

Slovenian Experience with the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

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ABSTRACT

Slovenia is a relatively small European country with only one operating nuclear power plant, one operating research reactor and one Central Interim Storage for Radioactive Waste from small producers. There are also a uranium mine and mill at Zirovski vrh, both in the decommissioning stage. The Slovenian Government, its public and neighboring countries are most interested in the managing of radioactive waste in the safest possible way by carefully utilizing best practices and existing human and financial resources. In order to achieve this goal the tight connection with the international community in the area of radioactive waste management is essential. Slovenia was among those countries involved in the process of preparation of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention) from the very beginning and was also among first ratifiers. Slovenia had prepared the first report under the Convention and took part in the first Review Meeting in November 2003. The preparation of this report was not regarded only as a fulfillment of obligation toward Joint Convention, but was considered primarily as a kind of self appraisal of the national radioactive management program. Therefore the preparation of the report primarily contributed to the improvements in the field of radioactive waste management and consequently enhanced the safety of our public. For the preparation of the second report for the review meeting in 2006 it was decided to follow the structure of the first report. Only updates were introduced and eventual changes in the area of radioactive waste management were reflected.

INTRODUCTION

Slovenia is with its 20,151 km² and approximately 2 million large population the smallest country with the operating nuclear power plant. It is located in the central Europe and has joined European Union on 1st May 2004 together with the other 9 countries from central and eastern Europe. Slovenia is the contracting party to the Joint Convention. This paper describes reasons why Slovenia joined the Joint Convention and the process of fulfilling its obligations.

SLOVENIAN NUCLEAR PROGRAM

The Nuclear Power Plant Krsko was constructed by Westinghouse and started its commercial operation in 1983. It is two loop PWR with the 676 MW electric power. It is co-owned with neighboring country Croatia, however, because it is located on Slovenian territory, it is under the Slovenian regulatory control. Until the end of 2005 it has produced 2,314 m³ of Low and Intermediate Level Waste (LILW) and unloaded 732 spent nuclear fuel assemblies. All LILW is kept in an on-site waste storage, while all the spent fuel is stored in the spent fuel pit also on the site. With the yearly production of about 40 m³ of LILW the capacity of the storage could be sufficient until about the year 2010, while the spent fuel pit could accommodate all the spent nuclear fuel until the foreseen end of the plant's lifetime in 2023.[1]

The second nuclear facility in Slovenia is TRIGA Mark II research reactor located in the vicinity of Ljubljana. It has a thermal power of 250 kW. All the spent nuclear fuel produced in about 35 years of operation was in 1999 shipped back to the USA.[1] There is still enough fuel on the site for at least ten years of operation. The amount of produced LILW is relatively small.

All the radioactive waste from small producers (industry, medicine, research) is stored in a Central Interim Storage for Radioactive waste situated at the location of the TRIGA Mark II research reactor. It is operated by the national Agency for Radioactive Waste Management. Currently, around 70 m³ of radioactive waste is kept in the storage with an estimated total mass of 65 to 75 tons.[1] Production of the LILW outside the nuclear power plant is actually only few cubic meters per year.

Bigger amount of LILW will be produced during the decommissioning of the nuclear power plant. Within the scope of the Decommissioning Plan for the Nuclear Power Plant Krsko several decommissioning scenarios were prepared. About 13,000 m³ of LILW could be expected to arise during that process. It is planned to be disposed off in the future LILW repository.

The biggest amount of radioactive waste in the country is related to the uranium mining. The production at the Zirovski vrh uranium mine in central Slovenia started in 1982. Already by 1990 it was decided, that the mine was commercially unjustifiable, so the mining was stopped. The process of final remediation of two disposal sites, the one with about 1.9 million tons of mine waste and the other one with about 721 thousand tons of hydrometallurgical tailings has still not been finished.[1] However, this radioactive waste is going to remain on the same site and will not contribute to the amount of waste in the final LILW repository.

Major current problem of the country is non-existence of the final LILW repository. There was a serious attempt to find a location in the beginning of nineties, but it failed primarily because of the lack of public acceptance. Several possible sites were selected based on technical evaluations, while it was planned to get public opinion in later phases. However, this turned to be a very wrong strategy and the whole attempt failed.

In recent years the Agency for Radioactive Waste Management is again involved in the process of site selection for the repository, this time putting the highest importance to the public acceptance. All the local communities (193 altogether) were invited to offer sites for the repository on their territory. Eight communities applied, three of them were chosen as suitable for field investigations starting in 2006. A financial compensation for field investigations will be given by the Government to these communities. It is expected to have the site for the repository selected by 2008 and the repository constructed by 2013.

WHY SLOVENIA JOINED THE JOINT CONVENTION

The small size of the territory and of the nuclear program do not mean that the magnitude of issues, connected with the use of nuclear energy, are of less importance than in the larger countries. On the contrary, the effective use of human resources is of utmost importance. This applies in particular to the problems related to safety of radioactive waste management. The Slovenian Government, the public and the neighboring countries are most interested in the managing of radioactive waste in the safest possible way by carefully utilizing best practices and existing human and financial resources. In order to achieve this goal the tight connection with the international community in the area of radioactive waste management is essential. Keeping this in mind it was logical that Slovenia was among the countries involved in the process of preparation of the Joint Convention from the very beginning and was also among first ratifiers.

Before the accession to the Joint Convention Slovenia was already the contracting party to the Convention on Nuclear Safety. The country became independent in 1991 (before that it was part of the former Yugoslavia) and was struggling to become a part of the developed Western world. Most important national goals became accession to the European Union and joining the NATO alliance. Eventually these goals were reached in 2004, but at the time of the preparatory process of Joint Convention Slovenia was still not fully considered as the free market economy and fully developed democracy. Therefore it was essential for everybody in the country to try to prove that, also by adhering to the recognized best practices in the area of the utilization of nuclear energy. Accession to the Joint Convention was just one of such steps.

Not less important was our internal wish to assure for our people the best protection against harmful effects of the ionizing radiation. It was clear to us that we could not develop all the needed expertise in the country, therefore international connections in this area were essential. We were aware of the fact, that it could become quite difficult to built international connections, if the country does not join the other countries which are trying to apply the best practices in radioactive waste management and spent fuel management by joining the international convention. We considered it to be the club of countries striving to improve national practices and help each other in achieving this goal.

Because of these reasons the decision to join the Joint Convention was straightforward.

As already mentioned, Slovenia took part in the preparatory process for Joint Convention and signed it on 29th September 1997. The Slovenian Parliament ratified it in February 1999, when it became the part of our legal system.

MANAGING THE FIRST REPORTING PROCESS

For the country like Slovenia the biggest burden and the biggest challenge originating from the Joint Convention is the reporting process. At the first reviewing meeting in the fall 2003 all the countries were faced with the first of a kind challenge. Some help could have been developed only from the earlier process of reporting to the Convention on Nuclear Safety, but mostly we were faced with something new. In Slovenia the Slovenian Nuclear Safety Administration is responsible for implementation of Joint Convention and we were also responsible for the preparation of the first report.

The preparation of the report was a big project for us. We have started the preparation of the draft about 15 months before the review meeting took place. At the very beginning we have organized the initial meeting of all stakeholders in the country: Nuclear Power Plant Krsko, Agency for Radioactive Waste Management, Slovenian Radiation Protection Administration, Jozef Stefan Institute and the former Uranium Mine. The form of the report was agreed and the responsibilities for preparation of the draft were distributed. Each stakeholder became responsible for drafting a certain part of the report. Several meetings were necessary during the drafting period.

The drafting took about three months. After that all the stakeholders were asked to review the whole text. On the basis of the comments from the review process, the Slovenian Nuclear Safety Administration edited the report and a final report was prepared. Final report was first approved by the stakeholders and then sent to the Government, which approved it for the submission to the IAEA.

Soon after the submission date the reports from other contracting parties were sent through the IAEA to Slovenia in order to be reviewed. All the stakeholders in the country were invited to take part in the reviewing process, but there was not much interest in that. So, majority of the review had to be done internally at the Slovenian Nuclear Safety Administration. The reports of other countries were distributed among staff in the organization, responsible for different professional areas. Each of them had to propose questions for other contracting parties.

Once the internal reviewers prepared their proposal of questions to other countries, the management of the Slovenian Nuclear Safety Administration put them in the proper perspective. The objective was to avoid irrelevant questions, to prevent asking several countries in the country group the same questions, not to put too many questions to any country and to give more emphasis on the questions relevant to Slovenia. More questions were addressed to the countries with the similar kind of problems or to the neighboring countries where some kind of impact to Slovenia might be expected due to the geographical closeness.

The next task after the submission of the questions for other contracting parties was the preparation of answers to the 101 questions posted to Slovenia from the other countries. At the Slovenian Nuclear Safety Administration we have tried to spare our domestic stakeholders by preparing the answers to all the questions by ourselves. The stakeholders had to help only in few cases. We found out that none of the questions was very difficult to answer. We understood that as a proof, that we didn't have outstanding issues in the country which would raise serious concerns abroad.

Final step in the preparation for the review meeting was the design of the country's presentation. At the first review meeting the time allotted for each country was two hours. The Power Point presentation ended up with 95 slides. All the important facts from the report were stressed and summary of answers to the questions from other contracting parties was presented. Before the meeting the head of the delegation, who was giving the presentation, was extensively briefed and made a rehearsal.

During the presentation and the discussion following it, high number of Slovenian experts were present at the session. The experts from every field related to radioactive waste and spent fuel management were there giving immediate answers to every question raised during the discussion.

During the other days of the review meeting the number of experts of Slovenian delegation was much smaller. We have carefully planned the attendance to the presentations of other countries following the similar rule as with the preparation of questions: more to the countries with similar problems and to the neighboring countries.

Finally, after the review meeting, the whole campaign was analyzed at home. We tried to identify problematic areas, where we would need to invest more resources in the future. The reviewing process did point out our weaknesses, but we were glad to conclude, that none of them was new to us. It was another proof that we have been on the right track.

THE SECOND REPORT

Preparation of the second report was much easier task because we utilized all the experience gained from the first one. We have decided to keep the same format and basically also the content. Only the report was updated and eventual changes in the field described. A detailed project plan was prepared before the beginning of the process. Only one meeting with the stakeholders was organized, the following communication went through electronic channels. The drafting period was about four months. Final editing was again done at the Slovenian Nuclear Safety Administration. The report was approved by Slovenian Government on 6th September 2005 and submitted to the IAEA on time.

This time the Joint Convention web page helped a lot in smoothing the process.

RESOURCES NEEDED FOR FULFILLING THE OBLIGATIONS OF JOINT CONVENTION

The first reporting campaign was a little bit more demanding, but here is our estimate of the amount of human resources needed for the preparation of the second report. The main burden fell on the staff member of our administration, who was the editor. She has spent about 6 man/months of work in the period of about 15 months. In addition about 5 people employed at stakeholders had to contribute about 2 weeks of their work each. Reviewing of other reports occupied 4 to 5 our staff members for 2 weeks each. For the second review meeting there will be 2 or 3 people permanently staying in Vienna during the duration of the meeting, while 8 to 10 experts will spend there 2 days during the Slovenian presentation.

Rounding up above numbers gives us an estimate of about 1.5 man/year of human resources invested. Other expenses are negligible, the highest being the printing of the paper version of the report.

CONCLUSION

It is beneficial for Slovenia to be a contracting party to Joint Convention. We consider it to be a kind of a peer review of our self assessment process on a highest international level. However demanding the reporting process is, it is forcing us to make regular and comprehensive analysis of the situation in the field of radioactive waste management. The exposure to the international

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community is contributing to the safety culture of all people who are managing radioactive waste. Comparison with others always raises competition, which makes everybody better.

REFERENCES

1. Second National Report under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Slovenian Nuclear Safety Administration, Ljubljana, 2005. 134 p.