Groups (GPE). These GPE consist of appointed experts from universities and associations, but also from operators who are interested in the topic being addressed. **Whereas the participation of operators in these Advisory Expert Groups might be enriching, which precautions are taken by ASN to guarantee a sufficient level of independence of these operators?**	Each advisory committee has its own rules of procedure that have to been followed by its members. Among these rules are some dispositions regarding confidentiality and ethics. Regarding confidentiality, members of the advisory committees have to keep confidential the information received, the content of discussions occurring during the meetings of the advisory committees and the results of the votes. They can't disclose the information without previous authorization from ASN or from organizations who owns the information. Regarding ethics, each member has to speak as an expert and without consideration of interest of its organization. Besides, each member must confirm in writing its engagement to respect these two principles. In addition each member involved in advisory committee, announces at the beginning of the meeting if he attends the meeting as a member or as a company representative. In average, foreign experts represent 12% of the total Advisory Committee members and experts from licensees represent 15 %. The advisory committee chairman oversees the respect of these principles.
1	Belgium	Article 22	F.2.2.2.1, p. 84	2		The High-Flux Reactor (HFR) of the research Institute Laue Langevin (ILL) is managed by three associate countries (France, Germany and United Kingdom). **Which country is responsible for the management of waste generated by this reactor?**	France is the country responsible for the management of waste generated by ILL reactor because this reactor is a Basic Nuclear Installations (BNI) located on the French territory. As all the BNI operators, the ILL operator is dealing with the treatment, conditioning, and storage of its radwaste as defined in its safety assessment to manage waste according to French authorized routes. Its waste is currently routed to the disposal facilities operated by Andra (e.g. CSTFA facility for the Very Low Level radwaste) or other radioactive waste management facilities: treatment facilities (e.g. incineration at Centraco facility) or storage facilities (e.g. Saclay or Cadarache CEA storages, for

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							decreasing of radioactivity).
1	Belgium	Article 24	F.4.2.1.1, p. 97	3		For the public, ANDRA considers that the dosimetric impact of disposal facilities running under normal operation must be at as low a level as reasonably achievable and must not exceed a fraction of the regulatory limit of 1 mSv/y set by the Public Health Code (Book III, Title III, Chapter III). As mentioned in § D.3.3.2 and D.3.3.3, ANDRA sets a threshold of 0.25 mSv/y for itself. **Are such dose thresholds set by the operator itself or does the regulatory body officially set constraints on the dosimetric impact of disposal facilities to account notably for potential cumulative impact of several nuclear facilities in the area?**	This threshold of 0,25 mSv/y in normal conditions is set by Andra itself, in consistency with ICRP n°103 recommendation.
1	Belgium	Article 32	D.3.4.1, p. 53	4		Concerning the CSM waste disposal, the report mentions that "*ASN has prescribed that the relevant documentation to maintain the memory of the CSM be submitted to an operation test.*" **[1] What is meant by an "*operation test*"?** **[2] What kind of operation test is envisioned by ASN?**	[1] The "operation test" is to carry out a ten-year analysis of the relevance of the memorial dispositive to the needs of future generations by bringing together a group of French-speaking international stakeholders to question its adequacy and completeness over the decades. [2] The first "operation test" will be realised in 2012.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
1	Belgium	Article 32	D.3.4.3, p. 55	5		The waste stream may generate an earlier saturation than expected of the CSTFA's regulatory capacity, whose initial operating lifetime was expected to last about 30 years. Hence, some studies were launched in order to improve the density of the waste intended for disposal, to optimise the use of disposal space and to assess the feasibility of a recycling system for VLL metal waste. Those activities are monitored in the framework of the PNGMDR. **[1] What are the main causes of the discrepancy observed between the actual annual waste flux and that expected at the design stage (37 000 m³ instead of 24 000 m³)?** **[2] In addition to the studies launched to prevent an earlier saturation of the CSTFA, have specific actions been undertaken with operators to decrease their annual volume of very low level waste?**	The main reason for this discrepancy is a lack of experience of waste zoning consequences when this regulation was implemented according to the decree of 31 December 1999. Waste volumes to be disposed of were underestimated and the last available data show that the actual need could be in the range of 55,000 m^3 between 2020 and 2030. Another reason is that the densities of delivered and disposed of waste have been overestimated, due also to a lack of experience. For instance the mean density of disposed waste was assumed to be 1,45 as it is actually in the range of 1. A significant reduction of very low level waste could be obtained through an optimization of waste zoning. However this strategy is not relevant for facilities that were built prior the implementation of the present regulation.
3	Bulgaria	Article 10	G.7 p.126	1		It is stated that "*ANDRA examined the feasibility of a facility for the direct disposal of spent fuel before submitting its case on the feasibility of a deep geological repository in a clay formation…*". **Could France give further information on the results and respective conclusions?**	The feasibility study of geological disposal which was provided by Andra in 2005 addressed reprocessing HLW as well as spent fuel as a precaution (SF). The main conclusion is that such a geological disposal is feasible in the clay layer investigated in the Meuse/Haute-Marne URL in both cases, with respect to safety requirements and to the reversibility logic. Differences between HLW and SF concern in particular: - (i) higher thermal phase duration and larger underground footprint due to the higher content of SF in americium 241 (decay product of plutonium-241); - (ii) a much higher amount of steel required for

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							canisters due to the volume of SF compared to reprocessing HLW.
3	Bulgaria	Article 13	H.3 p.137	2		It is described that "T*he study and consultation approach will be pursued in order for the implementation of a disposal facility to be proposed during the public debate to be held in 2013*". **Could France provide some information on the public opinion and the expected results from that debate?**	A first public debate was organized in 2005-2006 concerning the national policy on radioactive waste management. The 2013 public debate will concern the creation of the industrial repository Cigeo, for HLW and ILW, in Meuse/Haute-Marne. Andra has the following ambitions for the public debate: 1. to share the necessity of a geological repository to ensure the long term safe management of concerned waste, 2. to discuss on the local insertion of the Cigeo project and 3. to prepare the future Act that will define the reversibility conditions.
3	Bulgaria	Article 32	B.2.1 p.26	3		In the report it is explained "*For that nuclear spent fuel and similarly to other countries, France has selected a processing/recycling strategy for spent fuel*". **Could France provide some more information on its strategy in respect of future SF reprocessing?**	The French strategy concerning the spent fuel reprocessing is described in § B.2.2 and B.2.4 of the French national report.
6	Canada	General	A.2.2.2, 16	1		Section A.2.2.2 states that "*Such exchanges contribute also to the preparation of the public debate and to the drafting of the future act prescribing the reversibility specifications for the repository*." **Could you identify the French Law where reversibility is discussed for repositories?**	The planning Act of 28 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/15563/100904/file/Loi_dechets_2006_+ENG.pdf) states that a future act, setting conditions for reversibility, will have to be taken before the authorization of the geological disposal will be given.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Canada	General	A.2.1, 14	2		**Has France identified any challenges with implementing aspects of Directive 2011/70/EURATOM [regarding the framework for the safe and responsible management of spent fuel and radioactive waste]?**	Although we are still examining the transposition of the directive, we have not identified any major challenges concerning its implementation because the French legislation already integrates the main requirements set by the directive. France already has a national framework which covers the main aspects of the directive requirements: - an exhaustive inventory of wastes (generated and forecast), - a dedicated agency financed by provisions from the waste producers, - a detailed description of routes and fields of research and development (e.g. for underground repository and special types of radioactive elements), - the timeframe to build the missing infrastructures (essentially repository). Installations covered by the directive are regulated through different legal regimes, some of them may require some adjustments to fully fulfil the directive requirements.
6	Canada	Article 5	G.2.2.3.3, 122	3		The report states that “Following the compliance problems encountered in the past with regard to the compliance with spent fuel transportation cleanliness limits, EDF conducted a project review, which led to a number of quality assurance recommendations and steps concerning the enforcement of transport regulations.” **[1] How were these compliance problems initially identified?** **[2] Can you please give a description of the problems encountered in the past.**	[1] These compliance problems were identified both at the routine checking of the transportation casks after transportation and by internal review of the experience feedback from shipment events. [2] Problems encountered in the past were: - cleanliness limits exceeded; - error of declaration in transportation case; - non respect of transport formal regulations or documentation.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Canada	Article 19	E.2.2.4, 67	4		This also covers Article 26, Section F.6.1, Page 108 The terms “decommissioning” and “dismantling” appear to be used interchangeably in some instances but it doesn’t appear as though dismantling activities are completed under a decommissioning licence. **[1] Could you confirm the type of licence under which dismantling activities are completed?** **[2] Could you confirm if the decommissioning licence is in essence the release from regulatory control once the desired end-state has been achieved?**	It is agreed that the use of terms “dismantling” and “decommissioning” in the report is misleading. The following explanations will clarify the subject. [1] There is only one licence under which dismantling and decommissioning are to be undertaken. This licence consists in an authorization to proceed with the shutdown and the dismantling operations (given by a ministerial decree). This authorization covers all the activities until the facility is cancelled from the list of BNIs. [2] The procedure itself to release a BNI from the list of BNIs (decommissioning) is described in the Decree of 2 November 2007 (art. 40). When the facility is released from the list, it is no longer subject to legal and administrative regime (and control) for BNIs.
6	Canada	Article 26	F.6.1-F.6.2, 108	5		**[1] Is there sufficient capacity within storage facilities and proposed disposal facilities to accommodate all the wastes from the dismantling work noted in Section F.6.1?** Section F.6.2 suggests issues with some special wastes (e.g., graphite and asbestos). **[2] Are there significant issues with other waste types arising from dismantling?** **[3] Where will these materials be disposed?**	The figures provided by the National Inventory (http://www.andra.fr/download/site-principal/document/editions/450.pdf) show that the Centre de l'Aube (CSFMA) should accommodate waste generated by the operation and decommissioning of presently operated facilities (at least till 2040). The capacity of the Centre de Morvilliers (CSTFA) appears insufficient as its licensed capacity could be met in 2020 due to the increase of deliveries. Different measures are under study (increase of waste density, recycling, disposal compactness).

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6	Canada	Article 26	B.4.1.1.3, 113	6		Section B.4.1.1.3 identifies that natural or man-made radionuclides in all consumer goods or building materials is prohibited by Article R. 1333-2 of the Public Health Code. The report notes some initiatives to re-use metals (lead and steel) originating from dismantling or maintenance operations. **[1] Could you confirm that the intended use for these materials is as described in Section B.4.1.1.3?** **[2] Will these materials be limited for re-use in the nuclear sector?**	[1] Indeed the intended use for metals (lead and steel) originating from dismantling and maintenance operations of BNIs (Basic Nuclear Installations) is as described in § B.4.1.1.3. The only reuse authorized for these materials is in the nuclear sector. No material coming from nuclear waste zones in BNI can be reused outside the nuclear sector (BNIs, CSTFA). Up to now the quantity of recycled metals is low. [2] The feasibility of recycling more significant quantities of steel and rubbles (concrete, masonry, earths) essentially coming from dismantling is being studied (recycling in the nuclear sector).
6	Canada	Article 27	I.1, 147	7		**[1] Is there a process in place to notify or consult with communities along the transportation route when spent fuel and radioactive wastes are transported?** **[2] If yes, could you provide a high-level summary of the process?**	For each shipment of spent fuel or radioactive waste, the consignor shall notify the competent authority of the country of origin of the shipment and the competent authority of each country through or into which the consignment is to be transported. This notification shall be in the hands of each competent authority prior to the commencement of the shipment, and preferably at least 7 days in advance. The consignment notification shall include: - Sufficient information to enable the identification of the package or packages, including all applicable certificate numbers and identification marks. - Information on the date of shipment, the expected date of arrival and proposed routing. - The nature of the radioactive contents. - The maximum activity of the radioactive contents during transport and the mass of fissile material. If such a transport is likely to constitute an important media interest, ASN informs each French “Departement” “prefecture” through or into which the consignment is to be transported. Following several transports of spent fuel or radioactive

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							waste during year 2011, an increasing interest of the public and media for the transport of radioactive materials was noticed. ASN has consequently put on-line an educational file on its website www.asn.fr.
3	China	Article 5	G.2.2.3.3, p. 122	1		It is described that EDF has taken into account the experience feedback concerning the cleanliness limits for the shipment of radioactive materials and waste, as well as of spent fuel, by abiding to a set of good-practice rules completing official regulations. **Please describe the system of the experience feedback and good practices in detail.**	Concerning shipment events, the system consists in studying the declaration of shipment events in order to avoid them. Technical assessment of conveyors hired by EDF are planned by contract and conducted regularly. A double check of important points to be checked before transportation (cleanliness limits, external dosimetry...) is imposed. Concerning waste packages: for each package, control of the whole external surface with a rag (like a duster) to investigate an eventual presence of non-fixed contamination. This control is followed by several smears (300 cm^2) in compliance with the transport regulation. Moreover, radiological cleanliness operated by EDF, particularly for some storage areas, leads to control the non-fixed contamination of packages surface at a level of 0.4 Bq/cm^2 (beta/gamma) under the criteria of 4 Bq/cm^2.
	China	Article 11	H.1.2.1, p. 128	2		As mentioned in the Report, once sorted, the waste must be characterised qualitatively and quantitatively with regard to mass, physico-chemical properties and composition, potential radioactive content. Such characterisation must be consistent with existing regulations and technical specifications, notably concerning treatment, conditioning, elimination or recovery processes etc. **Please provide a detail description of the existing regulations and technical specifications.**	According to the law Andra is responsible for the waste acceptance specifications related to its disposal facilities. Andra specifications include several criteria linked to safety such as radiological and chemical content, physical criteria, confinement, etc. as well as some criteria for handling like dimensions and handling devices. Andra ensures that its specifications comply with: - the prescriptions related to the licence of operating the concerned facility (CSFMA or CSTFA), - the safety demonstration of the concerned facility, - and, as far as the CSFMA is concerned, the Basic Safety Rule RFS-III.2e revised on 29 May 2005 (« Conditions préalables à l'agrément des colis de déchets solides enrobés destinés à être stockés en surface » available in French on ASN website). Developing and implementing waste acceptance criteria are driven by the safety assessment and in particular by the result of impact of normal and accidental scenarios for each phase of a disposal facilities lifetime.

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							The Waste acceptance criteria before being applied have to be agreed by ASN. An agreement is then delivered by Andra to a producer for a given “family” of waste packages when it complies with Andra’s criteria and to relevant QA procedures. ASN also conducts inspections regularly in this field, in particular for checking that Andra follows the whole agreement process to deliver acceptation and provides an adequate organisation and associated resources. Up to now no difficulties occurred as to the adequacy of the system put in place and sufficiency of resources.
3	China	Article 12	Abstract, p. 9	3		As described in the Report, "The removal and conditioning of historical waste remains a subject of concern, although advances have been observed at various operators." **Please explain what is such historical waste.** **What difficulties were met during its removal and conditioning?**	Areva provided information arising in NPPs operations related to the removal and conditioning of historical remaining waste of La Hague site in § H 2.2.3, H.2.3.3, H2.3.4 and H.2.3. The major steps of these projects are related to: - the characterization of the waste to be removed and conditioned, - the approval of the specifications of the final package, i.e. the submission of the specifications to ASN, their review by IRSN and ANDRA, and finally their approval by ASN, - the development of a safe treatment/conditioning process.
3	China	Article 24	F.4.2.2.4, p.100, § 4	4		The impact of tritium was not considered in the evaluation of the report, **[1] Please explain if there are the control limits to the release of tritium and what are the control limits.** **[2] How to consider the impact on the environment and the public?**	In the environment, there is a marking only for tritium due to legacy. [1] All the nuclear installations containing tritium have discharge limits for tritium, defined as low as the operation allows it to minimize the impact of the facilities and based on the best available technologies. The results of each discharges are recorded and sent each month to ASN. [2] The impact is estimated with models, using the values of the tritium radioactivity in the discharges. ASN publishes each year the impact of each nuclear site considering the discharges of the previous year. Since 2011, ASN publishes also on the website of the White Paper of tritium (http://livre-blanc-tritium.asn.fr/), a tritium inventory of

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							sources including the impact of each nuclear site and the percentage of the impact of tritium in the overall impact on the public.
3	China	Article 24	F.4.2.3, p.101, § 2	5		It is described only the maximum dose exposed to the CEA and EDF staff in the Report, not including the maximum dose exposed to the AREVA staff. **What is the maximum dose exposed to a AREVA employee in 2010?**	The maximum dose received 2010 by an AREVA staff of La Hague site was 5,23 mSv.
3	China	Article 24	F.4.2.4.1, p. 103	6		It is described that EDF launched a new ALARA initiative in 2000, in that context, the collective dose per reactor decreased further to 0.62 man.sievert in 2010 and the initiative is based on three improvement areas. **Please provide the detailed information about three improvement areas, especially for the specific measures for reducing contamination in systems (zinc injection, decontamination work, etc.)**	In the beginning of the 2000s EDF management decided to launch a new formalized ALARA project. The main actions performed in the scope of this project are the following: sharing and improvement of the EDF radiation protection internal rules and associated guidance on ALARA practices, development of softwares aiming at facilitating the preparation of activities and the implementation of radiation protection optimization (Prevair – dose planning, radiological work permits, etc. -, Cartorad – radiological maps database). In parallel, specific actions were launched to manage the source term in EDF plants: tests of zinc injection in two units to optimize the source term, guidance on chemical specification to reach cold shutdown and for restart, guidance to manage resins and filters, decontamination of circuits (mainly RCVS, RHR, pools, tanks) in the most contaminated unit (both high source term and dose indicators).
3	China	Article 24	H.1.2.3, p. 129, Figure 9	7		It is showed that the deliveries of VLL-waste packages are increased gradually in the last three years. **Please explain the reasons in detail.**	The VLLW repository has been commissioned in 2003. The increase in deliveries is mainly due to the on-going decommissioning programs at CEA, AREVA and EDF sites. The flow of LLW deliveries is expected to stabilize at this level over the next years.
3	China	Article 32.1.1	D.1.2.1.2, p. 50	8		**[1] How to deal with the damaged, if any, spent fuel assembly generated in NPPs in France?**	No special treatment is made for damaged spent fuel. Leaking fuel assemblies, if any, are kept in NPPs ponds and activity level of the ponds is monitored. Leaking fuel assemblies can be transferred to the

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
						[2] Can they be directively transferred to interim storage facility or reprocessing plant?	reprocessing plant directly in transportation cask, but the H_2O quantity in the cask must be measured to ensure that there is no radiolysis risk. Disseminating fuel assemblies are not transferred nowadays.
3	China	Article 32.1.2	B.3.1, p. 27	9		**[1] In addition to the pools located in the fuel buildings, as described in the Report, is there any special spent fuel storage facility elsewhere inside a NPP in France, such as spent fuel storage water pool or dry storage facility?** **[2] If there is any, how many years will spent fuel be stored in such facility?**	There is no additional spent fuel storage other than pools located in NPP fuel buildings and at AREVA La Hague facility.
3	China	Article 32.1.2	D.1.2.1.2 , p. 50	10		**How were the spent control rods and burnable poison assembly generated in NPPs in France treated?**	Control rods are currently placed in holders and stored in reactor spent fuel pools. They will be transferred, processed and stored in a facility called ICEDA, before being disposed of in the deep geological repository. Fuel rods containing burnable poison are reprocessed at la Hague site like fuel rods.
3	China	Article 32.1.2	F.4.2.1.3, p. 97, § 3	11		For hypothetical reference groups, the impact of the CSM is estimated in 2010 at less than 10-4 µSv for discharges into the sea and at 0.36 µSv for discharges into the closest stream. **What computational model was used during the calculation on the impact to the hypothetical reference groups?**	The impact of the discharge in the closest stream is directly derived from actual measurements in the river; it includes the input to the river by groundwater. The hypothetical critical group is assumed to use only local products. For the discharge to the sea it uses a model for dispersion in the sea water. Calculations are pessimistic.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
3	China	Article 32.1.3	Abstract, p. 9	12		As indicated in the Report, "*Radioactive-waste management is ruled by the 2006 Planning Act, which sets a "route card" for the overall management of radioactive waste*". **Please provide a detailed description of the "route card".**	Planning Act of 28 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/22274/123575/file/radioactive-waste-management-act-280606.pdf) displays the detailed "route card" for the overall management of radioactive waste. This act deals with the definition of a radioactive materials and waste management policy, the improvement of transparency and democratic control, as well as the funding and economic support policy. It prohibits the disposal in France of waste coming from foreign countries and organises the so-called orphan waste management. The law stipulates that the management of these radioactive materials and waste must satisfy three fundamental principles: protection of human health, safety and the environment; prevention or limitation of obligations overburdening future generations; producer/payer principle, similar to the polluter/payer principle, which exists in the environmental law. The French National Plan organises the implementation of the research and studies on the management of radioactive materials and waste along the following three orientations defined by the law: - the reduction of the quantity and the harmfulness of the waste, notably the reduction at the source by spent fuel reprocessing and in the future possibly by separation - transmutation; - the storage as a possible previous stage, notably for the ultimate waste waiting for disposal; - the deep repository as a sustainable solution for ultimate waste which cannot be disposed of in a surface disposal facility or in a low depth disposal facility.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
3	China	Article 32.1.3	Please explain in detail the origin, cau	13		**Please explain in detail the origin, cause, follow-up treatment measures and disposal options for the asbestos-bearing waste.**	The reference in the report does not appear clearly. As a consequence, the hereinafter response to your question remains general. Asbestos has been used in NPPs not only for its thermal and electrical-insulation properties, but also as fireproof material. Hence, the dismantling of such facilities generates asbestos-bearing waste, which is intended primarily for the VLL-Waste Disposal Facility and to a lesser extent to the LIL-Waste Disposal Facility (*Centre de stockage pour les déchets de faible et moyenne activité* – CSFMA). The current inventory of asbestos-bearing waste has already reached several thousands of cubic metres m3 (conditioned equivalent), most of which are unsuitable to be taken over as such in surface disposal facilities. For the moment only a small portion of firmly-bound asbestos is taken over in surface disposal facilities and no free asbestos is accepted. Under those conditions, an overall approach regarding the take-over of asbestosbearing waste in disposal facilities was initiated by ANDRA with the following three objectives in mind: - refining the current and future inventory of asbestosbearing waste in co-operation with waste producers; - proposing processing/conditioning solutions, and - assessing better health hazards over the long term. The question of the disposal of asbestos waste is presently being investigated.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
3	China	Article 32.1.3	B.4.1.1.2, B.4.1.1.3, p. 29	14		**[1] Have some standards on exemption and clearance been developed and issued in France?** **[2] And how are the exemption or clearance waste managed in France?**	French regulation establishes exemption thresholds by radionuclides based on European standards. In a graduated risk approach, it is considered that a lot of exempt sources exceeding the exempt activity level should be regulated in the same way as a single source with the same total activity. If there are sources of many radionuclides, there is a rule for calculating adjustment (weighting of activity in relation to this exemption threshold and sum of quotients). In addition, the French doctrine does not provide any clearance level for radioactive material even if it is very low activity waste or source.
3	China	Article 32.1.3	B.6.1.1, p. 39	15		It is described that "*The decisive factors leading to the drop during the 1985-95 decade are chiefly organizational (reduction of potential waste at source, feedback sharing, good practices) and technical (implementation of changes to the re-draining of liquid effluents, denser packaging of certain waste by grouping and/or pre-compacting*". **Please give some examples about good practices and experience feedback for sharing in this aspect.**	The decisive factors leading to the drop during the 1985-95 decade have been for 1985 chiefly the developments of "responsibility" and "organization" (management field) and several technical steps. Management means: - the enhancement of the work of operators in charge of waste collection, sorting and conditioning (operational structures, training, etc.); - the integration of the costs of waste management (optimization of the sorting and the routes to eliminate waste); - the existence of several results objectives for each NPP (production, storages on sites, shipments, quality of the packages, etc.). Technical steps mean: - optimization of existing processes (for example: optimization of the filling of packages by gathering several water filters); - development of new processes (coming from the BAT): high pressure compaction, incineration, melting, etc.; - mitigation of waste streams (reduction at the source: ion exchangers are replaced when completely saturated, water filters are removed according to optimized criteria - radioactivity, differential pressure, using duration-. Good practices to limit radioactive dry active waste streams are involved, particularly with the

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							zoning principle that allows dropping waste from the nuclear status to conventional status).
3	China	Article 32.1.3	B.6.1.1, p. 39	16		"*Waste sorting before routing to the best management system*" is mentioned in the Report. **Please provide the standards for waste sorting.**	For example, the value of the sorting of VLLW (scraps and rubble) is enhanced because the cost of their direct disposal in the VLLW repository is lower respectively than melting and disposal in the LILW repository. In the same way, the value of the sorting of burnable waste is enhanced due to the great reduction of volume of waste packages to be disposed of in near surface repository.
3	China	Article 32.1.3	B.6.1.2.2, p. 39	17		It is described in the Report that Solid LIL-SL waste is either: - incinerated at the CENTRACO facility, or - compacted at Cadarache, Saclay and Marcoule facilities, or - transferred untreated to the CSFMA for conditioning purposes. **What are the standards or criteria for selecting different treatment process?**	To choose between incineration, compaction or direct packaging of radwaste, the main used criteria are the physical and chemical properties of the solid wastes (e.g. components ratio, incinerability, chemical toxicity, thickness of metallic peace, etc.). However, for all these solid LIL-SL waste the final packages produced are intended for surface disposal facilities. The compacted waste or the ashes produced by waste incineration, have packages with the same level of biological protection provided by concrete or steel containers. The final products are intended to comply with Andra standards.
3	China	Article 32.1.4	B.1.5.3, p. 24	18		**Please explain the origin, cause, follow-up treatment measures and disposal options for the residues containing mercury, magnesium, aluminium, organic liquids, etc**.	For present disposal options, please also see question by China on article 11. Hazardous waste in the chemical sense has to be stabilized and their impact in the long term is assessed in a similar way as radionuclides. However Andra considers elements with carcinogenic effects and elements with deterministic effects. Within the PNGMDR 2010 -2012, a working group (AREVA, CEA, ANDRA and EDF) was formed to conduct a joint study by drawing up an inventory, and proposing a program of work and a timetable for the definition of management arrangements appropriate to waste that currently has no waste stream.
3	China	Article 32.1.4	B.1.5.3, p. 24	19		**Please provide the results of the study concerning two actions for radionuclide transfers in concrete.**	Early results are available in the 2009 Andra annual report: (http://www.andra.fr/download/site-principal/document/editions/383.pdf)

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
3	China	Article 32.1.4	B.4.2.1, p. 32	20		It is described that very-low-level (VLL) waste is mostly due to the operation, maintenance and dismantling of NPPs, fuel-cycle facilities and research establishments. **Please provide an explanation on the operation mode and the treatment measures of the VLL waste treatment facility in NPPs.**	The management of VLL waste produced by NPPs is developed in § B.6.1.1 of the national report. For dismantling operations, waste is sorted and packaged according to ANDRA specifications.
3	China	Article 32.1.4	B.4.2.1, p. 32	21		The activity level of very-low-level (VLL) waste is generally lower than 100 Bq/g as described in the Report. **[1] Does this means the overall specific activity of the total nuclides in the waste?** **[2] Is there a requirement for a single radionuclide in the waste?**	The main activity of presently disposed waste is 12 Bq/g. The waste acceptance criteria is not expressed as a maximum total specific value but as an acceptance index that is calculated as a summation of specific activities per nuclides with weighting factors depending of the impact of the radionuclide. For long lived radionuclides the “prefectoral” license prescribes a maximum activity to be disposed of by radionuclide in the whole repository.
3	China	Article 32.1.4	B.5.2.1, p. 33	22		The Report points out that the waste survey shall distinguish notably between a clearly-defined and separate "*waste zoning*" covering the areas of the facility where the waste is likely to have been contaminated with radioactive materials or activated by radiation, and zones in which the waste may not contain any added radioactivity. **Please further describe the principles of "*waste zoning*" and zones in detail.**	In a Nuclear Basic Installation (BNI), the methodology to decide whether a material is considered as radioactive relies on the waste zoning concept described in § B.5.2.1 of the report. The waste zoning consists in distinguishing zones of the facility where the waste is likely to have been contaminated with radioactive substances or activated by radiation (zones called “nuclear waste zones”), and zones where the waste is not likely to be contaminated or activated (zones called “conventional zones”). This concept was originally set up by the decree of 31 December 1999, now being replaced by the ministerial order of 7 February 2012 (taking effect from 1st July 2013). Details are provided in an ASN guide. A “zone” is a room, part of a room, or part of an installation for which boundaries or physical barriers exists and can be deemed to prevent any transfer of contamination between

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							the outside and the inside of the zone. Thus the possible interruptions of the physical barriers must be considered very carefully. The licensee determines the waste zoning on the following bases: - design of the installation, - operational procedures, - history of the installation (incidents, modification, controls, etc.). It is reminded that this approach constitutes the first line of defence, the others being radiological controls of the waste considered as conventional according to the waste zoning. The licensee has to submit a waste survey to ASN for approval. Of course this document includes the definition and justification of the proposed waste zones. In addition, inspections are conducted on site by ASN on this subject.
3	China	Article 32.1.4	B.6.1.1, p. 38	23		The volumes of reactor vessel heads and steam generators are large with high radiation levels. **How to treat the replaced reactor vessel heads and steam generators to reduce radioactive wastes in France?**	The radiation level of these items is not so high and they can be considered as low level waste. The reactor vessel head are disposed of as one single piece, inside a specific container and is packaged in dedicated cells of Centre de l'Aube disposal facility. The steam generators from operational PWRs are stored in specific buildings localised on site. At present, the future of these steam generators post-storage is currently being examined and studied. Four steam generators from the decommissioning of Chooz NPP (PWR) are presently being decontaminated in order to be disposed of as VLL large disused components in Morvilliers facility (CSTFA). But this option is not considered by Andra as relevant for all steam generators to be replaced or dismantled and some studies have to be performed in order to identify the best relevant management route (decontamination, melting...).

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
3	China	Article 32.1.4	B.6.1.1, p. 39	24		Several measures such as "waste reduction at source" have been taken in EDF to reduce radioactive waste. **What methods have been taken to perform "waste reduction" at source in EDF?**	EDF analyses technological waste, water filters and ion exchanger resins and establishes correlations according to the types of unit outages for maintenance. Good practices, shared with operators, are identified with the goal of a consumption of DAW (bags, plastic film...) reduction. Ion exchanger resins are replaced once they are saturated.
3	China	Article 32.1.4	B.6.1.1, p. 37	25		**Please describe the treatment methods of organic liquid waste, such as oils, covered in technological waste arising from maintenance activities.**	All organic liquid waste (oils, solvents…) arising in operation are incinerated in the Centraco facility (Marcoule). Processes used at Centraco facility are developed in § B.6.1.1. and on the following webpage: http://www.socodei.fr/en/waste-processing/centraco/
3	China	Article 32.1.4	B.6.1.1, p. 38	26		**Please explain the reasons of explosion at the CENTRACO's low-level-waste processing and conditioning plant, located in Codolet, near the Marcoule Site in the Gard, and please describe the measures that have been taken after the accident.**	Centraco facility is mainly composed of two installations: an incinerator (3.500 t/yr of solid and liquid LLW) and an induction furnace (melting of 1.500 t/yr of scraps slightly contaminated). On September 12, 2011 an accident (explosion) occurred at the work level of the furnace, followed by a fire which has been brought under control within one hour while the melting process was shut down. A worker died, burned by the melted metal ejection, and four others were injured (one seriously). At the present time, two of three inquiries launched after the accident are still in progress. Seals are always affixed to the melting unit of Centraco facility. It is premature to evocate the causes of the accident. Following this event, it was also decided to stop the incineration process (still stopped 6 months later - March 2012). More than 80 % (in mass) of DAW waste (paper, plastics, clothes...conditioned in plastic drums) arising from operation of EDF PWR fleet used to be incinerated. It was decided that NPPs would commit in the sorting of DAW because 70 % of them are accepted into the repository Centre of Aube, when pre-compacted in metallic drums. This option has contributed to limit the quantity of DAW in interim storage on sites waiting for the commissioning of the incinerator.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							Concerning liquid waste, all 1300/1450 MWe reactors' evaporator bottom concentrates, enriched in boron, used also to be incinerated. EDF is in progress to restart a mobile machine able to manage these concentrates by cementation directly in concrete containers.
3	China	Article 32.1.4	B.6.1.1, p. 38	27		For the final packaging of ion-exchange resins, EDF uses the MERCURE process (encapsulation in an epoxy matrix) with two identical mobile machines, as described in the Report. **[1] Please explain the MERCURE process and how to perform the process in detail.** **[2] And please describe the operational mode of the two identical mobile machines.**	As mentioned in the Joint Convention report; § B.6.1, the Mercure process is based on encapsulation in an epoxy matrix. Ion-exchangers resins are embedded in a polymer matrix (epoxy). Two mobile units (so called MERCURE 1 and MERCURE 2) are used for that conditioning. A mobile unit comes back every 3 or 4 years on a given NPP site and it is connected onto the chosen tank. Epoxy resin and the hardener product are introduced in a concrete container of $2m^3$ (the final package), pre-equipped with a stirring device (disposable blade). The operator then fills the resins hopper and determines the activity spectrum of the wastes (collimated gamma spectroscopy). A concrete container contains an average of 400 L of resins (capacity of three hoppers). When the first charge of resins is put into the container the stirrer is set rotating. Finally the concrete container is transferred out of the tunnel of the machine and the polymerisation is started. Epoxy matrices have been chosen to meet safety assessment requirements (risk of fire) and for a greater IER incorporation rate (58%). In comparison to cement matrix, polymer matrices have been chosen based upon their following characteristics: - higher containment level, required for keeping the radioactivity in the waste container, - best resistance to ageing mainly due to their resistance to irradiation, - lower weight and volume (factor 4 based on density combined with incorporation rate), - best compatibility with ion exchangers (homogeneity of the waste block, significant tolerance particularly for a high content of free water). Mobile machines MERCURE have also benefited from a new design allowing optimisation of dose uptake and high processing rate of conditioning (3 packages during a shift of 8 hours).

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							In conclusion, polymer matrices and more particularly an epoxy matrix have been selected because of the excellent behaviour of the final package - in accordance with containment and ageing requirements. Nevertheless, in case of a lower requirement particularly if it has been considered that the «durable-and-containing» concrete container itself can assure the activity containment, a cement matrix could be considered.
3	China	Article 32.1.4	B.6.1.2.2, p. 40	28		Contaminated metal waste, such as lead and mercury, for which decontamination processes are available and have been used at Saclay and Marcoule (lead fusion and mercury distillation), as in the Report. **Please provide a detailed description of these decontamination processes.**	Lead is decontaminated in a first melting furnace in Marcoule CEA's facility. After the agreement of authority and a public inquiry, another facility located near Marseille, the D'huart Industry ICPE (classified facility on environmental-protection grounds), has been authorized to melt the lead ingot in a second melting furnace to refine it and to produce lead components. Then, lead is upgraded and recycled to be used for biological protection of new equipments in nuclear facilities. This is an example of recycling in France. The final products are used as radiation shielding in BNIs. ASN considers that recycling of very low level materials can only be envisaged if they are re-used in BNIs. Mercury is decontaminated by distillation. By heating, the mercury contained in the waste vaporises, and condenses again as pure mercury in a condensation column. The condensation unit is followed by a filter, which removes the remaining traces of mercury from the exhaust-gas stream. For the safety of the employees and of the environment, distillation is conducted as a batch process to guarantee low-emission. The pure mercury phase is solidified as insoluble mercury sulphide (HgS) to comply with disposal's Andra standards.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
3	China	Article 32.1.4	B.6.1.3.2, p. 41	29		**Please describe the categorization and treatment approaches to structural waste (hulls and end-pieces).**	Hulls and end pieces from reprocessed spent fuels are compacted and conditioned in canisters (CSD-C: Conteneur Standard de Déchets Compactés) that have the same size than the canisters used for vitrified wastes (CSD-V: "Conteneur Standard de Déchets Vitrifiés"). CSD-C is Intermediate Level conditioned Waste to be sent to an underground final disposal. Hulls and end pieces are the metallic structure parts of a spent fuel. They are separated from the nuclear material in the shearing/dissolution facility. End -pieces are only rinsed as they were not in contact with the nuclear material, while hulls - the fuel rod cut in small pieces by the shearing machine, are sent to the dissolver to remove their nuclear material contain, separated from the boiling nitric solution and rinsed. After these separated processes, hulls and end-pieces are transferred into drums and sent to a dedicated facility for compaction.
4	Czech Republic	Article 16	Generale	1		**[1] Are discharges of boric acid containing liquids to the environment authorized by the regulatory authority in France?** **[2] Could you estimate the potential impact of the new classification of boric acid as "reprotoxic (may impair fertility, may cause harm to the unborn child)" to existing practice?**	[1] Authorized discharges of boric acid can be permitted. These discharges are authorized in accordance with an impact assessment on environment and human health. [2] The evolution of the regulation for this substance is a matter of concern of ASN. Classification of boric acid is being assessed at a European level and is under discussion. Restrictions on using this substance are in particular discussed considering the specificity of its use in nuclear industries. According to the results of these discussions, this existing practice may change. Operators should regularly review the impact on the environment and human health of their facilities. So the potential impact of the new classification of boric acid will be also considered.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Finland	Article 10	B.1.5, B.1.6, B.3.1, B.4.1.2.2, G.7	1	Strategy for handling spent nuclear fuel (including spent MOX fuel) relies heavily on reprocessing and development of Gen-IV reactors. Reprocessing technology exists already but days of Gen-IV reactors in commercial use lies at least few decades ahead (page 23). It is stated on page 27 that development of Gen-IV determines the faith of the spent fuel and on page 31 that in case the Gen IV reactors do not realize in commercial use the recyclable material becomes waste. Strategy for this option is described on page 126. (ANDRA has examined in Bure the feasibility of a deep geological repository in a clay formation and found this option also possible.) If Gen-IV reactors will prove to be unfeasible, there will be changes in time schedule and funding of waste disposal. This option is not very well dealt in the JC report	.	As described in § G.7, no spent fuel has been officially designated so far for final disposal in France, except in rare cases involving experimental reactors for which reprocessing would not constitute a significant economic advantage or might raise technical issues. The French strategy is to reprocess the entire spent-fuel inventory generated by existing nuclear reactors. This explains why the French Report doesn't deal a lot with the option of final disposal of spent fuel, such as for instance spent MOX fuel, that could result from the unfeasibility of GEN-IV reactors. However, if GEN-IV reactors prove to be unfeasible, the impact on funding of waste disposal would be managed: according to the Planning Act of 28 June (http://www.french-nuclear-safety.fr/index.php/content/download/15563/100904/file/Loi_dechets_2006_+ENG.pdf), if there is no existing industrial reprocessing facilities for specific spent fuel, operators have to set aside specific provisions in their accounts and constitute specific financial assets to cover the provisions for final disposal of that spent fuel. Consequently, EDF has set aside specific provisions in its accounts and constituted specific financial assets to cover the provisions for final disposal of existing spent MOX fuel. In terms of schedule, the studies conducted by ANDRA show that spent-fuel disposal seems possible. If spent MOX fuel comes to be considered as waste, it will be put in a final disposal after a sufficiently long timescale to benefit from the heat decrease of short-lived fission products and reduce its heat discharge, meaning at the end of the century.
5	Germany	Article 8	Intro, A3, p. 10	1		It is reported that, for the purpose of assessing the experience feedback from the Fukushima accident, almost all "Basic Nuclear Installations" ("INB") are requested to perform complementary safety assessments ("ECS"), and that top-priority facilities have submitted reports describing the methodology	Complementary Safety Assessments (CSAs) [1] Timeframe: a) for priority installations (all NPPs, the reprocessing plant at La Hague, all the nuclear facilities at Tricastin, five CEA basic nuclear installations,…) the operators have sent their reports presenting the conclusion of the assessment with respect to the specifications previously issued by ASN

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
						for conducting the assessment. Minor priority facilities should submit corresponding reports by January 2012. **[1] What timeframe is expected be needed to carry out the ECSs and for the presentation of the results and consequences, especially for the high priority facilities?** **[2] Will those reports be available for public interest and discussion?**	(specifications consistent with the European specifications, but extended to installations other than NPPs and to the issues linked to sub-contractors). Those reports were analysed by ASN and its technical supports (IRSN and the relevant Advisory Groups "GPE"). Then ASN issued its report on 3rd January 2012, and its Chairman handed it to the French Prime Minister who was in charge of the transmission to the European Commission. Consequently ASN will issue technical regulatory resolutions fixing the requirements. (In particular, the licensees must identify before 30 June 2012 the "hard core" of material and organisational provisions that are required for maintaining the fundamental safety functions of the facility in extreme situations.) b) for lower priority installations, the operators should send their reports presenting the conclusions of their assessment before mid-September 2012. c) the other facilities will be dealt with through appropriate ASN requests, in particular on the occasion of their next ten-yearly periodic safety review. [2] Reports: - The section of the ASN report concerning the NPPs and the ASN opinion are available in English on ASN's website http://www.french-nuclear-safety.fr/ - The full ASN report (i.e. including the facilities other than NPPs), the reports issued by the operators as well as the GPE opinion are available in French on the ASN website. - The summary of the IRSN report is available in English on the IRSN website http://www.irsn.fr/EN/publications/thematic/post-fukushima-CSA/Pages/overview.aspx - The full IRSN report is available in French on its website. - The HCTISN opinions are available in French on its website http://www.hctisn.fr/

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							The reports are also submitted to discussion with the public in different frameworks (local information commissions, associations…).
5	Germany	Article 10	G.7, p. 126	2		It is reported that EDF's approach is to reprocess the entire spent-fuel inventory generated by existing nuclear reactors. Since the idea is to process only the quantity of spent fuel corresponding to the amount of recyclable plutonium on line in reactors licensed to receive MOX fuel, there is a difference between the quantity of spent fuel removed from reactors and the quantity of reprocessed spent fuel, with due account to the current plutonium-recycling capabilities. That situation leads to a gradual increase of the quantities of spent fuel, which tends to stabilise themselves thanks to the new fuel management methods in reactors. **[1] Could you describe the new fuel management methods in reactors?** **[2] How or with which technical tools/ design and at which sites the new fuel management methods will be realized?** **[3] Will an increase of the further interim storage capacity for fuel elements also be taken into account?** **[4] In summary, which technical concept will bridge the period until the Generation IV reactors can be commissioned?**	[1] The fuel management called "MOX Parity" (PMOX) enabled to increase the quantity of Pu in fuel assemblies in order to reach an equivalency of energy generated by UOX and MOX fuel and have MOX be burned for four annual cycles like Uranium fuels. [2] This fuel management required to revise the plant safety files and to add control rods in the reactors (vs previous UO2-MOX fuel management). Twenty two 900 MWe plants are now licensed and under operation with PMOX fuel management. Blayais 3 and 4 are now under licensing process for PMOX. [3] As MOX and reprocessed uranium spent fuels are not supposed to be reprocessed until Generation IV reactors commissioning, there might be a need for an extension of interim storage for those spent fuel assemblies. [4] Until Generation IV, the concentration of Pu will have to be increased in MOX fuels to compensate for a decrease in Pu energetic value due to higher burn-ups in uranium fuels. MOX and reprocessed uranium spent fuels will have to be stored and monitored until Generation IV.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
5	Germany	Article 12	Intro, p. 9	3		It is reported that the retrieval of historical low and intermediate level waste from former activities remains a subject of concern, although advances have been observed at various operators. **Is there any experience in France concerning the technical realisation of retrieving radioactive waste from former repositories?**	Andra experienced in the past the retrieval of some waste at Centre de la Manche disposal facility. The first experience was related to the removal of waste that was disposed in a trench at the very beginning of operation. This removal was performed in June-August 1982 and concerned 630 m^3 of waste or contaminated earth were removed. The second experience was related to tritiated waste that had contaminated the groundwater. It was performed between October 1987 and February 1988 and generated 120 m^3 of waste. The third experience was decided by Andra as Andra considered that waste disposal by the operator of the facility was not satisfactorily. 4400 drums were retrieved, some of them were reconditioned and the other ones were disposed of in an appropriate disposal structure. Similarly, some waste packages stored in trenches and pits, near surface, have been retrieved in French nuclear facilities. In some cases, the waste packages were deteriorated and they have been reconditioned since.
5	Germany	Article 17	D.3.4.1, p. 53	4		The Centre de la Manche Disposal Facility (Centre de stockage de la Manche – CSM) commissioned in 1969 entered in January 2003 officially into its post-closure monitoring phase for a maximum period of 300 years. It is reported that the documentation designed to maintain the memory of the disposal facility was assembled and a copy was deposited in the French National Archives. **In view of such a long time span, how are those data managed and passed to the future generations?**	The management is based on two devices known as "active memory": 1. development of communication with the public through the organization of open days, conferences, exhibitions and interviews, as well as by the diffusion of communication tools specific to memory, and platelets website...; 2. in strengthening the role of Local Commissions of Information (CLI). The question of memory is one of the issues addressed and should allow her to live locally. One examination is carried out every ten-year to see the relevance of the memorial dispositive to the needs of future generations (see D.3.4.1, p. 53).

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
5	Germany	Article 19	A.2.1, p. 15	5		It is reported that the public must have access to all necessary information relating to the management of spent fuel and radioactive waste and must be able to participate effectively in the decision-making process concerning the management of spent fuel and radioactive waste. **What steps are required pursuant to the national legislation and international obligations?**	The French national program (PNGMDR) is tabled to Parliament for assessment. It is transmitted to public. The decree establishing the prescriptions of the national program is tabled to public for comments before its promulgation.
5	Germany	Article 26	Intro, p. 9, B.4.1.2.1 B.4.1.2.2	6		It is reported that the further handling of spent fuel fully relies on reprocessing, Generation IV reactors and, as a further option, on partitioning and transmutation of long-lived radionuclides. Furthermore it is mentioned in Chapter B.2.4 (B.4.1.2.1. and B.4.1.2.2 as well) that "*experimental Mixed Oxide Fuel (MOX) processing campaigns have already taken place at La Hague and demonstrated the feasibility of that operation*". However, industrial routine operation especially when taking into account MOX fuel from the second or third use is still open. **[1] Could you summarize the main experience gained during these experimental campaigns and highlight some major differences between the reprocessing operations for *"usually applied*" spent fuel and MOX fuel?** **[2] How much spent MOX fuel has been processed so far?**	[1] MOX Fuel experimental processed runs started on UP2 400 in 1992, followed by industrial runs in 1999 after achievement of complementary R&D. After R&D improvement programs, several industrial MOX fuel processed had been performed on UP2 800 between 2004 and 2008. MOX Fuel were fabricated with this recycled plutonium and used in NPP in several European countries. For France, as explained in § B,4,4,2,2 irradiated MOX fuel is a storage of Pu that is planned to be use for Gen IV reactors. [2] 60 tons of MOX fuel were processed within 4 campaigns with a wide range of used MOX fuel. A throughput 2T/day had been demonstrated leading to a production of all products within specifications (plutonium & uranium powder and waste residues). MOX Fuel were fabricated with this recycled plutonium and used in NPP in several European countries. [3] At present time, there is no precise timescale for implementing industrial process for MOX fuel recycling. This will be scheduled in accompanying the implementation process for industrial GEN IV reactors. It is to be noted that future operations of reprocessing MOX shall be subjected to ASN authorization on the basis of justifications to be provided by AREVA.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
						[3] Is there a time scale for implementing the routine operation of the reprocessing of MOX fuel and is it linked to the expected advances of Generation IV reactors as well as partitioning and transmutation?	
5	Germany	Article 26	Intro, p. 9, B.4.1.2.2	7		It is reported that depleted uranium offers a recovery potential, since it may be enriched to the same extent as natural uranium and used in MOX fuel and in potential future Generation-IV reactors. The availability of the first two recovery systems is regarded as sufficient to justify on its own that depleted uranium constitutes a radioactive material since its use is already scheduled or contemplated. **Nevertheless, are there back-up solutions in mind if it must be taken into account that spent fuel and depleted uranium might be requalified as radioactive waste?**	The French PNGMDR prescribes that before the end of 2010, all French owners of reusable radioactive materials have to conduct, as conservatory measures, studies on possible management routes in the case that these materials would be qualified as waste in the future. The French owners of reusable radioactive materials issued several reports at the end of 2010. Those reports confirms the reusable character of depleted uranium, URT (uranium originating from reprocessing operations), and thorium. They also propose a solution for their disposal in case these materials would be qualified as waste in the future. As regards spent fuel, it is to be noted that the 2005 report issued by Andra took into account several scenarios, including direct disposal of spent fuel. The report concluded to the feasibility of such disposal in the clay formation of East of France, in the vicinity of the deep geological laboratory.
5	Germany	Article 26	Intro, p. 9, F.6.3.4.1	8		It is reported that a dismantling decree for the Brennilis NPP has been rejected by a Public Inquiry Committee. **[1] What have been the main reasons or concerns addressed by the committee?** **[2] Is the Conditioning and Storage Facility ICEDA for intermediate-level long-lived waste mentioned in Chapters F.6.2.3. and F.6.3.4.1 planned as a centralized facility or specially dedicated to the Brennilis NPP?**	The main reasons are as follows: - Decree authorizing the creation of the storage facility for ILW-LL waste (ICEDA) not yet published at the time of the public inquiry, - Inadequate description of the radiological and chemical baseline - Insufficient reasoning behind the "immediate" dismantling strategy.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
5	Germany	Article 32	Intro, 9 G7 H3	9		The recent report introduces Bure as a site where a deep geological repository is intended to be developed for high-level waste. The site of Bure was previously (especially in the Joint Convention Report 2009) assigned to an underground research lab (URL) and a conversion into a repository was excluded. **With the principal decision towards the suitability of a HLW repository in claystone formations in mind, have other locations with claystone formations besides Bure been taken into account and compared to the Bure region, or will other locations also be considered in the siting process?** Within the EU-program "Engineering Studies and Demonstration of Repository Designs" (ESDRED), originally, not only techniques for the disposal of vitrified high level waste from the reprocessing process (CSD-V) had been intended to be developed and tested in full scale, but also techniques for the disposal of spent fuel. Positive results were published for disposal techniques for CSD-V, whereas the French part of the program concerning the disposal techniques for spent fuel is not reported on and seems to be cancelled for the time being. **Are there plans for re-launching a development program for the disposal techniques for spent**	The French law specifies that the host formation of a deep geological repository should be surveyed by means of an underground research laboratory (URL) prior to create the repository. A 250 km^2 area has been defined in 2005 where the data obtained in the Meuse/Haute-Marne URL can be transposed on a geological point of view. Therefore this "transposition zone" is considered as suitable to host a repository. In 2009, Andra proposed to the government a 30 km2 area within the transposition zone, on the basis of (i) geological criteria, (ii) a dialogue with local stakeholders. After instruction the government validated the selection of this zone as favourable to the location of the underground facility (see answer below). By law, the spent fuel (SF) generated by NPPs is not considered as waste and consequently it is not included in the repository's inventory. However, as a precaution, studies are carried out by Andra in order to check the compatibility of the repository project with a potential evolution in waste management strategy. Today there are no plans in the short term for new experimental developments of SF specific disposal techniques.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
						fuel?	
5	Germany	Article 32.1.3	B.1.2.1, p. 20 B.1.5.1, p. 23	10		Retrievability for 100 years is one principle for the disposal of radioactive waste in France. **[1] Is it planned to test retrieval operations in full scale aboveground and/or underground?** **[2] Are there special measures planned for maintaining the mining infrastructure (e.g. shafts, drifts) technically, personally and institutionally, and also keeping aboveground storage and handling facilities ready for operation?**	[1] Retrieval operations of simulated waste packages were and will be conducted aboveground before the licence application for construction of the disposal facility. Underground retrieval demonstrations of real waste packages will be made possible in the repository after commissioning. [2] Measures are planned for maintaining the mining infrastructure for at least 100 years. Similarly, aboveground facilities will be operated for such period. Storage facilities capable to accommodate retrieved waste disposal packages are been studied. If retrieval of large amount of waste would be decided, it might be possible to build new storage facilities along with progressive retrieval. The repository's surface facilities can be designed to allow further building of storage facilities, if necessary.
6	Hungary	General	Executive summary p. 8	1		In case of the R7 workshop facility the "retrieval and conditioning of historical waste (other than fission products) remains a subject of concern";. **What characteristics of that waste stream do require special attention?**	The wording of the paragraph page 8 needs to be clarified. In fact there is no historical waste in the R7 workshop. The only historical waste which will be treated in this facility is the old concentrated solution stored in the SPF2 unit outside the R7 workshop. This solution (220 m^3) originating from the reprocessing of GCR (Gas Cooled Reactor) spent fuels contains fission products with a high concentration of molybdenum and phosphorus. The new innovating process in cold crucible will allow vitrifying them from 2011 to 2017 (expected volume of waste packages: 158 m^3). The other historical wastes, notably those described in § H.2.3, will be treated and conditioned in installations other than the R7 workshop.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Hungary	General	Executive summary p. 8	2		The equipment of a large number of nuclear research facilities became obsolete and no overall safety reassessment took place. For these facilities a safety assessment has to be made until 2017. The 6 year deadline to perform the SA seems to be quite a long period. **What was the reason for not prescribing a shorter deadline?**	[1] The context of such safety assessments is the following: Many current CEA installations began operating in the early 1960s. The equipment in these installations, of older design, may now be timeworn. Furthermore, it has been subject to modification on several occasions, sometimes without any overall review of its safety. In 2002, ASN informed licensees that it considered a review of the safety of the older installations to be necessary every 10 years. This provision is now included in the TSN Act of 13 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/22273/123572/file/loi TSN-uk.pdf) and in the Decree of 2 November 2007, which imposes to all licensees to carry out a first safety reassessment within a 10-year period, thus finishing in 2017. Consequently, the periodic safety reviews for CEA's facilities have been scheduled according to a calendar approved by ASN. All of the facilities are to be reviewed by 2017 at the latest, then every 10 years. [2] As mentioned in the annex 4 of the French report, in the light of Fukushima accident: - complementary safety assessments (CSAs) concerning 20 INBs and 2 site support functions, of high-priority, were performed in 2011 in addition to those performed for all the NPPs also considered as high-priority. - 22 INBs and 2 site support functions, of lower priority, will be assessed in 2012. - the 40 remaining installations (with very low priority) will be assessed according to specific ASN requests, including by anticipated periodic safety reviews. Among them, the number of CEA installations concerned by these CSAs is the following: - 5 installations of high-priority assessed in 2011, - 9 installations of lower priority to be assessed in 2012, - 22 installations to be assessed according to specific ASN requests.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Hungary	General	A.3.3, p. 17	3		It is mentioned that there are some differences between EU and France approaches regarding the methodology of stress tests. **[1] What is the nature of the deviation?** **[2] Technical parameters or administrative measures are concerned?**	The two differences between EU and France approaches regarding the methodology of stress tests are the following: - The French stress tests called Complementary Safety Assessments (CSAs) concern not only all the NPPs, including the one in construction, but also the other nuclear installations (fuel cycle facilities, including the reprocessing plant at La Hague; nuclear research installations). As a first step, the priority installations have been assessed. The first priority included all the NPPs, all the major fuel cycle installations, notably the reprocessing plant, five CEA installations. For lower priority installations, the licensees' reports shall be sent to ASN for assessment by mid-September 2012. - The human and organisational factors including the organisation of the use of subcontracting were subjected to evaluation in the CSAs. Therefore the differences do not concern technical parameters or administrative measures.
6	Hungary	Article 9.6	G.6.2.2, p.125	4		CEA and ILL facilities declare all safety relevant events to ASN and other authorities in real-time. But ANDRA facilities have to declare it only in 48 hours. **Why are two days allowed for it?**	All operators have to declare significant events to ASN in real time. But, if it is not an emergency situation, the operators have to declare events within 48 hours. This delay is recommended in ASN's guides relating to events declaration.
7	Hungary	Article 9.6	G.6.2.1, p. 125	5		CEA has set up a Central Experience Database. **Is it accessible for other countries?**	This Central Experience Database is currently an internal tool for experience feedback in the CEA safety management.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Hungary	Article 11	H.1, p. 129	6		Regarding low-level long-lived waste and graphite and radium-bearing waste a feasibility report is to be made until the end of 2012. Based on this report a decision is to be made how to dispose of them. **[1] Is there no deadline needed for the decision?** **[2] Does the graphite waste require special attention during storage?**	[1] For the moment it is not possible to define a deadline for the decision. The present situation is as follows: - After the two selected communes have withdrawn from the project in 2009, Andra has to find new potential sites. In this respect the High Committee for Transparency and Information on Nuclear Security called HCTISN (its role is described in § E.3.4.3.3) issued a report analysing the failure of the process and providing recommendations for a new research of sites. This report was sent to the ministers in charge of nuclear safety and energy in October 2011. It is available in French on the HCTISN website http://www.hctisn.fr - Besides, as mentioned in the French report, Andra will submit by the end of 2012 a report describing a study on management scenarios for the concerned waste (graphite and radium-bearing waste) including a model of inventory to be taken into account in the Project. [2] The graphite waste does not require any special attention during storage in comparison with the storage of other types of waste. In particular there is no increased risk of fire since there is no cause for ignition and graphite is hardly inflammable. The risks for its storage are the same as those attached to all other aged storage facilities (e.g. soil and water table contamination by loss of containment). For instance EDF has recently improved the safety of the semi-buried silos located at Saint-Laurent A by creating a geotechnical containment barrier around the silos.
6	Hungary	Article 20.1	E.3.1.2.2, p. 75	7		"*Managing staff skills is based notably on a formalised curriculum of technical training courses for each agent in accordance with a detailed and regularly updated training reference system. For instance, an inspector must follow a series of predefined training sessions involving technical, legal and communication techniques, before being certified to carry out inspections.*";	Up to date, eight technical training programmes have been defined for being certified as nuclear safety inspectors. Programme contents depend on several criteria according to the inspector's duties once at ASN: inspector at national or local levels, field(s) of competences such as NPPs, nuclear pressure equipment, transport, fuel cycle facilities, research reactors, etc. Before being certified, inspectors have to follow these training programmes. Their average length is 80 days.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
						How long does it take to become a certified inspector for a newcomer?	
6	Hungary	Article 26	F.6.1.3.1, p. 109	8		**What is the difference in meaning between "dismantling plan" and "decommissioning plan"?**	There is only one plan, called “plan de démantèlement” in French and translated “dismantling plan” in the French report. As mentioned in the report this plan is similar to the “decommissioning plan” defined by the IAEA in the Safety Requirements n°WS-R-5.
6	Hungary	Article 32.1.1	B.3.1, p. 27	9		"*After cooling in the pools located in the fuel buildings of nuclear reactors, spent-fuel assemblies are transferred to the AREVA plant at La Hague. After a few years, the spent fuel is dissolved in order to separate the reusable materials from HL waste, which is then vitrified. Reusable materials are recycled into MOX fuel (plutonium) or partly now into fuel containing re-enriched separated uranium during the processing of spent fuel (reprocessed re-enriched uranium) after re-enrichment*."; **For how long are the assemblies altogether cooled before reprocessing?**	The entire process between spent fuel unloading from reactor and processing takes around ten years.
6	Hungary	Article 32.1.2	B.3.2, p. 28	10		"*Pending their reprocessing at the La Hague Plant or the availability of a deep geological repository, the CEA stores its spent fuel at two facilities on the Cadarache Site, in accordance with specific safety rules. Those facilities include a dry-storage bunker for spent-fuel elements cooled in pits by natural convection (casemate d'entreposage sec d'éléments combustibles usés avec refroidissement des puits par convection naturelle; CASCAD) in order to store most of the spent fuel from the CEA's activities in the*	The CASCAD facility is a dry-storage bunker with 317 pits or shafts. The CARES storage is a pool located in the RES facility. However, the capacity of this pool isn't communicated because it is a part of the RES facility, a secret facility ("Secret facilities" are facilities dedicated to the defense program. These facilities are controlled by the DSND - Délégué à la Sûreté Nucléaire et à la radioprotection pour les activités et les installations intéressant la Défense - Delegate for nuclear safety and radiological protection for installations and activities concerning Defense).

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
						civilian nuclear sector, as well as an underwater storage facility (CARES pool)." **What is the capacity of these stores in comparison with the spent fuel production by CEA?**	
6	Hungary	Article 32.1.3	B.1.3, p. 21	11		"*Nurtured by that work, the 2006 Planning Act then confirmed the principle of the national management plan. It also provided that a decree set forth its requirements; hence, the decree for the first Plan was issued on 16 April 2008, whereas the validation of the decree stating the requirements for the second Plan is under way.*" **When is the reviewed National Management Plan for Radioactive Materials and Waste expected to be ready?**	The French National Management Plan for Radioactive Materials and Waste (PNGMDR) for period 2010-2012 was published in June 2010. The New PNGMDR for period 2013-2015 is planned for being published in 2013.
6	Hungary	Article 32.1.3	B.1.2.1, p. 20	12		Among the definitions there are the "Radioactive Waste" and the "Ultimate Radioactive Waste". In the national report the term of "radioactive waste" is used in general, meanwhile at several points the objective of the section of the report is "ultimate radioactive waste". **Do you use the term of "ultimate radioactive waste" in daily work?**	The term of “ultimate radioactive waste” is not often used in daily work. However the notion itself is the basis of the French policy consisting in reprocessing the spent fuel (in order to extract the recoverable share of the spent fuel which otherwise would have been considered as waste). This notion is also the basis of the policy aiming at treating and conditioning the waste to reduce their volume and their polluting or hazardous character.
6	Hungary	Article 32.1.3	B.5.2.2.1, p. 34	13		**How is it decided which type of repository of the three types listed in the text is used for disposal of VLL waste with enhanced naturally-occurring radioactivity?**	The management of waste with enhanced naturally-occurring radioactivity is still an issue under consideration. For the moment: - As mentioned in the report, most of the waste with enhanced naturally-occurring radioactivity has been disposed of on site (ash and phosphogypsum stockpiles) representing at least several hundreds of thousands of tonnes. It is not envisaged to move them.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							The production has been stopped. - As also mentioned in the report some waste with enhanced naturally-occurring radioactivity is stored on operator's premises (e.g. residues from rare earths industry) pending a disposal facility (for LL-LL waste). - A few conventional disposal facilities (for hazardous waste) have received VLL waste in the past. Two facilities still receive waste with enhanced naturally-occurring radioactivity. Bellegarde disposal facility receives naturally radioactive fluorspar sludge from the nuclear industry and residues from pottery industry. Villeparis disposal facility receives tartar, residues from steel plants, refractory bricks, ashes. Between 2000 and 2001 the following quantities have been disposed of: 70800 t at Bellegarde and 25500 t at Villeparis. Regulatory requirements are set by the circular issued by the Ministry of Ecology on 25 July 2006 (waste characterisation, radiological impact, controls, etc.) and guidance is provided by an IRSN methodology guide for the acceptance of such waste. Among other things, the radioactivity of the waste (and impact) shall be insignificant and the proportion of such waste in the conventional disposal facility shall be low. - Some waste may be disposed of in the CSTFA. The PNGMDR 2010-2012 made recommendations based on an ASN report issued in June 2009 (see § B.5.2.2.2 of the French Report). In particular it recommended that the services of the Minister of Ecology conduct in connection with the concerned industry, the disposal centres and Andra for the end of 2011 an assessment of the application of the circular of 25 July 2006 related to the acceptance of waste with enhanced natural radioactivity in the waste disposal centres and propose, if necessary, complementary actions to be implemented to secure and optimise the disposal of waste with enhanced natural radioactivity. This assessment issued in December 2011 will be integrated into the PNGMDR 2013-2015.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Hungary	Article 32.1.3	B.5.2.3, p. 35	14		It is mentioned that radioactive material is not disposed at disposal facilities for hazardous waste. **Is there any radioactive waste stream, the disposal of which is not possible because of its hazardous content?**	The safety case of presently operated surface disposal facilities may lead to restrictions for some chemical toxics. Generally this restriction is expressed in term of an acceptable inventory with regard to long term impact. The question of the disposal of asbestos waste is presently investigated.
6	Hungary	Article 32.1.5	B.4, p. 30	15		"*Since the French doctrine does not include any unconditional clearance of VLL waste based on universal thresholds, that waste is managed according to a specific treatment or disposal system in dedicated facilities*". **Could the harmonization be easily carried out between conditional clearance level and VLLW category?**	The report reminds that France has not adopted clearance levels and does not authorize unconditional clearance of VLL waste. Instead, France has developed a specific approach according to which: - any material subject to the regulation of radiological use (i.e. within the framework of a nuclear activity) is considered as radioactive as soon as it is likely to have been in contact with radioactive contamination or to have been activated by radiation. - such radioactive material remains in the nuclear sector. This policy has led to: - the creation of a VLL waste repository (namely the CSTFA), whose design is close to a disposal facility of dangerous waste (not radioactive), but dedicated to very low level radioactive waste coming from “nuclear waste zones” determined by the operators of BNIs (basic nuclear installations) and approved by ASN, - the recycling of materials only in the nuclear sector (on a case-by-case basis). Under those circumstances it seems difficult to reach a real harmonization between the French practices and those foreign practices which are based on clearance levels and unconditional clearance in conventional sectors; insofar ASN does not intend to change its prudent policy.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
4	Indonesia	Article 32	D.2	1		France receives spent fuel from other countries for reprocessing. **What are the considerations of the French government to receive the reprocessing of the spent fuel from other countries?**	The French legislation requires the signature of an intergovernmental agreement between France and the country wishing to reprocess its spent fuel before the import of spent fuel may take place. The agreement must mention the maximum date of storage in France of the ultimate waste generated by the reprocessing as well as the provisional dates of reception and reprocessing of the spent fuel. The agreement must also specify the perspectives of use of the radioactive materials separated during the reprocessing.
5	Ireland	General	General	1	Ireland would like to thank France for preparing a comprehensive national report on the implementation of its obligations under the Joint Convention.		France thanks Ireland for this comment.
5	Ireland	Article 4	A, p. 17	2		The fact that ASN has organised complementary safety assessments at French nuclear facilities with regard to similar events to those that occurred at Fukushima is noted. **What improvements or changes have been identified, if any, for the storage of spent nuclear fuel at nuclear power plant sites and other nuclear facilities?**	Following the complementary safety assessments (CSAs) performed on the priority nuclear facilities (which also include the storage of nuclear fuel), ASN considers that the facilities examined offer a sufficient safety level to require no immediate shutdown of any of them. At the same time, ASN considers that for the continuation of their operation, an increase of the level of the facility robustness to extreme situations, beyond their existing safety margins, is necessary, as rapidly as possible. The improvements or changes are identified in the ASN report and the opinion n°2012-AV-0139 of 3 January 2012, (http://www.french-nuclear-safety.fr/index.php/English-version/Complementary-safety-assessments). Moreover all the reports are also available in French on the ASN's website. With regard to the spent fuel storage pools localised in the various nuclear facilities, ASN recommended and will require (via a technical regulatory resolution) the implementation of complementary strengthened measures to reduce the risks associated with the consequences of the dewatering of the fuel.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							Similarly to NPPs reactors, ASN will require for these facilities the creation of a “hard core” of material and organizational measures designed to ensure control of the basic safety functions in extreme situation. The licensees will propose to ASN the content and specifications of this “hard core” for each facility before 30 June 2012.
5	Ireland	Article 6	B, p. 23	3		The plans for studies on reversible deep geological disposal are noted. **On what criteria (scientific or social) is the location for the future facility to be chosen?**	Andra defined a 250 km² around the Bure URL where the geological properties of the Callovo-Oxfordian clay studied in the URL can be transposed on a geological point of view. Andra proposed in 2009 a 30 km² area for detailed investigations. This area was selected first on geological criteria and second took into consideration local insertion criteria identified through dialogue with local stakeholders. This area was validated by the government in 2010 after consultation of the National Review Board and ASN.
5	Ireland	Article 32	B, p. 22	4		**Noting the formal ban on the disposal of foreign radioactive waste in France, how are wastes discharged (to air or water) from the reprocessing of spent fuel from foreign contracts accounted for under the requirements of this Order?**	The Decree 2008-209 of 3 March 2008 defines the procedures for implementing the Article L. 542-2-1 of the Environmental Code to be applied for the reprocessing of spent fuel and radioactive waste from abroad. Its Article 2 describes the allocation mechanism which ensures that the radioactive activity and the masses of radioactive substances in conditioned waste shipped back to foreign customers correspond to the ones of the used fuels imported into France for their reprocessing. This Article 2 states explicitly that the liquid or gaseous releases authorised in the framework of the decision on waste are excluded from the above balance of activities and masses imported into France and shipped abroad.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
5	Ireland	Article 32	B, p. 31	5		**With regard to the radioactive materials held by the Rhodia company, please clarify what 'airborne materials' are and what techniques will be used to recover these?**	Airborne matters are originating from the processing of chemical effluents (not radioactive) in the rare earth production process. Airborne titrated on the average with 25 to 30 % rare earth oxides corresponding to approximately 7 000 tonnes of produced rare earth oxides. The airborne matter is stored on a tarpaulin leak-tight area. A study made by Rhodia identifies perspectives of processing and reusing of the stills contained in rare earths and concludes with the technical/economic feasibility of the reusability of these materials.
5	Ireland	Article 32	B, p. 37 and section L	6		**While noting that waste from the INBs managed by EDF contains only a few or no alpha emitters, and the discharge data from EDF sites summarised in Section L - Annex 7, what alpha emitters are the operators required to monitor and report?**	The presence of alpha emitters in the RCP (Reactor Coolant System) is due to "serious clad failures" (declared when overall alpha radioactivity is greater than 4 Bq/L, reactor in operation). Alpha emitters are characterized by an alpha spectrometry or by a type spectrum and then declared in solid waste according to the scaling factors method (ISO standard 21238). The key nuclide easy to be measured is 60Co, in correlation with overall alpha emitters. Generally, in the rare cases of "serious clad failures", the total amount of alpha in solid waste does not exceed the acceptance limit of the national repository Aube centre. Alpha emitters are mainly trapped on water filters. Anyway they are almost absent in spent effluents to be released. The NPP decrees covering the release of radioactive liquids in the environment fix two overall alpha radioactivity limits: 1 Bq/L in each release and 0.37 Bq/L in a monthly aliquot (these limits correspond to decision thresholds). There is not any explicit discharge limit for alpha-emitters (neither liquid nor gaseous). The operator shall ensure that these emitters are absent from the discharges by checking that volumes activity is bellow a decision threshold (0,001 Bq/m^3 for gaseous discharges, 0,37 Bq/L for liquid discharges). Research carried out in 2000-2002 showed that the annual doses due to alpha emitters in NPPs were similar to those calculated in other INB which have a discharge license for this type of radioactive products.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							In addition, article 13 of the Order of 26 November 1999 imposes a “permanent control” of the discharges, and states that the operator shall monitor that “*some categories of radioactive elements, for which the discharge licenses do not set any limits, are not detected in the discharges*”.
5	Italy	Article 12	H.2.	1		**Has France experienced some problems on the storage of IL-LL waste, particularly bituminized waste that showed degradation?** **If yes what kind of intervention have been implemented?**	Taking into account the degradation of historical bituminized waste drums in older bunkers, a safe retrieval processing has been used for drums of several bunkers in Marcoule. After the retrieval, each drum is over packed and transferred with a specific transportation package to a new storage facility. Drums are stored at the Multipurpose Interim Storage (EIP) facility in Marcoule. Retrieval, repackaging, conditioning & storage of historical waste are the standard implemented interventions.
5	Italy	Article 12	H.2.	2		**Could France give details on the on going activity at Marcoule, in particular on the retrieval and repackaging of historical waste?**	Historical wastes are graphite wastes, tritiated wastes, wastes generated by research and reprocessing plants, some stored oils and solvents, some radium bearing wastes. They can also include certain samples of spent fuels, spent sealed sources and some radioactive bituminized wastes. Those wastes are taken into account in the National Management Plan for Radioactive Materials and Waste. The Planning Act of 28 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/15563/100904/file/Loi_dechets_2006_+ENG.pdf) has laid down target dates for their long-term management (All the wastes produced before 2015 will be conditioned before 2030). For the moment the LL-LL repository is the only project delayed. Progress of all the ongoing activities at Marcoule are regularly followed by The National Management Plan Working Group. The IL-LL waste is intended for geological deep disposal (CIGEO) and as soon as the ultimate disposal packaging will be defined, the waste will be packaged according to ANDRA specifications.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
5	Italy	Article 32	D.3.4.1, p. 53	3		**Could France give more details on the ASN prescription to ANDRA to submit to an operation test the relevant documentation to maintain the memory of the CSM?**	Further to the safety review and the corresponding assessment made in 2009, ASN has required the exercise, proposed by Andra, consisting in verifying the adequacy of the data and the criteria adopted to select these data in the detailed documentation to maintain the memory of the CSM. In particular the adequacy should be verified with regard to the understanding of the repository behaviour in the future. The tests will be made by external experts in addition to those made by Andra staff. The results are expected in 2012. Afterwards this type of exercise will be made periodically. The periodicity will be defined by Andra after feedback from the first exercise.
5	Italy	Article 32	D.3.4.1, p.53	4		**Could France give more details on the design modifications or intervention (done or to be done) on the CSM?**	There are two main issues to be considered: 1- the question of the long term stability of the slopes of the capping system as observations showed that it had to be improved, 2- the demonstration of the long term water tightness properties of the bituminous membrane that prevent infiltration of water in the waste. For the first topic a strategy of progressive implementation of smoother slopes has been established. It will include periods of civil engineering works and periods of observations. It will require an extension of the area of the facility. About the bituminous membrane, studies about mechanisms of ageing of the membrane are carried out and a progress report will be presented to ASN in 2015.
5	Italy	Article 32	D.3.4.2, p. 54	5		**With the reference to Table 13, could France explain the meaning of the text under the table "Maximum radiological capacities specified for a certain number of radionuclides in tonnes t"?**	The capacities are expressed in TBq.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
3	Japan	General	A.3.3, p.18	1		In the Report (Section A.3.3, page 18), the ECS process is shown. According to it, the licensee's ECS reports were submitted and ASN and IRSN assessed the contents of the reports. ECS:Complementary Safety Evaluation. **[1] If any measures are proposed, how ASN and IRSN conclude that the measures should be taken?** **[2] Can ASN or the government order the licensee to take such measures?** **[3] On what legal base is the order placed?**	The procedure defined and implemented for conducting the Complementary Safety Assessments (CSAs), including all the information provided to the public on this subject as well as the large cover by the media, will strongly incite to go to the end of the process and the implementation of all requirements issued. The CSAs respond to both the French Prime Minister's and the European Council's requests to carry out a safety audit of the country's nuclear installations. The ASN Chairman delivered its report and the opinion n°2012-AV-139 on 03/01/2012 (http://www.french-nuclear-safety.fr/index.php/English-version/Complementary-safety-assessments) after having analysed the reports sent by the operators (also available in French on the ASN's website). He delivered them personally to the Prime Minister and presented them to the medias. ASN will issue resolutions fixing the prescriptions. ASN has the authority to issue such resolutions that are binding for the nuclear operators (EDF, AREVA, CEA,…). They are the legal bases regarding the measures to be implemented. As mentioned in the above opinion, ASN will be particularly vigilant to ensure the implementation of all requirements issued. ASN will also focus on learning the lessons from the results of the European peer review process. ASN will periodically present the progress of all these actions.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
3	Japan	General	K.2, p.156-159	2		In the Report (Section K.2, page156-159), it is shown that licensees and implementers as well as the regulatory bodies in France conduct international co-operation positively. This seems to be a good practice. Almost all the nuclear power countries are making strong efforts to find and select their safe disposal sites for high-level radioactive wastes. **If international co-operation is helpful or enhancive to find and select the sites, what kind of international co-operation is effective or enhancive? Please show some examples of such co-operation.**	All French actors involved in the management of high-level radioactive waste (generators, regulatory body, ANDRA, IRSN, etc) are devoting much effort and human resources to international cooperation actions which are carried out in both multilateral and bilateral frameworks. The French report develops these different kinds of international cooperation within the international context (IAEA, NEA, and other associations) and European context (WENRA, ENSREG, EU research programmes, etc.). Europe remains the main focus of international actions performed by France bodies. At regulators' level, the European club WENRA comprises a working group dealing with spent fuel and radioactive waste management and decommissioning operations (WGWD) set up in 2002. The WGWD is more specifically tasked with defining reference levels and in 2010, it extended successfully its work to include definition of the reference levels applicable to the disposal of radioactive waste in repositories. ENSREG has worked on the directive on the management of waste and spent fuel (see. A.2.1.1 in French national report). This directive sets, inter alia, a common framework for the national management policies to be developed and implemented in every EU Member State, including the waste elimination. EU also launched different R&D programmes in which ANDRA and waste producers can enrich and share their experience and knowledge (BIOCLIM, 2000-2003, http://www.andra.fr/bioclim/, ESDRED, 2004-2009, http://www.esdred.info/, and MoDeRn, started in 2009, http://www.modern-fp7.eu/). Waste producers also participate in different European organizations such as ENISS and ENEF aiming at setting common approaches in the field of safety and waste. All these initiatives help in setting a common framework for a better understanding of national approaches and

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							experience feedback sharing. Much information about other multinational action is included in the report. At bilateral level, several spheres exist for addressing the different topics in relation with this issue, including public consultation. In particular, France has developed a specific cooperation with Spain, Sweden and Finland. For example, tripartite meetings are organized between the French, Swedish and Finish regulators and their TSO on an annual basis. These closer co-operations help in having a comprehensive overview of national approaches and the exchange of detailed technical competences in a very efficient manner.
3	Japan	Article 13	H.3.3, p. 138	3		Section H.3.3 states that "ASN ensures full compliance with relevant regulations by reviewing the reports filed by operators". In each siting process, siting data in the reports vary in quality. **Would you please describe in detail how ASN manages quality assurance when reviewing the reports filed by operators?**	To guarantee and improve the quality and effectiveness of its actions, ASN defines and implements a quality management system inspired by the ISO and IAEA international standards. This system is based on: - an organisation manual containing organisation notes and procedures, defining the rules to be applied for each task; - internal and external audits to check rigorous application of the system's requirements; - listening to the stakeholders; - performance indicators for monitoring the effectiveness of action taken; - an annual review of the system, to foster continuous improvement. The review of reports sent by operator is also ruled by the ASN quality management system. Depending of the nature of the reports, specific procedures can be defined by the ASN departments or divisions for a greater quality and effectiveness, in particular if other entities have to participate in the review and decision process (lawyers, ministries in charge of nuclear safety and radiation protection, etc.).

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
3	Japan	Article 16	H.6.1, 142	4		Section H.6.1 states that "Acceptance criteria depend directly upon the safety demonstration of the facility. In the case of the CSFMA and of the CSTFA, the criteria are reflected as requirements concerning the radiological content, the limitation of chemicals, package resistance, etc. (mechanical strength of packages, durability or not of containers, etc.)". **[1] Please provide more detailed information about the acceptance criteria.** **[2] What powers does the regulatory body have to seek the appropriate information to make a determination of adequacy, and what enforcement powers are there if the resources are found to be insufficient?**	According to the law Andra is responsible for the waste acceptance specifications related to its disposal facilities. Andra ensures that its specifications comply with: - the prescriptions related to the licence of operating the concerned facility (CSFMA or CSTFA), - the safety demonstration of the concerned facility, - and, as far as the CSFMA is concerned, the Basic Safety Rule RFS-III.2e revised on 29 May 2005 (« Conditions préalables à l'agrément des colis de déchets solides enrobés destinés à être stockés en surface » http://www.asn.fr/index.php/Les-actions-de-l-ASN/La-reglementation/Regles-fondamentales-de-surete-et-guides-de-l-ASN/Guides-de-l-ASN-et-RFS-relatifs-aux-INB-autre-que-les-reacteurs). Developing and implementing waste acceptance criteria are driven by the safety assessment and in particular by the result of impact of normal and accidental scenarios for each phase of a disposal facilities lifetime. ASN, receives the Andra's specification and therefore is well aware of their content. An agreement is then delivered by Andra to a producer for a given "family" of waste packages when it complies with Andra's criteria and to relevant QA procedures. ASN also conducts inspections regularly in this field, in particular for checking that Andra follows the whole agreement process to deliver acceptation and provides an adequate organisation and associated resources. Up to now no difficulties occurred as to the adequacy of the system put in place and sufficiency of resources. Should such difficulties arise, the regulatory body would have at its disposal all the provisions laid down in the articles 40 to 53 of the TSN Act of 13 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/22273/123572/file/loi TSN-uk.pdf), as well as in the articles 53 to 56 of the Decree of 2 November 2007.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
3	Japan	Article 26	F.6.1.3.1, 110	5		Section F.6.1.3.1 states that the final state after dismantling, forecasts for the subsequent use of the site and the potential modalities to monitor it. **What options can operators adopt about the final state?**	ASN has defined its policy with regard to dismantling in a document issued on April 2009, after a public consultation. With regard to the final state of the facility the ASN policy is to strongly recommend that the final state be such that all dangerous substances, including non-radioactive ones, have been removed from the facility, as in the case of radioactive or dangerous waste. If a full cleanup is impossible to achieve, the operator must justify that situation in the dismantling plan, although it must remain exceptional. In this case, land-use restrictions may be imposed in order to prevent exposure of members of the public to any radiologic risk associated to the residual pollution remaining on the site after release of the regulatory control.
3	Japan	Article 26	F.6.1.3.5, p. 110	6		Section F.6.1.3.5 states that ASN maintains the right to carry out an inspection with intakes and measurements before granting its approval. **Has a specific criterion for site release been determined? Has a specific method(s) to confirm completion of decommissioning been determined?**	There is not a single criterion to release a Basic Nuclear Installation (BNI). Indeed, release is granted on a case-by-case basis, based on the following principles. The file which the licensee has to submit to ASN as support of the request to release the installation from the list of BNIs (see article 40 of the Decree of 2 November 2007) shall demonstrate that the target final state of the facility has been reached (evacuation of the dangerous materials, results of the clean-out operations, controls). The demonstration of the licensee concerning the absence of pollution in his installation and soils must be robust and based on at least 2 independent lines of defence, including: - a solid analysis of the history of the installation - a complete analysis of the state of the soils and of the underground water including underneath the existing buildings (radiological and chemical analysis, verification of the absence of buried wastes, etc.); After assessment performed by ASN, including on-site inspection(s) and the administrative procedure defined by the above-mentioned article, the decision to release the installation is taken according to two possibilities of easements: - at least a conventional easement aiming to preserve

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							the information concerning the presence of an older BNI on the concerned parcels, thus informing the successive buyers/occupiers - or if the operator is not able to demonstrate the absence of any residual radioactive or chemical pollution, a public-utility easement defining a certain number of land-use restrictions or monitoring measurements to be made.
3	Japan	Article 32	B.1, p. 19-25	7		In the Report (Section B.1, p. 19-25), as the key terms of waste management policy, 'reversibility', 'retrievability' and 'recoverable' are used. These three terms are abstract and conceptual and need clear definition in order to avoid unnecessary confusion. **How do you avoid such confusion in France?** **How do you make the technical consensus among regulators, operators and other stakeholders?**	The OECD Nuclear Energy Agency recently published documents to clarify the notions of reversibility, retrievability and recoverability (see http://www.oecd-nea.org/rwm/rr). This documentation also defines successive retrievability levels. The aim of these documents is to facilitate dialogue between national organizations in this field as well as to support dialogue with the public and various stakeholders. This documentation was established by a working group involving a number of countries. The final step of this work was an international conference on reversibility and retrievability organized by the NEA with the support of IAEA and other organizations in December 2010 in Reims (France). Andra uses the NEA definitions and documentation.
3	Japan	Article 32	B.1.5.1, p. 23	8		According to the Report (Section B.1.5.1, p. 23), the 2006 Planning Act specifies a minimum reversibility period of 100 years. **[1] On what technical grounds is this specification of 100 years based?** **[2] Is it based on the half- lives of radionuclides contained?** **[3] Or is it based on other technical or non-technical bases?**	The minimum duration of the reversibility period defined by the Planning Act of 28 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/15563/100904/file/Loi_dechets_2006_+ENG.pdf) is based on the results of the feasibility study described by Andra in the "Dossier 2005", and the assessments of this dossier by various reviewers, which concluded that a duration of 100 years is technically achievable. It is not related to the half-lives of radionuclides. The reversibility in France is a social and political requirement. One motivation is to allow next generations to modify, if they wish, decisions made now.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
3	Japan	Article 32	B.1.7.2, p. 25	9		Section B.1.7.2 states "*additional research tax*". **[1] Can only ANDRA spend the additional reseach tax which is more than 100 millon euro every year?** **[2] And what is main issue of the research spending the tax?**	[1] Yes. [2] The research tax is dedicated to the research and studies conducted by Andra. The main issues are engineering studies and safety studies, R&D, demonstrations including operations in the URL. To carry out these studies, Andra has contracts with scientific laboratories and engineering contractors.
3	Japan	Article 32	B.4.1.1.2, p. 29	10		Section B.4.1.1.2 states the case of significant accumulation of a large number of exempt sources and the accumulation rules. **[1] What case is assumed as the case of significant accumulation of a large number of exempt sources?** **[2] And we would like to have more explanation of the accumulation rules.**	French regulation establishes exemption thresholds by radionuclides based on European standards. In a graduated risk approach, it is considered that a lot of exempt sources exceeding the exempt activity level should be regulated in the same way as a single source with the same total activity. There are sources of many radionuclides, there is a rule for calculating adjustments (weighting of activity in relation to this exemption threshold and sum of quotients).
3	Japan	Article 32	B.5.5, p. 36	11		Section B.5.5 states that "*A sound co-ordination of research programmes is necessary in order to improve the overall safety of that management*". **Please provide more detailed information how to co-ordinate research programmes.**	The PNGMDR 2010-2012 includes an annex devoted to research matters related to the management of radioactive waste (http://www.french-nuclear-safety.fr/index.php/content/download/15566/100913/Radioactive_Material_Waste.pdf). It is reminded that the Planning Act of 28 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/15563/100904/file/Loi_dechets_2006_+ENG.pdf) fixed objectives and milestones for the research concerning the management of radioactive materials and waste. As such, it is a structuring element for the R&D work conducted in this field. The PNGMDR describes the management routes developed for the radioactive materials and waste and makes a number of recommendations for the three years following its publication. Besides, the National Review Board (CNE) issues annually a report which in addition to the evaluations of the conducted research, proposes some

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							orientations for the strategy to be implemented in order to comply with the fixed milestones. The Planning Act of 28 June 2006 conferred the responsibility of the separation-transmutation research to CEA and the research on the reversible disposal for HL/IL-LL waste and storage (taking account of the future production of waste) to Andra. It assigns the tasks of the various players for the research in radioactive waste management. In parallel, a number of R&D actions are also performed by industry (EDF and AREVA) in part in the framework of agreements associating them with CEA and/or Andra. All these agencies are supported as needed by the extensive competence base of CNRS, which has structured its research around an interdisciplinary research programme called PACEN (Programme on the Downstream of the Cycle and Nuclear Energy), Universities, and other agencies such as BRGM or INERIS. To ensure consistency between all these programmes, a Committee for Research Orientation and Follow-Up Downstream from the Cycle (COSRAC) was set up: DGRI (ministry of higher education and research) and DGEC (ministry of ecology, energy, sustainable development and the sea) alternately share the presidency and DGRI is responsible for secretariat tasks. COSRAC, a unique upstream exchange platform between all the players in the research endeavour, helps in the implementation of a common strategy for the research related to the Planning Act of 28 June 2006.
5	Korea, Republic of	General	A.3, p. 17	1		Section A.3 discusses effect of the nuclear accident in Fukushima on safety. **What is the management plan for spent fuels under abnormal conditions?**	After Fukushima accident, these abnormal situations have been studied within the Complementary Safety Assessments (CSAs). These studies identified material modifications which are in progress (e.g. electrical power back-up of heavy crane to reinsert a fuel assembly being handled, water back up supply...).
5	Korea, Republic of	General	p. -	2		There was explosion nuclear facility at Macoule in 2011. **What is the cause, result and lesson-learned in relation to this accident?**	At the present time, two of three inquiries launched after the accident are still in progress. Seals are always affixed to the melting unit of Centraco facility. It is premature to evocate the causes of the accident. Following this event, it was decided to stop the incineration

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							process (still stopped 6 months later - March 2012). More than 80 % (in mass) of DAW waste (paper, plastics, clothes...conditioned in plastic drums) arising from operation of EDF PWR fleet used to be incinerated. It was decided that NPPs would commit in the sorting of DAW because 70 % of them are accepted into the repository Centre of Aube, when pre-compacted in metallic drums. This option has contributed to limit the quantity of DAW in interim storage on sites waiting for the commissioning of the incinerator. Concerning liquid waste, all 1300/1450 MWe reactors' evaporator bottom concentrates, enriched in boron, used also to be incinerated. EDF is in progress to restart a mobile machine able to manage these concentrates by cementation directly in concrete containers.
5	Korea, Republic of	Article 6	G.3, p. 123	3		Section G.3 states that there is currently no siting project for any spent-fuel management facility in France. **What is your policy for high-level waste disposal, and what is the future plan?**	The French strategy is based on a processing/recycling of spent fuel. In this context, there is no specific siting project for SF disposal. As a precaution, studies are carried out by Andra in order to check the compatibility of the repository project with a potential evolution in the waste management strategy.
5	Korea, Republic of	Article 15	H.5, p.141	4		Section H.5 states that the memory of a disposal facility shall be kept for at least 500 years. **Who should keep the memory of a disposal facility, and how is the memory kept?**	The relevant information (documents, plans, photographs, data, etc.) is selected at source continuously, according to defined criteria, by those who produce it in order to constitute the site long term memory. This overall work is supervised by two archivists and the memory manager. The management is based on two devices known as "active memory": 1. development of communication with the public through the organization of open days, conferences, exhibitions and interviews, as well as by the diffusion of communication tools specific to memory, and platelets website...; 2. in strengthening the role of Local Commissions of Information (CLI). The question of memory is one of the issues addressed and should allow her to live locally. One examination is carried out every ten-year to see the

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							relevance of the memorial dispositive to the needs of future generations (see D.3.4.1, p. 53).
5	Korea, Republic of	Article 16	H.6.1, p.142	5		Article 16 (ix) of the Joint Convention states that "*plans for the closure of a disposal facility are prepared and updated*". **[1] How often is the plan for the closure of disposal facilities updated?** **[2] What are the criteria for the review of the regulatory authority?**	[1] The closure of a disposal facility is assessed with the same regulatory process than a new one. The plan for the closure of disposal facilities is updated whenever a periodic safety review of the facility is performed as required by the TSN Act of 13 June 2006 (i.e. with a maximal periodicity of 10 years). For the Centre de la Manche that is an already closed facility, safety reviews are also performed every 10 years [2] The review of the regulatory authority concerning the plan for closure consists in verifying the adequacy of the justifications provided by the licensee, notably in terms of: - integration of the feedback (evolution of the facility, environmental measurements, etc.); - consistency with the safety review of the facility. For the deep geological project, the licence application includes its post-closure safety assessment. This assessment describes the closure plan of the repository and the design of relating components (seals, backfilling material); it defines their specified requirements and justifies that the design meets with these requirements. This assessment will be regularly updated and reviewed by ASN along with the operation of the facility, as part of the safety case. By law the final closure decision should be authorized by an act; the procedure will include a safety review of the closure plan as for any kind of authorization associated with the repository. Partial closure steps will occur during the operation; their authorisation will also require a safety review. The compliance with ASN safety requirements will be checked systematically; this includes the calculation of safety indicators (including public exposure in the long term).

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5	Korea, Republic of	Article 24	F.4.2.4.1, p.103	6		Section F.4.2.4.1 states that: - In order to optimize and to reduce further the doses of exposed individuals, EDF launched the ALARA-1 policy as early as 1992, thus leading to significant improvements - reduced contamination in systems (zinc injection, decontamination work, etc.); **[1] What are the specific details of the ALARA-1 Policy?** **[2] What is the zinc injection method?** **[3] How much radioactivity is reduced in the systems?**	[1] The ALARA approach was implemented at EDF for the preparation and the implementation of the steam generator replacement at Dampierre in 1990. Then a formal ALARA policy was developed in order to reduce the collective dose and individual doses, particularly for those with the highest doses. This policy was based on the following aspects: - An organization at the national and local levels (ALARA committees and groups); - A policy to enhance stakeholder motivation (EDF management commitment, set-up of formal objectives related to doses, ALARA in radiation protection culture, etc.) - Development of appropriate means and tools for the preparation of the activities, dose collection and archiving, collect and use of feedback experience. For example, creation of ALARA files describing the appropriate practices for the repetitive and high-dose tasks (refuelling, steam generators activities, etc.). [2] The zinc injection method consists in injecting a solution containing zinc in the RCS. Zinc should replace cobalt on the surface of the circuits: then the cobalt-60 contamination is reduced (zinc cannot be activated). [3] Zinc injection has been tested in two units since 2004 and 2006. So far it has not been possible to correlate zinc injection with dose reduction in these units.

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5	Korea, Republic of	Article 26	F.6.1.3.2, p.110	7		Section F.6.1.3.2 states that "*Regulatory aspects are detailed in § E.2.2.4.5. It should be noted here that, according to the TSN Act, the shutdown and dismantling of any INB are subject to a prerequisite license, to be delivered by decree after a public inquiry has been held and after ASN has issued its opinion*". **[1] Is there a legal basis for the participation of the public in the licensing process for the decommissioning of nuclear facilities?** **[2] What is the regulatory standard for free release of the site after decommissioning?**	[1] The participation of the public in the licensing process for the decommissioning of nuclear facilities consists in a public enquiry according to the article 38-I of the decree of 2 November 2007 (decree available in French http://www.asn.fr/index.php/Les-actions-de-l-ASN/La-reglementation/Cadre-legislatif/Decrets/Decret-n-2007-1557-du-2-novembre-2007). The conditions of this type of public enquiry are the same as those concerning the authorization procedure for creation of a Basic Nuclear Installation (BNI - see article 13 of the above decree). [2] The regulatory standards for free release are: - the article 40 of the above mentioned decree; - ASN guide n°6 (§8 "final end-status of the instal lations, easements) of 18 June 2010; - ASN guide n°14 (§ 7.3 concerning the end of the clean-out works in a nuclear waste zone). These two ASN guides are available in French on the ASN website.
5	Korea, Republic of	Article 28	J., p.151	8		**[1] Which organization is responsible for the management of radioactive wastes except for wastes generated from nuclear utilization facilities?** **[2] What is the long-term management plan for disused sealed sources?**	Andra is in charge of the collection and treatment of waste generated by non nuclear activities (institutional waste). A report on the strategy for the management of spent sealed sources was issued by Andra in 2008. It describes potential waste management routes to be used. It has to be completed at the end of 2012 within the French National Radioactive waste Plan in order to plan the collection, conditioning and disposal of spent sealed sources.

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5	Korea, Republic of	Article 32	B.4, p.32	9		Section B.4 deals with the classification of radioactive waste. **[1] How is VLLW very-short-lived waste managed and disposed of?** **[2] What is the standard or procedure in terms of regulation?**	The regulation concerning the VLLW repository CSTFA is the regulation for ICPEs (classified facilities on environmental protection grounds). The regulation for ICPEs is described in § E.1.2 and E.2.3 of the report. In particular, the licence procedure includes: - a creation-licence application by the operator including all the justifications required such as impact study and risks analysis, - a local consultation and a public enquiry, - a “prefectoral” order authorizing the creation of the facility and including the relevant prescriptions, i.e. requirements the licensee will have to comply with. In the case of the CSTFA, the applicant Andra had to carry out a safety demonstration on the short, medium and long terms and produced a safety report which is not usually required for other ICPEs. The facility was authorized in 2003 by “prefectoral” order including a number of prescriptions, notably regarding: - the operation of the facility, including the waste acceptance criteria and controls, as well as the measures after closure (being understood that the surveillance period should last at least 30 years after the last receipt of waste), - water supply and discharge, - information of the public (prefect, mayors of Morvilliers and La Chaise, Local Information Committee), - public easements after the closure of the repository.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
5	Korea, Republic of	Article 32	B.4.2.1, p. 32	10		Section B.4.2.1 states that France is dividing that Low & Intermediate level radioactive waste in with ILW, LLW and VLLW etc. **[1] How much is the disposal cost (per drum or per m^3) for individual waste disposal?** **[2] What is the item included in the disposal cost?**	Data about costs should be considered carefully as they are highly dependent on the characteristics of the repository, on waste annual streams and overall capacity. For operation, most of the costs are provided by fixed charges, that is to say charges that do not depend on the annual deliveries. The following figures include construction costs, conditioning costs on site, disposal costs (waste acceptance, expertises on delivered packages, disposal, maintenance, environment monitoring), closure costs, institutional control costs: they are in the range of 500 €/m^3 for VLL waste and 5000 €/m^3 for LIL-SL waste.
6	Latvia	General	p. 10	1	It is mentioned in the report that France considers that it is essential to draw all possible lessons from the accident that occurred at the Fukushima-Daiichi NPP in Japan.	**Please explain the main activities for summarization of the lessons.**	The activities resulting from the accident that occurred at the Fukushima-Daiichi NPP in Japan are described on the French and English versions of the ASN's website: http://www.asn.fr/index.php/Les-actions-de-l-ASN/Le-controle/Evaluations-complementaires-de-surete http://www.french-nuclear-safety.fr/index.php/English-version/Complementary-safety-assessments The process which consists in in-depth operating experience feedback from this event will be spread over several years, as was the case for the Three Miles Island and Chernobyl accidents. For the moment, a number of complementary safety assessments (CSAs) responding to the French Prime Minister's request have been carried out. These CSAs, aiming at assessing the capacity of the nuclear installations to resist to extreme situations and to define additional measures if necessary, first concerned the priority nuclear installations (i.e. all the NPPs; most of the fuel cycle facilities, including the reprocessing plant at La Hague; five nuclear research installations,…). The various activities and outcomes are detailed in the above-mentioned websites (Prime Minister's letter, ASN specifications and decisions sent to the licensees, licensees' reports, inspections, IRSN report, and finally the ASN opinion and its report). The ASN conclusions are summarized in the ASN opinion,

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							referenced n°2012-AV-0139 of 3 January 2012. ASN considers that the facilities examined offer a sufficient safety level to require no immediate shutdown of any of them. At the same time, ASN considers that to continue to operate them, an increase in their robustness to extreme situations beyond their existing safety margin, is required as soon as possible. The next activities will be as follows: - ASN will issue resolutions for the attention of each licensee. They will consist of requirements (based on the above-mentioned ASN opinion) to improve safety with regard to extreme situations, - ASN will focus on learning the lessons from the results of the European peer review process. It will continue to participate actively in all the analyses being conducted worldwide to gain a clearer understanding of the Fukushima accident and learn all relevant lessons. - the reports from the licensees regarding lower-priority nuclear facilities shall be submitted before 15th September 2012, and ASN will assess them - ASN will be particularly vigilant with regard to monitoring the implementation of all the requirements. As of the summer of 2012, ASN will periodically present the progress of these actions as a whole.

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2	Lithuania	Article 13	H.3	1		It seems the most probable site for deep geological disposal should be at or near Eastern Laboratory Site, at Bure. **[1] Is there information on the public acceptance of deep geological facility?** **[2] If opinion of the public is negative then what measures are taken or will be taken to get acceptance of public?**	Andra provides each year a survey on the level of knowledge, any concerns, uses and expectations of the public both at a national and a local levels. For the Cigeo project, the survey of June 2011 (2000 people around Andra's URL) gives a quick overview of the project and Andra's disposal centres acceptance: *Personally, are you worried about the deep geological disposal project?* - Not at all: 15 % - Not really: 25 % - Yes a little: 34 % - Yes a lot: 25 % *Personally, are you worried about living near the Andra disposal centre?* - Not at all: 20 % - Not really: 26 % - Yes a little: 36 % - Yes a lot: 18 % These surveys help Andra to modify existing tools or to develop more efficient ones, adapted for the diversity of audiences, their level of knowledge, their use and their needs.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	Lithuania	Article 28	J.3	2		**What is the radioactive waste management policy for those disused sealed sources, which wouldn‘t be acceptable in the disposal facility, due to potential hazard in case of accidentally recovery of these sources?**	The policy and strategy for disused sealed sources are described in the PNGMDR 2010-2012 § 2.5.2 (present situation) and § 3.5.2 (actions to be conducted). The PNGMDR is available in French http://www.asn.fr/index.php/content/download/25802/154785/file/pngmdr_web_rapport_2010.pdf. Apart from reuse of the radionuclides existing in some sealed sources, the main route for used sealed sources is a disposal route. The scheme proposed by Andra is based on several criteria, such as the radionuclide period, the dimension of the sealed source, activity, heat generation According to Andra: - 15% may be disposed of in the CSFMA (a part of sources with radionuclide periods equal to the period of 137Cs or less). Some of them have already been authorized to be disposed of in the CSFMA; - 83% would be disposed of in a near surface repository (it is reminded that the search for a site and the studies for a LL-LLW repository are still under consideration); - 2% would be disposed of in the planed geological repository. A working group has been created (Andra, main suppliers including CEA, and the regulatory bodies) in order to: - update the first inventory, taking into account some factors (reuse, return from foreign countries, forecast,…), and determine expected streams and storage capacity; - consider the available treatments and conditioning methods which could be used for sealed sources; - set scenarios for recovery, conditioning and disposal. A first report is expected by the end of 2012. In addition, specific studies on tritium sources and other gaseous and liquid sources are planed.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
5	Luxembourg	Article 24	F, p. 104	1		The report states that EDF could substantially (100 times less since 1984) reduce liquid discharges except for tritium and carbon-14. **Please describe how ASN encourages the operator, according to the optimisation principle of the regulatory framework, to further reduce these discharges?**	The TSN Act, and in particular its Article 29, task ASN with establishing the requirements on abstraction of water intake for BNIs and on discharge of radioactive substances from those installations. Where NPPs are concerned, ASN's objective is a review of most of the existing discharge requirements in order to attain better harmonisation between the different sites. ASN applies the following principles when requests for discharge authorisation or modification are received: • for radioactive discharges, ASN tends to lower the regulatory limits on the basis of operating feedback on actual discharges, while taking account of the contingencies of day-to-day reactor operation; • for non-radioactive substances, ASN has decided to establish requirements on discharges of substances that were not formerly regulated, in order to control virtually all of the discharges and to adopt an approach that is more in line with heightened awareness of environmental issues. ASN sets discharge limits as low as possible, in the light of current technical knowledge and the economic situation, ensuring at the same time that they do not have significant impacts on people or on the environment, while allowing the installation to operate normally. Lastly, it should be noted that technological progress has made it possible to alter limits and decision thresholds, guaranteeing better determination of actual discharges. Since the beginning of the 90s, the global activity discharged has bottomed out, reaching a level considered as relatively incompressible (unless the production is reduced). Nevertheless, ASN is very careful that the engaged efforts are continued, so that the radioactive discharge management is more and more rigorous, deviations from the norm are less and less frequent, best practices are shared and measurement techniques are improved.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
5	Luxembourg	Article 32	B, p. 20	2	We acknowledge the positive development of the 2010-12 PNGMDR to advocates long-term management solutions for recoverable materials in cases where they would not be reused.		France thanks Luxembourg for this comment.
5	Luxembourg	Article 32	B, p. 24	3		According to an agenda published in June 2008 by ANDRA, it was foreseen to propose a site for the disposal of LL/LL waste to the Government by the end of 2010. The present report only indicates that ANDRA will submit a report on possible management scenarios for LL/LL waste in 2012. This seems to be a step backwards in programming management solutions. **Could you please provide more information on the concrete developments between the two review meetings?**	Andra published in 2008 a call for candidates in the search for a disposal site. Forty or so communities declared themselves candidates. Two communities were selected by the Government. Under opponents' pressure, by the end of 2009, both communities stand down as candidates. Within the framework of the National plan for managing radioactive materials and waste 2010-2012, the Government charged Andra to re-examine different options for managing graphite and radium bearing waste and to continue dialogue in view of siting. Andra will provide the Government in 2012 with a report outlining different possible management scenarios for LL-LL waste.
5	Luxembourg	Article 32	B, p. 22	4		The report reiterates the formal ban on the disposal of any foreign waste in France according to the 2006 Planning Act. **[1] Is the export of French waste to a foreign disposal facility forbidden as well?** **[2] If not, what are the underlying reasons for not treating import and export in the same way?**	France does not export any radioactive waste or spent fuel to foreign sites. In accordance with the national management of radioactive materials and waste plan, French operators have to use the French storage and disposal infrastructures.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Poland	Article 19	E.1.2, p. 62	1		**Regarding mining activities, could more insight be given on what is exemplary role of ASN in these procedures if any, as well as whether uranium mining does require separate nuclear regulatory license or supervision, e.g. in terms of safeguards?**	As regards mining we have two types of installations: - Classified facility on environmental-protection grounds (ICPE), including the storage of mine tailings, regulated by the Environmental Code. - Mines - regulated by the Mining Code. These regulations are implemented by the prefects of departments and they are assisted by inspectors of classified installations (IIC). ASN is tasked with supervising the compliance of the general and specific requirements for radiation protection (Public Health Code). For the mining, ASN looks in particular: - The environmental monitoring; - The waste management (PNGMDR); - The radiation protection. In particular, the Planning Act of 28 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/15563/100904/file/Loi_dechets_2006_+ENG.pdf) required “an appraisal in 2008 of the long term impact of the disposal sites of uranium tailings and implementation of a strengthened radiological surveillance plan at these sites”. This requirement is of the same nature as the requirement currently applied to INBs like the CSFMA. The ministerial order of 16 April 2008 for the application of the PNGMDR recommendations required the ASN opinion on the impact study to be carried out. AREVA provided an impact study which was assessed by ASN (see ASN opinion of 25 August 2009 available in French http://www.asn.fr/index.php/Les-actions-de-l-ASN/La-reglementation/Bulletin-Officiel-de-l-ASN/Avis-de-l-ASN/Avis-n-2009-AV-0075-du-25-aout-2009-de-l-ASN). Consequently, in a circular dated 22 July 2009, the ministry responsible in charge of ecology and ASN established an action plan covering the following areas of work: - Controlling the former mining sites; - Improving understanding of the environmental and health impact of the former uranium mines and their surveillance;

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							- Waste rock management: achieving a better understanding of its uses and reducing its impacts if necessary; - Improving information and dialogue. The PNGMDR includes the safety of those sites. The PNGMDR 2013-2015 will continue to deal with this issue as it was done by the previous version of the plan.
6	Poland	Article 19.2.2	E.2.2.2, E.2.2.3, p. 65-66	2		It is understood that there is no separate license for the site. **Could be an average time frame given of how much time ASN expects to be given for each of the review stages, i.e.: to review the site documentation, creation license documentation, etc., with regard to the surface repositories?**	There are very few examples of safety options and creation of surface repositories. The timeframe of how much ASN expects to be given for each of the review stages with regard to the surface repositories might be: - stage of safety options (for the definition see § E.2.2.3.1): about 1 year; - stage of creation-licences applications: 3 years (it is a maximum between the application for authorization of creation and the signature of the decree authorizing the creation of the considered facility); - safety reviews and re-assessments: about 2 years.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Poland	Article 20.1	E.3.1.2.2, p. 75	3		**Regarding staff training, could be more information given on how the training is organized - e.g. are the courses organized at operating facilities or there are another ways of providing them?**	The ASN technical training programme for its inspectors is fully consistent with the ASN strategic plan (http://www.french-nuclear-safety.fr/index.php/content/download/25854/155163/file/PLAN-STRATEGIQUE-20010-2012-uk.pdf). The training process is based on several training programmes proposed to future inspectors for being certified as nuclear safety inspector, radiation protection inspector, ASN auditor or staff tasked with monitoring compliance with the provisions on the nuclear pressure equipment. These training programmes include general and specific training courses, time spent with other certified inspectors during visits or inspections for experience gathering and integration periods in licensees'/waste producers, etc. premises (NPPs, transport companies, etc.). Human resources devoted to training process are the following: - 3 full time staff devoted to the definition and to the implementation of the training process, - 34 persons are tasked with running in-house training courses: creation, organization, improvements. Training courses represent 4147 training days. 45,2% of these training days are run by ASN staff, - A tutorial system has been implemented for new inspectors: each new inspector has one reference person, generally in its future field of competence, for accompanying him/her in his/her new functions.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Poland	Article 22	E.3.1.2.1, F.2.2.1.1, p. 75, 82-83	4		It would be interesting to know more in detail about the legal provisions for the financing schemes and rules for the RW/SNF management; it is understood that parts come from the State Budget and parts are provided by operators. **Could be more information given on the existing legal rules, their rates and scheme?**	In 2006, the French legislation made nuclear operators the only contributors for their decommissioning-dismantling (D-D) costs, as well as RW and SNF management costs. As a consequence, the State shall only finance the long-term costs of nuclear operators that are public bodies, such as the nuclear research body "CEA". Furthermore, all nuclear installation operators are required to secure the financing of their future costs related to D-D as well as RW management, including the costs of the existing or projected disposal facilities. Operators are especially required to comply with the following step: 1. Assessing carefully all future D-D & RW costs related to the currently operating installations; 2. Including in their financial annual documents (balance sheet, etc.) appropriate provisions, the value of the discounted amount of the costs assessed in step 1. The discounted rate can not exceed a certain ceiling (currently 5,1%). 3. Buying and managing a portfolio of financial assets in order to cover the current amount of the discounted provisions. Eligible assets are detailed by decree (mostly OECD countries bonds, major markets stocks, etc.) and each asset category can not exceed a certain limit of the portfolio. The value of the portfolio shall always be equal or exceed the value of the discounted provisions. 4. Every year, D-D operations and RW management is financed by selling the appropriate amount of assets from the portfolio. Provisions and portfolio value are then adjusted.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses

6	Poland	Article 32.1.4	B.6.2.1, B.6.2.4, p. 42,43	5		The text in B.6.2.1 gives the reference to the paragraph: "*The overall modalities for managing the contaminated waste and effluents of any facility must be described in a management plan for contaminated waste and effluents detailing the sorting, conditioning, storage, control and elimination modalities for such waste and effluents produced by the relevant facility (see § B.6.2.4.3).*"; though the reference section does not appear. It is understood that it should be B.6.2.4.2.
						
						[1] Could be more information given about the legal basis on which licenses for releases or discharges are issued?
						
						[2] Do there any thresholds exist (if so, what are they) or each case is treated separately (if so, could be a rough exemplary case given for illustration)?
							[1] The ministerial order of 23 July 2008 validating the ASN resolution No. 2008-DC-0095 of 29 January 2008 is the legal basis concerning the radioactive waste and liquid effluents management in biomedical research and nuclear medicine. This resolution is available in French on the ASN website.
							
							[2] Concerning the waste and liquid effluents managed by decay, the main requirements, laid down in the ASN resolution, are the following:
							- the waste and liquid effluents concerned are those containing radionuclides whose period shall be less than 100 days (in addition, the ASN resolution has set up rules applying to waste and effluents with descendants periods exceeding 100 days);
							- time for radioactive decay must be at least 10 times the period value of the radionuclides present in the waste or in the effluents;
							- provisions are necessary for segregating and managing the different categories of waste and effluents (see § B.6.2.4 of the report);
							- checks prior to any release in the environment are required:
							  - waste: the remaining activity of waste shall be less than 2 times the natural background radiation;
							  - effluents: the remaining activity shall be less than 10 Bq/l (100 Bq/l for the effluents coming from patients treated with iodine 131). In addition there are requirements for storage tanks, collecting and release network and outlet.

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6	Poland	Article 32.1.4	B.6.2.1, p. 42	6		**For clarification: is there any possibility that radionuclides with half-live longer than 100 days are managed on-site through decay?**	- Waste: It is always possible to store on-site waste containing radionuclides with half-life longer than 100 days. However these types of waste are not authorized to be released in the environment even after decay. They must be disposed of in a radioactive waste repository facility (CSTFA or CSFMA) or treated at CENTRACO. - Liquid effluents: The possibility of discharging liquid effluents containing radionuclides with half-life longer than 100 days in the drainage water system is taken into account by the ASN resolution No. 2008-DC-0095 of 29 January 2008 validated by the ministerial order of 23 July 2008 (see § B.6.2.4.1 of the report). However this resolution reminds that the radioactivity of effluents must be managed in such a way that the activity be as low as reasonably achievable. Besides, the release of effluents with half-life longer than 100 days (discharge in the drainage water system) shall be licensed by ASN on an environmental impact statement and with ASN providing for the conditions of such releases. The applicant must establish the documents required by the ASN resolution to justify his request and demonstrate the absence of risks. As a matter of facts the are very few examples in this field up to now.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Russian Federation	Article 19	L.7.2.1.1, p. 187, L.7.2.1.2, p. 188	1		There is a significant gap between the level of the «discharge limit» and the practical level (for example, for the NPP «Le Bugey» Tritium Limit equals 2590 TBq/year, while the actual discharge is 0,475 TBq/year). **[1] Are there plans in France to cut the discharge limit for tritium?** **[2] Is there in France a system that encourages producers to follow the ALARA principle?** **[3] What were the main principles that were used during the discharge license renewal in 2006?**	[1] As expressed in answer [3], a progressive license renewal was initiated in 1997 for all NPP in France, through which ASN cuts the radioactive discharge limits and get closer to practical levels, laying down specific limits for carbon-14, iodine and tritium. Regarding the 2590 TBq/year limit at Le Bugey NPP, it comes from an original license of 1978. It applies to both gaseous tritium and rare gases, not only tritium. It will be cut by the future license (and a specific limit for gaseous tritium will be defined): for instance, when the license of Dampierre-en-Burly NPP was renewed, the gaseous tritium limit was established at 10 TBq/year for the four reactors. Unlike other radioactive discharges, liquid tritium limits were increased in some cases to allow new fuel management options. In addition, ASN gave a mandate to two working groups in 2008 to review the behaviour of tritium in the environment and the evaluation of the biological impact of tritium on humans. These groups (“Tritium Impact” and “Tritium: Defence-In-Depth”) delivered their conclusions in 2010. They were included in the “Tritium White Paper” published by ASN in June 2010, and the renewal process made the most of them. [2] ASN sets discharge limits at the lowest possible level, regarding the available technical and economical knowledge, and ensuring that no significant impact on human health or on the environment is caused, while the normal operation is not affected. The Order of 26 November 1999 (on the General Technical Requirements Concerning the Limits and Methods Relating to Intakes and Discharges Subject to Licensing, Made by Basic Nuclear Facilities) stipulates that uncontrolled discharges are forbidden and that installations are designed, operated and maintained so as to limit the effluents, which shall be collected at source and, if need be, processed in order to limit the discharges at a level as low as reasonably possible.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							A mere experience feedback is not sufficient: the operator needs to demonstrate its optimisation approach, taking into account the best available technologies (BAT). In setting the limits, ASN also looks at site specificities, technical contingencies, fuel management options and variability of the environment. [3] No general discharge license renewal took place in 2006. Since the 4 May 1995, the following decree is in force ("décret n°95-540 du 4 mai 1995 relatif aux r ejets d'effluents liquides et gazeux et aux prélèvements d'eau des installations nucléaires de base"), and throughout the progressive license renewal initiated in 1997 and soon completed (in 2011, only two original licenses remained in force, at Fessenheim and Le Bugey NPPs), ASN took benefit from the regulatory evolutions (4 May 1995 Decree, later replaced by the Decree of 2 November 2007) to: - cut the radioactive discharge limits and get closer to practical levels (which go far beyond sanitary objectives). Carbon-14, iodine and tritium have specific limits; - increase the control requirements; - take into account the OSPAR Sintra statement about the protection of the Marine Environment; - take into account cumulative impacts; - strengthen the requirements regarding chemical discharges.
6	Russian Federation	Article 19	L.7.2.2.3, p. 190	2		**To what extent the do the technical issues associated with management of water containing tritium affect the annual tritium discharge limit (that is prescribed by the license for AREVA's La Hague)?**	The tritium liquid discharge limit prescribed by the license for AREVA La Hague allows the performance of fuel reprocessing program without specific additional constraint based on current annual throughput and fuel burn-up.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Russian Federation	Article 24	F.4.1.4.3, p.96	3		According to the Public Health Code, ASN may deliver a licence for the discharge in the cleanup-water network of effluents containing radionuclides with a radioactive half-life exceeding 100 days. In preparation for such a licence, the MPCWE must justify not only those discharges, with due account of the technical and economic restraints, but also the efficiency of the implemented provisions to limit the discharged activity, an impact study describing the effects of the discharges on works, the population and the environment, as well as the procedures set in place to control discharges and suspend them, if certain criteria are not met. **What is the order of magnitude for annual tritium discharges into Paris municipal sewerage that is permitted by ASN?**	ASN is tasked with defining discharge limits for basic nuclear installations (BNI) and installations authorized in accordance with the Public Health Code. Nevertheless, in the Paris region, the CEA Fontenay aux roses (BNI) is the unique installation which is authorized to release tritium in sewerage. It released 5,210E6 Bq of tritium in 2010. The water quality monitoring is then performed by the operators' water networks.
6	Russian Federation	Article 24	F.4.2.4.2, p. 104	4		The dose impact of radioactive discharges remains extremely low, in the order of one or a few microsieverts per year, as calculated for the reference group living close to an NPP. **[1] Do regulatory bodies take into consideration the problem of optimizing (reducing) the quantity of environmental surveillance studies for sources which create a dose of less than 10 µSv/year?** **[2] In this context, what is the role of passive monitoring?**	It is recalled that, although Directive 96/29 Euratom permits it, French regulation do not take over the concept of liberation threshold, nor the notion of trivial dose of 10 µSv/year (dose below which no action is deemed necessary) in radiation protection. As for each basic nuclear installation with authorization of effluent discharges, NPPs must meet the technical requirements concerning the environmental monitoring. The minimum monitoring program focuses on the atmospheric compartment (including aerosols, gamma dose rate), the aquatic compartment (surface water and groundwater) and terrestrial compartment (herbs, milk and main crops). These requirements are suitable for radionuclides released by NPPs during normal operation. At this time, there is no plan aiming at reducing the monitoring programme. EDF confirms that the dosimetric impact of radioactive

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							NPPs discharges remains extremely low, in the order of one or a few microsieverts per year, as calculated for the reference group living in the NPP vicinity. As mentioned in the report, the environmental monitoring program performed by EDF relies on both periodic regulatory environmental controls (weekly, monthly, quarterly and annually...) and annually / ten-yearly radioecological studies. These studies have a double objective: to determine to what extent NPP operation contributes to the supply of artificial radionuclides to the receiving environment and to identify and understand artificial radionuclide transfer mechanisms in the environment especially for some radionuclide of interest (despite their low dosimetric impact and radiotoxicity).
6	Russian Federation	Article 24	L.7.2.1.1, p. 187, L.7.2.1.2, p. 188	5		There is a significant gap between the level of the «*discharge limit*» and the practical level (for example, for the NPP «Le Bugey» Tritium Limit equals 2590 TBq/year, while the actual discharge is 0,475 TBq/year). **[1] Are there plans in France to cut the discharge limit for tritium?** **[2] Is there in France a system that encourages producers to follow the ALARA principle?** **[3] What were the main principles that were used during the discharge license renewal in 2006?**	Question asked twice. Please refer to Question 1.
6	Russian Federation	Article 24	L.7.2.2.3, p. 190	6		**To what extent do the technical issues associated with management of water containing tritium affect the annual tritium discharge limit (that is prescribed by the license for AREVA's La Hague)?**	Question asked twice. Please refer to Question 2.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
6	Russian Federation	Article 25		7		**How has the accident at Japanese NPP Fukushima Daiichi affected the emergency preparedness plans for French NPPs?**	In France, all stakeholders (operators, publics authorities, TSOs, etc.) are reviewing their organisation to draw lessons from the accident of Fukushima Daïchi. So, ASN defined an action plan to improve its internal organisation, in order to handle efficiently emergency situations resulting from a long and/or far accident. In the same way, public authorities, including ASN, are assessing the crisis national organisation in order to define and implement necessary changes. Emergency preparedness plans are also under review, to confirm their robustness to such accidents.
6	Russian Federation	Article 32	B.4.1.1.1, p. 29	8		**[1] Is the radiation control of sewage treatment facilities being carried out?** **[2] If so, does it lead to problems associated with accumulation of sludge inside those facilities in concentrations that require to categorize them as solid radioactive wastes?**	[1] The absence of added radioactivity is monitored by the operators' water networks. [2] If added radioactivity is detected in sludge, it is categorised as solid radioactive waste according to its characteristics.
2	Slovakia	General	General	1		**What is your operation experience in dry storage of the spent fuel?**	In France, the spent fuel unloaded from NPPs is sent to AREVA La Hague facilities for centralized storage in pools and reprocessing. Nevertheless, AREVA has also an experience in dry storage of spent fuel in casks through its daughter companies such as TN International (France) and Transnuclear (USA) in many countries like Belgium, Switzerland, Armenia and the USA. The CEA stores its spent fuel in two facilities localised on the Cadarache Site, one of them being a dry-storage bunker for spent-fuel elements cooled in pits by natural convection (casemate d'entreposage à sec d'éléments combustibles usés avec refroidissement des puits par convection naturelle – CASCAD) in order to store most of the spent fuel from the CEA's activities in the civilian nuclear sector. This facility contains 317 pits or shafts.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses

2	Slovakia	General	p. 15	2		**For which kind and amount of RAW a final solution is still pending?**	[1] There are RAW for which a final solution is not yet available but is identified, planed or under study:
							- HLW an IL-LLW (geological disposal 2025) / Volume (conditioned) expected in 2020:
							  - HLW: 3,700 m^3
							  - IL-LLW: 47,000 m^3
							
							- LL-LLW (radium bearing and graphite waste) which should be disposed of in a near surface repository (under several ten meters). The project is still under study.
							  - Volume (conditioned) expected in 2020: 115,000 m^3.
							
							[2] However there is some waste without defined management routes, in the present state of knowledge. This waste has been identified and volumes are small. In the framework of the future version of the PNGMDR, 3 priorities have been identified:
							- free asbestos (400 m^3)
							- mercury (6.2 t) and mercurial waste (300 m^3)
							- oils and organic liquids which cannot be incinerated (less than 300 m^3).
							
							R&D is conducted to find solutions for this kind of waste. The objective is to treat it with chemical impact in order to be acceptable in one of the existing or planed repository.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	Slovakia	Article 15	H.5, p.140	3		The report states that licence do not include any time limit. **[1] What are the instruments of ASN to force the operator to comply with the safety requirements/improvements after a PSR?** **[2] Do you perform periodic safety assessment also for waste pre-disposal management facilities?** **[3] If yes, is the methodology the same/similar as for nuclear power plants or is different procedure applied? Please specify these procedures and provide more details on this issue.**	[1] After a periodic safety review, ASN assesses the report of the operator and is entitled to impose new technical prescriptions. If the licensee of an installation does not comply with these prescriptions, ASN is competent to urge him to have the work or to suspend operation. [2] Indeed periodic safety reviewing (by the licensee) and the corresponding assessment by ASN are performed for waste pre-disposal management facilities. [3] The methodology is the same as for nuclear power plants. It is defined by the article 29-III of the TSN Act of 13 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/22273/123572/file/loi TSN-uk.pdf), by the article 24 of the Decree of 2 November 2007 and part III 3 “safety demonstration” of the ministerial order of 7 February 2012 (available in French http://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000025338573&dateTexte=&categorieLien=id).

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	Slovakia	Article 16	H.6.2.1,143	4		**For your disposal facility, please describe the way of application of IAEA recommendations to limit activity of long lived radionuclides up to 4000 Bq/g for individual waste package in relation to 400 Bq/g as average limit of those radionuclides.**	The technical prescriptions for the surface repository (LIL-SL waste) issued by ASN require that long-lived radionuclides do not exceed specified limits fixed by these prescriptions. In particular the limit for the total alpha emitters are: - for each waste package: concentration less than 3700 Bq/g; - for each disposal unit: concentration less than 1000Bq/g; - for the whole of the waste packages when the repository is filled: 370 Bq/g. Concerning the limit of 3700 Bq/g for each waste package: - the producer calculates the alpha activity of each package. The calculation is based on direct or indirect measurement (method to be approved by Andra) and made at 300 years; - the producer declares the characteristics of each package electronically to Andra before shipment (he is supposed to have verified the above requirement as to 3700 Bq/g); - Andra checks electronically the consistency of the producer's declaration for each package. No package over the specified limits is disposed of; - Andra records the declared characteristics; - Andra carries out some destructive and non-destructive tests from time to time and may ask the producer for improvements accordingly, being understood that the conformity of each waste package relies fundamentally on the quality assurance provisions defined by the producer and audited by Andra. As to the disposal units, on the one hand, the whole of the waste packages is disposed of and on the other hand, the verification is made by Andra. ASN is informed of the process and the results and conduct inspections on these issues.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	Slovakia	Article 16	H.6.2.1,143	5		**Does the safety case for your near surface repository take into account scenarios determining heterogeneous distribution of activity to enable e. g. disposal of some spent sources?** **If yes, what kinds of methodology and scenarios are applied?**	One characteristic of the disposal of disused sealed radioactive sources near surface or at an intermediate depth relates to an exposure risk in case of human intrusion and recovery. Acceptance criteria for disused sealed sources in surface or low depth repositories are defined considering such scenarios of radiation exposure. Safety scenarios take indeed into consideration a potential retrieval of sources after the institutional control period. Scenarios that were assessed are derived from the investigation of accidents that actually occurred with sealed sources (and that are reported in IAEA documentation).
2	Slovakia	Article 18	p. 61;64;73	6		**[1] Does the current legislation concerning RW pertain also defence program and production of RW in this area? (p. 61;64;73)** **[2] Are RW treatment and storage facilities specified in section Annexes L2 used also for RW coming from defence program? (p. 167)**	[1] As all repositories are civil, the legislation is the same in the field of radioactive waste acceptance whatever the waste originates from defence program or civil installations. The waste must comply with Andra's specifications and Andra has to make verifications on site in both cases (civil and defence installations producing radioactive waste). The requirements concerning the safety of the "secret basic nuclear installations" (i.e. working for defence) producing radioactive waste are laid down in regulatory documents different from those concerning civilian facilities, but the requirements of both regulations are consistent. The radioactive waste originating from defence program is included in the National Inventory and the PNGMDR. [2] The treatment and storage facilities inside secret basic nuclear installations are not listed in Annexes L.2 but the civil disposal facilities CSFMA and CSTFA which receives waste from defence program as well as waste from civilian nuclear installations are listed in Annex L.2. It is the same for the treatment facility Centraco.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	Slovakia	Article 26	F.6, p. 108	7		**Please provide your experience with selection, archiving and long term transfer of operational information relevant for decommissioning including guidance on implementation of these records for preparation of decommissioning plant.**	Concerning the basic nuclear facilities (BNI), the operational information had been recorded and stored during all facility lifetime. Archiving of these data was usually performed through paper medium or electronically. For this reason, the situation of the facilities before decommissioning is generally known. The assurance quality plans set up also defines the information required to prepare decommissioning. Attention is also paid for transferring the knowledge from the operator to the dismantler.
2	Slovakia	Article 32	D.3, p. 55	8		**Please describe in more details the management of large components with focus on their disposal and provide regulatory approach to safety assessment for their disposal.**	For the management of large components, a solution taking into account the dismantling operation, waste transportation, waste management and waste storage is optimized for cost, security, radiation protection, environment and safety in connection with ANDRA and EDF. In certain cases, waste is stored as a single piece (e.g. reactor vessel head) and in other cases; waste is cut into several pieces (as with the steam generators of Super-Phénix). There is no specific regulation concerning the disposal of large components. The regulatory approach remains based on the Basic Safety Rule I.2. In particular there is no difference concerning the safety objectives between the management of large components and current radioactive waste packages. However ASN is aware of the specificities of large components. This is why the disposal of large components at the centre de l'Aube is performed on the basis of a case by case study including the development of dedicated safety scenarios that are relevant for the considered large item. The main operation up to now was the disposal of 55 EDF reactor vessel heads which had been replaced by EDF. Andra sent, among other things, a safety report analysing the risks in operation and on the medium and long terms. ASN assessed the report and asked Andra for complements (acceptance procedure, activity evaluation, conditioning, safety demonstration). After receipt of a

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							revised report, ASN authorized in 2001 the vessel heads to be disposed of. The maximum authorized values of radionuclides content per vessel head were attached to ASN's authorization. Of course this type of operation was included in the recent safety review of the CSFMA. Having in mind some possible future operations with large components Andra intends to complete its acceptance specifications by including acceptance criteria for this type of waste. ASN will analyse Andra's request in due time. The overall relevance of disposal of large components should be assessed in the framework of a technical guide that will be issued by NEA in 2013; this guide was written within a working group including operators and regulators.
2	Slovakia	Article 32	p. 22	9		**What are the main milestones of the development of a geological disposal within the updated PNGMDR 2010?**	Research related to the long-term management of high or intermediate level and long lived (HL/IL-LL) radioactive waste is being pursued, mainly around the three research objectives defined by the Planning Act of 28 June 2006: reversible deep disposal (reference option), the separation-transmutation of long lived radioactive elements, and storage. In addition, complementary research is also being conducted on the processing and conditioning of the waste. The objective is to have by 2015 sufficient elements to file an authorisation for implementation for a deep disposal centre. The PNGMDR recommends research, which is to be pursued and increased in the upcoming years and which will aim notably at implementing conditioning modes adapted to IL-LL waste containing organic substances and at specifying the conditioning modes for all the historical IL-LL waste still not conditioned (for which the law stipulates that it must be conditioned before 2030). The PNGMDR states additional steps for the definition of the HL/IL-LL waste management route: - on the deep repository: Andra will pursue its research and studies in order to submit by the end of 2012 a

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							support file for the organisation of a public debate on waste scheduled for 2013, consisting of notably a site proposal for the location of the disposal centre. Thereafter, Andra will file an authorisation application to create the repository by the end of 2014, in conformity with the legally fixed objective; - on separation-transmutation: the research assessment conducted by CEA will be completed and updated in 2012; it will include notably industrial perspectives and the advantages of this process with respect to direct deep disposal. In parallel, a feasibility review on fourth generation nuclear reactors will be carried out in 2012 to assist in making a selection between the studied reactor types; - on storage: Andra is to submit by the end of 2012 an assessment of all the research and studies which it will have driven and coordinated.
2	Slovakia	Article 32	p. 42	10		**The report states that some nuclear medicine service encounter technical problems in installing storage devices. In this regard what is the technical and health bases to set the criteria of 100 days for the half lives of radionuclides?**	The “100 days rule for the half live of radionuclides” is an “historical rule” used in France to manage radioactive wastes and effluents from nuclear medicine services. It is not based on any “health arguments” but only on practical issues. Most of radionuclides used in these services are characterised by a period less than 100 days, and therefore managed on site by radioactive decreasing. The period of iodine 125 (very closed from 100 days) was the reference.
2	South Africa	Article 16	H.6.1, p. 142	1		**What is the periodicity of ASN inspections at ANDRA and does ASN also perform independent inspections on authorised facilities?**	Indeed the inspections performed by ASN on authorized facilities are independent. Among them, there are inspections on Andra’s facilities CSM and CSFMA repositories, with the following periodicity: - 2 inspections/year on the CSM now in surveillance phase; - 4 inspections/year on the CSFMA which is in operation.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	South Africa	Article 18	E.1.2, p. 62	2		**What are fundamental differences between the regulatory framework for INBs and uranium mines with regard to the radiological safety standards that must be complied with in such operations?**	The regulation for uranium mines is different from the one for INBs as it is explained in the French report. Storage sites for waste uranium mines are regulated by the environmental code for the ICPE (classified facility on environmental-protection grounds - Decree No. 2006-1454 of 24 November 2006 created a specific category 1735 for these sites) or by the mining code. ICPE legislation is described in § E.1.2 of the French report. However, the Planning Act of 28 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/15563/100904/file/Loi_dechets_2006_+ENG.pdf) required “an appraisal in 2008 of the long term impact of the disposal sites of uranium tailings and implementation of a strengthened radiological surveillance plan at these sites”. This requirement is of the same nature as the requirement currently applied to INBs like the CSFMA. AREVA provided an impact study which was assessed by ASN (see ASN opinion of 25 August 2009 available in French on the ASN website). In a circular dated 22 July 2009, the ministry responsible in charge of ecology and ASN established an action plan covering the following areas of work: - supervising the former mining sites; - improving understanding of the environmental and health impact of the former uranium mines and their surveillance; - waste rock management: achieving a better understanding of its uses and reducing its impacts if necessary; - improving information and dialogue. The PNGMDR includes the safety of those sites. The PNGMDR 2013-2015 will continue to deal with this issue as it was done by the previous version of the plan.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	South Africa	Article 19	E.2.2.7.2, p 72	3		It is noted from your report that for major issues, ASN requests the opinion of the competent GPE before which ASN itself or its technical support organisation tables the results of its assessments; for the majority of other matters, safety analyses are the subject of an opinion to be sent directly to ASN by the IRSN. **What has been the role so far of the GPE in terms of technical aspects of deep geological disposal and are foreign experts also consulted by the GPE?**	When preparing its resolutions or opinions, ASN asks for opinions and recommendations from the Advisory experts groups (GPEs). As mentioned in the report there are 7 GPEs. The GPE competent in the field of waste, including the deep geological disposal project is the GPD. This GPD is composed of 35 experts nominated for their individual competences. Among them there are at the present time 5 experts from foreign countries. Because of the large variety of experts (ASN, IRSN, licensees, associations, foreign experts…) the GPE meetings and therefore their opinion and recommendations are essential. For further details see: http://www.french-nuclear-safety.fr/index.php/English-version/Technical-support/The-Advisory-Committees ASN publishes the documents related to the GPE meetings (held since 1st October 2008) in the French version on its website. The GPEs opinions and recommendations as well as the IRSN report (which is used during the GPEs meeting) and the ASN stances are available. As regards the deep geological disposal project, the last GPD (GPE for waste) was held on 29 November 2010: http://www.asn.fr/index.php/Les-actions-de-l-ASN/Les-appuis-techniques/Les-groupes-permanents-d-experts/Groupe-permanent-d-experts-pour-les-dechets-GPD

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	South Africa	Article 19	E.2.2.7.2, p. 71	4		It is noted from your report that Any “significant event” (see § E.2.2.4.4) relating to the safety of an INB, to the radiation protection of workers, members of the public and the environment, or to the transport of radioactive materials, must be promptly declared to ASN. **Does ASN use the INES system for all occurrences or a system integrating INES and national critera/requirements?**	The INES Scale is used to communicate to the public the safety significance of nuclear and radiological events. In France, any event characterised as "significant" according to ASN's specific guidance (available in French http://www.asn.fr/index.php/Haut-de-page/Professionnels/Installations-nucleaires-de-base/Guide-relatif-aux-modalites-de-declaration-des-evenements-significatifs-INB-et-TMR) has to be declared. This Guidance includes every step of the declaration and the information / analysis expected from the licensee by the regulator. In particular, the declaration has to include an INES rating proposal based on INES user's manual. ASN has defined events declaration criteria in several fields: safety, radiation protection of workers, protection of the public and the environment, transport of radioactive materials. Information of the public is made according to the importance of the event: - Events concerning nuclear installations and radioactive material transport rated at level 1 on INES scale and beyond are systematically released on ASN website (http://www.asn.fr/index.php/Les-actions-de-l-ASN/Le-controle/Actualites-du-controle/Avis-d-incidents-des-installations-nucleaires). A press release is also published for events rated at level 2 and beyond and these events are published on IAEA/USIE website. - All events concerning radiation protection rated at level 1 are released on ASN website. In the case of the loss of radioactive sources, events at all INES levels are notified to IAEA and those above level 2 published on IAEA/USIE website. - For information, events concerning patients in the field of radiotherapy are also released on ASN website according to their rating on the ASN/SFRO scale.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	South Africa	Article 19	E.2.2.2, p. 65	5		It is stated that French Government has to inform neighboring countries in accordance with treaties that it is siting INB. **[1] What are the implications in terms of liability in case of an accident at the INB?** **[2] What legal recourse does neighboring countries have in case they are opposed to the siting of an INB?**	[1] In case of accident, damages are compensated in the conditions defined in the modified Paris convention of 29 July 1960 and the modified Brussels convention of 29 July 1960 both of them signed and ratified by France as well as the national civil liability regime which empowers the provisions of these conventions. [2] Neighboring states can express their opposition during the public enquiry consultation preceding the authorization of the plant. They can decide to take legal actions against the decree authorizing the plant.
2	South Africa	Article 23	F.3.4, p. 92	6		**Does IRSN interact directly with the holders of authorisation and how is this process managed by ASN?**	IRSN interacts directly with the holders of authorisation to get further information in the course of the assessment phase leading to its report on the considered facility. This additional information is provided through documents and discussions. IRSN does not regulate the holders of authorisation and therefore does not interfere with ASN responsibilities.
2	South Africa	Article 24	F.4.1.4.1, p. 96	7		**Has there been guidance for the yearly forecast of discharges to holders and how will this be assessed by ASN experts?**	Discharges limits are based on the best available technologies and as low as the exploitation permits it. Until now, the licensees are not bound by regulation to provide a yearly forecast; even most of operators do it internally for operational reasons. Nevertheless, a new regulation was published at the beginning of 2012: operators will have to communicate to ASN the forecasts of releases each year. Operators bear the responsibility of these forecasts, but they will have to justify to ASN and to the local information commission (CLI) any differences between forecasts and actual discharges.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	South Africa	Article 24	F.4.2.2.4, p. 100	8		**What is the frequency of independent monitoring for Sr90 by the Regulatory Body and if detected, how are the results evaluated?**	The monitoring of Sr90 in liquid discharges is performed for operating NPPs and reprocessing plants. For some sites with legacy, the monitoring is also performed in the subterranean waters. For NPPs, the monitoring for Sr90 is done by an independent laboratory, once a year on a monthly aliquot of liquid waste. Until now, the results for all NPPs have always been measured below a decision threshold, so a yearly measurement seems appropriate. Besides, as part of its national monitoring mission, IRSN performs independent monitoring for Sr90 in surface water and groundwater (about 250 measurements per year), of plants (about 50 measurements per year) but also of milk (about 125 measurements per year). Sr90 is still detected in milk and environmental samples. It comes almost exclusively from the past atmospheric nuclear tests, except in the vicinity of sites that have authorisation to release Sr90 (as Marcoule). Outside influence of nuclear facilities in operation, the levels of Sr90 observed in food are generally between the detection limit of 0.01 Bq/kg fresh weight and 0.1 Bq/kg fresh. When a measurement result differs from activity levels usually measured on the same type of matrix and in the same region, there is an investigation in the nuclear installations nearby to identify the origin of this activity.
2	South Africa	Article 25	F.5.1, p. 105	9		**What are the plans in France with respect of the implementation of the ICRP/IAEA protection strategy for emergency exposure situations?**	In France, the Public Health Code and the Labour Code give the legal prescriptions regarding the radiological emergencies and the emergency exposure situations. These prescriptions were prepared before the ICRP recommendations. There are not major discrepancies between the French regulations and the ICRP recommendations. The ICRP recommendations have been taken into account in on-going works such as the preparation of the French doctrine for post accident matters (CODIRPA). In the future, some potential modifications and improvements may be made in the French regulations once the new Euratom Basic Safety Standards will be issued.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	South Africa	Article 25	F.5.1, p. 106	10		It is noted from the report that bilateral conventions may be signed with the authorities of bordering countries. **[1] How many bilateral conventions has France signed to date with its neighbouring countries?** **[2] How frequently are these conventions reviewed if there are any?**	[1] France has bilateral agreements on emergency matters with the following neighbouring countries: Luxembourg, Belgium, Switzerland, Germany, Spain, Italy. There were signed by the Government. [2] ASN together with the French ministry of interior, the involved prefectures, IRSN and the counterparts on the other side of the border prepared the implementation of operational documents deriving from these agreements several years ago. Some of them are still not finalized. Yet, they should be evoluting documents, dealing with crisis organization on both sides of the border, contact points, etc., and so are not necessarily dedicated to be signed.
2	South Africa	Article 25	F.5.1, p. 105	11		**How often are emergency exercises conducted at radioactive waste management facilities and how are they performed?**	Each radioactive waste management facility has a specific on-site plan (PUI) which stipulates the frequency of the site exercises. The operator is responsible for the implementation of on-site exercises. For the installations with an off-site plan (PPI), an exercise must be done at least every five years, involving public authorities. These national exercises are defined in a regulatory document (circular) each year. There is not any specific frequency because it depends on the annual priorities. For example, La Hague performed an emergency exercise last December in which the operator (local and national levels), the prefect, ASN and the IRSN were involved.
2	South Africa	Article 32	p. 44	12		It is noted from your report that the management of former uranium mines is the subject of continuous attention from French public authorities since those mines were closed. Once the sites were secured, their management continued by restoration, rehabilitation and monitoring measures. **Please explain what regulatory standards/criteria have been put in place for the disposal of mine tailings?**	Mine tailings are classified facility on environmental-protection grounds (ICPE) with a special monitoring. The regulatory standards/criteria on ICPE are set by the Environmental Code, including his book V. The regulatory fixes that the limit added dose for members of the public due to the mining and industrial activity must be lower in 1 mSv per year. See also the response to § E.1.2, (p. 62)

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	South Africa	Article 32	p. 55	13		It is noted from your report that after two years of operation, ANDRA requested the Prefect of the Aube département to increase the annual volume of the facility from 24,000 to 37,000 m3 and to modify some operating conditions (cover slope, leachate-pumping rule). The request was granted by the Prefectoral Order of 21 July 2006 and allows ANDRA to face adequately the rise in VLL-waste stream, with due account of current dismantling operations. **What process does the Prefect follow to approve the changes to the waste facilities and how is the Regulatory Body involved?**	The CSTFA is a classified facility on environmental-protection grounds (ICPE) and not a basic nuclear installation (BNI). The ICPE system comprises objectives that are similar to those for BNIs, but it is not specialised and applies to a large number of installations involving risks or detrimental effects of all types. The CSTFA facility requires a licence issued by order of the “préfet” comprising requirements which may be subsequently modified by a further order. The licensing procedure begins with a licence application containing an impact statement and a risk study. It is subject to various consultations, notably with local communities, and a public inquiry. The procedure ends with the issue (or denial) of the licence in the form of a “prefectoral” order containing requirements. Requirements imposed on licensed facilities are set on a case-by-case basis, depending on the characteristics of the facility. The Nuclear Safety and Radiation Protection Mission (Mission de sûreté nucléaire et de radioprotection – MSNR) is the ministerial service placed under the authority of the Minister of Ecology and Sustainable Development, the Minister of Industry and the Minister of Health, in order to deal on their behalves with the issues pertaining to the government’s jurisdiction in the field of nuclear safety and radiation protection. In particular, the MSNR co-ordinates all regional activities regarding ICPE where radioactive substances are involved.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	South Africa	Article 32	D.3.5, p. 56	14		**What role does the Regulator play in the research concerning the deep geological disposal activities?**	Research concerning the deep geological disposal project is carried out essentially by the main research centres (BRGM, CEA, …) and by French and foreign universities. Research is managed by Andra (definition of the programmes, follow-up, integration of the results into the project). Andra has a scientific council which assesses the research works. According to the Planning Act of 28 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/15563/100904/file/Loi_dechets_2006_+ENG.pdf) a national commission is tasked with evaluating, annually, the progress of research and studies on the management of radioactive materials and waste (Commission nationale d'évaluation – CNE): see § E.3.4.2 of the report. The IRSN (ASN's technical support) does research on different issues, including deep geological disposal (Tournemire experimental station, European programmes, etc.). ASN considers it has no vocation to conduct research by itself. However ASN has recently decided to take actions in the field, particularly in the definition and the development of the research works. This is the reason why, in 2008, ASN created an internal network of correspondents on this issue and met the main research centres and operators. Then ASN set up a scientific committee on 5 May 2010.
2	South Africa	Article 32	D.3.4.2, p. 54	15		**Noting that tritium has been detected in the water table, what plans does France have to ensure that the conatminated water does not affect the environment?**	This question is related to CSM. The tritium has been detected in 1976 and waste was retrieved (see also the question asked by Germany on retrieval of waste). But the pollution diffused and is still transported by the groundwater. The impact was never significant. Presently it is of 0.36 µSv (see also the related question asked by China).
1	Spain	General	F.4.1.2	1		**Regarding the implementation of the R.4451-10 al 11 of the Labour Code in nuclear installations for spent fuel management or radioactive waste facilities in France, how is the ALARA principle implemented under the**	The ALARA principle is implemented in AREVA Nuclear Safety Charter which specifies that AREVA is committed to keeping personnel exposure to ionizing radiation in its facilities as low as reasonably achievable in application of the ALARA principle, and has adopted a continuous improvement program to that effect.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
						organizational point of view (e.g. ALARA Committee, procedures…)?	
1	Spain	General	F.4.1.2	2		**How are the inspections to spent fuel and radioactive waste facilities and decommissioning activities carried out in France, on the aspects of occupational radiation protection and on the application of the ALARA principle (e.g. technical guides, procedures…)?**	First of all, the safety reports include a chapter concerning the occupational radiation protection (based on the ALARA principle). For information, this chapter for the CSFMA represents 110 pages. Inspections are conducted to verify the application by the licensee of the measures described in this chapter. Besides, for major operations, especially in the dismantling phase, ALARA studies are required and are assessed by ASN. An inspection may be conducted accordingly. In addition, in the course of inspections the measures taken by the licensee for minor operations may also be examined.
1	Spain	General	F.4.1.2	3		**[1] Does France publish periodically the results of the dosimetry control to exposed workers from spent fuel and radioactive waste facilities and decommissioning activities?** **[2] How frequently?** **[3] Does France publish the results of consecutive years?** **[4] Could you provide reference to any document/s where this information could be looked up and updated?** **[5] Additionally, we would appreciate receiving a summary of maximum and collective doses for the last five years as well as bar charts, if possible.**	Each year, IRSN assesses the monitoring of the workers' exposure in all sectors of activities in a report sent to the Ministry of Labour, to ASN and to the Delegate for the Nuclear Safety of National Defence Activities and Facilities (DSND). According to the Labour Code, this report has several objectives: - to highlight difficulties in the monitoring of workers' exposure, - to detail workers' exposure levels according to the nature of professional activities. The monitoring assessments of external and internal exposures are based on data collected by different entities tasked with ensuring workers' monitoring (dosimetry laboratories, biological and medical analysis laboratories, health services for workers, etc.). All the reports are publicly available on SISERI website (in French: http://siseri.irsn.fr/index.php?page=bilans/bilanexpo). In particular, they include the results of consecutive years in the nuclear industry field.

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							Maximum and collective doses are developed in the reports mentioned per activity sectors, in particular fuel cycle facilities and decommissioning activities (§ 4.3 of 2010 report).
1	Spain	Article 32	p. 28	4		CEA´s spent fuels are stored in the CASCAD storage facility on Cadarache Site. **[1] Could France provide information on the design life of this vault storage facility, and the duration the licence?** According to the data included in the national report, the CASCAD storage facility was licensed in 1980. **[2] Could France provide information on the storage facility operational experience? Has the facility been subject to periodical safety reviews taking into account the operational experience and the update of international applicable standards and practices?**	[1] The CASCAD facility at CEA/Cadarache is a dry-storage bunker with 317 pits or shafts. Shafts contain various types of fuel in this dry-storage facility which only accepts experimental fuel. This facility is the current reference design concept for CEA's spent fuel storage. This concept is designed for a 50 years duration. However, in France, after the license application for creation of a new facility has been submitted, reviewed and agreed, a 10 years periodic process of complete safety re-evaluation is done for basic nuclear installations (BNI). The initial license is a decree signed by the ministers in charge of nuclear safety, after an ASN consultation, and the continuation is agreed after each safety re-evaluation by ASN. [2] According to the French nuclear operating system, each storage facility is subject to periodical (10 years) safety review as all the French BNIs.
2	Sweden	General	A 2.3, p. 16	1		The text refers to a Technical Meeting on the creation of a national radioactive waste management organisation. It is described that the significance of having a radioactive-waste-management agency, independent from the producers, was emphasised. **[1] Could you please elaborate on this in relation to the polluter-pays-principle (PPP) according to which the waste generators would be directly responsible (i.e.**	[1] In the French case, radioactive-waste-management agency "ANDRA" is independent from waste producers. Achievement of the polluter-pays-principle is demonstrated, as the financing of ANDRA operations is mostly coming from waste producers either via contracts or via taxes on producers. The financing from producers is ensured through mandatory financial provisions and portfolio system (see above). This regulation ensures the safety level of waste management. [2] As part of these agreements, waste producers offer to Andra their industrial feedback and skills as necessary to develop the deep geological repository project in compliance with the responsibilities of each. These provisions plus systematic exchanges along project

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
						not independent form the waste management organisation) for management and disposal of spent fuel and radioactive waste, under the supervision of a competent regulatory authority? **[2] Also, could it not be so that that having an independent agency for developing methods as well as managing and disposing of spent fuel and radioactive waste might lead to a more costly solution than having the nuclear companies taking responsibility for this? Please elaborate.**	progress allow Andra to benefit from the same economic competitiveness drivers that would be available as waste producers. In order to ensure that having an independent agency for developing methods as well as managing and disposing of spent fuel and radioactive waste shall not lead to a more costly solution than having the nuclear companies taking responsibility for this, the government has created a committee for industrial coordination of nuclear waste (CICNW). This committee is chaired by the director for energy and is composed of ANDRA and the producers of nuclear waste (EDF, Areva, and CEA). Among other issues, it deals with the GDF project. Although ANDRA remains fully responsible for the project, this organisation enables producers to get the necessary information in order to challenge the agency. Moreover, for the geological disposal for example, according to French law, Andra has to propose the corresponding cost to the Minister of energy, after having received (1) the recommendation of the radioactive waste producers and (2) the recommendation of ASN. The Minister then issues an evaluation of the global cost of the project by ministerial order. In addition to this regulatory framework, ANDRA regularly submits the project to an independent review team.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	Sweden	General	A.2.1.1, p.14	2	We believe the date given for developing and notifying the Commission of national management programmes is incorrect, it should be 23 August 2015, not 23 August 2013. We also note that the text describing what the national programmes must comply with is somewhat different from the English version of the Directive which may create confusion, e.g.: French report: “the production of radioactive waste must be kept at the lowest possible level” EC Directive 2011/70/Euratom, Article 4, 3: “the generation of radioactive waste shall be kept to the minimum which is reasonable practicable…” Also the description of the… disposal of waste in the Member State where it was produced does not really follow the text of the EU-Directive? **Why are these reformulations made?** In this type of formal document we would suggest to have as exact wording as possible when referring to texts in other legal documents.		Thanks a lot for your comments. As the report is first written in French and then translated in English, it might happen that our translation service translates the text of the report initially in French without verifying that an official version in English is available. ASN will strive to pay attention to this specific point in the next national reports.
2	Sweden	General	A.2.2.1 p.15-16	3		The licensee or operator of a nuclear facility has the prime responsibility for safety. In those activities where waste is produced, at the authorization stage, the	[1] As it is mentioned in the French report (§ A.2.2.1), the Planning Act of 28 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/15563/100904/file/Loi_dechets_2006_+ENG.pdf) entrusts upon the government to develop a National Plan Management for Radioactive

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
						justification and optimization of the operation of the facility (management of the activity) as well as the management of the radioactive waste should be considered simultaneously. **How is it ensured that the elaboration of the PNGMDR (with prescription of deadlines for implementation of management modes, creation of facilities, etc) is not infringing on or taking over the responsibilities and tasks of the licensees/operators, e.g. how are the different and separate roles of the legislator, the authority and the licensee/operator guaranteed?**	Materials and Waste called PNGMDR and to update it every three years. The same Act has set the objectives (article 6, see § A.2.2.1 of the French report). The PNGMDR is both descriptive and guiding and is not of a regulatory nature. It is the function of the law and decrees to set up the objectives and requirements. To carry out such a plan, a number of competencies are needed. This is why the plan is carried out by a pluralistic working group placed under the aegis of ASN and the Directorate General of Energy and Climate (DGEC). [2] The responsibility of the working group members is clear: - DGEC is in charge of the policy concerning energy and raw materials (DGEC belongs to the ministry in charge of environment and energy), - MSNR represents the Administration for nuclear safety and radiation protection, - ASN is tasked, on behalf of the State, with regulating nuclear safety and radiation protection in order to protect workers, patients, the public and the environment from the risks involved in nuclear activities. It also contributes to informing the citizens, - IRSN is the technical support of ASN, - Among other things Andra is responsible for establishing a national inventory of radioactive materials and wastes and for designing, installing, building and managing radioactive waste storage or disposal centres, - The licensees/operators are responsible for the management of their waste, technically and financially. [3] The PNGMDR is tabled before Parliament which in turn refers to the Parliamentary Office for Science and Technology for assessment (OPECST). [4] The measures implemented and the organisation set up have the objective to improve the waste management process without infringing on or taking over the responsibilities and tasks of the licensees/operators.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	Sweden	Article 12	H.2.2.2, p. 131	4		This section describes that the treatment of historic wastes poses challenges as it raises specific problems relating to recovery, characterisation and treatment and once it has undergone specific processing, the waste is sent to existing or new treatment facilities. It is further described that the waste involved includes mainly; solid waste placed generally in drums, which are stored in pits, cells or ditches; solid waste buried in open ground under various forms (in bulk wrapped in vinyl, in metal drums or concrete casks), and; liquid aqueous and organic waste, contained in tanks, carboys or drums. **[1] Could you please elaborate on whether there are standardised methods for treatment of the liquid waste?** **[2] If so, could you please describe this method/methods?**	There are no standardized methods for treatment of the liquid waste but main criteria for selecting different treatment processes (incineration, filtration, co-precipitation, vaporization and concentration, solidification by encapsulation in concrete, bitumen or epoxy matrix, vitrification in glass, etc.). For ex. sludge resulting from site effluent treatment, are embedded in concrete matrices. Due to the huge diversity of R&D facilities in historical nuclear research centres there are no scale and series effects. Furthermore, due to the traceability level versus waste diversity resulting from back end and front end fuel cycle and reactors researches, each historical waste class needs a specific treatment process. The priority is the safe storage of historical wastes using a detailed feedback experience to challenge the treatment programs taking into account the main criteria: Liquid wastes are sorted to segregate aqueous liquids and organic liquids, according to the concentration levels of corrosive elements (halogens), the radiolysis gas flux (hydrogen) the solid load and the chemical compatibility (Cf. § B.6 and H.2).
2	Sweden	Article 12	H.2.3, p. 133-135	5		This section contains a listing of different historical liabilities. **Is the management of those different wastes equally challenging or are there some specific historic wastes that poses more challenges than others?**	The management of historical waste depends on their characteristic and the specifications of the storage facility. Hence, the management of the different waste is not equally challenging. Thermal processes, especially as temperature increases over several hundred degrees like in vitrification/incineration process, give rise to more challenging issues on safety and reliability points of view than compaction or cementation processes. However, such thermal processes lead usually to performing long term behaviour regarding waste stability and lixiviation in storage facility. For graphite sleeves, the main issue is related to the

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							shallow disposal for LL-LL waste. The process of site selection for this repository is currently suspended.
2	Sweden	Article 12	H.2.3, p. 133-135	6		It is stated that “precise characterisation of historical waste” should be performed by the INBs. **Is this possible for all historical waste or do there exist drums with undefined content which are difficult – or impossible – to characterise “precisely”?**	The level of characterization is considered sufficiently "precise" when it allows to define a treatment route for waste and/or to guarantee that the waste will be packaged according to ANDRA specifications. The deal is also to quantify if a given component has an impact on the mean characteristics of the packaged waste. To obtain a sufficient waste knowledge level for historical waste, the characterization program is basically and firstly based on the traceability of waste producing process and details of historical treatments applied to this waste. Due to the huge diversity of waste produced by R&D programs during one half a century of nuclear researches, each historical waste class needs a specific treatment process. During retrieval operation, CEA proceeds to complementary chemical and radiochemical characterization before waste re-packaging. Traceability concerns on the one hand the origin and characteristics of the waste and on the other hand the kind of treatment or packaging applied in each facility.
2	Sweden	Article 13	H.3.2.1, p. 137	7		This section describes Andra´s development work to establish a HLW repository. **Is there a detailed time plan for what type of different wastes, and when, that will be emplaced for disposal in the repository during the rather long period of time for operation of the facility?**	Andra and waste producers (AREVA, CEA, EDF) have established an "industrial waste management programme" which includes a waste delivery time-schedule taking into account the whole operational period of the repository. This programme is used as a basis for the design of the repository as well as the development of logistic support.

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2	Sweden	Article 19	E.2.2.3.2, p. 66	8		This chapter includes a section describing the process for consultation of local public and authorities. It is not clear from the description whether the granting of a license for establishing a nuclear facility or a disposal facility requires an affirmative decision by the host municipality **[1] Could you please confirm whether the host municipality has the right of veto, or not, as regards the siting/establishment of a spent fuel or radioactive waste repository?** **[2] If that is the case, is there a possibility for the Government to overrule such a veto decision?**	[1] The Cigeo project is a national project. There is no local veto right in France. A public debate in planned in 2013 to allow for a direct dialogue with the public. From 2015, the license application will include a local public inquiry. By law the local communities will also be consulted by the Government. [2] The reversibility conditions of the repository will be discussed by the Parliament around 2016. Finally the creation of the repository will be a governmental decision taking into account all points of view.
2	Sweden	Article 20	E.3.1, p. 73-76	9		This section provides for an account of the Nuclear Safety Authority (ASN) as regards e.g. organisation and human and financial resources. Taking into account the size of the nuclear power program in France, the ASN organisation is rather slim and . a large part of the regulatory related work is performed by the TSO. **[1] How much work is done by TSOs?** **[2] And what is the rationale for having these resources by means of a TSO rather than within the ASN organisation?** **[3] What processes are in place to determine that the current**	The Institute of Radiation Protection and Nuclear Safety (IRSN) is at the present time the main technical support organization of ASN. Reciprocally, ASN represents the principal beneficiary of the expertise of IRSN (€ 73 million in 2009 that is 24% of the global budget of IRSN and 73% of its budget of expertise). This organization was intended by the legal framework: - the law of 9 May 2001 gathers the public resources of expertise and research within the IRSN, - the TSN Act of 13 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/22273/123572/file/loiTSN-uk.pdf) confirms the ASN position in establishing consultation by the Government on the part of the state subsidy to the IRSN corresponding to the technical support mission of the Institute to ASN. This particular status is reflected in a formal framework of relations between ASN and IRSN through a

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
						situation is appropriate as regards balance between internal resources (ASN) and external resources (IRSN and others).	complementary set of documents consisting in particular in a five-year agreement and an annual protocol. Independently of current relations between ASN departments and divisions and IRSN directions, relations are marked by meetings at several levels. Moreover, the ASN Chairman attends the meetings of IRSN board and ASN is associated with the preparation of the contract of objectives between IRSN and the State (COB), the medium and long term plan (PMLT). ASN managing director also serves on the IRSN research steering committee.
2	Sweden	Article 24	F.4.2.4, p.103-104	10		The improvements in radiation protection of workers belonging to EDF are well described. The situation for staff receiving the highest doses, the average collective dose per reactor and for crafts receiving the highest doses (insulation fitters, welders etc.) is well described. **In view of the use of operational dosimeters, could something be said about the typical doses to staff working with waste management or work with waste management operations?**	The dosimetry of EDF operators and contractors involved in the radioactive waste management represents 3 % of the overall dosimetry of the EDF PWR fleet.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	Sweden	Article 25	F.5.1.2.2, p.106	11		**[1] For radioactive waste management facilities and facilities managing spent nuclear fuel away from the reactor sites – is the distribution of iodine tablets then really necessary (Assuming that any iodine –131 then has decayed)?** **[2] Are there any specific requirements for the emergency planning made for the waste management facilities?** **[3] How often are exercises performed?**	[1] France organizes pre-distribution of iodine tablets for all the NPPs and some other types of nuclear installations. There is no pre-distribution of iodine tablets for radioactive waste management facilities and facilities managing spent nuclear fuel far from any reactor site as, in the event of an accident, no or few radioactive iodine would be released. [2] The emergency planning is detailed in the on-site plan (PUI) prepared by the operator. Each radioactive waste management facility has its own on-site plan (PUI) depending on its specificities and the potential (natural, human...) threats. ASN gives its approval before the implementation of the PUI, based on IRSN specific technical analyse. Some of these installations also have an off-site plan (PPI), prepared by the prefect, which stipulates the local emergency organization in the event of an accident. [3] Each on-site plan (PUI) details the frequency of the site exercises. For installations with PPI, there are also exercises testing the off-site crisis management. The frequency of national exercises is at least every five years. For example, La Hague performed an emergency exercise last December in which the operator (local and national levels), the prefect, ASN and the IRSN were involved.
2	Sweden	Article 32.1	B 1.7.2, p. 25	12		It is described that pursuant to the 2006 Planning Act, a specific fund was created within ANDRA in order to finance investigations and studies on storage and deep geological disposal, and that the amount of that tax is calculated as the product of a lump imposition by an adjustment factor. **Could you please explain:** **1. what is the basis for this lump sum?** 2. **How it is estimated or calculated?**	The lump sum is determined by the Planning Act of 28 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/15563/100904/file/Loi_dechets_2006_+ENG.pdf) for each category of basic nuclear facilities (INB): - Nuclear power reactors - Nuclear reactors dedicated to research - Other nuclear reactors - Spent-fuel cycle facilities The French government checks regularly that the additional research tax is sufficient to finance the fund created for Cigeo's studies & researches.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	Sweden	Article 32.1	B.1.2.2, p. 20	13		It is stated that depleted uranium resulting from the enrichment of natural uranium is not widely used (only in the fabrication of MOX fuel) and is stored. Strictly speaking this was at least not earlier quite true, since depleted uranium was used in several civil activities (aeroplanes, boat keels, counter-weights in elevator/lift systems etc) and also in research. As we understand it, quite some amount of depleted uranium was used in detector systems at the European Particle Physics Laboratory CERN on the border between France and Switzerland. **[1] This material might perhaps not be of French origin?** **[2] Furthermore, can ultimate radioactive waste be stored so that, pending technical development in the society, it could become a radioactive material in the future?**	[1] It is true that some depleted uranium was used on several occasions besides MOX fuel fabrication. However the corresponding quantity is very low compared to the stock accumulated in France. According to the National inventory, published in 2009, the stock in 2007 was 254,800 t. An extensive use of depleted uranium is expected with generation IV NPPs. [2] The French law defines two management routes for ultimate radioactive waste. - For very short lived (half-life<100 days) radioactive waste, the management route is radioactive decay on the production site. - For short-lived (half-life<31 years) and long-lived (half-life>31 years) radioactive waste, the management route is the disposal in the relevant disposal facilities (surface disposal facility, sub-surface disposal facility or deep repository according to levels of activity). Depleted uranium, reprocessed uranium, thorium and plutonium are considered in France as reusable radioactive materials and are not considered as radioactive waste. A very small amount of ultimate radioactive waste is stored so that, pending technical development in the society, it could become a radioactive material in the future. This might be the case for some sealed sources, presently stored, containing long-lived radionuclides which could be reused in new sources. Among the materials such as steel and pieces of concrete coming from dismantling operations, the part reused in the nuclear sector might increase if the operators take the decision to do so (instead of being disposed of in the CSTFA). Of course if the decision is taken, the concerned materials will not be called “ultimate waste” anymore.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	Sweden	Article 32.1	B.1.3.1.1, p. 21	14		It is stated that one of the driving principles of the PNGMDR is *optimisation (cost/benefit) of all overall systems.* Now, the term optimisation is usually reserved for optimisation of the radiation protection/safety and refers to weighing whether the cost of the envisaged or foreseen protection measures are reasonable as compared to the lower radiation dose (or lower risk of receiving dose when this is not certain) expected as result of the measures taken. **Could you please elaborate on the use of optimisation in the context of cost/benefit of all overall systems?**	PNGMDR sets three orientations that are pursued in order to improve the global consistency of the management of radioactive materials and waste: - the definition of management routes for waste categories still without any management route; - the optimisation of the distribution of waste between management routes existing today or in the project stage; - research in the field of human and social sciences. The notion of optimisation of all overall systems concerns the distribution of waste between the different management routes. A working group has been created in this respect. Insofar as a global optimisation of the management of all French radioactive waste is difficult to accomplish, studies per waste type, processing type, and disposal solution are considered. The working group will propose progressive industrial scenarios which optimise distribution between the VLL, LL-SL, LL-LL and IL-LL management routes. This optimisation is understood to be the definition of, if possible upstream from where the waste is produced, the best processing and disposal management route with due consideration to: - the risks linked to each type of waste (notably in terms of dose with an ALARA optimisation as far as possible), - the disposal volume resource being considered as a “rarity” and, - the technical-economic aspects.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	Sweden	Article 32.1	B.1.5, p. 23	15		It is stated that the 2006 Planning Act specifies a minimum reversibility period of 100 years for the deep geological repository which seems to quite a long period of time. **[1] What risk analyses have been carried out, in comparison to a closed repository, as regards unexpected events during that relative long period of time, e.g. sabotage or natural catastrophes?** **[2] Have you made an analysis of potential negative effects on post closure safety due to the long time that the repository will be open?** **[3] What program of monitoring is planned/expected during the reversibility period?** **[4] Would there be any contingency plans should the monitoring programme indicate that the development of the disposal facility is not according to expectations?**	The repository is planned to be operated for around 100 years. By law final closure should be authorized by a new act. During the operating period, partial closure of the repository might be decided, for example backfilling/sealing of disposal cells (stage 3 of the International Retrievability Scale defined by the OECD Nuclear Energy Agency), or backfilling/sealing access galleries (stage 4). No measure enhancing reversibility/retrievability will be considered which might jeopardize safety. The robustness of the repository concept with regard to long term safety has been assessed. A monitoring program is planned during the reversibility period. Monitoring refers to several objectives: compliance with operational safety requirements, performance confirmation, feedback for the design of future repository components (disposal cells, galleries, etc.), local stakeholder's confidence building and support for future decisions to be made. If some unexpected behaviour of the disposal facility would be detected, the impact of this unexpected behaviour on safety would be assessed, and if necessary corrective solutions would be looked for. In such case, retrieval would be an option, among others, which would be analysed according to a cost-benefit approach.
2	Sweden	Article 32.1	B.1.5.1, p. 23	16		Under the 3rd bullet it is stated that in accordance with the reversibility principle, storage will also allow for managing any package that would need to be removed from the repository. **[1] Could you please elaborate on the rationale for this statement?** **[2] Generally, emplacing of waste (packages) in a disposal facility should preferably be performed**	For the decision of emplacing the waste packages into the repository to be made, it shall be demonstrated that long term safety objectives will be met with such waste packages in the repository. At that date, there will not be any intention to retrieve the waste packages in the future. But modesty and respect of the freedom of future generations to make different decisions imply that retrieval shall be made possible, without excessive efforts, for a reasonable period of time (at least 100 years according to the Planning Act of 28 June 2006). This means that some provisions are made, including storage, to allow for managing any package that would be removed from the

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
						only when you are confident that waste acceptance criteria are met and there should be no need for removal of waste packages from a disposal facility?	repository.
2	Sweden	Article 32.1	B.1.5.1, p. 23	17		It is described that the reversibility of repositories, as described by the Planning Act, is a noteworthy evolution in relation to the 1991 law. A specific law prescribing the applicable reversibility conditions will also specify a minimum period of at least 100 years during which the reversibility of the repository will be maintained as a precaution. **[1] What practical implication will this have and how can such a requirement be implemented?** **[2] What will differ in practice (except obvious formulation of texts etc.) between planning a period of 75-80 years as compared to 100 years?** **[3] Which legal party will have the responsibility of implementing this requirement and which body will enforce it?**	Provisions are made in the repository design to provide flexibility in the stepwise development and management of the underground facility as well as retrievability of waste packages. No design option is considered which may jeopardize safety. By law the reversibility period should not be less than 100 years. Therefore there is no plan in France for a 75-80y reversibility period; there would be no noticeable difference in the design in the case of such lower duration. Reversibility is a social and political requirement. Andra has to implement the repository in compliance with this requirement. By law the French Parliament will define the conditions of reversibility in a future act (expected around 2016).

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
2	Sweden	Article 32.1	B.1.5.3, p.24	18		Asbestos is described in the text as one issue in connection with the management of radioactive wastes. Other such materials could be PVC and its content of phthalates. PVC produces HCl upon combustion almost quantitatively related to its chlorine content. Release of dioxin is also an issue. **Is there a French policy or strategy taking such risks and different hazards into account from what is sometimes referred to as "mixed waste", e.g. waste being radioactive as well as containing chemical or other hazards?**	Indeed there is a French policy taking into account the risks other than the radiological ones in radioactive waste: - health risks due to chemical toxicity (mercury, lead, …) or biological content (waste produced by hospitals), or physical content (free asbestos); - fire or explosion risks - corrosion risks on concrete. The French regulation requires the licensee to take account of such risks in his safety demonstration and operational documents. The safety report includes a chapter devoted to the chemical impact. For the moment, a small amount of waste cannot be accepted in Andra's repositories because of characteristics other than radioactive ones (free asbestos, mercury, certain oils and organic liquids, etc.). R&D is conducted on this particular category of waste. The PNGMDR also recommends studies concerning waste containing organic substances and/or complexing agents.
2	Sweden	Article 32.1	B.4.1, p. 29-30	19		France has a very proactive approach concerning reprocessing/recycling spent nuclear fuel and minimising the waste. However, when it comes to other radioactively polluted materials France is not following the principle of minimising the amount of waste by using a limit for radiological clearance. **What is the reasoning behind this strategy?**	The reasoning behind those decisions is specific to each of them: 1. the objective of spent fuel reprocessing is to recover uranium an plutonium for reuse (see § B.2.2), to minimise the amount and the radiotoxicity of the ultimate waste, and to provide a high-quality containment of the waste (vitrification); 2. the fundamental objective regarding clearance of materials is precaution principle.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
5	Switzerland	Article 22	B.1.7.1, p. 25	1		INB operators must establish conservative estimates of the charges for dismantling their facilities and for managing their spent fuel and radioactive waste; they must also set aside specific provisions in their accounts and constitute specific financial assets to cover the provisions, with the understanding that such assets be entered separately. The law also provides for a State control supported by regulatory and sanctionary powers, including the seizure of funds (see § F.2.3.2). That control must be valid notably on the basis of the reports to be submitted every three years by operators in order to describe not only the costs for decommissioning activities and waste management, but also the modalities selected by operators to allocate the assets corresponding to the coverage of the associated financial charges. At the instigation of Parliament, the law also created a second-level control authority, called the National Financial Assessment Committee for Charges Relating to Decommissioning Operations for Basic Nuclear Facilities and the Management of Spent Fuel and Radioactive Waste, in order to assess the control conducted by the administrative authority. **Which organisation reviews the technical and scientific basis to estimates the costs for dismantling their facilities and for managing their spent fuel and radioactive waste?**	Reviewing the technical and scientific basis of cost estimates is a two-step basis: - First, ASN reviews if broad decommissioning and waste management strategies and major technical assumptions (such as the length of the decommissioning period, the availability of storage at a certain time, the viability of a specific technology, the risks taken into consideration, etc.) comply with the regulatory framework and are sufficiently reasonable, considering current knowledge on these issues; - Second, the Ministry for Energy is in charge for monitoring the validity of the cost estimates. In order to review these data, the Ministry for Energy defines audit programs to be conducted by a third party, usually from the private sector. Public auditing entities (such as the Accounting Court - "Cour des Comptes" or the General Financial Inspection "inspection générale des finances") also regularly conduct audits on those aspects within operators. The Ministry for Energy has also the legal power to require any supportive documentation by operators.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
5	Switzerland	Article 26	F.6.1.3.4	2		The report mentions that for every basic nuclear facility undergoing dismantling, a safety review must be prepared every 10 years, as in the case of basic nuclear facilities in service. **[1] Could you please specify the extend of the safety reviews for facilities undergoing dismantling?** **[2] What are the main differences in comparison to safety reviews for facilities in service?**	[1] The objectives of the safety reviews are laid down in the TSN Act of 13 June 2006, article 29-III (http://www.french-nuclear-safety.fr/index.php/content/download/22273/123572/file/loi TSN-uk.pdf) They are the same for basic nuclear installations (BNIs) undergoing dismantling and those in operation. As to the procedures, they are also the same: - the licensee of a facility sends to ASN and to the ministers tasked with nuclear safety a report including the conclusions of the review and, where applicable, the provisions he envisaged to remedy the observed anomalies or to improve the safety of his facility; - after analysing the report, ASN can impose new technical requirements. It sends the ministers tasked with nuclear safety its analysis of the report. - safety reviews take place every ten years. However, the authorisation decree can lay down a different periodicity if this is justified by the specificities of the installations. [2] Although the objectives and procedures do not differ in both cases, the dismantling phase presents some characteristics as opposed to the operational phase. Of course the safety review must take them into account; this is why a specific safety case is to be submitted with the application file for dismantling. These specificities are amongst others the following: - the existence of a final status of a BNI in a dismantling phase; - the management of the waste which is particularly important in a BNI to dismantle (availability of appropriate disposal routes, minimization, difficulties related to the historical waste recovery, etc.); - the evolution of the risks which can change as the dismantling operations progresses (sometimes rapidly); - the duration of dismantling operations which involves taking into account the risks inherent in the obsolescence of certain equipments and the potential

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							instability of partially dismantled structures. The ASN guide n°6 Annex 2, available in French on the ASN's website, lists a certain number of elements which particularly need to be included in the safety review of a BNI in a dismantling phase.
5	Switzerland	Article 26	F.6.1.3.2	3		The report mentions that the final shutdown and dismantling of any basic nuclear facilities are subject to the delivery of a relevant licence prior to such operations. **Does it concern only one licence for the both activities (final shutdown and dismantling)?**	Indeed there is now a single licence for both activities (final shutdown and dismantling). This procedure was set up by the TSN Act of 13 June 2006 (article 29-V, http://www.french-nuclear-safety.fr/index.php/content/download/22273/123572/file/loi TSN-uk.pdf). Having a single licence covering all dismantling activities up to the final end-state gives the advantage to provide a general and global overview of the whole process. For further details see the ASN 2010 annual report (chapter 15 § I.2, http://annual-report2010.asn.fr/).
5	Switzerland	Article 32	A, p.15-16, p. 21	4		The government is now responsible for the implementation of the current PNGMDR (decree in preparation) and is preparing the publication of the next Plan for 2013-15 (scheduled in 2013). The government drafts and updates the PNGMDR. **[1] Which organisations perform the scientific and technical review of this plan?** **[2] How is the review of PNGMDR organised?** **[3] How is the research strategy integrated?** **[4] Are the costs for the implementation also included in this plan?**	[1] & [2] The Planning Act of 28 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/15563/100904/file/Loi_dechets_2006_+ENG.pdf) entrusts upon the government to develop a National Plan Management for Radioactive Materials and Waste (Plan national de gestion des matières et des déchets radioactifs – PNGMDR) and to update it every three years. The content of the PNGMDR is based on the work of a pluralistic group (co-chaired by the Ministry in charge with energy and ASN).The Plan is tabled before Parliament, which in turn refers it for review to the Parliamentary Office for Scientific and Technological Choices (Office parlementaire d'évaluation des choix scientifiques et technologiques – OPECST) before publication. [3] The French National Plan organises the implementation of the research and studies on the management of radioactive materials and waste along the following three orientations defined by law: - the reduction of the quantity and the harmfulness of the waste, notably the reduction at the source by spent fuel re processing and in the future possibly by separation - transmutation (cf. p. 21);

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							- the storage as a possible previous stage, notably for the ultimate waste waiting for disposal; - the deep repository as a sustainable solution for ultimate waste which cannot be disposed of in a surface disposal or in a low depth disposal. [4] The Planning Act of 28 June 2006 prescribes the financing modalities for dismantling and waste management costs. The PNGMDR only develops the optimisation (cost/benefit) of all overall systems.
5	Switzerland	Article 32.1.4	B.6.1.3.3, p. 41	5		The report mentions that conditioning modalities for the waste resulting from the treatment of radioactive effluents are currently under study. Discussion about waste shipments to foreign AREVA customers is under way between those customers and relevant authorities with a view to using bitumen drums or other packagings yet to be designed. **[1] Why did the report not mention the CSD-B packages?** **[2] Is it still foreseen to ship bitumen drums to foreign customers?**	Since 2000, AREVA has stopped the production of bituminized waste (co-precipitated salts from effluents) in the framework of foreign fuel treatment. As far as the bituminized waste produced before 2000 is concerned, it is being replaced by ILW vitrified residues called CSD-B, which is currently being produced, for the settlement of the obligation of return to foreign countries.
4	Ukraine	Article 12	H.2.2.4.2, p. 133	1		**What procedures are planned to characterize legacy wastes, especially those containing hard-to-measure radionuclides?**	Historical waste characterization is performed as follows: - Determination of radiation spectra by calculations and / or laboratory analyses of samples; - Radiological measurements directly on waste; - Ratios application to determine the activity of all hard-to-measure radionuclides (DTM).

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
4	Ukraine	Article 23	F.3.2, p. 89	2		**Is there any review of personnel's commitment to nuclear safety culture (procedures, criteria, frequency)?**	The ministerial order of 7 February 2012 establishing the general rules concerning INBs stipulates the following: - the licensee shall define and apply a policy with respect to nuclear safety, radiation protection, protection of public health and of nature and environment. The policy shall be spread widely among the personnel, and the licensee will have to ensure that it is understood and applied by the whole staff involved, including the sub-contractors staff (article 2.3.2); - the licensee shall define and set up an integrated management system (including organization and resources) ensuring that the above-mentioned objectives are taken into account in every decision concerning his facility (article 2.4.1); - the licensee shall perform periodic reviews of the efficiency of his integrated management system. He will have to identify possible improvements and plan actions accordingly (article 2.4.2). This order supersedes the former "quality order" of 10 August 1984 which was the reference up to now. This "quality order" already prescribed internal assessment by the licensee of his quality system. ASN regularly specifically addresses safety culture through inspections, or instructions of the Expert Advisory Group ("Groupe permanent d'experts") ASN periodically assesses the management system for safety set up by each major company (EDF, AREVA, and CEA). This was the case for the nuclear installations of AREVA in December 2011.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
4	Ukraine	Article 24	F.4.2.1.2, p. 98	3		**Do the specified exposure doses apply to all personnel involved in the nuclear power industry, or specifically to those involved in SF treatment?**	In France the concept of optimisation is clearly included in the regulatory framework and concerns all employers from the nuclear industry. Optimisation of radiation protection of the employees must be considered at all stages (design, operation, decommissioning, etc). Despite of not using the term dose constraints in legislation, licensees use relevant administrative dose limits even if they do not call them dose constraints. The regulations clearly specify that the obligation is on the employer to set dose objectives at a level as low as possible. In practice, numerical values are set by the operator, in particular at the design stage, and are periodically reviewed by the regulator (for example, during subsequent regulatory inspections).
4	Ukraine	Article 24	p. 103-104	4		**Using your experience, please describe which activities intended to minimize the personnel exposure (external and internal) that has been implemented in nuclear power industry proved to be most efficient.**	Beyond specific technical actions, it is essential that the ALARA approach is recognized and promoted by the high-level management to be effective. Moreover, it must also be shared by all the workers and not only by radiation protection specialists. Actions on source term are essential for managing doses. Since about 10 years, EDF has been working on reducing the source term. These actions had an effective impact on collective dose but it is also essential to develop in parallel a specific policy to limit the source term (for instance by avoiding hot spots). Nowadays, apart from actions on the source term, EDF is also working on the optimization of biological shielding use during outage and on the use of remote monitoring systems to supervise high-dose activities.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
4	Ukraine	Article 26	F.6, p. 108-116	5		**What technologies are used to reprocess radioactive metals generated during NPP decommissioning (including large-size equipment, e.g. reactor pressure vessels, steam generators etc.)?**	Most of VLL metallic waste is currently disposed of in the Morvilliers repository. - LL metallic waste generated by EDF plant dismantling is melted in the CENTRACO plant for volume reduction. Part of the melted metal waste is recycled in the biological shielding concrete waste containers. - Large-size equipments are either disposed of or melted in CENTRACO facility, depending on the optimum of the entire waste management route. Opportunity studies are carried out on the opportunity to implement a facility to melt and recycle VLL metallic waste.
4	Ukraine	Article 28	J.2, p. 152	6		**What particular technologies are used for conditioning of disused radiation sources into the packages for the purpose of disposal or storage?**	CEA has been an important producer and supplier of sealed sources and is an important user of sealed sources. Three basic rules are followed for the management of Disused Sealed Radioactive Sources (DSRS) by CEA: 1. Recycle the sources when this option is technically and economically practicable for very high activity Cobalt, Caesium, Americium and Beryllium sources or very rare isotopes, for some specific usages; 2. Destroy the sources when their physical or chemical nature is inadequate for management as solid waste (gaseous sources, liquid sources, some other specific batches of sources may be totally or partially destroyed: degraded source, aluminium parts, plastic support sources, etc.) 3. Manage all other DSRS as radioactive waste (small sources are grouped in closed capsules, with the objective of reducing their number), with the following objectives: - Using existing facilities for conditioning sealed sources into waste packages; - Using existing of planned facilities for interim storage; - Considering irradiating properties of each source batch for choosing of the conditioning process (ALARA principle). A reference planning has been defined for sending packages to final French disposals (Surface existing

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
							facility, Subsurface and Geological planed facilities) in accordance with Andra.
4	Ukraine	Article 32	B.4.1.1.3, p. 29-30	7		**How a decision (procedure, documentation) that "*material is considered as radioactive*" is made and how the moment when the material "*is likely to have come in contact with radioactive contamination*" is defined?**	In a Nuclear Basic Installation (BNI), the methodology to decide whether a material is considered as radioactive relies on the waste zoning concept described in § B.5.2.1 of the report. The waste zoning consists in distinguishing zones of the facility where the waste is likely to have been contaminated with radioactive substances or activated by radiation (zones called “nuclear waste zones”), and zones where the waste is not likely to be contaminated or activated (zones called “conventional zones”). This concept was originally set up by the decree of 31 December 1999, now being replaced by the ministerial order of 7 February 2012 (taking effect from 1st July 2013). Details are provided in an ASN guide. A “zone” is a room, part of a room, or part of an installation for which boundaries or physical barriers exist and can be deemed to prevent any transfer of contamination between the outside and the inside of the zone. Thus the possible interruptions of the physical barriers must be considered very carefully. The licensee determine the waste zoning on the following bases: - design of the installation, - operational procedures, - history of the installation (incidents, modification, controls, etc.). It is reminded that this approach constitutes the first line of defence, the others being radiological controls of the waste considered as conventional according to the waste zoning. The licensee has to submit a waste survey to ASN for approval. Of course this document includes the definition and justification of the proposed waste zones. In addition, inspections are conducted on site by ASN on this issue.

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4	Ukraine	Article 32	B.4.1.1.3, p. 30	8		**Please provide some examples of recycling of VLL materials in the nuclear sector.**	In France there are only two examples of recycling of VLL materials (in operation): - D'Huart industrie which melts lead pieces. The final products are used as radiation shielding in Basic Nuclear Installations (BNIs): about 100 t/year (the facility is authorized for 400 t/year); - Centraco which melts steel pieces. The final products, i.e. steel cylinders, are used as radiation shielding in radioactive waste packages in concrete to be disposed of in the CSFMA: up to now the averaged production is 55 t/year (but 140t in 2011). However the melting of steel has been stopped since 12 September 2011 after the explosion accident and the re-start of the ovens is subject to ASN's authorization on the basis of a report to be transmitted by the licensee.
1	United Arab Emirates	Article 27	p. 148	1		With regard to controlling the safe transport of radioactive and fissile materials, the report states that ASN is responsible for proposing and organizing public information. **Please describe in more detail the systems and procedures that ASN employs to propose and organize this public information**	The article L. 125-10 from the Environment Code and the decree 2011-1844 determine the kind of transport of radioactive materials for which it cannot be refused to the public the access to safety-related information. Specifically, it is the case for package transport requiring an agreement from ASN, i.e. type B and C packages and shipment approvals. Every citizen can from now ask for information on the safety of transport and any movements refereed in the aforementioned decree. The Administrative Documents Access Commission (Commission d'accès aux documents administratifs, or CADA) can be seized, before any appeal, by anyone who is denied access to information on behalf of a transport supervisors. Disputes concerning denial of access can then be brought before the administrative courts, even if they oppose two individuals. However, movements of fissile or radioactive materials related to nuclear weapons or nuclear marine propulsion are not concerned.
4	United Kingdom	Article 12	H.2.2.3, p. 131	1		The text includes the following: "*Almost all fission products have already been vitrified, except for solutions with high molybdenum concentrations, which are not*	The vitrification of high activity solutions with the cold crucible started in La Hague in April 2010. Since then, several production runs have been carried out for a total production of 115 CSD-B (app 45t of glass). Only rinsing solutions from dismantling activities have been processed

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						compatible with the current vitrification solution in hot crucible (corrosion aspect), but will be vitrified starting in 2011 thanks to a new technology for cold crucibles." **Could France please provide an update to the report describing the progress of the commissioning of the cold crucible vitrification process?** **Is the vitrification being done in one of the existing vitrification lines that has been modified to utilise the cold crucible?** **Is the crucible the only part of the existing vitrification plant that has needed to be changed for this modification, or have other parts of the plant also needed to be modified, for example the extract ventilation system, or the calciner?** **In view of the favourable experience of vitrification plant operation in the USA, particularly at West Valley and Savannah River, could France indicate why it first chose the hot crucible vitrification process for La Hague?** **With its current state of knowledge, could France please summarise the perceived advantages and disadvantages of the hot crucible compared with the cold crucible vitrification process?**	so far. The cold crucible has been set up in an existing vitrification cell inside the La Hague site. It has been connected with a dust scrubber offering extended capacity to allow a higher production rate. The calciner and the other components of the gas treatment chain are based on the same technologies. The cold crucible requires a high frequency power generator which had to be installed as well. The choice of hot crucible vitrification process for the La Hague R7 and T7 facilities was based on the favourable experience at the Marcoule PIVER pilot facility, operated from 1968 to 1970 (production of 164 canister - 1,5E5 TBq vitrified) and the AVM, first industrial HLW vitrification facility started in 1978 (3181 canisters produced at the end of 2010 with a total activity immobilized of 16,9 E6 TBq since start-up). Induction technologies like hot crucible used in several countries have led to the vitrification of more than 95% of the total activity vitrified in the world. The cold crucible process requires a high level of skills and qualifications to be operated properly. Even though this process is still on the learning curve, it has already proven a high level of efficiency when running at full capacity. Moreover, the cold crucible allows higher production rate and is able to process different types of high activity solutions. On the other side, the hot crucible is sturdier and takes advantage of more than 20 years of operation in a nuclear workshop environment.

Gr	Country	Article	Ref. in National Report	Q/C n°	Comments	Questions	Responses
4	United Kingdom	Article 16	H.6.1, p. 142	2		The text includes the following: "*ANDRA is legally responsible for developing acceptance specifications for waste packages in disposal facilities."* *However, the text under Article 21, F1.2.2, on page 81 says:* *"With regard to the respective responsibilities of the waste producer and ANDRA when the radioactive waste is taken over by ANDRA, it is clear that the waste producer remains responsible for his/her waste, even after storage or disposal by ANDRA. The ownership of the waste is not transferred to ANDRA."* **[1] Could France please clarify whether the package specification developed by ANDRA extends to the detailed design of the packages themselves, or is the detailed design of the waste package the responsibility of the waste producer?** **[2] Does the responsibility for producing a safety justification for the disposal of each type of waste package rest with the waste producer or with ANDRA?**	[1] The characteristics of waste package produced by the waste producer will have to comply with the waste acceptance criteria provided by Andra. [2] Andra is responsible for the demonstration of the disposal safety and the Waste acceptance criteria will mostly result from that demonstration.
4	United Kingdom	Article 18	E.1.1, Page 61	3		**[1] Could France please clarify whether nuclear safety and radiation protection at national-defence facilities is now placed under the regulation of ASN, or whether these aspects are under the supervision of the Minister for National Defence?** **[2] Is nuclear safety and radiation**	[1] Nuclear safety and radiation protection at national defence facilities is placed under regulation of Minister for National Defence. [2] CEA is a public body which carries out research in the nuclear field. The regulation of each of its facilities depends on the purpose of the facilities. The civil facilities are under regulation of ASN, military facilities are under regulation of the Minister for National Defence.

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						protection at all of the facilities at CEA sites under the regulatory supervision of ASN?	
4	United Kingdom	Article 32	B.2.3, p. 26	4		The text includes the following: "…*the fuel is reprocessed as prospects develop for the extracted plutonium ("flux-adequacy principle") and causes about 1,050 t of fuel (out of the 1,150 t to be unloaded from French reactors) to be processed every year*, …" **[1] Could France please explain what happens to the 100 t of spent fuel every year that is not reprocessed? Is part of this spent MOX fuel?** **[2] Does France reprocess for a second time any spent fuel that has been made from reprocessed and re-enriched uranium?**	[1] The difference is indeed due to MOX and reprocessed uranium spent fuels that are not reprocessed and are stored until Generation IV reactors are commissioned. [2] EDF does not reprocess a second time MOX and reprocessed uranium spent fuels.
4	United Kingdom	Article 32	B.6.1.1, p. 38	5		The text includes the following: *"Process waste is packaged in concrete containers with a metal liner. Filters, evaporator concentrates and liquid sludges are encapsulated in a hydraulic binder in fixed facilities, such as the nuclear auxiliary building or the plant's effluent-treatment station."* **Could France please clarify the physical and chemical nature of this "hydraulic binder"?**	The hydraulic binder is a mortar with a specific composition (sand, cement, water).

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4	United Kingdom	Article 32	Section D.4.2.1, p. 58	6		The text under Table 15 refers to CSD-V and CSD-C packages, but within Table 15 both rows are labelled CSD-V; CSD-C is not mentioned within the Table. **[1] Could France please clarify whether the upper or lower row of Table 15 should have been labelled CSD-C?** The report provides no details of the size of the CSD-V and CSD-C packages. **[2] Could France please clarify the dimensions and volumetric capacity of each of these waste packages?**	[1] The problem highlighted is a typo. The last line of table 15 is related to CSD-C. [2] Both CSD-V and CSD-C have an external volume of 180 L.; the upper part consisting of shoulders, neck and top is left empty.
1	United States of America	Article 10	G.7, p. 126	1		The report describes the storage and disposal of spent MOX fuel as dependent on development of new reactor generations. **[1] What time scales are envisioned for spent MOX storage?** **[2] Also, how will the option of direct disposal of spent fuel, including MOX, be included as part of the 2013 public debate regarding the high-level waste repository?**	[1] Within the framework of the development of Gen IV reactors, storage duration of MOX spent fuel prior to reprocessing can be a function of the time schedule of the reactor development program. In case of direct disposal, a cooling storage duration of 90 years was considered for the feasibility study of direct disposal of MOX SF provided by Andra in 2005. [2] The National radioactive waste plan provides that Andra checks the compatibility of the repository project with potential direct disposal in case of an evolution of the waste management strategy. This possibility of direct disposal may be raised at the public debate planned in 2013 stating that the repository design does not exclude this eventuality.

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1	United States of America	Article 14	A.2.2.2, p. 16	2		In 2009, ANDRA (French National Radioactive Waste Management Agency) submitted to the government several proposals concerning the implementation and design of the repository project for high-level and intermediate-level long-lived waste. The project is now preparing to exit its feasibility phase and enter into the definition phase and, subject to approval, into its execution phase. **[1] Please provide additional details on the activities and duration of the "definition phase" and "execution phase."** **[2] Is the 2025 operational date achievable?**	The definition phase concerns the detailed studies to establish the licence application until 2015 and to support its evaluation. The execution phase concerns the studies and operations to build and operate the disposal after its authorization. The planning of realization of the project, subject to its authorization, will be specified during the definition phase.
1	United States of America	Article 20	E, p. 75	3		The report states: "Some managers with experience in nuclear or radiological activities have also been seconded by the CEA or the IRSN, while some radiation-protection engineers have been hired on contract." **Since ASN is responsible for regulating all nuclear activities including small-scale industrial facilities and research laboratories, how does France assure independence and objective decision making as a regulator involving these companies?**	The art. 15 TSN Act of 13 June 2006 (http://www.french-nuclear-safety.fr/index.php/content/download/22273/123572/file/loi TSN-uk.pdf) stipulates that ASN can "*employ officials holding a post and recruit contractual agents under the conditions laid down by the regulation […]. Officials holding a post in the State services can, with their agreement, be seconded, where applicable part-time, to ASN in accordance with procedures specified by a State Council decree. ASN can benefit from the secondment, with their agreement, of agents from public organizations*", such as CEA or IRSN. These secondments ensure ASN the availability of the necessary expertise for caring out its duties. These secondments occur in specific frameworks, in particular secondment agreements, in which is stipulated, inter alia, that this seconded staff cannot be involved in the supervision of CEA nuclear facilities.

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1	United States of America	Article 24	F.4.2.3.1, p. 101	4		**Please elaborate on the measures being studied by AREVA to further reduce radioactive discharges at the La Hague Plant.**	Several directions of progress are analysed or envisaged concerning liquid effluents: - The preferred orientation of liquid effluents towards vitrification will be extended to the effluents resulting from the decommissioning programs of the UP2-400 plant. - The reduction of the 106 Ru discharges from the alkaline concentrates based on the relatively low half-life of 106 Ru. - The improvement of the chemical treatment of the liquid effluents by modification of the order of the reagent addition, by adjustment of the reagent quantities. - The test of filtration technology for specific radionuclides like Co60. - Periodic review of the processes that could be used to examine the best available technologies.
1	United States of America	Article 25	F.5.2.4.3, p. 107	5		The scope of emergency preparedness includes the appropriate frequency of emergency drills for INBs. **[1] Please explain how often such drills are conducted and whether neighboring countries such as Germany and Spain participate in such drills.** **[2] Were these capabilities reviewed following the Fukushima incident? If so, please describe the conclusions reached and lessons learned.**	[1] An annual regulatory circular gives the calendar of national exercises. Each year, around 10 exercises are performed. In general, each installation such as NPPs has to play a national exercise each 3-5 years, testing the on-site (PUI) and off-site (PPI) plans. For the radioactive waste management facilities and facilities managing spent nuclear fuel away from the reactor sites, each on-site plan (PUI) stipulates the frequency of the on-site exercises. Some of these installations also have an off-site plan (PPI). In this case, these installations (such as La Hague which played an exercise last December) are mentioned in the annual circular. When the installation is located near the French border, the exercise is also performed to test the alert and information exchange mechanisms with the neighbouring countries (mainly, Germany, Belgium, Switzerland, Luxembourg and Spain). Observers from the neighbouring country are also invited. The next step is to enhance the participation of the neighbouring countries in the French exercises and to organize a joint exercise. [2] Following the Fukushima accident, European "Stress

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							tests" and French "Complementary Safety Assessments" (CSAs) were initiated in 2011. In 2012, these "stress tests" and CSAs will continue. First conclusions on site emergency organization are already available (see French report). As for off-site emergency organization, an inter-departmental work has been launched with all the involved ministries. The work is under way.
1	United States of America	Article 28	J.2, p. 151	6		Section J.2 notes that an agreement was signed between France and the IAEA to secure all sources of French origin. **How has the IAEA agreement enabled the repatriation of French disused sources?**	The agreement signed between France and IAEA for safe and secure management of disused sealed radioactive sources (DSRS) concerns sources which have the potential to cause serious radiological consequences if they are involved in accidents or malicious acts. This agreement plans that IAEA provides the necessary logistic and administrative support. The objective of this agreement is to plan (prioritization of recipient countries) and to facilitate the information exchange between authorities.