Answers to the questions addressed to Finland

Topic number (1-2-3)	Page number (of NAcP)	Text of question / comment	Text to answers/comment
1.1 & 2.3	7	In the ENSREG peer review country report for Finland, reviewers recommend to consider additional assessment of critical SSC with respect of PGA = 0,1 g. One French comment in 2013 was that in section 8 it was not found any action planned to address this issue. The question seems to be still valid in so far as the list of actions in section 8 addressing topic 1 remains unchanged in the updated NAcP. However it is said in section 1.1 page 7 that "STUK has required Fortum to evaluate the needs and possibilities for improving the supports of the seismically most sensitive main components [...]. In accordance with the new regulatory YVL Guides, STUK has required that the licensees review and update the site specific seismic hazard". Could Finland clarify whether these complementary information constitute new actions in response to the above ENSREG recommendation and in this case why they are not reported in section 7?	The review and update of the seismic hazard is based on the Finnish requirements and experiences from siting processes before the Fukushima accident and is not a response to the ENSREG recommendation. However, a corresponding seismic hazard evaluation is under review and the results and/or the update may affect the conclusions on the seismic acceptability and is therefore relevant regarding the ENSREG recommendation.
2.2	26	From §3.5 the internal and external communication network in case of severe accident has been identified as a system to strengthen. Could Finland clarify whether there is an action dealing with this issue recorded in section 7 tables 2 and 3?	Several communication channels are available as indicated in NAcP. At this moment, there are no current activities by the licensees ongoing rearding to communication means.
1	7 (51)	The confidence level for the annual frequencies of exceedance is not indicated. Was the 10E-4/a a mean estimate? Is the 10E-5/a a meadian one?	The value 1E-4/a (not 10E-4) is mentioned in a quotation from an ENSREG report and the confidence level is not specified. 1E-5/a (not 10E-5) refers to the median value.
1	7 (51)	Are the requirements for analysis of the sieimic safety for DEC C conditions identified by the Finnish Regulations?	Yes, they are stated in regulatory guide YVL B.7
1	9 (51)	"In accordance with the new regulatory YVL Guides, STUK has required that the licensees review and update the site specific seismic hazard in connection with the periodic safety reviews." Are you aware of that the new hazard evaluation can result in a controversal result, hence the 10E-5/a median PGA might be smaller than the former 10E-4/a mean PGA?	We are aware of this. However, it is not relevant for risk studies and the current design basis PGA requirement has already previously been based on median value at 1E-5/a frequency.
1		There is no mentioning of the man-made hazards.	Screening analysis for man-made hazards has been done. At the Finnish sites the major man-made external hazard is a large oil spill or other sea transport accident resulting in a large release of materials and impurities in the sea water, which could cause a blockage of sea water systems.
2	12	The alternative heat removal system was or not implemented in 2014?	The sentence in the text is unpunctual. The installation of the alternative heat removal system has been implemented in 2014 and the commissioning of the system will be done in 2015.
3	16	Regarding the spent fuel pools, the approach is to "practically eliminate" the events involving fuel damage in the pools. What are the criteria that allow or support such elimination? Does the practical elimination also mean that even SAMG (containing possible operator actions that would be carried out at least to avoid unnecessary worsening of the situation) is not required and not developed for those supposedly rare and eliminated events?	According the the WENRA report for new NPPs (p. 29): "Accident sequences that are practically eliminated have a very specific position in the Defence-in-Depth approach because provisions ensure that they are extremely unlikely to arise so that the mitigation of their consequences does not need to be included in the design. The justification of the "practical elimination" should be primarily based on design provisions where possible strengthened by operational provisions". Considering the time constants associated with spent fuel cooling accidents, the proposed modifications for diverse spent fuel cooling and heat removal by alternative heat sink at the operating plants are considered adequate for justification of practical elimination. SAMGs will consist of instructions to prevent fuel damage (use of alternative systems).

Answers to the questions addressed to Finland

Topic number (1-2-3)	Page number (of NAcP)	Text of question / comment	Text to answers/comment
3	27	The radioactive material is assumed to be maintained inside the containment and there is a claim that it is not necessary to treat large amounts of contaminated water outside the containment. Is the leaktightness of the containment with all the auxiliary systems ensured for the long term (for months) after a severe accident? Are there any creteria for opening of the containment for long (stabilisation, clean-up etc.) term actions.	Duration of one year is assumed when qualifying SSCs required to maintain the containment leaktighness. Thus, there is time to prepare for actions dealing with the situation after reaching the safe state after severe accident.
3	48 (51)	Action/Activity 213 in table 3 marked as "In progress", although its schedule is set as 2013. As the updated version of the National Action Plan is dated December 2014, it needs clarification.	The year statement is unpunctual. The design process of the modification for top venting of reactor hall has been started in 2013. The impletation of the modification has not been started.
n. a.	48 (51)	It is not clear to which Action/Activity the remark with asterisk (*) is related below table 2. (May be the relevant part within the table wass deleted or modified.)	The remark with asterisk (*) in uncessary, and thus, erroneusly in the updated report. The remark shoul be deleted.
1	10 PartI/1.2	Decision to improve seawater flood protection in 2015. What will be the expected implementation of the improvements?	The licensee has assessed alternative solutions for the plant flood protection concept against high seawater level. An expert evaluation on seawater level ordered by the licensee from the Finnish Meteorological Institute was finalised by late 2014. In the beginning of 2015 the licensee started the measures for improving the leak tightness of the auxiliary emergency feed water pump building as a part of the flood protection concept. A new project for that has also been established in 2015, and the need of mobile equipment for additional flood protection of protected buildings/objects, the detailed design of modifications and schedule of implementation will be provided within the project. The duration of implementation is preliminary estimated as two years. The seawater flood protection during annual outages has been started with the modifications for heightening the stoplog gates at the cooling outtake channels of both units. This work is scheduled to be finalised by 2018.
1	10 PartI/1.2	STUK will consider the capacity of the drainage system. When will this be ready?	STUK will consider the capacity of the drainage system in connection of the licenseee's plans for the plant protection concept (Please, see the previous answer regarding the plant flood protection concept).
1	11 PartI/1.6/	What is your plan to develop more rigorous guidance for walkdowns?	STUK does not intend to develop a detailed national guidance for walkdowns. The licensee shall submit for STUK's acceptance a plan which can be based on international guides and corresponding plant specific features.
1	7 -9 PartI/par1.1	The seimic levels in Finland are very low, even below 0,1g. Why has it been decided to require seismic PSA in stead of Seismic Margin Assessment? What are the advantages/disadvantages of both? Can STUK specify which requirements are set to update the site specific seismic hazard?	STUK requires full scope Level 1 and 2 PSA. Seismic risks are included in PSA results used in risk informed applications. A site-specific probabilistic seismic hazard assessment is required. However, any specific method or standard is not required to be used.
1	9 PartI/par1.1/ p9	Seismic improvements will take place when components are replaced due to ageing. What is the rationale behind this?	This requirement is stated for operating units which are not originally designed against earhtquakes.
2	13 PartI/2.1/p13	The ACIS: will it be a bunkered system? Please specify the design requirements against extreme events.	The Alternate Coolant Injection System will not be a bunkered system. The system is assigned to seismic class S1 with respect to integrity. The requirements against external events are set as for the plant when designing the new system and the evaluation of parameters will be performed during the detailed design.

Answers to the questions addressed to Finland

Topic number (1-2-3)	Page number (of NAcP)	Text of question / comment	Text to answers/comment
2	13 PartI/2.1/p13	Paragraph starting with "the licensee has assessed possibilities….normal systems are lost". Please explain in some more detail what options might be available for OL3	The paragraph refers to loss of ultimate heat sink (sea), which belongs the design basis of the Olkiluoto 3 plant. If cooling through the steam generators is possible (the primary system is closed), heat can be released into the atmosphere via the secondary side Main Steam Relief Train. The water storages of the emergency feedwater tanks and the demineralized coolant tanks enable 72 hours operation. If also emergency feedwater is lost, coolant can be injected by external sources. Steam removal would be the same as in the desing case. If the primary system is open, steam would be released into the containment and from the containment into the atmosphere via the containment filtered venting system. Make-up water would be supplied by one of the four LHSI trains from the IRWST tank. IRWST can be refilled from the EFWS tanks. In the exceptionla case, that LHSI is not available, an external source is needed. The concept is still under evaluation.
2	15 PartI/2.3/p15	Why will the depletion times of the batteries be substantially lengthened through the ongoing automation renewal project. Please give some more details.	With the new technology, new equipment consumes less energy. Some subsystems have also been moved to other systems. Earlier the margins in the consumption devices were also estimated bigger. Afterwards, when the real currents were measured, the total battery capacity was detected to be larger.
2	15 PartI/2.3/p15	Last alinea: is there no battery charging by dieselgenerators foreseen in OL3?	In OL3, there are two diverse batteries (2h and 12h) and two diverse dieselgenerators (EDG and SBO). The diverse 2h and 12h batteries both are rechargable by the EDG and SBO.
2	16 PartI/2.4/p16	Independent air-cooled cooling units..is under implementation. In 2.1 it was written that it was implemented in 2014. What is right?	The sentence in the text is unpunctual. The installation of the alternative heat removal system has been implemented in 2014 and the commissioning of the system will be done in 2015.
2	17 PartI/2.5/p17	It seems that the implementation of mobile pumps was delayed at least one year and the decision is still pending because of combination with another project. Please give a somewhat more detialed reasoning for the delay.	The need of mobile equipment will be a part of the plant overall flood protection concept. Licensee has assessed alternative solutions for flood protection against high seawater level i.e 1) flood wall, 2) comprehensive improvement of buildings leaktightness or 3) focusing to certain buidlings and strengthten their leaktightness. In the beginning of 2015 the licensee started the measures for improving the leaktightness of the auxiliary emergency feed water pump building as a part of the flood protection concept. A new project for further flood protection has also been established in 2015, and the need of mobile equipment, their location, the detailed design and schedule will be provided within the project. The duration of implementation is preliminarily estimated as two years.
3	19 PartI/3.1/p19	Is there no ex-vessel retention at Loviisa, when in-vessel retention fales? Is in-vessel retention at OL1/2 not possible?	The ex-vessel retention in the Loviisa plant is not possible. The reactor cavity is so small, that there is no possibility to install a core catcher, for example. The Loviisa PRA assumes, the the containment fails (due to melt-coolant interaction) if the in-vessel retention fails. The large drywell below RPV in the Olkiluoto 1 and 2 does not allow cavity filling to enable in-vessel retention. In addition, the BWR RPV lower head has many penetrations, which would fail even if the RPV external wall would be cooled.
3	2 PartI/3.4 and 38 PartII/5.4	For emergency exercises explain more on the frequency and content of the long-duration events that are exercised, including the way how stressful conditions are trained. Also specify what is the duration and frequency of the long-duration excercises	The intermediate phase was exerciced for the first time in 2014 during OLKIKARTTA 14 and OLKI14 exercises. OLKIKARTTA 14 was a table top "pre-exercise" delaying with the early phase of the accident followed with OLKI14 large scale national exercise. OLKI14 scenario included a large release of radioactivity which caused wide protective actions outside the EPZ. The training situation itself with challencing scenario are seen as stressful, no "extra stress factors" are included despite the fact that usually exercise scenarios develope very fast.

Answers to the questions addressed to Finland

Topic number (1-2-3)	Page number (of NAcP)	Text of question / comment	Text to answers/comment
3	23 PartI/3.2/p23	What is TDCF and LLERF for OL1,OL2, L1 and L2. For those values that are still to high: what strategy is followed to bring them down according the principle of continuous improvement? What are the main contributors to the higher values that could be improved?	For OL1/2, large release frequency is 5E-6 1/a. 35% of this is due to refueling phase with open containment. 30% is due to early inadvertent filtered venting, in which case the release is just slightly above 100 TBq. Remaining 35% is mostly due to energetic phenomena at or just after vessel failure. Late releases or late loss of heat removal cause only 1 % of large release frequency, so additional SAM measures are not considered very effective. It is more important to keep the core damage frequency low. For Loviisa, large release frequency is 1.1E-5 1/a. 55% of this comes from refueling, about half of which comes from fuel pool. Weather phenomena contribute 40% to large release frequency. Internal events contribution is 5%.
3	25 PartI/3.5/p25	The Reserve Emergency Centers: what minimum distances from the NPP are required for the remote location? What are the design requirements? Are they also protected against extreme external events?	There are defined facilities or rooms outside the power plant area where the emergency situation could be managed, if the access to the NPP is blocked. There is no intention to build any new buildings but use existing facilities of nuclear operators or regional rescue services for this purpose. STUK does not specify any exact minimum distance concerning the location of the Reserve Emergency Centers. In practice the planned reserve emergency centres are located from 12 to 80 km from the NPP. In selecting the location for these facilities and planning their equipment and structures attention shall be paid to the fact that the facility shall be accessible even if an accident has occurred at the site area and access to the site is blocked (YVL C.5).
3	26 PartI/3.5/p26	Large volumes contaminated water: the design strategy is understood, but for reasons of contingency it might be considered to have a plan how to deal with the failure of the strategy. Please comment.	Duration of one year is assumed when qualifying SSCs required to maintain the containment leaktighness. Thus there is time to prepare for actions dealing with the situation after reaching the safe state after severe accident. In case of leakages, contaminated water does not cause imminet threat to population in the vicinity of the plant. Severe accident mangement is required from the licensees, but leakages of the contaminated water is beyond that since they are prevented within the strategy.
3	27 PartI/3.5/p27	What are the (beyond) design requirements of the SAM control room at Loviisa? How is electricity secured and communications.	Independent SAM diesels provide electricity to the SAM control room. The SAM control room has the same communication set-up as the emengency center: process computer set-ups and landline telephone connections.
3	28 PartI/3.5/p28	It is written that "at the moment" there are no emergency control rooms at OL1/2. What does this mean for the future?	There is an ongoing project at Olkiluoto NPP targeting to have ECR in use by the end of 2017 for both units. The conceptual design plan of the emergency control room in Olkiluoto 1 and 2 has been approved by STUK. At the moment, in case the main control room is not accessible, reactor shutdown can be performed in the equipment room outside the MCR.
4, nat org.	32 PartII/4.2/p32	IRRS recommendations: the inspection effectiveness should be improved. In what way will they be improved? How does defence in depth have a role in this? The qualification of inspectors formalized: what are the plans to do this and how much time will it take to realize?	The qualification of each inspector is steered by an individual program. Each new inspector will go through an extensive training program that will consist of three levels of training: 1) general introduction training, 2) General Inspection Training (common for all STUK inspectors) and 3) discipline specific qualification training. In addition to the training program, to qualify as an inspector, one must pass through the on-the-job training that is designed separately for each technical discipline. On-the-job training plan supports the development of professional competence once the new inspector has started working. The plan indicates the areas and tasks where the person shall gain experience and knowledge. Working is supervised and supported by the supervisor and the senior inspectors and the level of independence in work is developed gradually. Once all the elements of the qualification training program are carried out successfully and the on-the-job training has been performed, the new inspector will carry out qualification examination inspections. After the examination inspections the Office manager will evaluate the performance and decide whether the individual program is fulfilled and the individual's competence level is adequate to perform inspection duties independently. Consequently, the qualification is granted or the individual training program is updated.

Answers to the questions addressed to Finland

Topic number (1-2-3)	Page number (of NAcP)	Text of question / comment	Text to answers/comment
5, EPR & PAM	36 PartII/5.1/p36	The launch of the National Nuclear Power Plant Emergency Peparedness Forum, combined with the permanent coordination groups could be considered as a good practice.	The comment is greeted with satisfaction.
2	12	Both licensees have investigated their cooling water reserves at site taking into account the situations where all plants in same site are in emergency including spent fuel pools. What were the results of these investigations?	The licensee at Loviisa NPP has estimated in 2012 the total consumption and adequacy of cooling water at Loviisa NPP units for 72 hours in different scenarios (incl. DEC and SA, and simultaneous loss of ultimate heat sink and power supply) both in power operation and shutdown. The scenario when the seawater as an ultimate heat sink is unavailable and both reactor units are simultaneously cooled through external injection via the fire fighting system, the total amount of water at site will last for 72 hours only with actions of operators such as for example sequential external injection. The licensee at Olkiluoto 1 & 2 has estimated the water reserves are adequate. In addition, the licensee has implemented a modification to improve the operability of mobile fire fighting pumps and the natural cooling water injection from the water reservoir of Korvensuo in case of the loss of ultimate heat sink i.e. seawater an loss of power supply.
2	14	The licensees together with the diesel engine manufacturers have carried out investigations of replacing conventional diesel with widely available biodiesel. Based on these investigations biodiesel is allowed to use in exceptional circumstances. Could you explain these exceptional circumstances? What does that mean?	Exceptional circumstances mean here any crisis situation during which the availability of conventional diesel fuel might not be secured for a long-lasting operation of diesel generators. The studies of the suitability of more widely available biodiesel indicates that certain biodiesel fuels are allowed to use instead of conventional diesel to some extent.
2	17	It is written that "the licensee of the Loviisa NPP has studied the possibilities to utilize mobile power supply and mobile pumps to support safety functions." The preliminary investment decision was planned in 2012. The investment decision hasn't been made yet. When are you planning to buy mobile power supply and mobile pumps to support safety functions?	The need of mobile equipment will be a part of the plant overall flood protection concept. Licensee has assessed alternative solutions for flood protection against high seawater level i.e 1) flood wall, 2) comprehensive improvement of buildings leaktightness or 3) focusing to certain buidlings and strengthten their leaktightness. In the beginning of 2015 the licensee started the measures for improving the leaktightness of the auxiliary emergency feed water pump building as a part of the flood protection concept. A new project for further flood protection has also been established in 2015, and the need of mobile equipment, their location, the detailed design and schedule will be provided within the project. The duration of implementation is preliminarily estimated as two years.
3	27, 28	The Loviisa units' MCRs can be used as emergency rooms for other unit, while for Olkiluoto 1 & 2 there are no ECR available. Are there some plans to install some ECRs or other capabilities that would enable controlling of the units in case of loss of MCRs?	There is an ongoing project at Olkiluoto NPP targeting to have ECR in use by the end of 2017 for both units. The conceptual design plan of the emergency control room in Olkiluoto 1 and 2 has been approved by STUK. At the moment, in case the main cotrol room is not accessible, reactor shutdown can be performed in the equipment room outside the MCR.
2	16, para 2.4	According to para 2.4, the plant modifications concerning water injection to the spent fuel pools will require further analysis before starting the detailed design work. The conceptual plan has been submitted to STUK in 2014. Please provide some details on the decisions that are under consideration. Will pure or borated water be supplied to SFP? Are the mobile devices going to be used?	The conceptual plans of the additional spent fuel pool cooling system for ensuring the spent fuel pool cooling in reactor hall and spent fuel storage pools at Loviisa NPP in case of the unavailability of normal SPF cooling systems in DEC/SA situations, were submitted to STUK by the end of 2014. The review is ongoing. The system consists of two air-cooled cooling towers per unit, dimensioned for decay heat removal form reactor and SFPs. One cooling tower circulates borated water from the emergency feed water tank through TF-system (intermediate cooling system). The decision of the use of mobile equiment will be made in connection with the plant flood protection concept or Periodic Safety Review.

Answers to the questions addressed to Finland

Topic number (1-2-3)	Page number (of NAcP)	Text of question / comment	Text to answers/comment
2	17, para 2.5 p. 47, line 110	According to para 2.5, the implementation of mobile devices (diesel generators and pumps) was planned to be completed in 2013. However, the licensee will make the decision regarding the mobile devices jointly with the decision on comprehensive solution for flooding protection. This measure is scheduled for 2018. Please provide explanation for combining the implementation of mobile devices with the solution for flooding protection.	The need of mobile equipment will be a part of the plant overall flood protection concept. Licensee has assessed alternative solutions for flood protection against high seawater level i.e 1) flood wall, 2) comprehensive improvement of buildings leaktightness or 3) focusing to certain buidlings and strengthten their leaktightness. In the beginning of 2015 the licensee started the measures for improving the leaktightness of the auxiliary emergency feed water pump building as a part of the flood protection concept. A new project for further flood protection has also been established in 2015, and the need of mobile equipment, their location, the detailed design and schedule will be provided within the project. The duration of implementation is preliminarily estimated as two years.
3	16	It is mentioned: "To improve monitoring of the water temperature and level in the spent fuel pools inside the reactor building, there is a plan to equip all spent fuel pools with a temperature and level measurement system that enables measuring water level from the normal level down to the top of the fuel assemblies. The measuring system will be visible outside the containment and independent from the power supply". What kind of measurement system is to be used? How the independence of this system from the power supply is ensured?	The water level and temperature measurements have been installed in Olkiluoto NPP. The new measurements are based on simple and robust design, and are readable outside the pool rooms. The new level measurements are float level measuring devices. The ON-OFF at five different levels is readable in case of loss of power supply. The system is also independent from other systems.
3	23, para 3.2	According to para 3.3, both at Loviisa and Olkiluoto operating NPPs, the frequency of large releases is higher than the limits set in STUK's regulatory guide YVL A.7. Is there any estimation of decrease in the frequency of large releases after implementation of SAM measures? Is it sufficient to comply with the limits set by STUK or additional measures should be taken?	For OL1/2, large release frequency is 5E-6 1/a. 35% of this is due to refueling phase with open containment. 30% is due to early inadvertent filtered venting, in which case the release is just slightly above 100 TBq. Remaining 35% is mostly due to energetic phenomena at or just after vessel failure. Late releases or late loss of heat removal cause only 1 % of large release frequency, so additional SAM measures are not considered very effective. It is more important to keep the core damage frequency low. For Loviisa, large release frequency is 1.1E-5 1/a. 55% of this comes from refueling, about half of which comes from fuel pool. Weather phenomena contribute 40% to large release frequency. Internal events contribution is 5%.
3	25(51)	In para.3.5, a new requirement of the Governmental Decree on Emergency Response Arrangements at NPPs concerning construction of the reserve emergency centres outside the power plant area is mentioned. Has a decision been taken on location of the reserve emergency centres? What is the progress in construction of the reserve emergency centres so far?	There are defined facilities or rooms outside the power plant area where the emergency situation could be managed if the access to the NPP is blocked. There is no intention to build any new buildings but use existing facilities of nuclear operators or regional rescue services for this purpose. STUK does not specify any exact minimum distance concerning the location of the Reserve Emergency Centers. In practice the planned reserve emergency centres are located from 12 to 80 km from the NPP. In selecting the location for these facilities and planning their equipment and structures attention shall be paid to the fact that the facility shall be accessible even if an accident has occurred at the site area and access to the site is blocked (YVL C.5).
3	26(51)	Para.3.5 mentions a requirement that maintenance personnel need to be trained and regularly participate in exercises. Does this requirement apply to the maintenance personnel of NPPs or to the outside maintenance personnel as well? What kind of competences and skills are to be trained? What is the recent practical experience in participation of the maintenance personnel in the exercises?	The requirement applies for the maintenance personnel of the NPPs. Working with heavy personnel protective equipment and the radiation surveillance as well as the use of personnel decontamination devices are examples of the practical training. Our experience is that the maintenance personnel is willing to participate but in practice it's often difficult to combine the challencing plant scenario together with the practical exercise of the maintanence staff in a effective way. Separate practical exercises may be more easy to manage.
5	36 (51)	Para.5.1 mentions that the National Nuclear Power Plant Emergency Preparedness Forum is to be launched in order to coordinate local cooperation between the regional rescue services, regional police departments, NPP licensees, STUK. What is a status of this Forum? Is it a consultative body to the	The forum will be a consultative body co-ordinating and sharing information between the emergency planning zones. Formal decicions will be made independently by each party.

Answers to the questions addressed to Finland

Topic number (1-2-3)	Page number (of NAcP)	Text of question / comment	Text to answers/comment
	45(4,5)	For the National Action Plan, two action points, which are related to the interaction of the "nuclear sector" with the "non-nuclear sector", are the only "national" action points which have not been implemented. It should be clarified whether this is related to the fact that it is outside the direct competence of STUK, whereas the responsibility to implement the measures is national	The interpretation of EC-JRC is correct. The implementation of these actions are outside outside the direct competence of STUK. The actors of the actions are other Finnish authoritites such the Ministry of Interior.
	27	Large volumes of contaminated water: As in the previous report, no preparation for solutions for post-accident contamination and treatment of potentially large volumes of contaminated water have been initiated. From other parts of the report, the shallowness of the seas around Finland is used as an argument not to take high tsunami waves into account (p.9). Furthermore, for both Loviisa and Olkiluoto, there is a difficulty to find/ define an alternative heat sink which does not rely on the sea water. This is an indication that other water sources are not abundant and that they may have to be protected from contamination. It should be better explained why it is accepted that no preparation for possible solutions has been initiated until now.	Duration of one year is assumed when qualifying SSCs required to maintain the containment leaktighness. Thus there is time to prepare for actions dealing with the situation after reaching the safe state after severe accident. In case of leakages, contaminated water does not cause imminet threat to population in the vicinity of the plant. Severe accident mangement is required from the licensees, but leakages of the contaminated water is beyond that since they are prevented within the strategy. LO1 & 2: The air-cooled cooling towers as an alternative heat sink, installed in 2014, will provide an independent way for decay heat removal from reactor and spent fuel pools in the reactor hall and in spent fuel storage pools in the both units. OL1 & 2: Sea water is not necessarily needed as the ultimate heat sink for the residual heat from the reactor core, because the design of the containment and containment systems enables residual heat removal from the reactor core to the atmosphere by using the condensation pool as a temporary heat sink and by venting the steam from the boiling condensation pool to the atmosphere through the filtered venting system of the containment. Because the venting system 362 is filtered and designed to work in severe accident conditions, the possible release of radioactivity+F47 to environment can be effectively limited even in the case of severe core degradation. If necessary, steam and other gases can also be vented from the containment to the atmosphere by using the unfiltered containment venting system 361. At present the use of this strategy is, however, hindered by the component cooling requirements of those safety systems that could be used to supply water to the reactor. The use of atmosphere as an efficient, alternate heat sink can be realised by removing the need for sea water based component cooling from the pumps of system 327. If system 327 is not dependent on sea water based component cooling, it can remain operational even during the loss of the primary ultimate heat sink (sea water), and, as system 327 uses water from the 733 water tanks, the boiling of the condensation pool does not affect the operation of the pumps. The described modification of the system 327 has already been implemented in one unit. OL3: Total loss of the ultimate heat sink, i.e. loss of sea water, is taken into account in the OL3 design and all safety functions are ensured in case of loss of the ultimate heat sink. Ambient air is the diverse heat sink for decay heat removal via the secondary side,