**F A N C [LOGO] 🗷 Internal Note**

Federal Nuclear Control Agency

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| **Title:** | Environmental effect report screening – note – long-term operation Doel 12 |
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| **Summary:** | A note on the environmental effect report screening (MER) was submitted within the framework of article 12 of the ARBIS for the LTO action plan. According to this article, the FANC decides whether the changes or expansions for which a declaration was made have to be subject of an environmental effect assessment.Based on the complete MER-screening note and the criteria of annex III of guideline 2011/92/EU, the FANC has been able to decide that the LTO-programme for Doel 1 & 2 is **not** subject to MER due to the fact that the change to be implemented either do not result in negative radiological environmental effects or do not entail a significant evolution in existing radiological environmental effects.The unchanged influence of the transboundary radiological environmental effects concurs with the conclusion of the FANC that there is no need for an environmental effect report. |

**Document approval**

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2015-08-18-MVDH-5-3-6-NL 1/10

2015-08-18-MVDH-5-3-6-NL 2/10

**Table of contents**

1. Purpose 3

2. Project description 3

3. MER-project 4

3.1. MER – projects (art. 1 – 2011/92/EU) 4

3.2. Projects subject to an MER (annex I – 2011/92/EU) 4

3.3. Projets potentially subject to an MER (annex II – 2011/92/EU) 6

4. Analysis of MER-obligation 7

4.1. Characteristics of the project 7

4.2. The location of the project 8

4.3. The type and characteristics of the potential effect 8

5. Conclusion 10

**1. Purpose**

This note discusses the evaluation of the MER-screening note with reference DOS12/4NT/0381296/000/00 which was submitted by the operator, Electrabel NV, on 7 August 2015 for the LTO-project of Doel 1 & 2 using letter 10010555463/000/00. This MER-screening note gives the potential effects of the changes within the framework of the LTO-project on the environment surrounding the nuclear power plant of Doel.

The MER-screening note was submitted within the framework of article 12 of the ARBIS – the general regulations on the protection of the population, of the employees and the living environment against the danger of ionising radiations (20 July 2001). According to this article, the FANC decides whether the changes or expansions for which a declaration was made, must be the subject of an environmental effect assessment.

This evaluation note substantiates the decision of the FANC whether or not to demand an environmental effect assessment for the LTO-project for Doel 1 & 2.

**2. Project description**

The operator Electrabel NV operates a few facilities of class 1 in Doel, including the nuclear reactor Doel 1 & 2 which is licensed by means of the Royal Decree S3.497/C of 25 January 1974.

Electrabel NV wishes to operate reactor 1 & 2 of Doel 10 years longer, as a result of which the age of the plants will exceed 40 years. The FANC has established requirements in the FANC note 008-194 for a so-called Long-Term Operation.

As for Doel 1 & 2, additional requirements were also established in a specific policy note with reference 2014-09-12-FH-5-4-2-FR.

In order to meet these requirements, the operator Electrabel has started an LTO-programme with a clear action plan. This integrated action plan consists of different projects that focus on improving the safety of the installations.

2015-08-18-MVDH-5-3-6-NL 3/10

As part of the actions that need to be implemented for the overall LTO-programme, the operator Electrabel NV has submitted an MER-screening note with reference DOS12/4NT/0381296/000/00.

**3. MER-project**

Article 12 of the ARBIS describes the fact that the FANC must take into account the criteria stated in European Guideline 85/337/EC to decide whether an environmental effect assessment is necessary. This Guideline is updated and replaced by Guideline 2011/92/EU regarding the environmental effect assessment of certain public and private projects. This Guideline 2011/92/EU was amended in 2014 by the Guideline 2014/52/EU which, however, has not yet been implemented in Belgian national legislation (deadline for this is 16 May 2017). The assessment by the FANC of the necessity to perform an environmental effect assessment is therefore based on the criteria of Guideline 2011/92/EU.

The MER-guideline describes two categories of projects:

* The projects subject to MER (annex I – 2011/92/EU)
* The projects potentially subject to MER (annex II – 2011/92/EU)

It is determined in this section whether the LTO-project satisfies the definition of a project and to which of these categories the described project belongs.

**3.1. MER-projects (art. 1 – 2011/92/EU)**

The definition of a project in the MER-guideline (art. 1.2.a) is given by:

* The execution of constructions or the establishment of other installations or works
* Other interventions in the natural environment or landscape, including the interventions for the extraction of resources

The LTO-project for Doel 1 & 2 was established in the Electrabel document “Long-Term Operation Synthesis Report – Doel 1 and Doel 2”, which was presented to the FANC in April 2015. This LTO-project for Doel 1 & 2 contains a number of actions at the nuclear power plant where work is performed to obtain physical changes to the nuclear power plant.

**Conclusion**: the LTO-project for Doel 1 & 2 is a project according to the definition of the MER-guideline.

**3.2. Projects subject to an MER (annex I – 2011/92/EU)**

The criteria from annex I of Guideline 2011/92/EU regarding the environmental effect assessment of certain public and private projects, for which the ANC has authority, are given in the table below:

2015-08-18-MVDH-5-3-6-NL 4/10

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| --- | --- | --- |
| **Criterion** | **Point of view of operator** | **Point of view of FANC** |
| 2.b | Nuclear power plants and other nuclear reactors, including the dismantling or decommissioning of such plants or reactors (with the exception of research facilities for the production and processing of nuclear fuel, with **a constant output of maximum 1 kWth)** | Electrabel describes that the project is about an action plan to improve the safety of the nuclear power plant. | It concerns a change to a nuclear power plant, this criterion that relates to the erection of a new or the dismantling of an existing nuclear power plant, does therefore not apply. (see criterion 24 – at the end of this checklist – for more info regarding changes) |
| 3.a | Installations for the reprocessing of irradiated fuels | Not mentioned/not applicable. | This activity is not exercised in a nuclear power plant. Therefore, **this criterion does not apply.** |
| 3.b.i | Installations that are designed for the production or enrichment of fuels | Not mentioned/not applicable. | This activity is not exercised in a nuclear power plant. Therefore, **this criterion does not apply.** |
| 3.b.ii | Installations that are designed for the treatment of irradiated fuels or highly radioactive waste | Not mentioned/not applicable. | Such installations are installed in a nuclear power plant. This relates to a change. Therefore, the **criterion does not apply**. |
| 3.b.iii | Installations that are designed for the permanent removal of irradiated fuels | Not mentioned/not applicable. | This activity is not exercised in a nuclear power plant. Therefore, **this criterion does not apply.** |
| 3.b.iv | Installations that are designed exclusively for the permanent removal of radioactive waste | Not mentioned/not applicable. | This activity is not exercised in a nuclear power plant. Therefore, **this criterion does not apply.** |
| 3.b.v | Installations that are designed exclusively for the storage of irradiated fuels or radioactive waste at a location other than the production site (**which is planned for more than 10 years**). | Not mentioned/not applicable. | This activity is not exercised in a nuclear power plant. Therefore, **this criterion does not apply.** |
| 24 | Changes or expansions of these projects when it meets certain threshold values, if these exist. | Electrabel describes that the project is about an action plan to improve the safety. The description of the action plan (section 1.1.4) does not mention improvements where a threshold value is exceeded. | This relates to a change in a nuclear power plant. However, not a single threshold value is exceeded. Therefore, the **criterion does not apply**. |

**Table 1: checklist – projects subject to MER for which the FANC has authority.**

2015-08-18-MVDH-5-3-6-NL 5/10

The criteria of the projects subject to an MER from annex I of Guideline 2011/92/EU do not apply to the LTO-project of Doel 1 & 2. This relates to change of a previously licensed facility without exceeding a threshold value.

**Conclusion**: by definition, the project is not subject to an MER.

**3.3. Projects potentially subject to an MER (annex II – 2011/92/EU)**

The criteria for which the FANC has authority are listed in the table below for which the same definition still remains applicable for the project. If one of these criteria is fulfilled, an analysis must be conducted in comparison with annex III of the same guideline to conclude whether the project is subject to an MER.

|  |  |  |
| --- | --- | --- |
| **Criterion** | **Point of view of operator** | **Point of view of FANC** |
| 3.g | Installations for the treatment and storage of radioactive waste that do not fall under annex I of 2011/92/EU (see table 1) | Not mentioned/not applicable. | The specific installations for the treatment and storage of radioactive waste at the site of Doel are licensed separately and are not part of the LTO-project of Doel 1 & 2. Therefore, the **criterion does not apply**. |
| 13.a | Changes or expansion of projects enumerated in annex I of 2011/92/EU (see table 1) or in this annex for which a licence has already been issued, which are or will be implemented and which can have considerable detrimental consequences for the environment. | Electrabel indicates in section 1.3 that the project must be evaluated by the FANC as compared to annex III of the MER-guideline. Therefore, Electrabel indicates implicitly that the project meets a criterion of annex II. | The LTO-programme changes the previously licensed nuclear power plants (a project from table 1). The implementation of the changes can have considerable detrimental effects for the environment. Therefore, the **criterion does apply.** |
| 13.b. | Projects enumerated in annex I of 2011/92/EU (see table 1) which are exclusively or primarily used to develop and test new methods or products and which are used for no more than two years. | Not mentioned/not applicable. | The LTO-project does not relate to development and testing. Therefore, the **criterion does not apply**. |

**Table 2: checklist – projects potentially subject to an MER for which the FANC has authority.**

**Conclusion**: the LTO-programme is a change of a nuclear power plant (a project from table 1) for which a license has already been issued. The implementation of the changes, i.e. the implementation of the action plan can have considerable detrimental effects for the environment. The LTO-programme is potentially subject to an MER and must be checked against the criteria of annex III of guideline 2011/92/EU.

2015-08-18-MVDH-5-3-6-NL 6/10

**4. Analysis of the MER-obligation**

The criteria for an environmental effect report are given in annex III of Guideline 2011/92/EU regarding the environmental effect assessment of certain public and private projects. These criteria relate to the **characteristics of the project, the location and the type and characteristics of the potential effect**. If the provided information in the MER-screening note demonstrates that the changes of the facility do not have detrimental consequences for the environment (e.g. no increase of the discharge limits or an increase of the impact of the most serious accident), the FANC can decide that the LTO-project of Doel 1 & 2 does not need to be subjected to an environmental effect assessment.

When evaluating the MER-obligation, the Treaty of Espoo was also taken into account. The transboundary effects are specifically reviewed as is also indicated in guideline 2011/92/EU. The public participation (the access to information, the voice of the citizen and access to the judge), as expressed in the Treaty of Aarhus, was adopted by the European Community in European legislative texts which, in turn, were implemented in national regulations wherever necessary, such as in the general regulations on the protection of the population, of the employees and the living environment against the danger of ionizing radiation (20 July 2001).

It should be noted that the implementation of the stipulations of the MER-guideline 2011/92/EU for nuclear facilities in Belgium belongs partially to the federal (protection against ionizing radiation) and partially to the regional authority (non-radiological environmental effects). The collaboration between the Federal State and the Flemish Region in terms of the environmental effect reporting procedure of nuclear facilities was formalized in 2010 using a protocol: “Protocol between the Federal State and the Flemish Region regarding the environmental effect report of nuclear facilities”.

The FANC has limited itself within its authority to analyse the MER-screening note in terms of the radiological environmental effects. As for the non-radiological environmental effects, the FANC has asked for sub advice from the competent department of the Flemish Region.

**4.1. Characteristics of the project**

**Scope of the Project and Cumulation with other existing projects**

Electrabel NV describes a project that must improve the safety of the nuclear power plant. This is a project that results in a relatively large number of changes and replacements at the nuclear power plant. However, Electrabel indicates that there will be no noteworthy interaction with other projects. There will be a certain interaction with the current operating processes due to the fact that the LTO implementation programme is spread over several years.

**Production of waste materials**

The replacements and changes in the installation will temporarily result in more radioactive waste than what is produced during regular operation. This increased production of radioactive waste materials will have an effect downstream of the cycle. However, it will not lead to a noticeable effect on the surroundings of the facility. The produced radioactive waste will be disposed or will be stored at the site according to the previously applicable criteria.

2015-08-18-MVDH-5-3-6-NL 7/10

**Risk of accidents**

External influences have already been taken into consideration when evaluating the draft for the safety report of Doel 1 & 2 (in accordance with art. 20.3 and art. 28 of the Royal Decree relating to safety provisions for nuclear power installations of 30 November 2011). Following the accident of Fukushima, it was also demonstrated using the resistance tests that the risk of serious accidents or disasters remained limited, even when climate change was taken into consideration. The changes of the LTO-programme do not have a detrimental effect on this, on the contrary.

**Contamination and hindrance**

The reactors of Doel 1 & 2 will also perform routine radioactive discharges after the changes to the LTO-programme. These routine discharges are limited in the safety report and are reported to the FANC. The impact on the human health of these discharges for the site of Doel is negligible and has been stable for a number of years (FANC Information File Radioactive discharges of the nuclear facilities of Class I – 2014). In addition, changes are also made to the installation, as part of the LTO-programme, to strongly reduce the radioactive discharges during a severe accident and to limit the chance of a severe accident.

**Conclusion**: the FANC is of the opinion that the intrinsic characteristics of the LTO-programme for Doel 1 & 2 are not a reason to require an environmental effect report. The project is managed in a responsible manner without there being any noteworthy effects in the surroundings of the nuclear power plant due to a routine emission or waste production, while the risk of severe accidents or disasters is acceptable as demonstrated with the resistance tests and even decreases due to the implemented changes.

**4.2. The location of the project**

Changes are implemented at the site of the nuclear power plant of Doel itself. This area is located in a zone marked as “industrial area” in the regional plan. The LTO-programme will not have an extra radiological effect on the areas bordering this zone.

**Conclusion**: the FANC is of the opinion that the location of the LTO-programme, i.e. the site of the nuclear power plant of Doel, is not a reason to require an environmental effect report.

**4.3. The type and characteristics of the potential effect**

The FANC is only authorised to express itself about the radiological effects. The evaluation of the potential effect on

* humans, animals and plants;
* soil, water, air and climate and landscape;
* material goods, the cultural heritage;
* and the cohesion between all these factors;

is therefore also limited to the radiological effects. The FANC has specifically investigated the evaluation of the potential radiological environmental effects described in paragraphs 5.3 to 5.5, 5.7 to 5.11 of the MER-screening note, which are considered as a complete set of radiological environmental effects by the FANC.

2015-08-18-MVDH-5-3-6-NL 8/10

**Radioactive emissions into the atmosphere during normal operation**

The current radioactive emissions into the atmosphere are only a fraction of the permitted discharge limit. The radioactive materials are routinely discharged whereby their concentration or deposit near the adjacent lands is not observable.

The radioactive emissions into the atmosphere during normal operation are not negatively influenced by the changes of the LTO-project to be implemented.

**Radioactive emissions into water during normal operation**

The current radioactive emissions into water are lower than the permitted discharge limit. The radioactive materials are routinely discharged in the river Scheldt, whereby their concentration near the adjacent lands is not observable.

The radioactive emissions into water during normal operation are not negatively influenced by the execution of the LTO-project.

**Accidental radioactive emissions**

When designing the nuclear power plant, all types of probable to improbable accidental scenarios have been taken into account. These scenarios do not result in non-radioactive discharges that exceeded the imposed limits.

This does not change because of the execution of the project. The chance of a certain type of accident is even reduced, together with the possible emissions, for instance by the installation of a Filtered Containment Vent.

The accidental radioactive emissions are positively influenced by the execution of the LTO-project.

**Radioactive waste**

When operating the nuclear power plan, both low and medium-radioactive waste is produced. This waste is sorted and treated, after which it is stored temporarily at the site itself while awaiting regular transport to NIRAS.

The execution of the project temporarily causes more radioactive waste to be produced by the replacements and changes. In other words, this still causes only a local and potential effect. Therefore, there is still a negligible transboundary effect.

The production of radioactive waste is not significantly influenced by the execution of the LTO-project.

**Radiological impact**

The nuclear power plant does not have a significant radiological impact on the environment and the population by the liquid and atmospheric discharges. As a result, the risk for people and the environment is also insignificant. This is also evident from the monthly notices to the Federal Nuclear Control Agency.

2015-08-18-MVDH-5-3-6-NL 9/10

The radiological impact on the environment and the population is not negatively influenced by the execution of the LTO-project.

**Exposure of personnel**

The radiation impact on personnel that is professionally exposed to radiation is limited by law. The nuclear power plant only allows a fraction of this statutory threshold value and aspires to keep the professionally accrued dose as low as possible.

Due to the execution of the project, there is no significant evolution in the exposure of staff.

**Nuclear fuels**

The action performed with irradiated and new nuclear fuels (i.e. transfer, storage,…) has a very limited influence on the surroundings due to the fact that sufficient protection barriers are already being used.

Not a single element of the project is related to the actions with fuels. Consequently, there is no evolution in the related environmental effects.

**Large nuclear components**

Due to the fact that no large nuclear components are replaced in the LTO-project, environmental effects related to such replacement operations can be ruled out.

**Conclusion**: the radiological effects do not evolve negatively due to the applied changes from the LTO-project.

The spatial coverage and the transboundary nature of all radiological effects are still the same as for the changes or the long-term operation, while the probability and the impact of an accidental discharge decreases because of the implemented changes.

The FANC is of the opinion that the characteristics of the potential effect, i.e. the radiological impact of the waste, an accident or routine discharges, are not a reason to require an environmental effect report.

**5. Conclusion**

Based on the complete MER-screening note and the criteria of annex III of guideline 2011/92/EU, the FANC has been able to conclude that the LTO-programme for Doel 1 & 2 is not subject to an MER because the implemented changes either do not lead to negative radiological environmental effects or do not entail a significant evolution in existing radiological environmental effects.

The unchanged influence of the transboundary effects substantiates the conclusion of the FANC that there is no need for an environmental effect report.

2015-08-18-MVDH-5-3-6-NL 10/10