

Economic Commission for Europe

Meeting of the Parties to the Convention
on Environmental Impact Assessment
in a Transboundary Context

Working Group on Environmental Impact Assessment

Fourteenth meeting

Geneva, 24–26 November 2010

Item 4(d) of the provisional agenda

Exchange of good practices

Application of the Convention to nuclear energy-related activities

Background note

Note by the secretariat

This note was prepared at the request of the Working Group on Environmental Impact Assessment (EIA) at its thirteenth meeting (ECE/MP.EIA/WG.1/2010/2, para. 44). This note was circulated for comments for a period of two months, August–September 2010, and then amended in the light of the comments received from four Parties to the Convention.

I. Introduction

1. Over the coming years, UNECE member States plan the construction of a large number of nuclear power plants (NPPs), while older existing plants either are decommissioned as they reach the end of their operational life or their operational life is extended. Several countries plan the construction of interim and long-term repositories for spent nuclear fuel and radioactive waste.

2. Most of the NPPs now operating in UNECE member States were built before the Convention entered into force in 1997; their construction was rarely subject to transboundary EIA, and not always domestic EIA. However, the decommissioning of some of these NPPs has been authorized after an EIA in accordance with the Convention.

3. Many examples of the application of the Convention to more recent nuclear energy-related activities were reported in completed questionnaires on the implementation of the Convention in recent years, including:

- (a) Bulgaria (Belene NPP);
- (b) Czech Republic (Temelin interim storage facility for spent nuclear fuel);
- (c) Finland (Olkiluoto-4, Loviisa-3 and Fennovoima NPPs, and a final repository for spent nuclear fuel);
- (d) Germany (interim storage facilities for spent nuclear fuel);
- (e) Hungary (Paks NPP lifetime extension);

- (f) Lithuania (Ignalina NPP, near-surface repository for radioactive waste, and interim storage facility for spent nuclear fuel);
- (g) Romania (Chernavoda NPP, units 3 and 4);
- (h) Slovakia (Jaslovske Bohunice NPP V-1 decommissioning);
- (i) Sweden (Barseback, Forsmark and Ringhals NPPs, and encapsulation plant and the final repository for spent nuclear fuel).

4. Current examples include activities in: Belarus (Astravets NPP); France (decommissioning of Chooz A NPP); the Netherlands (Borssele NPP); and Slovakia (Mochovce NPP, units 3 and 4). A list of operating nuclear plants and plants under construction in the UNECE member States was presented to the Working Group at its thirteenth meeting in May 2010 and subsequently revised by Parties.¹

5. This paper presents information on how the Convention has been and is applied to such activities, and highlighting good practice; this information is based in part on interventions made by delegates at the thirteenth meeting of the Working Group on EIA, and in part on comments by a number of Parties on a draft of this paper. In addition, examples of other international agreements to consider when assessing the environmental impact of an NPP are cited in annex to this paper.

II. Screening

6. NPPs and nuclear waste storage facilities are listed in Appendix I to the Convention:

- Item 2 includes “nuclear power stations and other nuclear reactors (except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load)”;
- Item 3 specifies “Installations solely designed for the production or enrichment of nuclear fuels, for the reprocessing of irradiated nuclear fuels or for the storage, disposal and processing of radioactive waste”.

7. These items have been revised in the second amendment of the Convention (adopted in decision III/7, in ECE/MP.EIA/6):

- Item 2(b) identifies “Nuclear power stations and other nuclear reactors, including the dismantling or decommissioning of such power stations or reactors (except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load)”;
- Item 3 identifies “(a) Installations for the reprocessing of irradiated nuclear fuel; (b) Installations designed:
 - For the production or enrichment of nuclear fuel;
 - For the processing of irradiated nuclear fuel or high-level radioactive waste;
 - For the final disposal of irradiated nuclear fuel;
 - Solely for the final disposal of radioactive waste; or
 - Solely for the storage (planned for more than 10 years) of irradiated nuclear fuels or radioactive waste in a different site than the production site.”

¹ The list is available on the website at http://www.unece.org/env/eia/meetings/wg_eia_13.htm (Unofficial documents, item 5(f)).

8. The second amendment explains that “for the purposes of this Convention, nuclear power stations and other nuclear reactors cease to be such an installation when all nuclear fuel and other radioactively contaminated elements have been removed permanently from the installation site.”

9. The renewal of an NPP license is generally subject to EIA, though the location, technology and operating procedures may remain unchanged (c.f. appendix III of the Convention). However, in many UNECE countries, NPPs are licensed without any lifetime limitation. When no licence renewal process is needed for the operation of the plant after its originally intended operating period, which can reasonably be fixed at 40 years (so called “long-term operation”), no EIA is required by the Convention. The unlimited license is normally coupled with the obligation to perform periodic safety reviews, usually every 10 years. Such a review could lead to a modification of the NPP and its operating license.

10. Major changes to nuclear energy-related activities, subject to the provisions of the Convention, might include:

- (a) Substantial increase in the release of radionuclides from an NPP, for example, by 25%;
- (b) Substantial increase in the production of radioactive waste from a facility (not only NPP), for example, by 25%;
- (c) A lifetime extension of a facility;
- (d) Decommissioning of the facility;
- (e) Closure of a final repository for radioactive waste.

11. Opinions differ as to whether screening should be based upon an assessment of transboundary radiological impact arising from normal operation, incidents and design base accidents, but not less probable events, or whether it should include severe accidents beyond the design base. The frequency of the initiating event for a severe accident may be below one millionth per year.

12. The Convention does not identify the risk of accidents as a screening criterion (appendix III), whereas the corresponding European Union (EU) directive² does (annex III, point 1).

III. Notification

13. The country of origin needs to determine which countries should be notified and what is the territory or area potentially affected and therefore considered for notification purposes. Past practice has often been notification of neighbouring States but, if an accidental release of radionuclides were to occur, the extent of the resulting damage would depend on, among other factors, meteorological conditions, and could be widespread. Opinions differ as to whether countries should be notified if an accident beyond the design-base accident would impact upon them, or only if they would likely be affected during normal operation, incidents and design base accidents.

14. The right of the potentially affected country to be notified upon request is not provided under the Convention, whereas it is under the corresponding EU directive.

² Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment, as amended by Directives 97/11/EC of 3 March 1997 and 2003/35/EC of 26 May 2003.

However, this does not lead to a clear distinction between legal frameworks in EU and non-EU States as many non-EU States have taken, or are taking, steps to transpose the EU legislation.

15. Nonetheless, the Convention, in article 3, paragraph 7, provides mechanisms by which a Party, which considers that it would be affected by a significant adverse transboundary impact, may discuss with the Party of origin, or refer to an inquiry commission (appendix IV), the question of whether there is likely to be such an impact.

Good practice

16. Wide notification, and responding positively to a request for notification, may avoid later delays in the approval procedure that would occur if the Convention's provisions in article 3, paragraph 7, would be applied. All neighbouring countries should be notified.

17. Other potentially affected countries, and affected areas within these countries, could be identified using dispersion calculation models and subsequent radiation exposure calculation; certain models might be selected for the calculation of transboundary radiological impact, with several proven models available. If the calculation shows a significant adverse transboundary radiological impact the affected country should be notified.

IV. EIA procedure

18. There may be a lack of information on and understanding of the EIA procedure in the other countries concerned, which may result in difficulties for countries involved to fulfil their obligations, for example in giving equivalent opportunities to the public of the affected country.

19. The construction of an NPP is normally part of a more general governmental policy, such as an electricity supply programme, which should already have been assessed earlier by the means of a strategic environmental assessment (SEA), when the locations of the planned NPP may not be known. On occasion, EIA has instead been initiated at this stage before a decision has been taken on the location, but this is problematic as EIA is site dependent.

20. In some EIA systems, the EIA procedure is carried out quite early with no detailed information on technical specifications.

Good practice

21. To ensure that the opportunities provided to the public of the affected country will be equivalent to those of the country of origin, the EIA procedure of the country of origin could be applied for the public of the affected country.

22. It may be appropriate to provide opportunities for the authorities and public of the affected country to participate repeatedly throughout the authorization procedure, and more frequently than required by the Convention.

23. Alternative locations or technologies for a planned NPP need to be simultaneously examined during the EIA procedure or, preferably, during a preceding SEA of a more strategic decision.

24. In cases where the construction of an NPP is within the framework of a more strategic decision already subject to SEA, the EIA procedure for the construction of the NPP can partially be based on the documentation and the outcome of the SEA.³

V. EIA documentation

25. The likelihood of radionuclide releases may be low, but possible damage in case of severe accidents may be very high. Neither the Convention nor the corresponding EU directive explicitly mentions risk assessment. However, both the Convention (appendix II, items (d) and (e)) and the directive (annex IV, points 4 and 5) require that the EIA documentation describe the potential environmental impact and mitigation measures to minimize the impact; these provisions might be interpreted broadly as requiring some risk assessment measures. However, opinions differ as to whether EIA should address severe accidents.

26. Given that design-base accidents are meant to be contained by the NPP design and operating procedures, it is unclear whether accidents beyond the design base are best addressed through EIA. It could be argued that they should only be assessed from the nuclear safety perspective, given that the aim is to reduce the probability of beyond design-base accidents (and severe accidents) below nuclear safety targets, rather than to minimize environmental impact. This would imply that the overall deterministic or probabilistic safety analyses of initial events, and the subsequent sequences and consequences, should be in the frame of nuclear safety licensing procedures rather than in EIA.

27. EIA is carried out at a stage when detailed information may not be available to enable overall deterministic or probabilistic safety analyses of initial events, and the subsequent sequences and consequences. Further, ionizing radiation is not always addressed in EIA legislation, making it perhaps difficult to provide comprehensive and consistent documentation.

28. The EIA and other documentation for nuclear energy-related activities is normally extensive and highly technical. This raises questions about both the communication of large volumes of information, and its translation.

29. Translation is not addressed in the Convention. Sometimes there is no translation of the documentation into the official language of the affected country or the translation is poor or incomplete. English is widely used in international affairs and English terminology regarding environmental protection, radiological impacts, etc. is well known, so its use might result in better quality documentation. However, the official languages of UNECE are English, French and Russian, and key information needs to be available in languages understood by the population of areas likely affected in the countries concerned. This might imply that as a minimum the non-technical summary and the transboundary chapter (if prepared) should be translated into the affected country's language.

Good practice

30. As a minimum, radionuclide releases initiated by an external event with a frequency above one millionth per year should be assessed during EIA.

³ A practice sometimes referred to as “tiering”.

31. If severe accidents are to be the subject of EIA (recalling that opinions differ on this question), there is a need for information about possible severe accident sequences, and other possibilities for the release of radionuclides, and of their probability.

32. Again if severe accidents are to be the subject of EIA, documentation should include information on measures to reduce the size and probability of radionuclide releases, as well as reports on probabilistic safety analyses, a description of emergency preparedness arrangements (though these may not be available at this stage), an environmental radiation monitoring programme and other risk assessment requirements.

33. Documentation should cover those external events that could pose a threat to safety at the site in question and assess the risks arising from such events. Effects on the supply of cooling water and on electric power grid connections should be considered as well as effects from terrorist attacks. Hazardous industry, traffic and exceptional natural phenomena should be considered. Examples of exceptional natural phenomena include: freezing or other clogging of the cooling water intake, storms, snow loads, flood, low sea level and seismic events.

34. Taking into consideration the recommendations of International Commission on Radiological Protection, on standards for environmental control needed to protect the general public, might ensure that other species would also not be put at risk.

VI. Consultations

35. Information regarding security is often confidential because of the physical protection measures planned. Therefore information regarding security cannot be exchanged in the framework of EIA, which is a transparent and public procedure.

Good practice

36. Security information of this kind, falling within article 2, paragraph 8, of the Convention, should only be communicated orally, during bilateral consultations (art. 5).

37. Affected countries might request maximum information regarding safety and security measures (not falling within art. 2.8) and their efficiency, and might expect state-of-art levels of safety and security. Affected countries might request modification of the project, effective monitoring systems and further exchange of information.

VII. Public participation

38. The public of the affected country has the right to make comments on and to express objections to proposed activities (art. 3.8, 4.2). The countries concerned need to ensure that opportunities provided to the public of the affected country are equivalent to those of the country of origin (art. 2.6). Nuclear activities often attract a high level of public interest and could result in thousands of written objections and comments.

VIII. Final decision

Good practice

39. Given the high level of public interest, and the strong interest often shown by the authorities in affected countries, it is important to demonstrate that, in the final decision on

the proposed activity, due account is taken of the outcome of the EIA, including the EIA documentation, as well as the comments received from the public and authorities of affected countries and the outcome of the consultations. This information needs to be shared with the public and authorities of affected countries.

Annex

Examples of other international agreements to consider when assessing the environmental impact of an NPP

All UNECE member States with one or more NPPs on their territory have joined the Convention on Nuclear Safety and some other international agreements relating to the operation of nuclear facilities. As Parties to the Convention on Nuclear Safety they participate at the review process of their national nuclear safety policy which is organised every three years.

All EU member States are also part of the European Atomic Energy Community (Euratom) and subject to the Euratom Treaty.

The following list is incomplete, but provides examples of relevant international agreements:

- Convention on Civil Liability for Nuclear Damage (Vienna, 1963, amended 1997) and Convention on Supplementary Compensation for Nuclear Damage (Vienna, 1997)
- Convention on Third Party Liability in the Field of Nuclear Energy (Paris, 1960, amended 1964 and 1982)
- Convention on Nuclear Safety (Vienna, 1994)
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Vienna, 1997)
- Convention on Early Notification of a Nuclear Accident (Vienna, 1986)
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (Vienna, 1986)
- IAEA Safety Series:
 - No. 50-C-S (REV. 1), Code on the Safety of Nuclear Power Plants: Siting (1988);
 - No. 111-G-3.1, Siting of Near Surface Disposal Facilities (1994);
 - No. 111-G-4.1, Siting of Geological Disposal Facilities (1994);
 - No. 115, International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, IAEA, FAO, ILO, OECD/NEA, PAHO and WHO (1996)
- EU Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community Framework for the nuclear safety of nuclear installations.
- Treaty establishing the European Atomic Energy Community (Rome, 1957)