Resolution of comments received about the Technical Specification

In the following tables, green boxes indicate that the comment has led to a modification of the TS.

N°	Section number	Comment	Resolution
Comments from Joint Project – Nuclear Risk & Public Control			
1	00.1	In the glossary it should be explained that the phrase "*areas of improvement*" means that there are deficits in these areas.	According to other comments : "areas for improvement" has been replaced by "weaknesses"
2	00.3	The term "*fire resistant*" has to be explained. Doesthis mean resistance to a fire of 800°C for 30 minutes?	The term "fire resistant" refers to fire resistance properties whose characteristics (duration, temperature) must be specified. No modification of the TS.
3	00.3	"*The NAR will: present the national selection of facilities*, " Since the requirements for fire protection have been increased over the years, in particular the passive fire protection is higher in newer installations. Therefore, the technical specifications should ensure that older facilities areselected for the National reports in order to achieve the intended goals of the TPR.	Annex 4 presents the selection process to draw the list of installations to be included in the NAR. No modification of the TS.
4	00.4	"*While the SRLs are considered as a framework forthe TPR, the TPR is not meant to be a compliance check to SRLs*." However, the NAR should state whether the RLs are fulfilled or when they will be fulfilled.	The purpose of the TPR is not a compliance check to the SRLs. No modification of the TS.

N°	Section number	Comment	Resolution
5	00.5	"*Each participating country will prepare its NAR in English*." However, to reach the goal of transparency there should also be a Non-technical Summary, like in EIA Reports, and this Non- technical Summary should be also published in the language of the country.	It was not the case for TPR I. It's up to ENSREG, the EC or participating countries to decide. No modification of the TS.
6	01.1	"*Scheduled end of operation date (if any).*" It shouldbe also mentioned if a lifetime extension is envisaged.	"scheduled end of operation date" encompasses a lifetime extension, if any. No modification of the TS.
7	01.2	"*The NAR should describe how international standards are used in developing the overall firesafety programme including:* *-relevant WENRA Safety Reference Levels (SRLs),* *- IAEA Safety Standards and other guidance, including the proven practices.* " The NAR shouldnot only mention how these international standards are used in general but also which of these standards are already used for the specific facilities (e.g. in the framework of an PSR).	Accepted. TS modified as follows:" *The NAR should describe which and how international safety standards are used in developing the overall fire safety programme including […]"*

N°	Section number	Comment	Resolution
8	01.3	"*In order to assess the suitability, effectiveness and reliability of fire protection means, operational experience feedback and other experience shouldbe considered*." This should also include events/failures per year of the fire protectionequipment during the previous operation.	Already included : "lessons learned from internal and external events" No modification of the TS.
9	01.4	"*eliminating combustible materials and potential ignition sources to the extent practicable*". "*In line with the concept of defence in depth, protection against fire is provided in general by ensuring the high quality and reliability of SSCs*, ..". A particularlylarge fire load in nuclear power plants is the cable insulation of the power supply cables. Therefore, special attention should be paid to the quantity and type of material, and these should be presented.	Cable insulation is covered by fire safety analyses. No need to specify it. No modification of the TS.
10	01.4.4	"*IAEA SSR-4 [12], para 6.163 requires that internal fires shall not challenge redundant safety groups*."The NAR should explain in which areas this requirement is not fulfilled.	Already addressed in section 01.4.5: 'It is expected that a brief general description on how the defence in depth principles (i.e. in the WENRA SRLs) as presented in this section are met in each nuclear installation. Section 03 of the NAR should describe how the defence in depth concept has been implemented with respect to fire safety in the nuclear installations, and that the impact of fire across the levels of defence in depth has been adequately considered.' No modification of the TS.
11	02	"*However, in this context, it is important to note that IAEA SSR-4 [12], requirement 20 applies*." The NAR should explain in which areas this requirement is not fulfilled.	Accepted. TS modified as follows:" - "fire safety objectives […] - main results of the FHA with regard to the safety objectives" have been added to the list of information requested in the NAR.
12	02	It is not clear in the Technical Specificationswhether the hazard of external fires is also evaluated.	External fires are not in the scope. SRLs quoted in the TS belong to "internal hazards" sections of Wenra SRLs. No modification of the TS.

N°	Section number	Comment	Resolution
13	02	In addition, the danger of a fire caused by an aircraft crash should also be considered. The NAR should state whether such investigations have beencarried out. It should be also mentioned whether a crash of sport plane, a military aircraft or passenger aircraft have been considered.	External fires are not in the scope. SRLs quoted in the TS belong to "internal hazards" sections of Wenra SRLs. No modification of the TS.
14	02.1	"*For nuclear power plants the focus should be on deterministic analyses in the TPR, but PSA should becovered at a general level.*" However, the NAR should provide the calculated results of the PSA 1 and the contribution of fire events for the results of the PSA 2.	Already requested by: 'the main results of the Fire PSA: - the most important accident sequences, - the contribution of the fire events to the overall PSA results.' No modification of the TS.
15	02.1	It should be explained which assumption are made for design basis accidents. (see WENRA RL E 6.1).	- Already addressed by: 'assumptions and methodologies applied to perform the analysis' No modification of the TS.
16	02.1	In addition, results/consequences of beyond-design-basis fires should be presented.	The relevant item for TPR II, e.g. item which allow a benchmarking, is already addressed by:" event combinations (e.g. seismic events) considered in the analysis, including the rules and/or criteria applied to consider such event combinations". No modification of the TS.
17	02.2	It should be explained which assumption are made for design basis accidents. (see WENRA RL E 6.1).	Already addressed : 'assumptions and methodologies applied to perform the analysis' No modification of the TS.
18	02.2	In addition, results/consequences of beyond-design-basis fires should be presented.	The relevant item for TPR II, e.g. item which allow a benchmarking, is already addressed by:" event combinations (e.g. seismic events) considered in the analysis, including the rules and/or criteria applied to consider such event combinations". No modification of the TS.

N°	Section number	Comment	Resolution
19	02.3	It should be explained which assumption are made for design basis accidents. (see WENRA RL E 6.1).	Already addressed : 'assumptions and methodologies applied to perform the analysis' No modification of the TS.
20	02.3	In addition, results/consequences of beyond-design-basis fires should be presented.	Same as §02.1 and §02.2. No modification of the TS.
21	02.4	"*In case of dry spent fuel storage facilities safety isprovided by passive systems such as the storage casks qualified to fire*." It should be presented in the NAR against which fire values (duration of fire and temperature of fire) the casks are qualified.	Already addressed in § 3.1 "fire prevention". No modification of the TS.
22	02.3	Since a fire involving uranium hexafluoride is a particular health hazard, it should be presented inwhich facilities uranium hexafluoride is available and what are the possible consequences.	TPR is focused on nuclear safety. Other aspects of fire safety are not included. No modification of the TS.
23	02.5	"*The fire safety analyses for such facilities are notrequired to be unduly sophisticated unless stored waste / waste packages as such are flammable*." For each waste storage facility, the amount of untreated flammable waste should be provided.	Already adressed in section 1.1 and/or in section 2 (hypothesis for FHA). No modification of the TS.
24	02.5	"*assessment of radiological impact following a postulated fire event and the adequacy of the performance levels in relation to the safety and radiological objectives*, " This assessment should also include beyond design basis accidents.	The relevant item for TPR II, e.g. item which allow a benchmarking, is already addressed by:" event combinations (e.g. seismic events) considered in the analysis, including the rules and/or criteria applied to consider such event combinations". No modification of the TS.

N°	Section number	Comment	Resolution
25	02.6	*"The fire safety analyses for such facilities are therefore not required to be unduly sophisticated unless highly contaminated parts or flammable waste in temporary storage are involved*." For eachfacility, the amount of untreated flammable waste should be provided.	Already addressed in section 1.1 and/or in section 2 (hypothesis for FHA). No modification of the TS.
26	2.7	"*Lessons learnt from events, reviews, OSART, INSARR and/or equivalent should be presented*." This important chapter should contain more requirements. It should be explicitly stated what should be included in this chapter, e.g. a list of events, especially those that were not included inthe FHA, recommendation of the OSART mission, etc.	The "and/or equivalent" allows to collect any source of feedback. No modification of the TS.
27	2.8	"*The conclusions on the adequacy of the licensee's fire safety analyses should be presented*." It should be explicitly listed in which issues the regulator see a lack of adequacy of the licensee´s fire safety analyses.	No modification of the TS.
28	03.1	A typical cause of internal fires in NPPs is a short circuit in an electrical component or a failure in ageing cable insulation. It should be explained how these kinds of fires are prevented. Also, it should bementioned if these kinds of fires have already occurred in the facility. The risk of fire is in general increasing when ageing effects of the NPP are increasing. This fact should be considered in the NAR.	Ignition sources such as short circuit in an electrical component are part of the FHA and considered in PSAs. See section 2. No modification of the TS.

N°	Section number	Comment	Resolution
29	03.2.2	The stress test had shown that in many old NPPs the fire extinguishing systems were not designed against earthquakes. The NAR should show for all facilities whether the fire extinguishing systems are designed against earthquakes.	Should be addressed by the study of combination of events. See section 2. No modification of the TS.
30	03.3.1	Regarding the prevention of fire spreading, there are two important issues missing in the technicalspecifications: -1) spatial separation of redundant safety systems, which is important for the fire hazard 2) the material and separation of cables for power supply and controlling which also is an important issue for the fire hazard.	TS lists information required in the NAR to describe the means for the prevention of fire spreading. These points are covered : - spatial separation of redundant safety systems is addressed in FHA - cables fire resistance and separation of cables are considered in FHA and/or PSA (common failure…) No modification of the TS.
31	3.4	"*Lessons learnt from events, reviews, OSART, INSARR and/or equivalent should be presented*." This important chapter should contain more requirements. It should be explicitly stated what should be included in this chapter, e.g. a list of events/failure of fire detection and alarm components, fire extinguish systems, fire barriers, ventilations systems, especially those that were notincluded in the FHA, recommendation of the OSART mission, etc.	The "and/or equivalent" allows to collect any source of feedback. No modification of the TS.
32	3.5	"*The conclusions on the adequacy of the licensee's fire safety protection concept should be presented*."It should be explicitly listed in which issues the regulator sees a lack of adequacy of the licensee´s fire protection concept.	No modification of the TS.

N°	Section number	Comment	Resolution
33	04	"*This should identify areas for improvement or potential good practices*..." The sentence shouldchange to: This should identify areas for improvement (i.e. deficits) or potential good practices…	"Areas for improvements" have been turned into "weaknesses".

N°	Section number	Comment	Resolution
Comments from AIEA			
1	01.4	Bullet on secondary fire effects references the protection of relevant SSCs against effects of fire hazard. It is understood that these SSCs are those needed to mitigate the radiological consequences of the fire. However, consider modifying the text to make it clearer.	Modification of the TS as follows: Mitigating secondary fire effects and maintaining safety functions identified as necessary in case of fire, including protection of the SSCs involved in the mitigation of the radiological consequences of the fire
2	01.4	IAEA SSG-77 in paras 4.3 and 4.4 calls for the fire hazard analysis to be regularly updated during the operation. The Section 01.4 address only the fire hazard analysis during the design stage. Kindly consider including the considerations of the cited paras of the SSG-77 as appropriate.	Addressed in section 02.1 "The NAR should describe, for deterministic and probabilistic fire safety analyses: - the management of changes to and updates of the fire safety analyses in the context of Periodic Safety Reviews (PSRs) including their consideration at the plant, […] - the approach how the fire safety analyses are updated to reflect relevant modifications to the NPP." No modification of the TS.
3	01.4.5	While speaking about the Defence in Depth, kindly consider including the request of specifying the DiD measures for the fire hazard protection to design and operational means.	Addressed in 01.4 : "the corresponding fire protection means implemented aim at: • Minimizing the likelihood of fires by ○ eliminating combustible materials and potential ignition sources to the extent practicable, ○ strict control of any such ignition sources by restricting their number and location, e.g. segregating ignition sources from combustible materials. • Controlling and mitigating the fire by ○ timely detecting and extinguishing fires, ○ preventing the spread of fires. Mitigating secondary fire effects and maintaining safety functions identified as necessary in case of fire, including protection of the SSCs involved in the mitigation of the radiological consequences of the fire. »

			No modification of the TS.
4	02.1	The scope of the fire hazard analysis description does not require to describe any results of the analyses and demonstration of meeting the success criteria as described in IAEA SSG-64. Consider extending the extent of the information to be provided in the NAR accordingly. This comment applies also to similar description of the information on fire analysis to be provided for other facilities in sections 02.2, 02.3, 02.4, 02.5 and 02.6 as practicable.	Modification of the TS as follows. Addition of:"main results of the FHA with regard to the safety objectives" in subsections 2.1, 2.2, 2.3, 2.4, 2.5 and 2.6.
5	References	Replace NS-G-2.1 with SSG-77	TS modified.

N°	Section number	Comment	Resolution
Comments from ENISS			
1	General comment	As fire safety is the responsibility not only of the regulator, but also of the Fire and Rescue Services and State fire supervision. Proposed new text : In producing the NAR, the regulator should work with the licensees and if relevant with other organisations such as Fire and Rescue Services and State fire supervision.	TS modified.
2	Heading / Introduction	Change title to "Fire Safety of Nuclear Installations…" and state clearly in the introduction section 00.1 that this TPR will only focus on nuclear safety aspects. When finalising the general introduction it would be helpful if the scope of this TPR could be clearly stated early on in section 00.1. The TPR will be publicly available and potentially it is therefore important to be clear about the scope of this exercise and its limitations. The legal basis for the TPR is the NSD and this exercise should therefore cover only nuclear safety related aspects. When it comes to fire protection it is often associated with protection of property and the protection of humans health. To ensure that there is no misunderstanding about the intent of this exercise it would be preferable if the introduction section 00.1 clearly states the limitation in scope of this TPR, consistent with the definition of the term "Fire safety" in section 00.2.	Not possible. Need to be consistent with TORs, those title is Fire protection. TS modified to add a sentence which explains how to interprete the title of the TS.

N°	Section number	Comment	Resolution
3	03.2.1 Fire detection and alarm Page 31	Proposed new text : Subject to the graded approach selected for the different installations, the NAR should describe: • … • to the extent practical, how independency between adjacent compartments and their installed fire detection means are achieved and maintained under hazard conditions, The sentence could read in a way, that in one compartment independent fire detection systems/means are installed	TS modified.
4	00.2 Topic for the review – fire safety	There is a large number of national and international reviews, mission and evaluation like WANO, OSART (see section 2.7 Licensee's experience of fire safety analyses), which already covered fire safety before and after Fukushima. Proposed new text: Regulatory peer reviews initiated after Fukushima did not cover fire safety. Therefore the results of TPR 2 can lead to new insights.	TS modified.
5	00.3 Scope of nuclear installations to be covered in the NAR	Please clarify the term "care and maintenance". Although it may be used in some countries it is not a commonly agreed and understood term.	TS modified.
6	01.1 Nuclear installations identification	Please shift this paragraph to 03.2.3 Administrative and organisational fire protection issues, page 15 after: firefighting capability, responsibilities and organisation (such as onsite plant internal fire brigade, organisation between onsite and offsite firefighters, etc…… Information does not fit in this section. Too detailed and comparable information in 03.2.3	Refused. The only information duplicated with 03.2.3 are the one regarding firefighting ressources. No modification of the TS.

N°	Section number	Comment	Resolution
7	02.1 Nuclear power plants	Propose to delete the details under the main topics and to use it in an annex. Concerning the deterministic analysis, the NAR should describe: - the scope of the analysis ~~including~~ ~~- different operational states,~~ ~~- scenarios analysed in the FHA and the technical~~ ~~elements used to justify that they are the most relevant (bounding scenarios),~~ ~~- event combinations (e.g. seismic events) considered in the analysis, including the rules and/or criteria applied to consider such event combinations,~~ - assumptions and methodologies applied to perform the analysis ~~- guidance used, if applicable,~~ ~~- identification of the safety functions and related SSCs to be protected against fire,~~ ~~- consideration of the plant locations where permanent or transient combustible material is present, rules and justifications used to consider the absence of fire in specific situations,~~ ~~- consideration of on-site or off-site fire brigades,~~ ~~- general description of how uncertainties are considered,~~ - fire phenomena and their analysis: ~~- methods, tools and data used for the quantification of direct (e.g., temperature, pressure, soot) and indirect fire effects (e.g. by fire suppression),~~ ~~- how the fire phenomena's complexity and the severity of the potential consequences are taken into account.~~ Text under main topics should be understood as a guidance and not as a rule. It is possible to provide more or less related information.	Sub-bullets need to remain to ensure sufficient information is provided. In addition, the sub-bullets discussed are applicable to the NAR for other facilities (FCF etc.). No modification of the TS.

N°	Section number	Comment	Resolution
8	03.1	It has to be clarified if "fire prevention" is pointing the DiD level 1 (prevention of fire starting) or as a more general terminology on the application of all three DiD levels (which means any preventive action concerning fire)	TS modified.
9	03.3 Passive Fire Protection	Please add "and to ensure and maintain a safe state of the plant by maintaining the safety functions capability". Clarification of the objective	TS modified.
10	03.3.1 Prevention of fire spreading (barriers) pages 36	We propose to delete the first part of the sentence on page 37 due to duplication. *(page 37)* - ~~the fire compartments and/or cells formed and~~ a description of fire barriers and other means to prevent or delay the spreading of fire, use of self-fire extinguishing and/or fire-resistant components (connecting doors) and materials	TS modified.
11	B92327 ANNEX 1	Remove this reference or replace it by a European or more international one. NFPA is a US national association. Considering the European context, wouldn't it be more adapted to mention standards like ISO 13943 in place? Or other EN or international reference. The NEA reference where NFPA is called may be sufficient.	No other reference available No modification of the TS.

N°	Section number	Comment	Resolution
12	03.2.3 Administrative and organizational fire protection issues, page 23	Editorial The text does not appear completely, please complete.	TS modified.
13	Glossary	Include PIE (Postulated initiating event) and cliff-edge effect in the glossary. There is a need for clarification. Particularly what does cliff edge effect mean in case of fire?	TS modified.
14	02.5 Waste storage facilities, page 25	Editorial The fire safety analysis should include an assessment of the fire hazard on which basis all the adopted prevention and protection measures to be adopted are identified.	TS modified.
15	Annex 3	Editorial Propose to include Nuclear Safety Directive as a quotation because of its importance	TS modified.
16	03.1 Fire prevention, page 29	Editorial The following SRL developed for NPPs applies to waste storage facilities on the same site and to dedicated spent fuel storage facilities and facilities under decommissioning.	TS modified.

N°	Section number	Comment	Resolution
Comments from Zwilag Zwischenlager Würenlingen AG			
1	01.4	Defense in depth is a standing term in nuclear technology as well as nuclear safety and should not be generalized. With regard to the "graded approach", the focus should rather be on the influence of fire hazards on "defense in depth" and thus on nuclear safety. Suggestion, the chapter should be renamed "Reduction of fire hazards and their influence on nuclear safety". Further, the content should be appropriately focused on nuclear safety.	Refused. This section develops how DiD is applied to fire safety. No modification of the TS.
2	01.4.3, 02.4 and 02.5	WENRA S-30 does not make sense from a nuclear safety perspective as is. Fire is an event like earthquake, crash of heavy loads, etc. against which the plant must be designed to adequately protect the barriers (defense in depth). At the same time – of course - the fire or its effects itself must also be avoided. This, however, with regard to its influence on nuclear safety, i.e. on protection aims and safety functions. Fire hazards without influence on nuclear safety cannot and should not be the subject of this review.	Refused. Wenra S 30 has been identified by WGWD as relevant for the TPR. Section 00.2 : “The term ‘fire safety’, as used throughout the Technical Specification, is understood to relate only to nuclear safety. Other aspects of fire safety are not included.“ No modification of the TS.
3	02.5	The first two sections are understandable. However, the following sections only fit NPP.	Refused. WGWD validated the document and its sections. No modification of the TS.
4	03.1	WENRA S 2.3 and 2.4 are understandable. For WENRA S 5.1 the link to S 2.3 and 2.4 is missing. Why WENRA S 2.2 without S 2.3 and 2.4? Does it need S 2.2? The same question arises for WENRA SV 6.1. Does WENRA S 26 make sense without the potential aspects of S 27?	Some changes have been made in this section due to other comments. S 26 and S 27 are both quoted in this section. No modification of the TS.