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Monitored this issue:

Slovenia and Croatia – radioactive waste, transparency, shared responsibilities, shared problems

By Nadja Zeleznik – Nuclear Transparency Watch

Slovenia and Croatia share the nuclear power plant Krško (NEK) which was constructed as a joint venture during 1970-ties in the socialist Federal Republic of Yugoslavia as part of the larger nuclear programme on the use of nuclear energy.

NEK is a two loop PWR Westinghouse (USA) design with all supporting infrastructure on site, including the buildings for radioactive waste and spent fuel management. Licensing was performed by the Republic Committee for Energy, Industry and Construction as the responsible authority in Slovenia. All other authorities were coordinated by this Committee, including the Expert committee on nuclear safety with its Technical Support Organizations. A safety report with safety analyses was mainly based on the provisions from USA NRC legal framework because the plant was of USA design. Trial operation was granted in 1981, in 1983 commercial operation started, and a license for normal operation was obtained in 1984 under Yugoslav and Slovene legislation.

A shared facility

Operator NEK d.o.o. is organized as a limited liability company in 100 % state ownership from entities of two republics: 50 % is owned by GEN energija d.o.o from Slovenia and 50 % by HEP d.d. from Croatia, both in 100 % ownerships by their states and the successors of the initial investors. The owners of NEK are equally responsible for ensuring all material and other conditions for safe and reliable operation of NPP, whereas the regulation and supervision of nuclear and radiation safety for NEK is the sole responsibility of the Republic of Slovenia. The regulatory framework for nuclear and radiation safety consists of the Ionizing Radiation Protection and Nuclear Safety Act with a set of regulations and decrees that are harmonised with international developments. All other legal requirements are incorporated in other legislation in Slovenia. The responsible authorities are primarily the Slovenian Nuclear Safety Authority (SNSA) within the ministry responsible for environment and the Slovenian Radiation Protection Administration (SRPA) within the ministry responsible for health.

After the breakup of Yugoslavia in 1991, NEK continued to operate under the legal framework of the Republic of Slovenia, although co-ownership with the Republic of Croatia was recognized and never argued but was not well defined under the new legal systems of both countries. Next to one major dispute on the energy supply which finished with lawsuits by both owners, the governments agreed to define in more details mutual relations regarding the status of NEK, its exploitation and decommissioning and adopted in 2001 the Agreement between the Government of the Slovenia and the Government of the Croatia on the Regulation of the Status and Other Legal Relations Regarding the Investment, Exploitation and Decommissioning of the Krško NPP (Intergovernmental Agreement – IA), ratified by both parliaments in 2003. The most vital points in the IA are the establishment of NEK decision making bodies, with as most important the Intergovernmental Commission (IC), in order to monitor the implementation of the IA, responsibilities in relation to the production of electricity, transmission, costs, recruitment, education, contractors and support for equal opportunities for workers. A very important part of the IA is devoted to decommissioning of NEK and radioactive waste and spent fuel management, where several provisions are agreed:

- Decommissioning of NEK, the disposal of all generated radioactive waste and spent fuel, as specified in the IAEA Joint Convention on safety of radioactive waste management and safety of SF management, is a joint obligation of the parties.
- Parties agree to provide an effective joint solution for the decommissioning and disposal of radioactive waste and spent fuel from an economic and environmental point of view.
- Two programmes are determined:
  - Programme of radioactive waste and spent fuel disposal: developed in accordance with international standards with the participation of NEK by responsible organizations (ARAO as waste management organisation in Slovenia and the Fund for financing the decommissioning of the Krško nuclear power plant in Croatia). The programme includes proposals for the possible division and takeover of radioactive waste and spent fuel, acceptance criteria for the disposal and assessment of the necessary financial resources, and deadlines for implementation and revised at least every five years.
  - Decommissioning programme: includes the management of all radioactive and other wastes generated during the decommissioning, until their removal from the NEK site, an estimate of the necessary financial resources and deadlines for its implementation, revised at least every five years.

- The location of NEK may be used for temporary storage of radioactive waste and spent fuel for the rest of its lifetime.
- If parties do not agree on a common solution for the disposal of radioactive waste and spent fuel by the end of its regular lifetime (that is until 2023), they shall undertake removal of radioactive waste and spent fuel from the NEK site no later than two years thereafter (until 2025), each half. Further removal of radioactive waste and spent fuel will take place in accordance with the radioactive waste and spent fuel disposal programme and the decommissioning programme, at least every five years, unless otherwise specified by the approved programmes.
- Financing of the costs of the preparation of the decommissioning programme, the costs of its implementation, as well as the costs for the radioactive waste and spent fuel disposal programme shall be shared in equal parts.

Radioactive waste and transparency

For improvement of safety and due preparation of NEK lifetime extension, a dry spent fuel storage is under development with the construction license issued in December 2020. Under pressure from environmental organisations, an environmental impact assessment (EIA) was carried out, and NEK has to take into account also some measures and conditions to mitigate adverse effects including zero base monitoring before facility construction, protection of soil and water, and emergency preparedness. The Waste Manipulation Building intended for storage and further manipulation of radioactive waste in drums was constructed in 2018. This happened without EIA. NEK's lifetime extension for 20 years, which is inevitably linked with radioactive waste and spent fuel generation, was initiated. SNSA took in 2012 a decision in principle, referring to the results of two Periodic Safety Reviews in 2023 and 2033. However, such an approach did not follow non-nuclear legislation and NEK had to file an application for lifetime extension to the responsible body ARSO in 2016. Only after an appeal from NGOs and a judgement from the Administrative Court in October 2020, ARSO decided that for the NEK lifetime extension an EIA is obligatory. The process will take several years, but information and participation will be assured.

The long-term radioactive waste and spent fuel management from NEK is defined in the Programme of NPP Krško Decommissioning and spent fuel and Low and Intermediate Level Waste (LILW) Disposal (DP) which was so far adopted with two revisions. The main purpose of the DP is to propose technical solutions, to estimate decommissioning and radioactive waste and spent fuel disposal costs for NEK, and to calculate annual instalments for devoted funds in Slovenia and Croatia. DP Rev.1 was approved by the Intergovernmental Commission, adopted by Slovenian government and Croatian parliament at the end of 2004. In 2011, the DP rev.2 was developed with new boundary conditions, including the option of NEK lifetime extension, but this was never adopted. There were no clear statements why there was no agreement. DP rev. 3 was developed again under new boundary conditions (like the NEK lifetime extension, dry SF storage as part of NEK's operation, so only three projects were still to be addressed: NEK decommissioning, LILW disposal and SF disposal) and was adopted in 2020 by the same main authorities: the IC, the Slovenian Government and the Croatian Parliament. A joint LILW repository was rejected by the council of the municipality of Krško, so in the DP Rev. 3 two separate radioactive waste disposals are taken into account: one in Slovenia on the selected site Vrbina, next to NEK, and one in the potential radioactive waste centre Čerkezovac in Croatia, although the latter is still in the licensing process. Therefore, the division of operational and decommissioning radioactive waste is analysed and included in this revision, starting with the removal of existing waste from NEK in 2023. Regarding spent fuel disposal, a joint solution is still foreseen between the two states. During the development of the DP, no public participation took place and all decision making was entrusted to the Intergovernmental Commission and its advisory committees.

In between, the Slovenian LILW repository has evolved, and a site licence was obtained in 2010 for a modular silo version of the repository at the Vrbina, Krško site, which is just next to the NEK. Information and public participation were broader than required and during site selection local partnerships were functioning, although later ceased. In the EIA report, two silos were included, thus creating the possibility that the disposal contains all radioactive waste generated at NEK. The construction licencing procedure is now in its final stage, while in parallel an EIA procedure with prescribed public participation, including a public hearing and 30 days for comments and suggestions, and a transboundary EIA (including also Croatia) is performed.

Challenges of shared responsibility

Until the adoption of the IA in 2003, the management of different issues of NEK were also bringing disagreements between the co-owners. One of the major ones was the issue of costs for NEK operation and the related decommissioning, radioactive waste and spent fuel management, to be set in a dedicated fund. The dispute ended with lawsuits and with the decision that Slovenia had to pay a total of around 40 million € due to the non-supply of electricity to Croatia in 2002 and 2003.

After the adoption of the IA in 2003, relations have become much more defined with procedures on how to approach in case of divergences. For on-site radioactive waste and spent fuel management, a basic decision-making process is in place and no disagreement is reported publicly (e.g., in media). However, for several new radioactive waste and spent fuel buildings on site or even for the lifetime extension of the NPP, NEK tried to minimise public participation. EIA processes started only

after successful appeals by NGOs, administrative court rulings and new decisions of ARSO: the EIA for the Waste Manipulation Building, an EIA process for the Dry Spent Fuel Storage, and an EIA for the NEK lifetime extension.

With regards to the long-term decisions for the radioactive waste and spent fuel management from NEK operation and future decommissioning, the issues are less conclusive and more complex. The main decision-making body defined in the IA is the Intergovernmental Commission. The basic documents that define the future decommissioning and disposal activities are the Programme of radioactive waste and spent fuel Disposal and Decommissioning, which should be developed every five years. The mechanisms for development of those programmes are also in place: two responsible organizations – ARAO and the Fund – with sufficient knowledge and resources for development of work, based on a Terms of Reference (ToR), adopted by the IC and further confirmed by the Slovenian Government and Croatian Parliament. However, the process of regular adoption of new revisions every five years was not successful. After the DP, Rev. 1, adopted in 2004, the Revision 2 of the DP scheduled to be adopted in 2009, although started on time, was never adopted. Only in 2020, Revision 3 of the DP was adopted, but the joint solution for LILW management was not agreed and two separate LILW repositories are planned for. The reasons for rejection of a joint LILW repository establishment were never set out in writing, but the basic principles as proposed by the advisory body to the IC (on safety of solutions, disposal of all radioactive waste in Slovenia and Croatia, optimization of costs and equal participation of entities from both countries) were already rejected at the level of the Krško municipality and were just taken over by the IC.

According to the IA, the decision making is limited to the official representatives of both countries, namely the members of the IC and its advisory body (this time called the Implementation Coordinating Committee), basically represented by appointed high ranking politicians or heads of responsible organizations. There is no other decision making foreseen, as programmes are seen as a kind of strategic documentation. However, there is a question whether such documents should also be also open for public participation (in terms of any kind of environmental assessment or other unofficial discussions) and would such broadening of transparency increase the acceptability of projects. Arguments for such public participation can be found in the Aarhus Convention, article 7, which obliges public participation for plans, programmes and policies related to the environment, the Kiev Protocol to the Espoo Convention on strategic environmental assessments and the EU Strategic Environmental Assessment Directive 2001/42/EC.

Typical for NEK activities, transparency in terms of nuclear safety and Waste Directive requirements remains an issue of concern: the approach used is to go for construction licenses to the Ministry of Environment and Spacial Planning, where SNSA provides consent for the nuclear safety and radiation protection part. Such an approach definitely shortens the procedure, but also excludes any public participation. Only lately we see a change, basically due to the appeals from NGOs to require EIA procedures for projects.

In relation to development of long term radioactive waste and spent fuel management solutions for NEK, the implementation of the IA is not so effective and successful, the functioning of the IC is limited. Members of the IC are changing with changing governments: the lead from each country is the responsible minister, a state secretary in the ministry and some other state officials. So the IC changes after each election. It would be important to stabilise future functioning of the IC and to think about professionalisation of the body. If the members would not change every two years (the current rate of government changes in Slovenia), they would be much more knowledgeable in the area, and also much more independent in decisions. Currently, the IC is perceived as a political body and also the broader context of relationships between the countries impacts its functioning (like the disputed border on the sea).

Transparency including information provision and public participation (not to mention access to justice) of developed programmes decided by the IC is really a weakness. Decisions are taken by the IC, on websites there is no further information on how decisions have been taken, the public is informed on press conferences about the outcomes. The programmes are published only after they are adopted and there is no public participation. However, individual projects (like the LILW repository) are going through all steps as prescribed in legislation, including an EIA process. The Law on environmental protection already now requires that for strategies or plans, a strategic environmental assessment (SEA) should be performed, also including public participation for important national strategies. Following the definitions in the Aarhus Convention, the Kiev Protocol to the Espoo Convention and the SEA Directive, the DP has to be understood as a national programme which directs radioactive waste and spent fuel management from NEK.

An open discussion on the shared option and a structured dialogue with interested parties from both countries would enable a more flexible approach in which disagreement could be addressed and potentially mitigated and solved.

Nadja Zeleznik – Nuclear Transparency Watch

This case studies is part of a larger report on radioactive waste and transparency, currently under preparation for the Euratom EURAD programme by Nuclear Transparency Watch. This is expected to be published in October 2021. Nuclear Monitor got permission to pre-publish parts of the final report.

New nuclear reactors? No!

Despite its setbacks on the Flamanville EPR site, Électricité de France (EDF) is pushing for a decision on the construction of new reactors. French NGO Sortir du Nucleaire is mobilizing against this project that is dangerous, risky and unsuitable with regard to the climate emergency.

Building new reactors in France? A few years ago, given the fiasco at the Flamanville EPR **(t**hird generation NPP, ed**.)** construction site, this prospect seemed like a good joke. When the CEO of EDF declared that «EDF must build reactors, as the cyclist must pedal in order not to fall», we just laughed. But the authorities took the joke seriously. First, it was a report issued in 2018, shortly after Nicolas Hulot's resignation, which called for the construction of 6 EPRs. Then the publication in Le Monde, in October 2019, of a letter from the ministries of the economy and ecological transition, asking EDF to prove that it could get into working order to build these reactors: officially, no decision would not be taken before the start of the Flamanville EPR, but the subject was on the table. In January 2020, the text of the Pluriannual Energy Programming opened the door to a decision on the construction of 6 EPRs. Finally, in November 2020, Contexte.com and Reporterre unveiled working documents reporting discussions between the ministries and EDF on the economic model for the financing of these reactors, the construction of which would take place between 2024 and 2044 and the cost of which would amount to at least 47 billion euros. According to this information, taxpayers money would finance 54% of the costs, not counting all or part of the additional costs. Shortly after, we learned that GIFEN (group of nuclear industries) was distributing «lobbying kits» to persuade local elected officials to host an EPR.

Who wants to acquire his reactor?

On February 10, 2021, at a hearing by the Senate, the CEO of EDF reaffirmed his wish to see these 6 reactors built. "If the government does not want a debate before the presidential election, then we want the decision to be taken as soon as possible" . He also specified the list of sites approached: Penly (Seine-Maritime), where a project of EPR had already been considered in 2009, Gravelines (North), and a third site in the Rhône valley, Tricastin (Drôme competing with Bugey (Ain). A choice dictated in large part by an increasingly severe climatic constraint : with a large number of reactors forced to shut down or reduce their power in summer when the rivers are overheating or too low, EDF has every interest in concentrating its projects on the coasts or on high-flow rivers, like the Rhône (which does not rule out all the problems, however, as we will see). However, this did not prevent some elected officials from continuing to preach for their parish by continuing to beg for a reactor in Belleville (Cher), despite the low flow of the Loire in summer.

As the prospect of reactor shutdowns looms on the horizon, for territories already equipped with power plants and fed on nuclear subsidies, these EPRs hold the promise of perpetuating the atomic windfall for generations. EDF knows this and plays abundantly with competition between elected officials from the various sites in the Rhône Valley, in order to be able to highlight, when the time comes, the "social acceptability" of the project. Near Bugey, a wish was made by the community of the commune of the Ain plain; of course, the residents were not consulted, which Sortir Du Nucleaire Bugey strongly denounced during a community council. A design office was appointed to make the SCOT (Schéma de Cohérence Territoriale (*regional coherence plan*) compatible with future reactor constructions. Close to Tricastin, where the new motorway exit has already been planned to allow the delivery of components (!), the elected officials went on a pilgrimage to Paris to plead their case with EDF. Even in the Gard department, wishes have been made in the municipal councils to welcome the EPRs. The community of commune Drôme Sud Provence, chaired by a former EDF employee, even embarked on the constitution of a "citizen committee" and in the organization of a popular vote, proposing beautiful yellow and green ballot boxes to encourage local residents to say "yes" to EPR!

In the meantime EDF continues to sneak in. According to the website Contexte.com [1], the company, which has already spent more than half a billion for this project of 6 new reactors, intends to send its request for a building license in September 2022, for a site opening in 2023!

Mobilization is organized

Building new reactors prolongs the nuclear risk for decades, not to mention the production of additional unmanageable radioactive waste. To rely on this expensive, dangerous and delay-prone technology is an aberration, especially since the cost of renewable energies, already lower than that of new nuclear, is constantly falling and a growing number of studies attest to the feasibility of 100% renewable. Finally, these projects raise questions in terms of vulnerability to climate change. Gravelines, built on a polder (land reclaimed from the sea), is threatened by rising water levels: according to forecasts, the plant would become an offshore site during the 21st century! The same risk arises for Penly, albeit less blatantly. And for the Rhône valley, what about potential future conflicts around water use and water management?

This is why we have created dynamics to block these new projects and support the local associations concerned, which also already have a lot to do with EDF›s project to extend the operation of existing reactors! A nascent dynamic made up of anti-nuclear groups from across the

country, who meet regularly to discuss the progress of these various projects, share important information on what the arrival of such a reactor would mean in their regions, and which actions to take concretely to deal with it. The objective of this cooperation is therefore to bring together the forces opposed to the EPR projects, to understand the needs of each in terms of struggle and to try to amplify the fight. Together, these groups can then develop various strategies to fight to build a collective mobilization against the arrival of these EPRs, which can be translated into action and awareness projects for the general public.

At the same time, a petition against the arrival of new reactors has also been launched: if you have not already done so, contribute your signature to say that the answer to new reactors is no!

Charlotte Mijeon and Marie Liger

Sortir du Nucleaire

Go to https://www.sortirdunucleaire.org/de-nouveaux-reacteurs-c-est-non to sign the petition.

(1) https://www.contexte.com/article/energie/info-contexte-nouveau-nucleaire-edf-fait-chauffer-la-carte-bancaire-pour-un-projet-epr2-pas-encore-acte_134715.html

Open letter Nuclear Transparency Watch on public participation EU Taxonomy

When and how will citizens be consulted whether or not to include nuclear energy in the European Taxonomy? That is the crucial question of an open letter Nuclear Transparency Watch has sent to the European Commission.

In order to meet the EU's climate and energy targets for 2030 and reach the objectives of the European green deal, it is vital that EU directs investments towards sustainable projects and activities. This is achieved by the action plan on financing sustainable growth called for the creation of a common classification system for sustainable economic activities, or an "EU taxonomy".

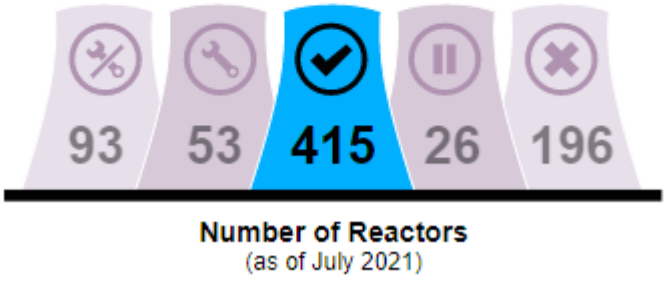
Under the Taxonomy Regulation, the European Commission had to come up with the actual list of environmentally sustainable activities by defining technical screening criteria for each environmental objective through delegated acts. A first delegated act on sustainable activities for climate change adaptation and mitigation objectives was adopted on 4 June 2021.

Already in 2020 the EC launched in-depth work to assess whether or not to include nuclear energy in the EU taxonomy of environmentally sustainable activities. As the first step, the Joint Research Centre drafted a technical report on the 'do no significant harm' aspects of nuclear energy. This report has been reviewed by two sets of experts, the Group of Experts on radiation protection and waste management under Article 31 of the Euratom Treaty, as well as the Scientific Committee on Health, Environmental and Emerging Risks on environmental impacts. It is planned to publish a second delegated act for the remaining objectives soon.

It is in this context that Nuclear Transparency Watch has written an open letter to the Commission to ask when and how citizens will be consulted on whether or not to include nuclear energy in the European Taxonomy. The full text of the open letter can be found on : http://www.nuclear-transparency-watch.eu/activities/lettre-ouverte-sur-la-question-de-la-participation-citoyenne-a-la-taxonomie-europeenne.html

NUCLEAR NEWS

World Nuclear Power Status



Source : https://www.worldnuclearreport.org/

Construction starts

China; At the Xudabao site, in north-east China, there were two construction starts. Units 3 and 4 are the VVER-1200 type. The two units are planned to be connected to grid in 2028.

New to grid

China: With a delay of about one year, Hongyanhe-5 in Dalian was connected to grid end of June 2021. The Hongyanhe site is owned and operated by Liaoning Hongyanhe Nuclear Power Co, a joint venture between China General Nuclear Power Corporation (CGN), China Power Investment Corporation (CNPC) and the Dalian Municipal Construction Investment Co.

Closures

Taiwan: Taiwan Power Company (Taipower) announced the permanent closure of unit 1 at its Guosheng nuclear power plant. The 985 MWe reactor had been scheduled to be decommissioned in late December this year, but the decision was brought forward.

ANTI-NUCLEAR NEWS

Netherlands;
Bike protest against new nuclear power plants

In the Netherlands discussion on new NPP's flared up in recent years. There is doubt whether wind-and solar energy in the densely populated country can contribute enough to the electricity demand. Esp. right-wing political parties are in favour of new nuclear power plants. WISE Netherlands wants to show that there is resistance to the construction of new NPP's, before it's too late! They are starting a bike protest through Zeeland and Noord-Brabant, two southern regions where a new NPP could be located. In the last weekend of September a group of anti-nuclear activists will cycle over 200 km to show the protest. You can sponsor the bike protest on : https://wise.kentaa.nl/?locale=en