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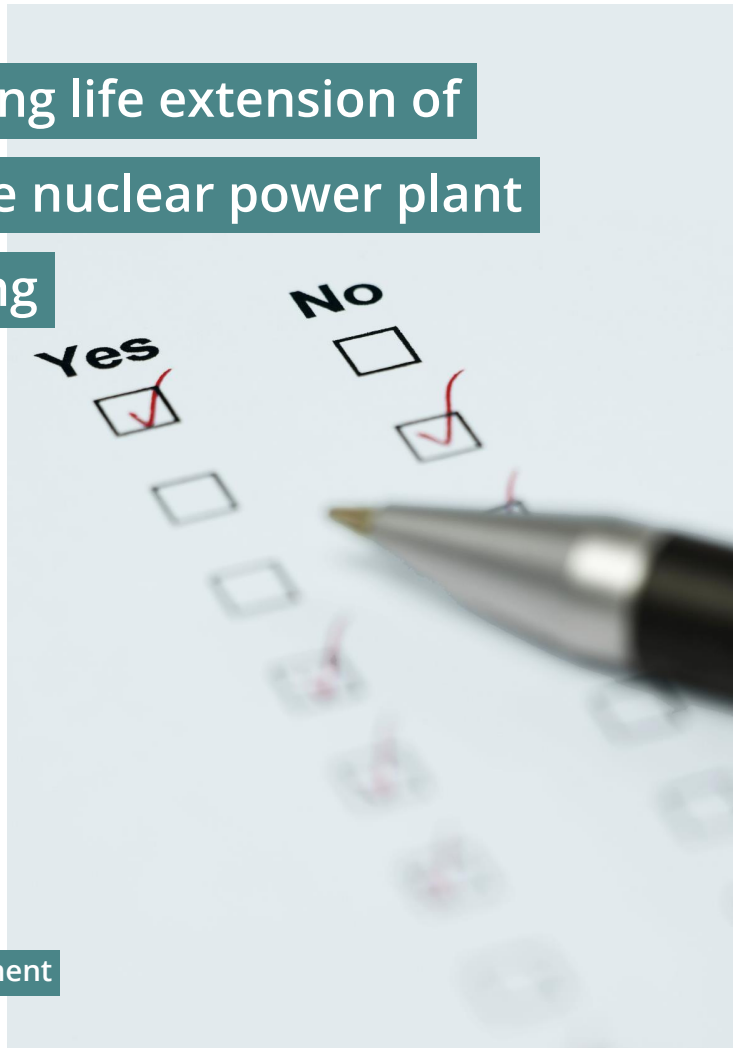

Expert Statement

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OPERATING LIFE EXTENSION OF BORSSELE NUCLEAR POWER PLANT – SCOPING

Expert Statement

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SUMMARY

An environmental impact assessment (EIA) is being carried out under Dutch law for the amendment of the Dutch Nuclear Energy Act to extend the operating life of the Borssele nuclear power plant (NPP) in the Netherlands.

Currently, the EIA procedure is in the first phase (delineation of the scope of the investigation) - scoping.

The competent authority (according to Art 1 Espoo Convention) is the Dutch Ministry of Infrastructure and Water Management. The Dutch Ministry of Economic Affairs and Climate Policy is the initiator of the procedure.

The owner of the NPP Borssele is N.V. Elektriciteits Productiemaatschappij Zuid-Nederland (EPZ).

In accordance with Article 3 of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) and Article 7 of the EIA Directive, the Dutch Ministry of the Environment has sent the scoping draft (Draft Memorandum on Scope and Level of Detail) and a German summary thereof to the Republic of Austria.

On behalf of the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, the Federal Environment Agency prepared an expert statement.

This expert statement lists the specific topics on which the environmental impact statement, which is to be made public in the next stage of the procedure, has to provide information. The environmental impact statement should be prepared in such detail that it contains sufficient information about the immediate surroundings of the plant to be able to assess the effects to which the plant is and will be exposed both at present and under the assumed scenarios for the extension of operation.

The EIS should show to what extent the result of the EIA procedure has a binding effect on the subsequent licensing procedures, in particular the nuclear licensing procedure.

The technical design of the nuclear power plant, which is currently one of the oldest nuclear power plants in operation in the European Union and, in the event of an extension of operation beyond 2033, will be the oldest NPP in operation, should be described.

The regulatory requirements for continued operation beyond 2033 should be described.

The extent to which the regulations correspond to the current state of science and technology should also be described.

Due to the long operating life of the plant, evidence for safe continued operation, in particular for safety-relevant components such as the reactor pressure

vessel, primary circuit pipes, steam generators, containment, etc., should be presented in the EIS.

This evidence should also refer to the scenarios to be investigated in the EIA (10, 20 years or indefinite continued operation).

Furthermore, it should be explained which accidents are conceivable in the plant in the case of the intended extensions of operation and which measures are to be implemented in each case in order to keep the escape of radioactivity as low as possible.

The accident analyses should be carried out and described in such a way that it can be verified whether or to what extent accidents could lead to releases of radionuclides that could contaminate the territory of Austria.

ZUSAMMENFASSUNG

Für die Änderung des Niederländischen Kernenergiegesetzes mit der die Verlängerung der Betriebsdauer der Kernkraftanlage Borssele in den Niederlanden erreicht werden soll, wird eine Umweltverträglichkeitsprüfung nach niederländischem Recht durchgeführt.

Derzeit befindet sich das UVP-Verfahren in der ersten Phase (Abgrenzung des Untersuchungsrahmens) - Scoping.

Die zuständige Behörde (gem. Art 1 Espoo Konvention) ist das niederländische Ministerium für Infrastruktur und Wassermanagement. Das niederländische Ministerium für Wirtschaft und Klimapolitik ist Initiator des Verfahrens. Eigentümerin des KKW Borssele ist N.V. Elektriciteits Productiemaatschappij Zuid-Nederland (EPZ).

Das niederländische Umweltministerium hat der Republik Österreich gemäß Artikel 3 des Übereinkommens über die Umweltverträglichkeitsprüfung im grenzüberschreitenden Rahmen (Espoo Konvention) und Art. 7 UVP-RL den Scoping Entwurf (Draft Memorandum on Scope and Level of Detail) und eine deutsche Zusammenfassung dazu übermittelt.

Im Auftrag des Bundesministeriums für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie wurde vom Umweltbundesamt eine Fachstellungnahme erstellt.

In dieser Fachstellungnahme wird aufgelistet, zu welchen spezifischen Themenbereichen die im nächsten Verfahrensschritt öffentlich aufzulegende Umweltverträglichkeitserklärung, Auskunft geben soll. Die Umweltverträglichkeitserklärung soll in einer Detailtiefe ausgearbeitet sein, dass über die nähere Umgebung zur Anlage ausreichende Informationen enthalten sind, um abschätzen zu können, welchen Effekten die Anlage aktuell als auch unter den angenommenen Szenarien für die Betriebsverlängerung ausgesetzt ist bzw. sein wird.

Die UVE sollte darstellen, inwieweit das Ergebnis des UVP-Verfahrens bindende Wirkung auf die nachfolgenden Bewilligungsverfahren, insbesondere das nuklearrechtliche Bewilligungsverfahren hat.

Die technische Auslegung des Kernkraftwerks, das derzeit eines der ältesten in Betrieb befindlichen Kernkraftwerke in der Europäischen Union ist und im Falle einer Betriebsverlängerung über das Jahr 2033 hinaus das älteste in Betrieb befindliche Kernkraftwerk sein wird, ist zu beschreiben.

Die regulatorischen Anforderungen an einen weiteren Betrieb über das Jahr 2033 sollten dargestellt werden.

Hier soll auch dargestellt werden, inwieweit das Regelwerk dem aktuellen Stand von Wissenschaft und Technik entspricht.

Aufgrund der bereits erfolgten langen Betriebsdauer der Anlage sollen Nachweise zum sicheren Weiterbetrieb, insbesondere zu sicherheitsrelevanten Komponenten, wie Reaktordruckgefäß, Primärkreisleitungen, Dampferzeugern, Containment etc.- in der UVE dargestellt werden.

Diese Nachweise sollen auch Bezug auf die in der UVP zu untersuchenden Szenarien (10, 20 Jahre oder unbefristeter Weiterbetrieb) zu nehmen.

Weiters sollte erläutert werden, welche Störfälle bei den vorgesehenen Betriebserweiterungen in der Anlage denkbar sind und welche Maßnahmen jeweils zu ergreifen sind, um den Austritt von Radioaktivität so gering wie möglich zu halten.

Die Unfallanalysen sollen so durchgeführt und beschrieben werden, dass nachvollziehbar überprüft werden kann, ob bzw. in welchem Ausmaß Unfälle zu Freisetzungen führen können, die das Staatsgebiet Österreichs kontaminieren könnten.

1 INTRODUCTION

The Dutch Ministry of Economic Affairs & Climate Policy published the Draft Memorandum on Scope and Level of Detail - Operating life extension of Borssele nuclear power plant on 9 May 2023. The Draft Memorandum on Scope and Level of Detail (draft NRD) for the amendment of the Nuclear Energy Act is noted to be the necessary first step towards extending the operating life of the Borssele nuclear power plant beyond 2033. The Dutch government intends to keep this nuclear power plant open longer as part of the transition to energy sources that do not emit greenhouse gases and achieving a fully climate-neutral energy supply.

The Dutch government, in order to facilitate the operating life extension, needs to amend (at least) Section 15a of the Nuclear Energy Act (KEW). The Borssele Nuclear Power Plant Covenant (2006) needs an amended as well. Further, it is stated in the Draft Memorandum, that in order to identify the environmental consequences of amending the legislation, an Environmental Impact Assessment (EIA) will be drawn up.

This procedure was notified to Austria. The Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology commissioned the Federal Environment Agency to assess the submitted EIA documents. The objective of the Austrian participation in the EIA procedure is to minimize or prevent likely significant adverse effects of the project on Austria. Following this aim, the further technical statement describes the content of the Environmental Report, which will have to be elaborated by the project sponsor in the next step of the EIA procedure.

The draft NRD gives notice of the proposed activity and indicates which environmental aspects will have to be investigated in the EIS, in other words: the scope and the level of detail of the EIA.

The steps in the NRD phase are:

- Giving notice of the intention to amend the law.
- Publicising the draft NRD and making it available for inspection for the purpose of public consultation about the proposal and participation plan.
- An opportunity for the public to have a say on the draft NRD, requesting advice from the Netherlands Commission for Environmental Assessment ('NCEA) and obtaining advice from legal advisors and involved administrative bodies.
- Adoption of the NRD.

Following the adoption of the NRD, the environmental research will be initiated and the environmental impact assessment drawn up. In reaching a decision on the legislative amendment, the environmental information from the EIA will also be included in the deliberations.

The EU-Commission notice regarding application of the Environmental Impact Assessment Directive, which reflects the European Court of Justice (ECJ) ruling in

relation with the lifetime extension of Doel 1-2, specifies that the EIA shall reflect the status of the unit(s) following the performance and approval of the PSR.[1]

The EIS should present in detail the findings of the latest available PSR as well as of the Ageing Management Programme (AMP), which are both a prerequisite to decide on the intended long term operation in general.

The review of the Draft Memorandum on Scope and Level of Details focuses mainly on the safety- and risk analysis. The aim is to assess if the concept allows anticipating that the EIS contains sufficient information on design and beyond design basis accidents (DBA and BDBA) in order to make reliable conclusions about the potential transboundary impacts. Therefore, the Austrian expert statement elaborates the information required for the evaluation of hazards which could have impacts with large radioactive emissions.

[1] Directive 2011/92/EU of the European Parliament and of the Council, as amended by Directive 2014/52/EU) to changes and extension of projects - Annex I.24 and Annex II.13(a), including main concepts and principles related to these (2021/C 486/01)

2 GENERAL OBSERVATIONS

2.1 Content of the Notification

Borssele nuclear power plant is the only nuclear power plant in the Netherlands currently in operation. Siemens KWU supplied the reactor; construction start was in July 1969. The nuclear power plant (NPP) has been operational since 1973, which makes it to one of the oldest still operational NPP in the European Union.

The plant is owned by N.V. Elektriciteits-Produktiemaatschappij Zuid-Nederland (EPZ). EPZ is jointly owned by ZEH Energy B.V. and Energy Resources Holding BV, which in turn is part of the German energy company RWE. The Borssele NPP has a thermal power output of 1366 MW and a net electrical power output of 485 MW. In 2021 Borssele NPP produced around 3.8 terawatt hours (TWh) of electricity, representing slightly more than 3% of total electricity generation in the Netherlands.

The Dutch government had previously decided that the Borssele NPP should not generate electricity beyond the end of 2033. This was laid down in the Borssele Nuclear Power Plant Covenant (2006) and Section 15 of the Nuclear Energy Act.

Now, it is intended to prolong the operation of NPP Borssele beyond 2033.

The draft Scoping Report states: "In the EIA, the environmental impacts of the proposed activity are investigated based on alternatives. In order to evaluate the impact of extending the operating life of the Borssele nuclear power plant compared to shutting it down, the environmental impacts of the following alternatives are described in the EIA:

Alternative 1:
- The expected environmental impacts given an operating life extension of 10 years.

Alternative 2:
- The expected environmental impacts given an operating life extension of 20 years.
- The periods of 10 and 20 years correspond to those explored in the technical feasibility studies by EPZ.

As yet, there is no concrete proposal for legislation, which means that there is still potential for the legislative amendment to take on different forms. For the sake of completeness, in a third alternative we consider the possible environmental impacts if no end date is specified in the Nuclear Energy Act.

• Alternative 3: The expected environmental impacts given an indefinite operating life extension. Alongside the environmental impacts, this involves looking at how safe and responsible operation can be assured if no end date is specified."

Therefore four scenarios should be presented in the EIS in detail:

- *Alternative 1:* extension of the operation of 10 years
- *Alternative 2:* extension of the operation of 20 years

- *Alternative 3*: indefinitive operating life time extension

The Netherlands' climate objective for 2050 is to be climate-neutral; for 2035, the objective is that no CO2 should be released by the production of electricity. Extending the operation of the plant is one of the measures that have been chosen, alongside the construction of two new nuclear power plants.

2.2 Discussion

Due to political debates, a prolongation of the operation of NPP Borssele is now under discussion and will be evaluated via an EIA procedure.

The EIA procedure is one-step in a set of administrative decisions, which could lead to permit the long-term operation of the plant - in one of the presented scenarios. The process of the procedure and the legal status of the decisions need to be clear: i.e. which institutions and administrative bodies decide on what in which state of the process; what is the legal status of decisions issues by an upstream decision.

Since the commissioning of Borssele NPP more than 50 years ago, the surroundings of the installations have changed. Further, the increased traffic on the Schelde, the expected future traffic and the transportation of goods like hydrogen or liquefied natural gas (LNG) should be reflected, when re-assessing the risk. Re-evaluate the risks associated with other industrial facilities near the Borssele NPP as described in IAEA No. SSG-79 allows to gain a comprehensive picture of potential threats, risks and hazards that might have or will develop/ed or evolve/d since the commissioning of the plant.

The EIS should include a map of the location with all facilities including their infrastructure and transportation routes of hazardous and potentially dangerous goods for the NPP.

Due to the fact, that NPP Borssele is one of the oldest nuclear power plants in operation in the European Union, and its principle design dates from the early 60ies of the last century, special emphasises should be given how the plant had been upgraded so far.

The EIS also should discuss a Zero-Option, which would mean to describe as an additional alternative that NPP Borssele will be shut down by 2033.

Alternative 4:

- No life time extension and therefore shut down of the plant by 2033

From an Austrian point of view, accidents, which could lead to the release of radionuclides, mainly airborne, are of special interest. Therefore the EIS should present a plant description, mainly what safety relevant features are in place and/or intended to be implemented, to limit the possible release of radionuclides into the environment.

Accident analysis - design base accidents as well as beyond design base accidents - should be presented in the EIS. The accident analysis should be presented in detail to be able to evaluate if the intended long-term operation of the plant could pose a risk to even countries like Austria. The related accident analysis should be based on a deterministic approach. The results of dispersion model analysis should present the deposition of radionuclides, even in a far distance, assuming wet and dry deposition.

3 RECOMMENDATIONS FOR THE CONTENT OF THE EIS

From an expert point of view the following topics should be included in the scope of the EIS:

3.1 EIA and following licensing procedures

The EIS should describe if and how a decision on the EIA will have to be respected by those administrative bodies and institutions, which will deal with the long-term operation of the plant licensing.

3.2 Energy Supply options

- Include a fourth alternative: No life time extension and therefore shut down of the plant by 2033
- For each of the four alternatives an analysis on the electricity generation options should be presented.
- The electricity generation system will change in the upcoming future. Due to the increase of the use of renewable energy generation sources load following operation might be a challenge for the plant. The EIS should discuss if and how the plant will be integrated into a generation system, which could require load following operation. A description of the assessment of safety relevant components of the plant should elaborate how stress factors, due to load following operation, had been analysed and what were the related results.

3.3 3.3. Regional factors - Status Quo

- The EIS should describe the surrounding area of the NPP and take into consideration what has changed since its commissioning. This description should focus on the development of settlements, industrial activities in the surrounding of the plant, the development of traffic, mainly transport of goods and products (street, rail, aviation and ship), which could pose a risk to the plant.
- Re-evaluate the risks associated with other industrial facilities near the Borssele NPP as described in IAEA No. SSG-79. The EIS should include a map of the location with all facilities and their infrastructure and transportation routes with hazardous and potentially dangerous goods for the NPP.

3.4 Regional factors - future development:

- For each of the Alternatives 1, 2 and 3 the surrounding of the plant, mainly influenced by the plant as well as areas and activities, which could influence the plant operation should be described in detail.
- These descriptions should focus on the foreseen development of changes - relevant for the timeframe of the intended lifetime extension of the plant - in settlements, industrial activities and traffic of goods and products (street, rail, aviation and ship), which could pose a further risk to the plant.
- Depending on the timeframe intended in Alternatives 1, 2 and 3 the projected development of the surroundings should be included in the EIS as to whether and how it will affect the plant operation, both during normal operation and in the event of an accident.
- Potential impacts of climate change for the respective time periods (10 years, 20 years, indefinite) should be addressed. This should include higher temperatures of the Schelde, stronger and more frequent extreme weather situations like storms, floods, heavy rain etc...
- Climate change considerations should be included in the analysis for LTO. Explain these considerations together with the IAEA SSG-25 safety factor 6 and safety factor 7 and the underlying assumptions for the time periods of Alternatives 1, 2 and 3 respectively.

3.5 Regulatory framework

- The EIS should describe the nuclear safety framework and its provisions, which are relevant to decide on the LTO. It should be presented how the recent updates of the regulations and the corresponding recommendations elaborated by international and EU institutions (IAEA, WENRA Safety Reference Levels, WANO, Euratom) are implemented in the Dutch legal framework.
- Based on 2014/87/Euratom Article 8a existing nuclear installations should reach a safety level as close as possible to new nuclear power plants. The approach to be in line with 2014/87/Euratom should be presented the EIS. The EIS should describe the differences between Borssele NPP - for each of the Alternatives 1, 2 and 3, in comparison to new nuclear power plants, with respect to the exclusion of early and large releases. This should include a description of releases of nuclides under design base and beyond design base accidents in comparison to new nuclear power plants.

3.6 Description of the plant

Related to the technical description of the plant, the EIS should include sufficient information on:

- Detailed description of active and passive safety systems, including in-formation regarding redundancy and diversity.
- Description of the containment and protective building structures (wall thickness etc.).
- Information on the implementation of the concept of defense-in-depth.
- Ageing Management Program: special focus should be given to the intended lifetime extensions in Alternatives 1, 2 and 3.
- For each of the safety relevant components, mainly of the primary circuit, it should be described when and by which methodology it was assessed.
- Description of the safety relevant parts and the methodology and testings' to assess the lifetime of SSC.
- The plant description should also include information on those parts of the plant, which, by technical reasons, cannot be assessed.
- For each of the intended alternatives necessary upgrades should be described.
- The EIS should allow to see how and to what extent safety margins for the proposed Alternatives 1, 2 and 3 will change.
- Some parts of the primary circuit cannot be replaced, like the reactor pressure vessel. Due to its age, results of the latest available PTS analysis and an elaboration of the used methods should be presented in the EIS.

3.7 Accident Analysis

- The requirements for the safety systems should be described in detail; the requirements regarding the proof of the functioning of the provisions for preventing containment breaching and major releases should be presented. This should inter alia contain a section dedicated to the status of the embrittlement of the RPV.
- Descriptions of technical concepts for the prevention of large releases following a core melt accident should be presented in the EIS.
- The EIS should describe if and to what extent the shell of the reactor building must be able to withstand an airplane crash.
- The EIS should describe how it is or will be assured that no meltdown can occur in the basement in the event of a core meltdown.
- The EIS should present the ability of the plant to prevent major releases following a core meltdown and how this is or will be assured.
- The Core damage frequency of PSA results should be presented in detail (contribution of different plant states and types of initiators). An indication of the uncertainty of the PSA results should be provided (e.g. 95%-fractile).

3.8 Accident Analysis - Initiating Events

Man-made as well as natural factors could challenge the safety of the plant.

- The EIS should describe all relevant natural factors as well as man-made events, which could lead to accident conditions and the release of radionuclides into the environment. The EIS should describe, if and how the plant is able to withstand these impacts.

3.9 Transboundary Effects

- A complete description of the core inventory, accident sequences, frequency of occurrence and release rates should be presented in the EIS in order to assess transboundary impacts.
- The EIS should describe the assumptions and scenarios that were investigated both as design basis accidents and as beyond design basis accidents. In case of accidents with core melt, the EIS should describe the measures in place and/or to be implemented to reduce the release of radionuclides into the environment.

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