European Nuclear Safety Regulators Group

European Nuclear Safety Regulator's Group

ENSREG

2nd Topical Peer Review – 'Fire Protection'

Board's review of the national selections of nuclear installations to be reported on in the national assessment reports

October 2022

1. Introduction

As the scope of the TPR II is wide and potentially includes a large number of installations, WENRA ad-hoc group has developed, to preserve the feasibility and the quality of the TPR exercise, an approach for the selection amongst the installations to report on in the national assessment report (NAR). In particular, the national selections should be made following the recommendations below:

- the national selection should include at least one facility of each category addressed by the Nuclear Safety Directive (NSD), if present in the participating country and likely to present a significant radiological risk in case of fire;
- the sample shall be representative of the various types of installations and technologies;
- the candidate facilities should be selected considering similarities with regard to the fire safety concept implemented.

The WENRA draft technical specifications (TS) initially envisaged a process in which the Board reviews and endorses the coordinated sample of installations.

This issue was then addressed at the 47th ENSREG plenary meeting in March 2022. At this meeting, the Board presented its concerns about the installations selection process in the draft TS, in particular:

- the need to focus the peer review on a reduced scope of installations to keep the peer review manageable, especially in those countries with a large number of them;
- the need for a process to select installations that ensures a consistent approach among the participating countries;
- the importance of full transparency of the sampling process to maintain the credibility of the peer review.

ENSREG took the following position:

(It) *Agreed to a review process of the national proposals of the nuclear installations to be reported on involving the team-leaders (TL) in the TPR-II Board; however, the final selection of installations would be a national decision. WENRA would provide the list of installations in the participating countries with the criteria and justifications for the review by the end of April 2022. This process should take place ahead of the start of the national assessments in July and outcomes reported to ENSREG at its next meeting.*

The TOR was updated to reflect this preparatory review.

This report presents the outcome of that review carried out by the TPR team leaders and its conclusions.

2 – Process for the review of the selection of installations

As the elements provided by WENRA for the review were not sufficient, especially with regard to criteria adopted to develop the national selections, the Board requested information directly from the participating countries to perform this review, in particular on the installations falling in the scope of the NSD and on the detailed justifications to select them as ‘candidate’ or ‘represented’, or to consider them as ‘excluded’. The criteria which were applied by the participating countries to draft their proposal had to be clearly mentioned with the transmission of the selection. This was of importance to ensure that a consistent approach was applied among the participating countries.

The information which was requested from each participating country was the following:

i. the starting list of all the installations that come within the scope of the NSD[1] in each country for each category (NPP, RR, fuel reprocessing, fuel fabrication, fuel enrichment, dedicated spent fuel storage, decommissioning, on-site radioactive waste storage), with the name of the associated licensee. Besides, complementary information was expected regarding the main characteristics of the installation, in particular for decommissioning facilities, about the presence of fuel and status of dismantling activities of contaminated/activated parts (structures, systems and components) as well as, for waste facility about the type, characteristic and amount of waste (VLLW, LLW, ILW, conditioned or not) …;

ii. the list of excluded installations as not posing a potential significant radiological risk in case of a fire (with criteria and justifications to select them);

iii. the selected candidate installations that will be reported on (together with the rationale and criteria);

iv. for each candidate installation, which are the corresponding 'represented installations' to which findings will be transferred.

Within the TPR Board, the participating countries were distributed amongst 5 groups for the TL's review, balancing those countries with few installations with those with many (e.g. UK, FR, DE). To ensure consistency of findings and taking account of TL's availability, each group had a main TL to develop a position with regard to the country's selection with a second TL to act as reviewer.

Besides, a guidance was developed to aid consistency of the review, with a checklist of points to review and a reporting template. A national contact point in each participating country was identified to allow TL's to seek clarifications or further information directly and to present the initial conclusions of the review. As result of interaction with the TLs in a few cases participating countries updated their country selection proposal, which has been taken into account by the Board in its review.

3 – Overall conclusions on the review of the selection of installations

The review of the selection of installations, performed by the team leaders, shows some inconsistencies of the national selections approach, especially regarding similar reactor types from different series of power reactor (e.g. VVER 440/1000; PWR 900/1300/1450MWe); spent fuel storage facilities; storage facilities for radioactive waste that are on the same site and are directly related to the nuclear installations; exclusion of a specific fuel fabrication plant; different approaches to dealing with decommissioning facilities; and some differences regarding research reactors. Given these inconsistencies the Board has formulated some recommendations and suggestions addressed to the individual countries.

The conclusions for each participating country are presented in the Annexes with a similar format.

[1] Under Directive 2014/87/Euratom (NSD), Article 3, for the purposes of the Directive, a 'nuclear installation' means: (a) a nuclear power plant, enrichment plant, nuclear fuel fabrication plant, reprocessing plant, research reactor facility, spent fuel storage facility; and (b) storage facilities for radioactive waste that are on the same site and are directly related to nuclear installations listed under point (a);

In addition, the global conclusions are listed below for each type of installation:

- nuclear power plants

In total, 30 candidate NPP installations were proposed by the countries. The main concern was related to the choice of only one candidate installation for some countries with many installations of similar design (but different thermal power) and the same licensee.

After discussion with these countries and within the Board, the following conclusion was adopted:

Whenever the fire protection approach is similar between several installations of the same type, the NAR should describe at least one installation in detail (the candidate one). However, the NAR must then highlight the differences in terms of fire protection approach for the other installations (represented ones). For example, if the fire protection approach is similar between two (types of/series of) nuclear reactors, one must be described extensively while the focus must be made for the other ones only on the specificities of their fire protection approach to avoid unnecessary repetitions (i.e., differences in terms of organisation of the fire protection brigade, local regulations for federal states, external environment or in terms of design…)(see Annexes 2, 4, 7, 20).

- research reactors

In total, 14 candidate research reactors were proposed by the countries. The main concern was about the inconsistency of the selection whereby the same type of research reactor is considered without potential significant radiological risk in case of fire in one country, and the opposite in another country.

After discussion with these countries and within the Board, there was a recommendation for a specific country to include in its selection its research reactor to be consistent with the choice of other countries for the same type of reactor and to share the experience of having improved fire protection measures following an earlier fire in 2010 *(see Annex 16).*

- fuel cycle facilities

In total, 13 candidate fuel cycle facilities (2 fuel reprocessing facilities, 7 fuel fabrication facilities, 4 fuel enrichment facilities) were proposed by the countries.

There was no global concern, but there was a recommendation for a specific country to include in its selection its fuel fabrication facility on the basis that it presents potential significant radiological risk in case of fire, and to be consistent with the choice of other countries *(see Annex 17).*

- dedicated spent fuel storage facilities

In total, 21 candidate spent fuel storage were proposed by the countries. The main concerns were related to:

- the choice of only one candidate installation for some countries with installations of similar design but without the same licensee;
- the inconsistency between countries' choices regarding the potential significant radiological risk in case of fire.

After discussion with these countries and within the Board, the same conclusion as for NPPs *(the NAR should describe at least one installation in detail (the candidate one) and highlight the differences in*

terms of fire protection approach for the other installations (represented ones)) was adopted and a recommendation (*see Annex 15*) was issued to consider that spent fuel storage facility presents potential significant radiological risk in case of fire, and should therefore be included.

- installations under decommissioning

In total, 17 candidate installations under decommissioning were proposed by the countries. The main issue concerns the criteria taken into account by the participating countries to consider the installation with potential significant radiological risk in case of fire or not. The wording of the TS with respect to stage of decommissioning installations had changed slightly in the final version, so there may be scope for countries to review their selections. This could potentially lead to final proposals different from those proposed for this pre-review, which is acceptable.

After discussion within the Board, the following conclusion was adopted:
"Concerning installations under decommissioning, and particularly nuclear reactors (either commercial or research), the absence of nuclear fuel at the facility cannot be the only criterion to determine whether the installation under decommissioning is or is not within the scope of the TPR. Other considerations regarding the remaining contaminated materials and the works planned to be carried out, and the radioactive waste in temporary storage in the facility (while waiting for treatment or transfer to dedicated storage facilities) must be taken into account to establish the level of significance of the radiological risk posed by the installation in case of a fire affecting such materials/tasks.", *(see annexes 7, 15,18, 20).*

- storage facilities for radioactive waste that are on the same site and are directly related to the types of nuclear installations listed above
In total, 15 candidate storage facilities were proposed by the countries. This seems very few compared to the overall number of nuclear installations.

The Board considers that the criteria adopted by participating countries for the selection of the on-site radioactive waste storage facilities are not always clear. In particular, some countries consider them as part of the site installation to which they are related (e.g. for an NPP in operation), whereas others consider them as separate dedicated facilities. This is not consistent with the technical specification which mentions "*waste storage facilities in case of presence of combustible waste and/or non-fire resistant conditioned waste classified above VLLW, or where fires have the potential to result in significant radiological risks to workers, the public and/or the environment by impairing safety barriers*". Furthermore, section 01.1' *Nuclear Installations Identification'* states that "*Waste storage on the site will be dealt with in the dedicated section*" and section 02.5 clearly refers to '*Waste storage facilities on nuclear installations sites'.*
To ensure consistency of reporting, and to enable fire protection approaches to be reviewed coherently for similar installations, the Board recommends that the on-site waste storage facilities related to operating NPPs should be reported on comprehensively under the installation to which they are related in a similar way to spent fuel storages. For the on-site waste storage facilities not related to operating NPPs, the Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as separate ones and report on them accordingly.

4 - Conclusion

The team leaders from the TPR Board were tasked by ENSREG to review the national proposals of the nuclear installations to be reported in the national assessment report. This review took place ahead of the start of the national assessments. In this report to ENSREG the Board gives the conclusions of the review, in particular recommendations for providing further justification or inclusion of some complementary installations as indicated in the Annexes. ENSREG underlined that the final selection of installations should be made by the national competent regulatory authorities, and that the outcome of the Board's review will be considered as recommendations for the authorities to follow. For that reason, in case of disagreement with the Board's comments, the difference of opinion should be recorded in the national assessment report giving the associated reasoning.

On the basis of the Board's comments and recommendations, and taking account of the criteria in the final version of the TPR technical specifications, participating countries are invited to review, and when needed, to update their selections. To facilitate the organisation of the peer reviews amongst the TPR expert reviewers, participating countries are requested to inform the Board of their final selection of candidate and represented installations that will be the subject of their national assessment report, by 31 January 2023. (The final selection is that which will be listed in the appendix to the NAR, as per Annex 2 of the TS '*Detailed contents list of the NARs*').

Note on the Annexes

Terminology

NSD Installations: National nuclear installations within the scope of the Nuclear Safety Directive (NSD)

Excluded Installations: NSD installations assessed as not posing a potential radiological risk and hence excluded from the TPR II

Candidate Installations: NSD installations that will be reported on in the NARs, selected in order to allow the identification of strengths and weaknesses.

Represented Installations: NSD installations that will not be reported on in the NAR but which are similar to candidate installations. Findings and insights from the TPR should be transferrable to the represented installations.

ANNEX 1 **AUSTRIA - National selection**

1- Information provided by Austria

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Name of Candidate installations
Nuclear power plant		
Research reactor	1	Triga Mark-II
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage		
Installations under decommissioning		
On-site radioactive waste storage		
Total	**1**	**1**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☐ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle “at least, one installation per category…”

☐ **NPP**

☒ **RR**

☐ **FCF**

☐ **SF storage facility**

☐ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The Board notes that Austria does not select any on-site radioactive waste storage facility. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

No installations excluded.

Conclusion on the acceptance of the excluded installations

Not applicable

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding ‘represented installations’

No selection has taken place. All installations are candidates. No represented installations.

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both ‘good practices’ and ‘areas for improvement’.*

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

Not applicable

Conclusion on the acceptance of the candidate installations:

The Board considers that the list of candidate installations is satisfactory.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate one and report on it accordingly.

ANNEX 2 **BELGIUM - National selection**

1- Information provided by Belgium

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☐ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	**Number of installations**	**Name of Candidate installations**
Nuclear power plant	6	Tihange 3
Research reactor	2	BR 2
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage	5	SCG Doel (dry)
Installations under decommissioning	1	Doel 3
On-site radioactive waste storage		
Total	**14**	**4**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☐ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☒ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

Two Fuel Fabrication Facilities have been removed from regulatory control.

Conclusion on the acceptance of the proposed list

The Board notes that the installations in the list of excluded installations are not in the overall list of the national installations in the scope of the NSD, and should be added.

3.2 - List of the nuclear installations meets the principle “at least, one installation per category”

☒ **NPP**

☒ **RR**

☐ **FCF**

☒ **SF storage facility**

☒ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The Board notes that Belgium does not select any on-site radioactive waste storage facility. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Three installations have been excluded. The rationale can be found in the table below.

Name of the facility	Type	Technology / main characteristics	State of operation	Additional Information
Central waste storage/treatment	SFSF	Belgoprocess site	operational	Contains only very limited quantities of SF from old RR.
Venus/Guinevere	RR	500 kW	operational	VENUS is a subcritical assembly and hence out of scope.
BR3	RR		decommissioning	Advanced state of decommissioning with only some activated concrete left. It is considered out of scope because there is no significant radiological risk.
Belgonucleaire - MOX manufacturing plant, Dessel	FCF	Fuel fabrication	decommissioning	Fully decommissioned and removed from regulatory control

FBFC UO2 manufacturing, Dessel	FCF	Fuel fabrication	decommissioning	Fully decommissioned and removed from regulatory control

Conclusion on the acceptance of the excluded installations:

The Board considers that the justifications for excluding installations are acceptable with regard to the potential radiological risk in case of fire.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Type	Candidate	Status	Represented Installation	Additional Information / Rationale
NPP	Tihange 3	operation	Tihange 1,2 Doel 1,2,4 DE Tihange(Wet Storage)	Same Licensee
NPP	Doel 3	decommissioning		
RR	BR 2	operation	BR 1 Storage VENUS	BR 2 is the largest and most complex research reactor in Belgium. Measures related to BR1 graphite-fire risk will be included in report.
SFSF	SCG Doel (dry)	operation	Doel SF Tihange SF	Any differences between SCG and Doel SF will be included in report.

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

The Board notes that Belgium has chosen only one candidate NPP to represent several installations, which are not similar. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

The Board considers that the information to justify the represented installations is clear and sufficient.

Conclusion on the acceptance of the candidate installations:

The Board considers that the list of candidate installations is satisfactory.

The Board notes that Belgium has chosen only one candidate NPP to represent several installations, which are not similar. Whenever the fire protection approach is similar between several installations of the same type, the NAR should describe at least one installation in detail (the candidate one). In such cases the Board recommends that the NAR highlights the differences in terms of fire protection approach for the other installations (represented ones). For example, if the fire protection approach is similar between two (types of/series of) nuclear reactors, one must be described extensively while the focus must be made for the other ones only on the specificities of their fire protection approach to avoid unnecessary repetitions (i.e., differences in terms of organisation of the fire protection brigade, local regulations for federal states, external environment or in terms of design…).

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.

ANNEX 3 **BULGARIA - National selection**

1- Information provided by Bulgaria

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☐ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Name of Candidate installations
Nuclear power plant	2	Kozloduy Unit 5
Research reactor		
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage	2	Dry SFSF Kozloduy site Wet SFSF Kozloduy site
Installations under decommissioning	4	Kozloduy Unit 4
On-site radioactive waste storage		
Total	**8**	**4**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☐ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle “at least, one installation per category”

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☒ **NPP**

☐ **RR**

☐ **FCF**

☒ **SF storage facility**

☒ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The Board notes that Bulgaria does not select any on-site radioactive waste storage facility. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

None of installations was excluded.

Conclusion on the acceptance of the excluded installations:
not applicable

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding ‘represented installations’

Type	Candidate, name of the facility	Status	Represented installation	Additional information/Rationale
NPP	Kozloduy Unit 4	decommissioning	• Kozloduy Unit 1 • Kozloduy Unit 2 • Kozloduy Unit 3	WWER 1000/V-230 Units 1 -4 with WWER-440 reactors are defueled and in a process of dismantling. The facilities have similar fire safety concept, and unit 4 is selected as candidate. Insights from the TPR will be transferable to the represented installations.
NPP	Kozloduy Unit 5	operation	Kozloduy Unit 6	WWER 1000/V -320 Units 5 and 6 with WWER-1000 reactors are twin units with identical fire safety concept. Insights from the TPR will be transferable to unit 6.

ISF	Dry SFSF Kozloduy site	operation		The dry cask type storage facility is selected as candidate.
ISF	Wet SFSF Kozloduy site	operation	-	The pool type storage facility is selected as candidate.

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

The Board considers that the information to justify the represented installations is clear and sufficient.

Conclusion on the acceptance of the candidate installations:

The Board considers that the list of candidate installations is satisfactory.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate one and report on it accordingly.

ANNEX 4 CZECH REPUBLIC - National selection

1- Information provided by Czech Republic

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Name of Candidate installations
Nuclear power plant	**6**	Temelin NPP (2xVVER-1000 V-320) ;
Research reactor	**3**	Research reactor LVR 15
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage	4	NPP Temelin Spent Fuel Storage; Spent Fuel Storage facility; High Level Waste Storage.
Installations under decommissioning		
On-site radioactive waste storage		
Total	**13**	**4**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☐ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☒ **NPP**

☒ **RR**

☐ **FCF**

☒ **SF storage facility**

☐ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The Board notes that Czech Republic does not select any on-site radioactive waste storage facility. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

One (1) facility was excluded. The rationale for exclusion see below.

Name of the facility	Type	Technology / main characteristics	State of operation	Licensee	Rationale / corresponding facility
Training reactor VR1	RR	Zero-power reactor, natural cooling	operation	Czech Technical University in Prague	Maximum allowed power output 5 kWth, low radiological risks, out of the scope

Conclusion on the acceptance of the excluded installations:

The Board considers that the exclusion is acceptable with regard to the potential radiological risk in case of fire. However, the Board notes that in respect of the RR VR1, according to the TS only homogeneous zero power reactors are out of scope.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Type	Candidate, name of the facility	Represented installation	Additional information

NPP	Temelin NPP (2xVVER-1000 V-320)	Dukovany NPP (4xVVER-440 V-213)	Dukovany NPP is represented by NPP Temelin (the same licensee, similar requirements, similar measures and procedures).
RR	Research reactor LVR 15	Research reactor LR 0	Maximum allowed power output 10 MWth
SFSF	NPP Temelin Spent Fuel Storage	• NPP Dukovany Spent Fuel Storage • NPP Dukovany Intermediate Spent Fuel Storage	NPP Temelin dry cask type storage facility is selected as candidate.
SFSF	Spent Fuel Storage facility; High Level Waste Storage	-	SF from research reactors and conditioned RAW

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

The Board notes that Czech Republic has chosen only one candidate NPP to represent several installations, which are not similar. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

The Board considers that the information to justify the represented installations is clear and sufficient.

Conclusion on the acceptance of the candidate installations:

The Board considers that the list of candidate installations is satisfactory.

The Board notes that Czech Republic has chosen only one candidate NPP to represent several installations. Whenever the fire protection approach is similar between several installations of the same type, the NAR should describe at least one installation in detail (the candidate one). In such cases the Board recommends that the NAR highlights the differences in terms of fire protection approach for the other installations (represented ones). For example, if the fire protection approach is similar between two (types of/series of) nuclear reactors, one must be described extensively while the focus must be made for the other ones only on the specificities of their fire protection approach to avoid unnecessary repetitions (i.e., differences in terms of organisation of the fire protection brigade, local regulations for federal states, external environment or in terms of design…).

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.

ANNEX 5 DENMARK - National selection

1- Information provided by Denmark

☐ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☐ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☐ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of	Candidate installations
Nuclear power plant	0	None
Research reactor	0	None
Fuel reprocessing facility	0	None
Fuel fabrication facility	0	None
Fuel enrichment facility	0	None
Dedicated spent fuel storage	0	None
Installations under decommissioning	0	None
On-site radioactive waste storage	1	None
Total	1	None

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☐ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries).

☒ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review.

Research reactors DR2 and DR3, the fuel fabrication and hot cell facilities at the Risø site have been dismantled and the spent fuel is in a storage facility at the site.

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle “at least, one installation per category”

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☐ **NPP**

☐ **RR**

☐ **FCF**

☐ **SF storage facility**

☐ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The Board notes that the current facilities at the Risø site for the handling and/or storage of waste from the dismantling of research reactors are not considered for inclusion in the scope of TPR2. The Board considers that they should be included according to their potential for a significant radiological risk in case of a fire.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

One facility has been proposed for exclusion:

Name of the facility	Type	State of operation	Rationale to exclude
Risø (Danish Decommissioning)	Storage facility	Operational	Stored radwaste will be moved to a new facility to be constructed and expected to be operational in 2026. Very limited remaining operational lifetime shortly after the TPR period. Very limited amount of radioactive waste compared to most facilities in the rest of Europe.

Reviewer’s position:

- *Criteria for inclusion of installations are provided at section 00.3 of the final text of the Technical Specifications, from which facilities operating past 30 June 2022 shall be considered in the scope.*
- *For facilities whose operating status is previewed to change within the period of writing of the NAR (July 2022 through October 2023) the NAR should detail if the information is related to the current stage of the facility and if and when this stage is expected to change (e.g. from operation to decommissioning).*
- *According to these criteria, current facilities at the Risø site for the handling and/or storage of waste from the dismantling of research reactors should be considered for inclusion in the scope of the exercise according to their potential of a significant radiological risk in case of a fire.*

Expected lifetime of the facility cannot be the reason for exclusion if the period of operation/decommissioning of the facility lies within the time span of the exercise and the potential for a significant radiological risk in case of a fire cannot be excluded.

Conclusion on the acceptance of the excluded installations:

The Board considers that the expected lifetime of the "*Risø storage facility*" cannot be the sole reason for exclusion since the period of operation/decommissioning of the facility lies within the time span of the TPR and the potential for a significant radiological risk in case of a fire cannot be excluded. Furthermore the case offers an example for the sharing of experience.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Neither candidate nor represented installations have been proposed by the country.

☐ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

3.5 - Conclusions

Conclusion on the acceptance of the represented installations:

not applicable

Conclusion on the acceptance of the candidate installations:

The Board notes that Denmark doesn't propose any installation.

The Board recommends that Denmark reconsiders its position on the "Risø storage" facility, since its period of operation/decommissioning lies within the time span of the TPR and the potential for a significant radiological risk in case of a fire cannot be excluded.

For the purposes of sharing experience, the Board encourages Denmark to highlight fire protection improvements in the design of the new installation despite the fact it has not yet been granted a construction licence.

ANNEX 6 **FINLAND - National selection**

1- Information provided by Finland

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	**Number of installations**	**Name of Candidate installations**
Nuclear power plant	5	Olkiluoto 1, 2 and 3 Loviisa 1 and 2
Research reactor		
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage	1	Olkiluoto KPA
Installations under decommissioning	1 (RR)	
On-site radioactive waste storage		
Total	**7**	**6**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☐ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☒ **NPP**

☐ **RR (n.a.)**

☐ **FCF (n.a.)**

☒ **SF storage facility**

☐ **Installations under decommissioning (RR was excluded)**

☐ **On-site radioactive waste storage facility**

The Board notes that Finland does not select any on-site radioactive waste storage facility. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Name of the facility	Type	State of operation	Rationale to exclude
Research Reactor FiR (Triga Mark II).	RR	Decommissioning	Fuel has been transferred from the reactor. The remaining radioactivity content is very small, and mostly within the structural material

Conclusion on the acceptance of the excluded installations:

The Board considers that the exclusion is acceptable with regard to the potential radiological risk in case of fire.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Finland selected all installations as candidate.

3.5 - Conclusions

Conclusion on the acceptance of the represented installations:

Not applicable

Conclusion on the acceptance of the candidate installations:

The Board considers that the list of candidate installations is satisfactory.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.

ANNEX 7 **FRANCE - National selection**

1- Information provided by France

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☐ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	**Number of installations**	**Candidate installations**
Nuclear power plant	56 in operation 1 in construction 2 in definitive shutdown	*1 NPP 900MWe - after PSR4 (Tricastin 1)*
Research reactor	3 in operation	RHF
Fuel reprocessing facility	4	UP3A
Fuel fabrication facility	8	MELOX Romans Sur Isere CERCA
Fuel enrichment facility	2	George Besse II
Dedicated spent fuel storage	3	La Hague
Installations under decommissioning	9 NPPs 9 RR 7 FCF	RR OSIRIS
On-site radioactive waste storage	2	La Hague
Total	**107**	**10**

Fessenheim 1&2 are reported twice in the list as being in definitive shutdown and as being in decommissioning. The 9 NNPs under decommissioning include Brennelis and Superphenix, (see 3.3), 5 GCR (3.2), and Fessenheim 1&2 represented by an NPP in operation.

Some installations are regrouped as one in the list for TPR (Fessenheim 1&2, Saint Laurent des Eaux 1&2…)

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☐ **updated due to any modification since 2020 (new installation, declassified…)**

The list submitted to the TPR Board has been massively extended in May 2022 compared to the initial list. Some 20 additional facilities have been included, so that the number of facility reported is near to the NSD list of facilities. Some non-relevant very small facilities (Laboratories type) for the TPR II are not reported in the TPR list despite being mentioned in the NSD list.

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☒ **NPP**

☒ **RR**

☒ **FCF**

☒ **SF storage facility**

☐ **Installations under decommissioning**

☒ **On-site radioactive waste storage facility**

France does not directly select an NPP under decommissioning as a candidate, in particular GCR are not included. France has indicated for defueled gas reactors (GCR) "to be discussed", and therefore not mentioned in the following table.

Taking in particular into account that other countries have included gas-cooled graphite moderated reactors under decommissioning in view of their potential radiological risk in case of fire, the Board recommends inclusion of such a reactor as a candidate installation. The Board notes that France does not select any on-site radioactive waste storage facility related to NPPs and RRs. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Name of the facility	Type	State of operation	Rationale / corresponding facility
MONTS D'ARRÉE (EL4D)	NPP	decommissioning	defueled. No significant radiological risk
Superphénix BNI 91	NPP	decommissioning	defueled. Fuel assemblies transferred in another facility (APEC). Sodium

			has been neutralized in the form of concrete.
CABRI BNI 24	RR	operation	no significant radiological risk in case of fire
RAPSODIE BNI 25	RR	decommissioning	no significant radiological risk in case of fire
MASURCA BNI 39	RR	decommissioning	no significant radiological risk in case of fire
ÉOLE BNI 42	RR	decommissioning	no significant radiological risk in case of fire
PHÉBUS BNI 92	RR	decommissioning	no significant radiological risk in case of fire
MINERVE BNI 95	RR	decommissioning	no significant radiological risk in case of fire
ULYSSE BNI 18	RR	decommissioning	no significant radiological risk in case of fire
ORPHÉE BNI 101	RR	decommissioning	no significant radiological risk in case of fire Permanently shutdown in 2019 Defueled
PHÉNIX BNI 71	RR	decommissioning	defueled. Lessons learnt may not be applicable to facilities without sodium.
ITER BNI 174	RR	under construction	no significant radiological risk in case of fire
NUCLEAR FUEL DRY STORAGE INSTALLATION (CASCAD) BNI 22	SFSF	operation	very specific facility. The suitability of the TS for this facility is questionable
ECRIN (B1 and B2 basins) BNI 175	WSF	operation	No combustible material. Radiological risk in case of fire are not significant.
CHEMICAL PURIFICATION LABORATORY (LPC) BNI 54	FCF	decommissioning	no significant radiological risk in case of fire

PLUTONIUM TECHNOLOGY FACILITY (ATPu) BNI 32	FCF	decommissioning	ATPu produced plutonium-based fuel elements intended for fast neutron or experimental reactors as from 1967, then, from 1987 until 1997, for Pressurized Water Reactors (PWRs) using MOX fuel. Shut down in 2008. The radiological risk relies on alpha radioactive waste.
GEORGES BESSE PLANT FOR URANIUM ISOTOPE SEPARATION BY GASEOUS DIFFUSION (EURODIF) BNI 93	FCF	decommissioning	After stopping production at this plant in May 2012, the licensee carried out, from 2013 to 2016, the Eurodif “Prisme” process of “intensive rinsing followed by venting”, which consisted in performing repeated rinsing of the gaseous diffusion circuits with chlorine trifluoride (ClF3), a toxic and dangerous substance. These operations, which are now completed, allowed the extraction of virtually all the residual uranium deposited in the diffusion barriers. The main residual risk of BNI 93 is now associated with the UF6 containers in the storage yards, which are still attached to the perimeter of the facility.
LABORATORY FOR RESEARCH AND EXPERIMENTAL FABRICATION OF ADVANCED NUCLEAR FUELS (LEFCA) BNI 123	FCF	operation	no more radiological substance on site. Activities transferred to Atalante (laboratory)
URANIUM CLEAN-UP AND RECOVERY	FCF	operation	Very low quantities of radioactive material and

FACILITY BNI 138			of combustible material. Radiological risk in case of fire is not significant.
AREVA TRICASTIN ANALYSIS LABORATORY (ATLAS) BNI 176	FCF	operation	Very low quantities of radioactive material and of combustible material. Radiological risk in case of fire is not significant.
TRICASTIN URANIUM-BEARING MATERIAL STORAGE YARD BNI 178	FCF	operation	No combustible material. Radiological risk in case of fire are not significant.
P35 BNI 179	FCF	operation	No combustible material. Radiological risk in case of fire are not significant.

Conclusion on the acceptance of the excluded installations:

The Board considers that the justifications for excluding installations are generally acceptable with regard to the potential radiological risk in case of fire.

Concerning ATPu facility, the Board suggests that the NAR presents complementary justifications for the exclusion due to presence of alpha radioactive waste.

Concerning installations under decommissioning, and particularly nuclear reactors (either commercial or research), the absence of nuclear fuel at the facility cannot be the only criterion to determine whether the installation under decommissioning is or is not within the scope of the TPR. Other considerations regarding the remaining contaminated materials and the works planned to be carried out, and the radioactive waste in temporary storage in the facility (while waiting for treatment or transfer to dedicated storage facilities) must be taken into account to establish the level of significance of the radiological risk posed by the installation in case of a fire affecting such materials/tasks.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Name of the Candidate facility	Type	State of operation	Represented Installation	Rationale
Fleet of 900 MWe post PSR4	NPP	operation	Fleet of 1450 MWe Fleet of 1300 MWe FLAMANVILLE NUCLEAR POWER PLANT (reactor 3 – EPR) Fessenheim 1 &2 ARDENNES CENTRALE NUCLÉAIRE CNA-D (CHOOZ A)	All NPPs are operated by EDF and have to comply with the same regulatory requirements. PSR4 improvements may be transferable to other existing facilities
HIGH FLUX REACTOR (RHF) BNI 67	RR	operation		Recent PSR. Improvements may be transferable to other existing facilities

GEORGES BESSE II PLANT FOR CENTRIFUGAL SEPARATION OF URANIUM ISOTOPES (GB II) INB 168	FCF	operation	TU5 AND W FACILITIES BNI 155	
NUCLEAR FUELS FABRICATION PLANT (MELOX) INB 151	FCF	operation	PLUTONIUM TECHNOLOGY FACILITY (ATPu) BNI 32	Melox is particularly interesting regarding the containment
SFP, La Hague	SFSF	operation		
La Hague (silo 115 or 130 - to be discussed) included in BNI 38	WSF	operation		Higher risk profile
REPROCESSING PLANT FOR SPENT FUEL ELEMENTS FROM LIGHT WATER REACTORS (UP3 A) BNI 116	FCF	operation	SPENT FUEL REPROCESSING PLANT (UP2-400) BNI 33 in decommisioning HIGH LEVEL OXYDE (HAO) FACILITY BNI 80 in decommisioning REPROCESSING PLANT FOR SPENT FUEL ELEMENTS FROM LIGHT WATER REACTORS (UP2-800) BNI 117 LIQUID EFFLUENT AND SOLID WASTE TREATMENT STATION (STE2) in decommisioning LIQUID EFFLUENT AND SOLID WASTE TREATMENT STATION (STE3) BNI 118	Focus on the T2 facility : Facility for separating uranium, plutonium and fission products and concentrating/storing fission product solutions, which has the highest risk profile in this plant. Potential for improvements Justification: similar facilities with same operator
OSIRIS-ISIS BNI 40	RR	decommissioning		Defueled. Osiris permanently shutdown in 2015 Isis permanently shutdown in 2019. Radiological risk in case of fire are not very important but this RR is included in the selection in order to

				represent one major operator (CEA).
NUCLEAR FUELS FABRICATION UNIT (CERCA + FBFC) BNI 63-U	FCF	operation	ENRICHED URANIUM PROCESSING FACILITY (ATUE) BNI 52 in decommissioning	
NUCLEAR FUELS FABRICATION UNIT (FBFC) BNI 98	FCF	operation		

Expected to be represented by foreign RR: JULES HOROWITZ REACTOR (JHR) BNI 172

Not mentioned: FUEL STORAGE FACILITY (APEC) BNI141 - Very little residual power and therefore long grace periods in case of loss of cooling

During the review, France has given more information about the candidate and represented NPP installations. France has proposed as a candidate for the TPR II a NPP 900 MWe at the PSR4 (4th periodic safety review) state that means a 900 MWe plant that has implemented the PSR4 improvements. These improvements result mainly from the use as a reference of the approach for the EPR Flamanville 3 reactor.

As the improvements on the 900 MWe may be transferable to the other series, these were called "represented" installations by France, since it is written in the TS "*Insights from the TPR will be transferable to represented installations"*.

In the NAR, France will highlight in the NAR, for the other series (1300 MWe, N4, EPR), the potential specificities of their fire protection, especially in terms of design. That means France will go further than what is requested in the NAR "*It is not expected to provide information about other installations, so-called "represented installations"*

In conclusion, France will report in the NAR on a NPP 900 MWe at the PSR4 state, highlighting the improvements related to fire protection for PSR4. France will also stress in the NAR, the potential specificities of the fire protection of the other series (1300 MWe, N4, EPR), especially in terms of design. Besides, the improvements implemented on the 900 MWe which are transferable to the other series of NPP will be mentioned and will be in the action plan.

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

The Board notes that France has chosen only one candidate NPP to represent a large number of such installations, which are of different series (900MWe, 1300MWe, 1450MWe and EPR). In general,

whenever the fire protection approach is similar between several installations of the same type, the NAR should describe at least one installation in detail (the candidate one). In such cases the Board recommends that the NAR highlights the differences in terms of fire protection approach for the other installations (represented ones). For example, if the fire protection approach is similar between two (types of/series of) nuclear reactors, one must be described extensively while the focus must be made for the other ones only on the specificities of their fire protection approach to avoid unnecessary repetitions (i.e., differences in terms of organisation of the fire protection brigade, local regulations for federal states, external environment or in terms of design…).

However, the Board suggests that given the size and significance of the NPP fleet, France should reconsider its choice of having only one candidate NPP and instead select one NPP per design series, including the EPR. Whilst highlighting any differences in fire-protection approaches, the NAR could still include cross references to similarities between the different selected NPPs.

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

The Board considers that the information to justify the represented installations is clear.

However, the Board suggests that given the size and significance of the NPP fleet, France should reconsider its choice of having only one candidate NPP and instead select one NPP per design series, including the EPR. Whilst highlighting any differences in fire-protection approaches, the NAR could still include cross references to similarities between the different selected NPPs.

Conclusion on the acceptance of the candidate installations:

The Board recommends that France reconsiders its list of candidate installations. In particular, the Board suggests that given the size and significance of the NPP fleet, France should reconsider its choice of having only one candidate NPP and instead select one NPP per design series, including the EPR. Whilst highlighting any differences in fire-protection approaches, the NAR could still include cross references to similarities between the different selected NPPs.

In particular, taking into account that other countries have included gas-cooled graphite moderated reactors under decommissioning in view of their potential radiological risk in case of fire, the Board recommends inclusion of such a reactor as a candidate installation.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly. Concerning ATPu facility, the Board suggests that the NAR presents complementary justifications for the exclusion due to presence of alpha radioactive waste.

ANNEX 8 GERMANY - National selection

1- Information provided by GERMANY

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☐ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Name of Candidate installations
Nuclear power plant	0	None
Research reactor	2	FRM II FRMZ (TRIGA Mark-II)
Fuel reprocessing facility	0	None
Fuel fabrication facility	1	ANF Lingen
Fuel enrichment facility	1	Urenco Gronau
Dedicated spent fuel storage	17	Rubenow Biblis
Installations under decommissioning	36 NPPs 7 RRs 1 FCF	NPP Groups 1 (not defueled) NPP Group 2 (defueled) FRM II, FRMZ Karlsruhe FCF
On-site radioactive waste storage	7	None (analysed as part of the mother SFSF facility)
Total	**72**	**9**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☐ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☐ **NPP**

☒ **RR**

☒ **FCF**

☒ **SF storage facility**

☒ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The Board notes that no installations in the category of operating "Nuclear Power Plants" have been proposed by Germany (see 3.3). In respect of the three currently operating power reactors in the country, the TS indicates that for facilities whose stage will change between June 2022 and the date for the submission of the NAR, the NAR should detail if the information is related to the current stage of the facility and if and when this stage is expected to change (e.g. from operation to decommissioning). Given recent policy announcements in Germany which could imply their continued operation beyond 2022, consideration should be given to including currently operating NPPs in the scope.

The Board notes that Germany does not select any on-site radioactive waste storage facility. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

The facilities proposed for exclusion follow:

Name of the facility	Type	State of operation	Rationale to exclude
SUR Furtwangen	RR	Decommissioning	Homogeneous zero-power research reactors with very, very low risk potential
SUR Stuttgart	RR	Decommissioning	Homogeneous zero-power research reactors with very, very low risk potential
SUR Ulm	RR	Decommissioning	Homogeneous zero-power research reactors with very, very low risk potential

Complementary information was provided by the country during the review for additional exclusions:

During the review, the Board requested information for the rationale to exclude SUR Aachen. Germany answered that the SUR Aachen reactor is a zero-power reactor. Its fuel plates were removed in 2008. Low maximum neutron flux of 1.0E07 cm^{-2} s^{-1}, no significant radiological risk from activation expected.

The Board considers that the justification for its exclusion is acceptable.

Conclusion on the acceptance of the excluded installations:

The Board considers that the justifications for excluding installations are acceptable with regard to the potential radiological risk in case of fire.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Type	Candidate, name of the facility	Represented installations	Additional information
Decommissioning Facilities	Group I: NPPs in decommissioning, with remaining fuel in RPV or wet storage (Installations in this category will be reported upon together)	Neckarwestheim II Gundremmingen C Isar 2 Emsland Grohnde Brokdorf Philippsburg 2 Gundremmingen B	Discussions with our experts in Germany led to the conclusion, that for NPPs in decommissioning with nuclear fuel in the pools, fire protection measures are comparable amongst all grouped facilities and can be described in a generic manner. We therefore chose "contains fuel" as a reasonable threshold
	Group II: NPPs in decommissioning, without remaining fuel	Krümmel Rheinsberg Kompakte Natriumgekühlte Kernanlage Mehrzweckforschungsreaktor Obrigheim	

	(Installations in this category will be reported upon together)	Neckarwestheim 1 Philippsburg 1 Isar 1 Gundremmingen A Grafenrheinfeld Biblis-A and B Greifswald-1, 2, 3, 4 and 5 Lingen Stade Unterweser Arbeitsgemeinschaft Versuchsreaktor Jülich (AVR) Thoriumhochtemperaturreaktor Würgassen Mülheim-Kärlich Brunsbüttel Research and Measuring Reactor Braunschweig (FRMB)	for different risk levels.
RR	FRM II	Berliner ExperimentierReaktor II Forschungsreaktor Geesthacht 1 Forschungsreaktor Geesthacht 2 Forschungsreaktor-2 Forschungsreaktor München Forschungsreaktor Neuherberg DIDO	20 MWth
	FRMZ		TRIGA MARK-II 0,1 MWth
FCF	Urenco, Gronau	None	
	Advanced Nuclear Fuels (ANF), Lingen		
	Karlsruhe site		Reprocessing (WAK) and vitrification (VEK)
SFSF/WSF	Rubenow site	Ahaus site Gorleben site Jülich site Karlsruhe site (only WSF)	spent fuel and high-level radioactive waste from reprocessing
	Biblis (part of the NPP site)	Brokdorf site Brunsbüttel site Grafenrheinfeld site Grohnde site Gundremmingen site Isar site Krümmel site Lingen site Neckarwestheim site Philippsburg site	spent fuel and vitrified radioactive waste from reprocessing licensed or applied for under § 6 of the Atomic Energy Act (AtG)

		Unterweser site Greifswald NPP Units 1 – 5 THTR Hamm-Uentrop Mülheim-Kärlich NPP Obrigheim site Rheinsberg site Stade site Würgassen site	

Complementary information provided by the country during the review

- *Criteria for representativeness of generic reactors for Groups I and II of NPP in decommissioning attending to the "contains spent fuel" criterion.*
- *Criteria for the selection of candidate/represented SFSF/WSF according to facility purpose and federal state location.*
- *Additional information regarding the consideration of the still operating NPPs (Neckarwestheim 2, Isar-2 and Emsland) as "NPPs in decommissioning", with their operating period potentially overlapping part of the time span of the TPR II, (further update or clarification requested in view of the recent situation at the country).*
- *Inclusion of RRs already dismantled or under decommissioning as represented installations.*

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

Germany proposes two RR in operation as candidates to represent the 7 RR in decommissioning. Other considerations regarding the works planned to be carried out and the radioactive waste in temporary storage in the facility (while waiting for treatment or transfer to dedicated storage facilities) should be considered for reactors under decommissioning.
The Board recommends that at least one research reactor under decommissioning is included as a candidate installation.

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

The Board considers that the information to justify the represented installations is clear and sufficient

Conclusion on the acceptance of the candidate installations:

The Board recommends that Germany reconsiders its list of candidate installations.

The Board recommends that given recent policy announcements in Germany which could imply their continued operation beyond 2022, consideration should be given to including currently operating NPPs in the scope.

Furthermore, as the two research reactors proposed as candidate installations are both operating, the Board recommends that at least one research reactor under decommissioning is included as a candidate installation.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate one and report on them accordingly.

ANNEX 9 HUNGARY - National selection

1- Information provided by Hungary

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☐ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Name of Candidate installations
Nuclear power plant	**4**	Paks NPP (Units 1,2,3,4) Paks II NPP (**tentatively** candidate, depending whether the construction licence will be granted before 1st of July 2022, or not.)
Research reactor	**2**	Budapest Research Reactor Training Reactor of the Budapest University of Technology and Economics
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage	**1**	Spent Fuel Interim Storage Facility
Installations under decommissioning		
On-site radioactive waste storage		
Total	**7**	**7**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☐ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☒ **NPP**

☒ **RR**

☐ **FCF**

☒ **SF storage facility**

☐ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The Board notes that Hungary does not select any on-site radioactive waste storage facility.
Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

None of the installations was excluded.

Conclusion on the acceptance of the excluded installations:

not applicable

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Hungary has selected all its installations as candidates.

Type	Candidate, name of the facility	Represented installation	Additional information
NPP	Paks NPP (Units 1,2,3,4)	-	

NPP	Paks II NPP (tentatively candidate, depending whether the construction licence will be granted before 1st of July 2022, or not.)	-	**TENTATIVELY** VVER 2006 type units with nominal power 1200 MWe each (PWR). The Basic design is completed and submitted for the construction licensing procedure as supporting documentation of the Preliminary Safety Analysis Report. This phase of the project could give real opportunity to influence the potentially revealed design issues in fire safety along the TPR process. **Initially, Hungary considered to include these units only tentatively as candidate facility**, depending whether the construction licence will be granted before 1st of July 2022, or not. (It is in line with the TPR II ToR.)
RR	Budapest Research Reactor	-	10 MWth light-water cooled and moderated beryllium reflected tank type reactor.
RR	Training Reactor of the Budapest University of Technology and Economics	-	100 kWth light-water cooled and moderated reactor (originally 10 kW).
ISF	Spent Fuel Interim Storage Facility	-	

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

Although technically, PAKS II is out of scope (as a construction licence for Paks II was granted by HAEA on 25 August 2022), the Board encourages Hungary to consider including the facility voluntarily in the reporting in particular how fire protection is included in the design assumptions for the new plant.

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

Not applicable

Conclusion on the acceptance of the candidate installations:

The Board considers that the list of candidate installations is satisfactory. However, the Board encourages Hungary to include the Paks II nuclear power plant voluntarily in the NAR, indicating in particular how fire protection is included in the design assumptions.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.

ANNEX 10 **ITALY - National selection**

1- Information provided by Italy

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	**Number of installations**	**Name of Candidate installations**
Nuclear power plant		
Research reactor	4	Lena Triga Mark II Tapiro Fast neutron
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage	3	ITREC-plant ESSOR-plant
Installations under decommissioning	11	Latina (NPP) Trino (NPP) ISPRA 1 (RR) ESSOR (RR) Eurex (FCF) IPU (FFP)
On-site radioactive waste storage	19	T1+T2 (Trino) E1, E2, E3 (Eurex) OPEC2 (IPU)
Total	37	**13**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☐ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

It was found that from the list of 2020 report 7 out of 9 RR were provided. SM-1 and RB-3 were not included.

☒ **updated due to any modification since 2020 (new installation, declassified…)**

RB-3 has now been fully decommissioned and therefore was not in the starting list of installations, whilst SM-1 should have been included.

Additional information was provided by email stating: "*Concerning SM-1 we would like to stress that the exclusion of this installation comes from the following considerations: SM-1 is a Subcritical Assembly composed by natural uranium within a tank filled by demineralized water. It was excluded in line with the note n.2 of point "00.3 - Scope of nuclear installations to be covered in the NAR" of the Technical Specification for TPR II.*

For the RB-3 reactor the decommissioning activities are concluded and the site was released free from the radiological constrains in 2021."

Conclusion on the acceptance of the proposed list

The Board considers that the *installation SM-1* should be added to the list of the national installations in the scope of the NSD.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☐ **NPP (n.a.)**

☒ **RR**

☐ **FCF (n.a.)**

☒ **SF storage facility**

☒ **Installations under decommissioning**

☒ **On-site radioactive waste storage facility**

The Board notes that Italy does not select any on-site radioactive waste storage facility for research reactors. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

The following facilities are excluded:

Name of the facility	Type	State of operation	Rationale to exclude
AGN 201 - Costanza Palermo	RR	Decommissioning	The reactor is a homogeneous type, zero power reactor, with the core consisting of a series of discs of a mixture of polyethylene (which acts as a moderator) and enriched uranium oxide. The reactor is currently in permanent cold shutdown conditions.
L54-M	RR	Decommissioning	The reactor is a homogeneous reactor with a thermal power of 50 KW. The fuel consists of a solution of uranyl sulphate. The spent fuel and radioactive sources have been already removed from the reactor. A few m3 of radioactive waste are still present on the site. The waste arising from decommissioning will be sent to an external storage facility.
Avogadro AFR (SFSF)	SFSF		Avogadro is a spent fuel wet storage facility away from reactors. The storage building is focused on its storage pool, where the spent fuel lays in several racks. Several transports have been arranged in recent years to transfer the fuel assemblies to UK and to France for reprocessing. At present only 63 fuel elements remain to be transferred to France in the framework of the in place service agreement (in the near future). To prevent chemical corrosion of the structural materials of the fuel storage racks and of the bottles containing Garigliano fuel elements, the storage pool is filled with demineralised water and periodical controls of the chemical composition of pool water are imposed by the operative technical requirements. Once the transfer abroad of the remained spent fuel will be completed the facility will enter into the decommissioning phase.

Bosco Marengo Fuel Fabrication Facility	Fuel Fabrication		All plant systems with contaminated parts have been dismantled "Brown field configuration" is close to be reached.
WSFs at the site of Bosco Marengo Fuel Fabrication Facility	Waste storage		Initial motivation by Italy: waste already processed and conditioned. After questioning about the effectiveness of the waste conditioning additional information was provided: the conditioned waste is fire-resistant.

Complementary information provided by the country during the review

During the review, the Board requested more information:

- regarding Avogadro AFR (SFSF): After questions to precise "in the near future" the following update was received: "*As the deadline of the 30th of June 2022 is now currently adopted for installation to be included into the scope of the exercise, the Avogadro AFR will be added among the Italian candidate spent fuel storage installations*."

- regarding the exclusion of 2 out of 5 storages at Garigliano NPP and 2 out of 6 at ITREC plant site related to the fire-resistance. The following answers were received from Italy*:*

  - *"Garigliano NPP: all radioactive waste into the excluded storage facilities is in fire-resistant conditioned form.*
  - *ITREC plant: in the first excluded storage facility the radioactive waste is in fire-resistant conditioned form. In the second one most of the radioactive waste is in fire-resistant conditioned form and other waste is segregated into fire-resistant barriers."*

Conclusion on the acceptance of the excluded installations:

The Board considers that the justifications for excluding installations are acceptable with regard to the potential radiological risk in case of fire, and the Board concurs with IT's assessment that Avogadro AFR can't be excluded with regard to the potential radiological risk in case of fire.

Excluded storages at NPP Garigliano NPP and ITREC should be added to the list of excluded installations.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Installation category	Candidate installations	Represented installations
Nuclear power plant		
Research reactor	Lena Triga Mark II Tapiro Fast neutron	*RC-1 Triga Mark II*
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		

Dedicated spent fuel storage	ITREC-plant ESSOR-plant **Avogadro AFR (added during the review)**	
Decommissioning	Latina (NPP) Trino (NPP) ISPRA 1 (RR) ESSOR (RR) Eurex (FCF) IPU (FFP)	*Caorso (NPP)* *Garigliano (NPP)* *Itrec (FCF)*
On-site radioactive waste storage	T1+T2 (Trino) E1, E2, E3 (Eurex) OPEC2 (IPU)	*C1, C2, C3 (Caorso)* *G1, G2, G3 (Garigliano)* *L1, L2 (Latina)* *I1, I2, I3, I4 (ITREC)*
Total	**17**	**14**

As discussed under 3.2 Italy has stated the list of candidate facilities will be extended with Avogadro AFR (bold in the table above).

☒ *Indicate if the sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

The Board considers that the information to justify the represented installations is clear and sufficient.

Conclusion on the acceptance of the candidate installations:

The Board considers that the rationale for initially not selecting the Avogadro AFR as candidate installation was not justified, (3.3), and therefore welcomes its inclusion. The Board considers the updated list of candidate installations satisfactory.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities for RRs are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.

ANNEX 11 **LITHUANIA- National selection**

1- Information provided by Country Lithuania

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	**Number of installations**	**Name of Candidate installations**
Nuclear power plant		
Research reactor		
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage	2	SNFSF - 2
Installations under decommissioning	2	IGNALINA -2
On-site radioactive waste storage	7	B3/4 project B2-2 project Building 151 Building 158 Building 158/2
Total	**11**	**7**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☐ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☒ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

SF and waste facilities were added since 2020.

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate, taking account of the ones added since 2020.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

At least one installation per category has been selected as candidate.

☐ **NPP**

☐ **RR**

☐ **FCF**

☒ **SF storage facility**

☒ **Installations under decommissioning**

☒ **On-site radioactive waste storage facility**

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Lithuania excluded the following installations due to low radiological risk.

Name of the facility	Type	Technology / main characteristics	State of operation	Additional Information / Rationale
Spent Nuclear Fuel Storage Facility (SNFSF - 1)	SFSF	Dry-cask storage facility	operation	Fires have not the potential to result in significant radiological risks to workers and the public, as there are no combustible materials near the casks and the casks in SNFSF-1 are stored in open walled area.
Solid Waste Retrieval Facility (retrieval from buildings 155, 155/1, B2-1 project)	WSF	Retrieval of solid, not treated radioactive waste, and pre-sorting	operation	Waste is classified as short-lived very low level waste (VLLW) and, as it was indicated in SAR, fires have insignificant radiological risks to workers, the public and/or the environment.

Very low-level waste storage facility (B19-1)	WSF	Temporary storage of very low-level radioactive waste	operation	Waste is classified as VLLW and, as it was indicated in SAR, fires have insignificant radiological risks to workers, the public and/ or the environment.

Conclusion on the acceptance of the excluded installations

The Board suggests to include SNFSF-1 as a represented installation rather than excluded.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Candidate	Type	Status	Represented Installation	Additional Information / Rationale
Ignalina NPP Unit 2	NPP	decomissioning	Ignalina NPP Unit 1	The fire safety concept of both INPP Units is the same, so it is proposed to select Unit 2 as "Candidate" installation for TPR-II. Also, the Unit 2 was shutdown later than Unit 1 as well as there is more safety related equipment there.
Interim Spent Nuclear Fuel Storage Facility (SNFSF - 2) (B1 project)	SFSF	operation	none	
Solid Waste Retrieval Facility (retrieval from buildings 157, 157/1, B2-2 project)	WSF	operation	none	
Solid Waste Management and Storage Facilities (B3/4 project)	WSF	operation	none	

Liquid Waste Storage Facilities (Building 151)	WSF	operation	none	
Bituminized waste Storage facility (Building 158)	WSF	operation	none	
Cemented waste Storage facility (Building 158/2)	WSF	operation	none	

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

The Board considers that the information to justify the represented installations is clear and sufficient

Conclusion on the acceptance of the candidate installations

The Board considers that the list of candidate installations is satisfactory.

The Board suggests to include SNFSF-1 as a represented installation rather than excluded.

ANNEX 12 **NETHERLANDS - National selection**

1- Information provided by Country Netherlands

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	**Number of installations**	**Name of Candidate installations**
Nuclear power plant	1	Borssele
Research reactor	4	Hoger Onderwijs Reactor (HOR)
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility	1	Uranium Enrichment Company
Dedicated spent fuel storage	1	HABOG
Installations under decommissioning	1	
On-site radioactive waste storage	6[2]	High Flux Reactor Waste Storage Facility (WSF)
Total	**14**	**6**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☐ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☒ **updated due to any modification since 2020 (new installation, declassified…)**

Research reactors PALLAS and SHINE have been added. Both installations are in the pre-licensing phase.

[2] Waste Treatment facility as reported included in this category

High Flux Reactor Decontamination & Waste Treatment (DWT) facility as well as five waste storage facilities (High Flux Reactor Waste Storage Facility (WSF), VOG, VOG-2, LOG, and COG) have been added compared to NSD list.

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

At least one installation per category has been selected as candidate. The only facility under decommissioning does not pose a significant radiological risk and has been excluded.

☒ **NPP**

☒ **RR**

☒ **FCF**

☒ **SF storage facility**

☐ **Installations under decommissioning**

☒ **On-site waste storage facility**

The Board notes that Netherlands does not select any on-site radioactive waste storage facility related to installations (NPP, RR, FCF, decommissioning). Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Netherlands excluded the following facilities due to different reasons.

Name of the facility	Type	Technology / main characteristics	State of operation	Additional Information
Kerncentrale Dodewaard	NPP	BWR, P = 60 MW_e	safe enclosure (2005)	All non-fixed radioactivity already removed
High Flux Reactor Decontamination &	Waste treatment	Waste treatment	operation	Facility that houses short term buffer storage for resins from HFR. Update: after having seen the outcome of the coordinated sampling, we conclude that

Waste Treatment (DWT)				there are no comparable facilities participating in the TPR-II. This makes the peer review a nonsensical exercise for this single facility. Therefore, in our final selection it is excluded.
VOG, VOG-2, LOG, and COG	WSF	Storage facilities	operation	Out of scope: not on the same site as KCB

Conclusion on the acceptance of the excluded installations:

The Board considers that the justifications for excluding installations are acceptable with regard to the potential radiological risk in case of fire.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

All installations that have not been excluded are candidates. There are no represented installations.

Candidate	Type	Status	Represented Installation	Additional Information / Rationale
Uranium Enrichment Company	FCF	operation	None	Enrichment plant
Kerncentrale Borssele (KCB) (2-loop PWR, P = 485 MW_e)	NPP	operation	None	
Hoger Onderwijs Reactor (HOR) (Tank-in-pool, P = 2 MW_{th})	RR	operation	None	
High Flux Reactor (HFR) Tank-in-pool, P = 45 MWth	RR	operation	None	
HABOG	SFSF	operation	None	
High Flux Reactor Waste Storage Facility (WSF)	WSF	operation	None	

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented*

installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.

The Dutch list of nuclear installations includes PALLAS and SHINE research reactors. However, their construction licences have not yet been granted (at least by 30 June 2022) and therefore are considered out of the scope of the TPR II in respect of the TS.

Although technically, PALLAS is out of scope, the Board encourages Netherlands to consider to include this facility voluntarily in the reporting in particular how fire protection is included in the design assumptions for this new installation.

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

Not applicable

Conclusion on the acceptance of the candidate installations

The Board considers that the list of candidate installations is satisfactory.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.

For the purposes of sharing experience, the Board encourages Netherlands to include the PALLAS reactor in the reporting and highlight fire protection improvements included in the design, despite the fact it has not yet been granted a construction licence.

ANNEX 13 **POLAND - National selection**

1- Information provided by Country Poland

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Name of Candidate installations
Nuclear power plant		
Research reactor	1	Maria, Świerk
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage	1	
Installations under decommissioning	1	
On-site radioactive waste storage		
Total	**3**	**1**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☐ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☒ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

The Board has noted that ZUOP, Świerk, which is a spent fuel pool in operation, is not on the EC NSD List. It has been added since 2020.

Conclusion on the acceptance of the proposed list

The Board considers that the installation ZUOP, Świerk should be added to the list of the national installations in the scope of the NSD.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

No installation under decommissioning or spent fuel storage included due to low radiological risk.

☐ **NPP**

☒ **RR**

☐ **FCF**

☐ **SF storage facility**

☐ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The Board notes that Poland does not select any on-site radioactive waste storage facility. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

PL excluded the facilities listed below due to low radiological risk.

Name of the facility	Type	Technology / main characteristics	State of operation	Additional Information
Ewa, Świerk	RR	10 MW	decommissioning	RR Ewa is at the late phase of decommissioning and all the fuel and radioactive materials have been already completely removed. Since there is no radiological risk due to the fire, RR Ewa is not of interest to TPR-II.
ZUOP, Świerk	SFSF	Spent fuel pool	operation	At present, there is no spent nuclear fuel in the facility (all fuel elements were shipped to the Russian Federation under the GTRI - Global Threat Reduction Initiative program). Anyway, this facility is designed only for such spent fuel which doesn't need active cooling. Therefore water is

				used just to provide shielding function.

Conclusion on the acceptance of the excluded installations:

The Board considers that the justifications for excluding installations are acceptable with regard to the potential radiological risk in case of fire

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Candidate	Type	Status	Represented Installation	Additional Information / Rationale
Maria, Świerk	RR	operation	none	

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

3.5 – Conclusions

Conclusion on the acceptance of the represented installations

Not applicable.

Conclusion on the acceptance of the candidate installations:

The Board considers that the list of candidate installations is satisfactory.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate one and report on it accordingly.

ANNEX 14 **ROMANIA - National selection**

1- Information provided by Romania

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☐ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	**Number of installations**	**Name of Candidate installations**
Nuclear power plant	2	Cernavoda NPP Unit 2
Research reactor	1	TRIGA Research Reactor, Pitesti
Fuel reprocessing facility		
Fuel fabrication facility	1	Pitesti Nuclear Fuel Fabrication Plant
Fuel enrichment facility		
Dedicated spent fuel storage	1	Cernavoda Spent Fuel Dry
Installations under decommissioning	1	
On-site radioactive waste storage	1	Radioactive waste storage related to Cernavoda Units 1
Total	**7**	**5**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☒ **updated due to any modification since 2020 (new installation, declassified…)**

Romania indicates that the VVR-s research reactor (in the NSD list) has been fully decommissioned, therefore it is excluded from this TPR analysis.

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☒ **NPP**

☐ **RR**

☒ **FCF**

☒ **SF storage facility**

☐ **Installations under decommissioning (RR was excluded)**

☒ **On-site radioactive waste storage facility**

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Name of the facility	Type	State of operation	Rationale to exclude
VVR-s research reactor	RR	Decommissioned	No longer under regulatory control, since 2021

Conclusion on the acceptance of the excluded installations:

Not applicable.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Romania selected all installations as candidate. Cernavoda Unit 2 will represent Cernavoda Unit 1. Although they are very similar units, there are still some differences between unit 1 and unit 2 of Cernavoda NPP and design changes are planned for improving fire protection of Unit 1 to incorporate the features from Unit 2.

3.5 - Conclusions

Conclusion on the acceptance of the represented installations:

Not applicable

Conclusion on the acceptance of the candidate installations:

The Board considers that the list of candidate installations is satisfactory.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.

ANNEX 15 **SLOVAKIA - National selection**

1- Information provided by Slovakia

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Candidate installations
Nuclear power plant	6	Mohovce 3 (MO34 Unit 3)
Research reactor		
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage	1	
Installations under decommissioning	3	
On-site radioactive waste storage	2	
Total	**12**	**1**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☐ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

☒ **NPP**

☐ **RR**

☐ **FCF**

☐ **SF storage facility**

☐ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The Board notes that Slovakia does not select any on-site radioactive waste storage facility. Therefore, the Board refers to its general recommendation under section 3 of the main text.

The Board notes that Slovakia has selected only one NPP and no other facilities (see 3.3 below).

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Name of the facility	Type	Technology / main characteristics	State of operation	Additional Information
The Bohunice A1 NPP	NPP		Shutdown, in decommissioning process.	Based on information, provided by Slovakia, fire hazard and the operational events arising from the fire have been evaluated as negligible in the safety analyses.
The Bohunice V1 NPP	NPP	2xWWER-440/V230)	Shutdown, in decommissioning process.	Based on information, provided by Slovakia fire hazard and the operational events arising from the fire have been evaluated as negligible in the safety analyses.
MSVP	Interim spent fuel storage facility (ISFSF)		Operation (Wet type part of ISFS) Dry type of ISFSF currently under construction, operation of dry	Based on information, provided by Slovakia fire hazard and the operational events arising from the fire have been evaluated as negligible in the safety analyses.

			part is expected in 2023. Operation of ISFSF is envisaged up to 2130.)	
RU RAO Near surface disposal facility for VLLW and LLW	On-site radioactive waste storage		Operation	Facility is fire hazard risk resistant. LLW RAW are solidified into high integrity disposal containers. Disposal of explosive substances is prohibited in waste acceptance criteria (WAC).
IS RAW (Integral RAW Storage Facility)	On-site radioactive waste storage		Operation	Based on information, provided by Slovakia, fire risk has been evaluated as very limited in the safety analyses.

The Board notes that Slovakia claims that "*fire hazard and the operational events arising from the fire have been evaluated as negligible in the safety analyses*". The Board recalls that the objective of the safety analyses is to demonstrate that given the provisions, the radiological consequences are acceptable. So this justification does not enable to exclude the installation.

In particular, taking into account that other countries have included spent fuel storage facility and NPP in decommissioning in view of their potential radiological risk in case of fire, the Board recommends inclusion of such facilities as candidate installations.

Conclusion on the acceptance of the excluded installations:

The Board considers that for consistency with other countries and from the point of view of sharing experience at least one reactor in decommissioning, and a spent fuel storage facility should be added to complement the candidate list.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Indicate the rationale presented by the national regulator for the selection of candidate installations among the not excluded installations (for example, similar characteristics, same licensee, coordinated sampling approach…) (NB: this item is to check by the Board at the end of the TLs' review that the rationale are consistent from one country to another)

Type	Candidate, name of the facility	Represented installation	Additional information
NPP	MO34 Unit 3	• Bohunice V2 • MO12	All operating nuclear power plants in Slovakia (NPP V2 and NPP MO12) and all nuclear power plants in deferred construction (NPP MO34) are nuclear power plants of

			the same type (VVER-440/V213) and belong to one permit holder – SE. The nuclear power plants in question have a comparable level of safety. For the purposes of the thematic peer review (TPR-II), it is proposed to create NPP VVER-440/V213 group in the Slovak Republic, which will be represented by the MO34 nuclear power plant (unit 3). Differences between nuclear power plants in fire protection will be described in the National Assessment Report (NAR). The candidate nuclear facility is MO34 (unit 3) due to the fact that the latest fire protection standards are implemented at the MO34 nuclear power plant and the knowledge gained from the inspection of the MO34 nuclear power plant can be transferred to both V2 and MO12 nuclear power plants.

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

The Board considers that the information to justify the represented installations is clear and sufficient.

Conclusion on the acceptance of the candidate installations:

The Board recommends that Slovakia reconsiders its list of candidate installations.

The Board considers that for consistency with other countries and from the point of view of sharing experience at least one reactor in decommissioning, and a spent fuel storage facility should be added to complement the candidate list. The NAR should describe at least one installation in detail (the candidate one) and highlight the differences in terms of fire protection approach for the other installations (represented ones). Concerning installations under decommissioning, and particularly nuclear reactors (either commercial or research), the absence of nuclear fuel at the facility cannot be the only criterion to determine whether the installation under decommissioning is or is not within the scope of the TPR. Other considerations regarding the remaining contaminated materials and the works planned to be carried out, and the radioactive waste in temporary storage in the facility (while waiting for treatment or transfer to dedicated storage facilities) must be taken into account to establish the level of significance of the radiological risk posed by the installation in case of a fire affecting such materials/tasks.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as separate ones and report on them accordingly.

ANNEX 16 **SLOVENIA - National selection**

1- Information provided by Country Slovenia

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☐ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Candidate installations
Nuclear power plant	1	Krsko NPP
Research reactor	1	0
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage	1	Dry SFDS Krško NPP site
Installations under decommissioning		
On-site radioactive waste storage	1	Solid waste storage facility (Krško NPP site)
Total	**4**	**3**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☐ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☒ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

New Installation: Dry SFDS Krško NPP site which belongs to the NPP under construction.

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

☒ **NPP**

☐ **RR**

☐ **FCF**

☒ **SF storage facility**

☐ **Installations under decommissioning**

☒ **On site radioactive waste storage facility**

The Board notes that Slovenia does not select any on-site radioactive waste storage facility related to the NPP and to the research reactor. Therefore, the Board refers to its general recommendation under section 3 of the main text.

The Board notes that Slovenia has not selected the research reactor (see 3.3).

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

According to Slovenia, the Ljubljana TRIGA RR cannot be directly compared to other TRIGA RR in EU – which cannot be verified by the board - and pose a low radiological risk. The operator invested in many equipment improvements and procedural/emergency response actions that significantly improved the fire safety of the facility.

Name of the facility	Type	Technology / main characteristics	State of operation	Additional Information
Ljubljana TRIGA Mark II	RR	0,25 MW	operation	RR with lower risk and without any significant additional risk according to its present configuration. No additional risks are envisioned in the near future. Following the fire event in 2010 the facility significantly improved its fire protection means and eliminated several sources of fire hazard in the reactor rooms. The INSARR follow-up mission in 2015 and the results of PSR confirmed the positive effect of the action plan

				improvements on reactor's fire safety.

Conclusion on the acceptance of the excluded installations:

The Board notes the arguments for excluding the Ljubljana TRIGA installation include the significantly improved fire protection measures following an earlier fire in 2010.

The Board notes that other countries included TRIGA Reactors with similar power. A similar fire safety improvement campaign might not have been the practice in other countries – that is why participation of the Ljubljana TRIGA would be valuable in order to share experiences from the fire event and its consequences.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

All installations that have not been excluded are candidates. There are no represented installations.

Candidate	Type	Status	Represented Installation	Additional Information / Rationale
Krško NPP	NPP	operation	none	
Dry SFDS Krško NPP site (Dry cask type storage building inside NPP Krško)	SFSF	construction	none	
Solid waste storage facility (Storage building for radioactive waste inside NPP Krško)	WSF	operation	none	

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented*

installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

Not applicable.

Conclusion on the acceptance of the candidate installations:

The Board recommends that Slovenia reconsiders its list of candidate installations.

The Board notes the arguments for excluding the Ljubljana TRIGA installation include the significantly improved fire protection measures following an earlier fire in 2010. A similar fire safety improvement campaign might not have been the practice in other countries – that's why participation of the Ljubljana TRIGA would be valuable in order to share experiences from the fire event and its consequences. In particular, taking into account that other countries have included TRIGA Reactors with similar power, the Board recommends inclusion of the Ljubljana TRIGA Mark II as a candidate installation.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.

ANNEX 17 **SPAIN - National selection**

1- Information provided by Spain

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Candidate installations
Nuclear power plant	8	Almaraz Cofrentes Vandellos 2
Research reactor	0	0
Fuel reprocessing facility	0	0
Fuel fabrication facility	1	0
Fuel enrichment facility	0	0
Dedicated spent fuel storage	0	0
Installations under decommissioning	2	0
On-site radioactive waste storage	0	0
Total	**11**	**3**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ consistent with the list coming from the 2020 national report on the application of the NSD (for EU countries) or other source (e.g. CNS/Joint Convention reports for non-EU countries)

☐ updated due to any modification since 2020 (new installation, declassified…)

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

No updates since 2020 identified.

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is not consistent with the list of NSD since the Vandellos 1 (decommissioning) is not mentioned.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☒ **NPP**

☐ **RR**

☐ **FCF**

☐ **SF storage facility**

☐ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The FCF installation and the installations under decommissioning are not retained as Spain considers that they do not present a significant radiological risk in case of fire (see here under).

The Board notes that Spain does not select any on-site radioactive waste storage facility. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Indicate the rationale presented by the national regulator for each excluded installation and your position (NB: this item is to check by the Board at the end of the TLs' review that the rationale are consistent from one country to another)

Spain has excluded the Juzbado FCF for the following reasons:

- Low risk associated to the handling of radioactive material (UO2 powder).
- No potential for a significant radiological risk identified in case of fires postulated in the safety *analysis*: from the analysis of events postulated in the safety analysis according to the license basis, the maximum expected dose to members of the public derived from fires in the facility are not greater than 0.1 mSv, less than 1/10 of the legal limits in the national regulation. On-site events in the facility do not require to warrant either urgent or early off-site protective or other response actions to achieve the goals of emergency response in accordance with international standards.

Besides, concerning the representativeness of the installations throughout the coordinated sampling in the exercise, and particularly because of the very limited set of activities carried out at the Juzbado FCF in comparison with other FCF in the exercise -which may perform enrichment, reprocessing, MOX fuel fabrication, etc.- Spain concluded that the potential lessons learned from the analysis of Juzbado would yield limited applicability to other FCF in the scope. Conversely, lessons learned from the other FCF in the scope of the exercise will be transferred, though with a limited applicability for some features.

Indicate the complementary information if any provided by the country during the review:

The Board recalls that the objective of the safety analyses is to demonstrate that given the provisions, the radiological consequences are acceptable. So this justification doesn't enable to exclude the FCF installation.

Taking in particular into account that other countries have included FCF in view of their potential radiological risk in case of fire, the Board recommends inclusion of such a facility as a candidate installation.

Conclusion on the acceptance of the excluded installations:

The Board notes that Spain has excluded the Juzbado FCF facility. In particular, taking into account that other countries have included FCF facilities in view of their potential radiological risk in case of fire, the Board recommends inclusion of Juzbado FCF as a candidate installation.

The Board notes that Spain does not select Vandellos I under decommissioning. In particular, taking in particular into account that other countries have included gas-cooled graphite moderated reactors in view of their potential radiological risk in case of fire, the Board recommends inclusion of such reactors as a candidate installation.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Indicate the rationale presented by the national regulator for the selection of candidate installations among the not excluded installations (for example, similar characteristics, same licensee, coordinated sampling approach…) (NB: this item is to check by the Board at the end of the TLs' review that the rationale are consistent from one country to another)

The national regulator chooses NPP in operation of different technologies, operated by different operators and/or applying different approach for fire protection.

- Almaraz (PWR) operated by Operated by CNAT and with a risk-informed fire safety approach;
- Cofrentes (BWR) operated by Iberdrola and with a deterministic fire safety approach
- Vandellos 2(PWR) operated by ANAV and with a deterministic fire safety approach

It should be noted that the NPP of KWU type at Trillo is represented by CN Vandellós 2 despite the fact that it is a different technology and operator (CNAT). Trillo is a single-unit site with a 1060 MWe 3-loop PWR reactor of KWU design operated by CNAT.

A close look to the fire safety concept and features (fire protection elements and systems, safe-shutdown pathways and operating procedures in case of a fire at any area of the station including the control room, alternate shutdown capacity, fire risk analysis…) shows that the similarities are large enough that both designs may well be considered in the same category and with equal

representativeness. It has been Spain's experience that, at least for the deterministic approach of fire safety regulation in Spain, fire protection is more closely related to the safe shutdown paths free of damage in case of fire and the operation procedures, and the major differences in these topics appear between PWR and BWR, rather than between KWU and Westinghouse PWRs.
Concerning the SFSF at CN Trillo, it is represented by the SFSF at any PWR candidate facility, as is the case of CN Almaraz, as the fire regulation and approach (deterministic), design (dry-cask storage), radiological characteristics, operational procedures and risks derived from fire in all of the SFSFs are quite similar to each other.

Candidate	Type	Status	Represented installation	Rationale
CN Almaraz Units 1 and 2 Includes dry-cask spent SFSF	PWR (Westinghouse)	Operation	CN Ascó Units 1 and 2 + Dry-Cask Storage	Same technology and fire regulation. Risk-informed fire safety approach
			CN José Cabrera + Dry-Cask Storage	Reactor fully decommissioned. Only site restoration activities -with no radiological risk- ongoing. Only Dry-Cask Spent Fuel Storage facility. Represented by the SFSF at CN Almaraz.
			Dry-Cask Storage of Trillo	
CN Cofrentes Includes dry-cask SFSF	BWR (GE)	Operation	CN Santa María de Garoña + Dry-Cask Storage	Same technology and regulation. Deterministic fire safety approach.
CN Vandellós	PWR (Westinghouse)	Operation	CN Trillo	Same regulation and approach (Deterministic fire safety approach).

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

The Board notes that Spain has chosen one candidate NPP to represent another installation from a different design and operated by a different operator. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

The Board considers that the information to justify the represented installations is clear and sufficient.

Conclusion on the acceptance of the candidate installations:

The Board notes that Spain has excluded the Juzbado FCF facility. In particular, taking into account that other countries have included FCF facilities in view of their potential radiological risk in case of fire, the Board recommends inclusion of Juzbado FCF as a candidate installation.

The Board notes that Spain does not select Vandellos I under decommissioning. In particular, taking into account that other countries have included gas-cooled graphite moderated reactors in view of their potential radiological risk in case of fire, the Board recommends inclusion of such reactors as a candidate installation.

The Board notes that Spain has chosen one candidate NPP to represent another installation from a different design and operated by a different operator. Whenever the fire protection approach is similar between these installations, the NAR should describe at least one installation in detail (the candidate one). In such cases the Board recommends that the NAR highlights the differences in terms of fire protection approach for the other installation (represented one). For example, if the fire protection approach is similar between the two nuclear reactors, one must be described extensively while the focus must be made for the other one only on the specificities of their fire protection approach to avoid unnecessary repetitions (i.e., differences in terms of organisation of the fire protection brigade, local regulations for federal states, external environment or in terms of design…).

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.

ANNEX 18 **SWEDEN - National selection**

1- Information provided by Sweden

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☐ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Name of Candidate installations
Nuclear power plant	6	Forsmark 2 Oskarshamn 3 Ringhals 3
Research reactor	0	None
Fuel reprocessing facility	0	None
Fuel fabrication facility	1	Westinghouse
Fuel enrichment facility	0	None
Dedicated spent fuel storage	1	CLAB
Installations under decommissioning	7	None
On-site radioactive waste storage	0	None
Total	**15**	**5**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☒ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

No new installations since 2020 identified.

On the other hand, from the information provided by the national representative, the RRs R2 and R2-0 are intended to be completely dismantled and delicensed in 2021, i.e. not at all relevant to be included in the TPR II exercise.

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☒ **NPP**

☐ **RR**

☒ **FCF**

☒ **SF storage facility**

☐ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The Board notes that Sweden does not select any on-site radioactive waste storage facility.
Therefore, the Board refers to its general recommendation under section 3 of the main text.

The Board also notes that Sweden does not select any installation under decommissioning. (see 3.3)

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Installations proposed for exclusion and their rationale follow:

Name of the facility	Type	State of operation	Rationale to exclude
Barsebäck 1 (B1)	NPP	Decommissioning	No significant radiological risk: the spent fuel has already been transported to the Clab facility.
Barsebäck 2 (B2)	NPP	Decommissioning	No significant radiological risk: the spent fuel has already been transported to the Clab facility
Oskarshamn 1 (O1)	NPP	Decommissioning	No significant radiological risk: the spent fuel has already been transported to the Clab facility
Oskarshamn 2 (O2)	NPP	Decommissioning	No significant radiological risk: the spent fuel has already been transported to the Clab facility

Ringhals 1 (R1)	NPP	Decommissioning	No significant radiological risk: the remaining spent fuel is planned to be transported to Clab by summer 2022
Ringhals 2 (R2)	NPP	Decommissioning	No significant radiological risk: the remaining spent fuel is planned to be transported to Clab by summer 2022
Ågesta			No significant radiological risk: no spent fuel left at the site
R2			Not considered by the country but in the scope of TPR-I
R2-0			Not considered by the country but in the scope of TPR-I

Indicate the complementary information if any provided by the country during the review

No spent fuel is expected to remain at the B1, B2, O1, O2, R1 and R2 reactors by the end of the summer 2022.

The results of the updated safety assessments for all reactors under decommissioning have demonstrated that there is no significant radiological risk during the activities. And, as a consequence, there is no need for an emergency preparedness zone.

In addition, the status of the facilities under decommissioning will change considerably between the finalisation of the national reports (NAR) by autumn 2023, used as input for the TPR II, and the planned development of the national actions plans and TPR II summary reports, scheduled for end of 2025.

By that time most of the decommissioning and dismantling activities will have been completed for all power reactors, and any nuclear/radiological risk deemed completely insignificant for the purpose of the TPR. Inclusion in NAcP/NAP and the summary reports of outdated/historical decommissioning status, and not any longer potential associated risks, will probably contribute to confusion about the status of things.

Additional information has been provided that justifies the exclusion/not inclusion of the RRs R2 and R2-0 according to the plans for dismantling and de-licensing them completely before or shortly after the cut-off date of the exercise (June 30th, 2022).

Reviewer's position:

The rationale provided by the country for the exclusion of the reactors under decommissioning is not adequate and additional information regarding the expected and foreseeable radiological risk in case of a fire during the elaboration period of the NAR should be provided to justify or reconsider their exclusion form the scope. In particular, about the Ringhals 1 and 2 reactors, whose dismantling activities are to start by 2023.

Concerning installations under decommissioning, and particularly nuclear reactors (either commercial or research), the absence of nuclear fuel at the facility cannot be the only criterion to determine whether the installation under decommissioning is or is not within the scope of the TPR. Other considerations regarding the remaining contaminated materials and the works planned to be carried out, and the radioactive waste in temporary storage in the facility (while waiting for treatment or transfer to dedicated storage facilities) must be taken into account to establish the level of significance of the radiological risk posed by the installation in case of a fire affecting such materials/tasks.

Conclusion on the acceptance of the excluded installations:

The Board considers that the installations under decommissioning can't be excluded with regard to the potential radiological risk in case of fire.

Taking into account his general recommendation on "installations under decommissioning" in section 3 of the main text and for consistency with other countries the Board recommends that one NPP under decommissioning is selected as candidate.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Type	Candidate, name of the facility	Represented installation	Additional information
NPP	Forsmark 2 BWR	Forsmark 1 Forsmark 3 (organisation)	The reactors F1 and F2 at the Forsmark site are of the same generation and operated by the same licensee according to the same nuclear and fire safety regulatory framework. It is thus concluded that the fire safety concept is implemented similarly and that F1 is represented by F2.
	Oskarshamn 3 BWR	Forsmark 3	The reactors F3 and O3 at the Forsmark and Oskarshamn sites, respectively, are of the same generation and subject to application of the same nuclear and fire safety regulatory framework. It is thus concluded that the fire safety concept is implemented similarly and that F3 is represented by O3 in design and represented by F2 in organisation.
	Ringhals 3 PWR	Ringhals 4	The reactors R3 and R4 at the Ringhals site are of the same generation and operated by the same licensee according to the same nuclear and fire safety regulatory framework. It is thus concluded that the fire safety concept is implemented similarly and that R4 is represented by R3.
SFSF	CLAB	None	spent nuclear fuel storage facility wet storage (pool type)
FCF	Westinghouse	None	fuel fabrication

Indicate the complementary information if any provided by the country during the review

Additional supporting information about facility status and planning as reported by the country under the Eighth National Report under the Convention on Nuclear Safety (see previous sections).

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

The Board considers that the information to justify the represented installations is clear and sufficient.

Conclusion on the acceptance of the candidate installations:

The Board recommends that Sweden reconsiders its list of candidate installations, especially concerning the installations under decommissioning. Taking into account his general recommendation on "installations under decommissioning" in section 3 of the main text and for consistency with other countries the Board recommends that one NPP under decommissioning is selected as candidate.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.

ANNEX 19 **SWITZERLAND - National selection**

1- Information provided by Switzerland

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Candidate installations
Nuclear power plant	3	Beznau I & II Gösgen Leibstadt
Research reactor	1	None
Fuel reprocessing facility	0	None
Fuel fabrication facility	0	None
Fuel enrichment facility	0	None
Dedicated spent fuel storage	3	Zwilag Zwibez Nasslager
Installations under decommissioning	1	Mühleberg
On-site radioactive waste storage	0	None
Total	**8**	**7**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☐ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☒ **NPP**

☐ **RR**

☐ **FCF**

☒ **SF storage facility**

☒ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The Board notes that Switzerland does not select any on-site radioactive waste storage facility. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Name of the facility	Rationale to exclude
EPFL - Crocus	Zero-power research reactor (RR)

Conclusion on the acceptance of the excluded installations:

The Board considers that the justifications for excluding this installation are acceptable with regard to the potential radiological risk in case of fire.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

All "not-excluded" installations are considered as "candidate". There are no "represented" facilities for this country.

Type	Candidate, name of the facility	Represented installation	Additional information
NPP in operation	Beznau I & II	None	Operating PWR
	Gösgen		

	Leibstadt		Operating BWR
NPP in decommissioning	Mühleberg	None	BWR in decommissioning
SFSF	Zwilag	None	Central interim storage facility inoperation
	Zwibez		Dry storage building at Beznau NPP in operation
	Nasslager		Wet storage facility at Gösgen NPP in operation

Indicate the complementary information if any provided by the country during the review:

- The country sent information about the expected status of the spent fuel at Mühleberg as of the cut-off date (June 30th, 2022) and during the elaboration period of the NAR.
- Nevertheless, the facility is proposed as a candidate and will be analysed.

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

N/A

Conclusion on the acceptance of the candidate installations:

The Board considers that the list of candidate installations is satisfactory.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.

ANNEX 20 **UNITED KINGDOM - National selection**

1- Information provided by United Kingdom

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Candidate installations
Nuclear power plant	7	Heysham 2 Sizewell B Hinkley Point
Research reactor	0	
Fuel reprocessing facility	1	Magnox reprocessing
Fuel fabrication facility	1	Springfields Fuel Ltd
Fuel enrichment facility	1	Urenco enrichment
Dedicated spent fuel storage	6+AGR fuel ponds (15)	AGR fuel ponds (15)
Installations under decommissioning	28	NPP Hunterston B NPP Dungeness B RR Prototype Fast Reactor
On-site radioactive waste storage	*~22*	Sellafield High Level Waste Plant /Waste Vitrification Plant/ or Encapsulation Plants (HLW) Sellafield Box Encapsulation Plant Product Store – Direct Import Facility (BEPPS-DIF (ILW – interim storage)

		Sellafield Product and Residues Store (SPRS) (interim storage)
Total	About 81	**27**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☐ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

The reactor Imperial College research reactor has now been demolished and the site cleared of all radioactive waste. On April 1st ONR announced that it had revoked the nuclear site licence.

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☒ **NPP**

☐ **RR (n.a.)**

☒ **FCF**

☒ **SF storage facility**

☒ **Installations under decommissioning**

☒ **On-site radioactive waste storage facilities**

The Board notes that United Kingdom does not select any on-site radioactive waste storage facility related to NPPs. Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Name of the facility	Type	State of operation	Rationale to exclude
2 Winfrith research reactors	RR	Decommissioning	*UK first position: The interim end state is expected to be reached after*

			demolition of the remaining reactors in 2023 *UK added position: The sites dominant risks are conventional safety not radiological: this site does not require an offsite emergency planning zone as the offsite radiological risk does not reach 1 mSv at the site boundary.*
Harwell	RR	Reactors in advanced stages of decommissioning	*UK first position: All fuel has been removed. ILW retrieval and packaging operations are underway; nuclear materials are being transferred off-site.* *UK added position: this site does not require an offsite emergency planning zone as the offsite radiological risk does not reach 1 mSv at the site boundary*
Sellafield Fast Reactor fuel plant, MOX fuel demonstration plant, plutonium purification plant	FCF	Decommissioning	*UK first position: Advanced stages of decommissioning. Facilities and equipment largely removed.* *UK added position: We intend the Sellafield sample to represent high hazard and risk facilities where fire management strategies are most significant*
Magnox NPPs *.*	NPP	Decommissioning	*UK final position: We (ONR) have considered the remaining radiological risk from those stations (all defueled) and there is either no foreseeable offsite radiological risk, or it is below 1 mSv. They have no requirement for detailed emergency planning*

The Board recalls that the objective of the safety analyses is to demonstrate that given the provisions, the radiological consequences are acceptable. So these justifications do not enable to exclude the installations.

Concerning installations under decommissioning, and particularly nuclear reactors (either commercial or research), the absence of nuclear fuel at the facility cannot be the only criterion to determine whether the installation under decommissioning is or is not within the scope of the TPR. Other considerations regarding the remaining contaminated materials and the works planned to be carried out, and the radioactive waste in temporary storage in the facility (while waiting for treatment or transfer to dedicated storage facilities) must be taken into account to establish the level of significance of the radiological risk posed by the installation in case of a fire affecting such materials/tasks.

The United Kingdom does not select a Magnox NPP under decommissioning as a candidate. The UK has indicated that the status of the defueled gas reactors (GCR) is “to be discussed”.

Taking in particular into account that other countries have included gas-cooled graphite moderated reactors in view of their potential radiological risk in case of fire, the Board recommends inclusion of such a reactor as a candidate installation.

Conclusion on the acceptance of the excluded installations:

The United Kingdom does not select a Magnox NPP under decommissioning as a candidate.

Taking into account his general recommendation on “installations under decommissioning” in section 3 of the main text, the Board recommends to include as candidate a Magnox reactor or to consider if this type of reactor can be represented by the Hunterston AGR graphite moderated reactor already selected as candidate.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding ‘represented installations’

Installation category	Candidate installations	Represented installations
Nuclear power plant	Heysham 2 Sizewell B Hinkley Point C	Hartlepool Heysham 1 Hinkley Point B Torness
Research reactor		
Fuel reprocessing facility	Magnox reprocessing	Reprocessing Thorp
Fuel fabrication facility	Springfields Fuel Ltd	
Fuel enrichment facility	Urenco enrichment	
Dedicated spent fuel storage	*AGR Spent Fuel Ponds (15) are included in the TPR and representing:*	• FGOSP Sellafield • FHP Sellafield • TRSP Sellafield • FGASP Sellafield
Decommissioning	NPP Hunterston B, NPP Dungeness B	

	RR Prototype Fast Reactor	RR • MTR Dounreay • DFR Dounreay FCF • Dounreay MTR Reprocessing • Dounreay Fast Reactor Fuel Reprocessing • Dounreay Enriched Uranium processing SFCF • Dounreay Irradiated Fuel Store • Dounreay Shielded Cave • DFR Irradiated fuel in vessel
On-site radioactive waste storage	High level waste plant, waste vitrification plant and/or encapsulation plant Box Encapsulation Plant Product Store- Direct Import Facility (BEPPS-DIF) Sellafield Product and Residues Store (SPRS)	All facilities below are represented by the three higher risk facilities on the left NPP • 4x Calderhall • Windscale GAR • 2x Windscale Piles SFSF (by HHRR) • PFSP Sellafield • FGMSP Sellafield WSF • Sellafield's main waste processing and storage facilities ~22 facilities including Waste Monitoring and Compaction Plant (WAMAC); Waste Treatment Complex (WTC); Magnox Encapsulation Plant (MEP); Waste Encapsulation Plant (WEP); Waste Processing and Encapsulation Plant (WPEP); Liquid Effluent Treatment Plants; series of facilities for engineered storage for conditioned wastes. Interim PCM drum storage (unconditioned); Magnox Swarf Storage Silo (MSSS), ILW tanks, MBGW store, High Level Waste Plants and vitrification; Active

		Handling Facility; WAGR Packaging Plant and Box Store; Floc storage tanks, Magnox sludge settling facility.
Total	27	About 44

Further position added by UK: for the on-site radioactive waste storages further detailed information on the 22 WSFs as represented by three candidates HLW etc., BEPPS-DIF, SPRS is provided in UK's 7th report to the Joint Convention. In addition for the representation of PSP and FGMSP the following additional information was provided: The focus for the UK sample across the Sellafield site is based on radiological risk (offsite and onsite) and level of fire hazard presented, focusing on facilities at the more significant end of these spectra. Inclusion of spent fuel ponds at Sellafield would also divert attention, unnecessarily, towards installation types that are already represented in the UK sample (fuel ponds at the candidate NPPs, and SZB's dry store) and in other participant countries', and is viewed as being disproportionately burdensome, offering little in value by way of additional insight. This would be at the expense of the depth of coverage on Sellafield's higher hazard and risk facilities which are rather unique in Europe /not otherwise represented in TPR.

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

The Board notes that United Kingdom has chosen Heysham 2 NPP to represent several AGR installations, which are not similar. Therefore, the Board refers to its general recommendation under section 3 of the main text.

The Board notes that United Kingdom has chosen a candidate installation on a site that represents several installations on the same site, but of other types: for example, the Prototype Fast Reactor is the candidate installation at Dounreay site and represents 8 other installations (RR, FCF, SFCF). The Board recommends that the NAR present adequate justifications for the represented installations.

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

The Board considers that the information to justify the represented installations should be complemented in the NAR, especially complementary elements on similarities between candidate and represented facilities to show that findings will be transferable to represented installations.

Conclusion on the acceptance of the candidate installations:

The Board recommends that United Kingdom reconsiders its list of candidate installations.

The Board recommends to include as candidate a Magnox reactor or to consider if this type of reactors can be represented by the Hunterston B AGR graphite moderated reactor already selected as candidate.

The Board notes that United Kingdom has chosen Heysham 2 NPP to represent several AGR installations, which are not similar. Whenever the fire protection approach is similar between several installations of the same type, the NAR should describe at least one installation in detail (the candidate one). In such cases the Board recommends that the NAR highlights the differences in terms of fire protection approach for the other installations (represented ones). For example, if the fire protection approach is similar between two (types of/series of) nuclear reactors, one must be described extensively while the focus must be made for the other ones only on the specificities of their fire protection approach to avoid unnecessary repetitions (i.e., differences in terms of organisation of the fire protection brigade, local regulations for federal states, external environment or in terms of design…).

The Board notes that United Kingdom has chosen a candidate installation on a site that represents several installations on the same site, but of other types: for example, the Prototype Fast Reactor is the candidate installation at Dounreay site and represents 8 other installations (RR, FCF, SFCF). The Board recommends that the NAR present adequate justifications for the represented installations.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.

ANNEX 21 **Ukraine - National selection**

1- Information provided by Ukraine

☒ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☒ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	Number of installations	Candidate installations
Nuclear power plant	15	South–Ukrainian NPP -1 Rivne NPP-2 Rivne NPP-3
Research reactor	5	WWR-M Institute for Nuclear Research
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage	4	ISF-2 SSE ChNPP
Installations under decommissioning	3	
On-site radioactive waste storage		
Total	**27**	**5**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☐ **updated due to any modification since 2020 (new installation, declassified…)**

In this case, indicate the modifications (for example: new installation xx…) and the complementary information, if any, provided by the country during the review

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations in the scope of the NSD is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☒ **NPP**

☒ **RR**

☐ **FCF**

☒ **SF storage facility**

☐ **Installations under decommissioning**

☐ **On-site radioactive waste storage facility**

The Board notes that Ukraine does not select any on-site radioactive waste storage facility.
Therefore, the Board refers to its general recommendation under section 3 of the main text.

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Nine (9) installations were excluded. The rationale for exclusion can be found in the table below.

Name of the facility	Type	Technology/Main characteristics	State of operation	Additional information
Chornobyl NPP-1	NPP	RBMK-1000	Decommi-ssioning	At the Chornobyl NPP, decommissioning of all units (№ 1, 2, 3) is carried out in accordance with the decommissioning program and project on the stage "Final Shutdown and Preservation of Chornobyl NPP Units 1, 2, 3" (FS&P). Nuclear fuel has been completely removed from the units. According to the conclusion of the FS&P project expertise, compliance with fire safety requirements was ensured during the FS&P stage. During the analysis of nuclear and radiation safety, the absence of risk of potential personnel exposure and additional impact on the environment in case of fire is justified. The adequacy of the implemented organizational and technical measures to eliminate emergencies with the occurrence of fire was also demonstrated. Impact on the population
Chornobyl NPP-2	NPP	RBMK-1000	Decommi-ssioning	
Chornobyl NPP-3	NPP	RBMK-1000	Decommi-ssioning	

				is excluded due to the Chornobyl site location in the exclusion zone.
IR-100 Sevastopol National University of Nuclear Energy and Industry (SNUNE and I)	RR	IR-100 / 0,2 MWt	Licence suspended	It has been impossible for the Government of Ukraine to regulate the safety of operation of the nuclear installations since 2014 due to the temporary occupation of the Autonomous Republic of Crimea by Russian Federation. The licence for the operation was suspended on 16 June 2014 taking into account temporarily occupation of Autonomous Republic of Crimea by Russian Federation.
Uranium-*hydrogen* subcritical assembly Sevastopol National University of Nuclear Energy and Industry (SNUNE and I)	RR	sub-critical assembly	Licence suspended	
P*hysical stand* Sevastopol National University of Nuclear Energy and Industry (SNUNE and I)	RR	DR-100 physical stand (critical assembly)	Licence suspended	
Nuclear subcritical facility 'neutron source'	RR	Accelerator driven system (ADS) subcritical facility / 0,36MWt	Commissioning	Low profile of potential risks for staff and the public (sanitary protection zone is limited by the building of the installation). In addition, this type of installation is not subject to the requirements of WENRA reference levels for existing research nuclear reactors.
SFDS Zaporizhzhya NPP	ISF	dry storage facility for spent nuclear fuel (container type)	operation	The project justifies the absence of dangerous effects of fire at nuclear power plant as well as the impact on nuclear and radiation safety. There are no sources of fire danger.

ISF-1 SSE ChNPP	ISF	spent nuclear fuel storage facility of wet type (pool type)	operation	The exclusion of the ISF-1 from the list was due to the lack of dangerous effects of fires on nuclear installation.

The Board notes that Ukraine has excluded two spent fuel storage facilities. For consistency with other countries, the Board suggests to consider these facilities as represented installations rather than excluded.

Conclusion on the acceptance of the excluded installations:

The Board notes that Ukraine has excluded two spent fuel storage facilities. For consistency with other countries, the Board suggests to consider these facilities as represented installations rather than excluded. The Board suggests also to reconsider the exclusion of the Chornobyl facilities under decommissioning as workers could still be exposed.

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Type	Candidate, name of the facility	Represented installation	Additional information
NPP	South–Ukrainian NPP -1	South–Ukrainian NPP -2	South–Ukrainian NPP -1 (WWER 1000/V-302) and South–Ukrainian NPP -2 (WWER 1000/V-338) are very similar especially on fire protection issue. The installations located on same site and operated by same Utility. South–Ukrainian NPP -1 is a candidate installation and South–Ukrainian NPP -2 (WWER 1000/V-338) - represented installation.
NPP	Rivne NPP-2	Rivne NPP-1	WWER 440/V -213
NPP	Rivne NPP-3	Zaporizhzhya NPP -1,2,3,4,5,6 Khmelnytska NPP – 1,2 South–Ukrainian NPP -1 Rivne NPP-4	WWER 1000/V -320 At the stage of operation there are 15 units of 4 projects (WWER 1000/V-320, WWER 1000/V -302, WWER 1000/V--338, WWER 1000/V -213). All units are operated by one operating organization (NNEGC Energoatom). In terms of fire protection, all units have a single system of regulations and industry standards. Due to the greatest completeness and relevance of analytical justifications for fire safety and its

			impact on nuclear and radiation safety, Rivne NPP -3 (WWER 1000/V-320), South– Ukrainian NPP -1 (WWER 1000/V -302) and Rivne NPP -2 (WWER 1000/V -213) were selected as representative nuclear installations.
RR	*WWR-M* Institute for Nuclear Research	-	A 10 MW nuclear installation is in operation and is located within the city.
ISF	ISF-2 SSE ChNPP	CSFSF	CSFSF - dry storage facility for spent nuclear fuel (container type) - is represented by ISF-2, since CSFSF has been designed according to the storage technology similar to ISF-2 technology, has storage container similar to the container used at ISF-2, and is at the commissioning stage at present. The facility is one of the most technology-intensive of all spent nuclear fuel storage facilities in Ukraine. Considering this, the ISF-2 SSE of the Chernobyl NPP is a representative installation. The analysis will be carried out in the terms of the impact of fires on nuclear and radiation safety during transport and technological operations and operations with the use of hot chambers.

☒ *Indicate if sufficient information has been provided to justify the represented installations and therefore show that findings of the candidate installations will be transferable to the represented installations, including how the proposed selection will allow identification of both 'good practices' and 'areas for improvement'.*

3.5 - Conclusions

Conclusion on the acceptance of the represented installations

The Board considers that the information to justify the represented installations is clear and sufficient.

Conclusion on the acceptance of the candidate installations:

The Board considers that the list of candidate installations is satisfactory.

The Board suggests to reconsider the exclusion of the Chornobyl facilities under decommissioning as workers could still be exposed and also of some spent fuel storage facilities.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities are considered in the NAR as a part of the installation or as separate ones and report on them accordingly.

ANNEX 22 Türkiye - National selection

1- Information provided by Türkiye

☐ **the list of nuclear installations covered by the nuclear safety directive (NSD)**

☒ meets the principle "*at least one facility of each category addressed by the NSD, if present in the participating country and likely to present a significant radiological risk in case of fire* (as proposed by WENRA as a "minimum" criterion and endorsed by ENSREG at the ENSREG plenary meeting on 31 March)

☐ **the list of excluded installations as not posing a potential significant radiological risk** in case of a fire (with criteria and justifications to select them)

☒ **the list of the selected candidate installations that will be reported on** (together with the rationale and criteria) and **the corresponding 'represented installations'**

2- Brief overview of the installations (initial list and proposed selection)

Installation category	**Number of installations**	**Name of Candidate installations**
Nuclear power plant	1	Akkuyu NPP (VVER-1200)
Research reactor	2	
Fuel reprocessing facility		
Fuel fabrication facility		
Fuel enrichment facility		
Dedicated spent fuel storage		
Installations under decommissioning		
On-site radioactive waste storage		
Total	**3**	**1**

3- Board review

3.1 - List of nuclear installations covered by the nuclear safety directive (NSD)

☒ **consistent with the list coming from the 2020 national report on the application of the NSD** (for EU countries) **or other source** (e.g. CNS/Joint Convention reports for non-EU countries)

☒ **updated due to any modification since 2020 (new installation, declassified…)**

Conclusion on the acceptance of the proposed list

The Board considers that the proposed list of the national installations (taking account of in the scope of the NSD) is adequate.

3.2 - List of the nuclear installations meets the principle "at least, one installation per category"

Indicate if at least one installation per category, if existing in the country, has been selected as candidate.

☒ **NPP**

☐ **RR**

☐ **FCF**

☐ **SF storage facility**

☐ **Installations under decommissioning (RR was excluded)**

☐ **On-site radioactive waste storage facility**

As well as the NPP under construction, Türkiye has two operating research reactors (ITU TRIGA Mark-II Training and Research Reactor, and TR-2 at Çekmece Nuclear Research and Training Center).

3.3 - List of the nuclear installations excluded as not posing a potential significant radiological risk in case of a fire

Name of the facility	Type	State of operation	Rationale to exclude
(No information received)			

Conclusion on the acceptance of the excluded installations:

Not applicable

3.4 - List of the candidate installations that will be reported on (together with the rationale and criteria) and the corresponding 'represented installations'

Türkiye selected its nuclear power plant under construction as a candidate.

3.5 - Conclusions

Conclusion on the acceptance of the represented installations:

Not applicable

Conclusion on the acceptance of the candidate installations:

The Board considers that the list of candidate installations is satisfactory. However, in relation to its two research reactors, Türkiye is invited to provide more information about whether they are considered to be within the scope of the TS or not. In particular, taking into account that other countries have included TRIGA Reactors with similar power, the Board recommends inclusion of the ITU TRIGA Mark II as a candidate installation.

The Board recommends that the NAR should clearly indicate if the on-site waste storage facilities related to nuclear installations are considered in the NAR as a part of the installation or as a separate ones and report on them accordingly.