Letter to DG ENER - Attachment

(02/19/2024)

INDEX

1. Summary

In January 1989, the CSN considered a Centralized Storage Facility (ATC in spanish) as the safest approach for temporary storing of the HLW of the Spanish NPPs, until a final DGDF would have been put in service. This criterion was endorsed by the Second General Radioactive Waste Plan (2º PGRR) and by all revisions of the PGRR thereafter, until and including the 6º PGRR, approved in June 2006.

The outcome of the 6º PGRR was the beginning of a thorough and transparent process for choosing a site, defining a concept, developing a project, conducting safety analyses and subjecting the whole process to a peer international review (IRRS ARTEMIS). The review resulted in a clear endorsement of it as reflected by the following statement (3rd parragraph of the Executive Summary): *"... the Spanish government has demonstrated its commitment to a basic principle for excellence in nuclear and radiation safety…"* and by qualifying several aspects of the ATC as "Good Practices".

In July 2018, the board of the CSN was expected to receive the final reports on 18 safety and technical areas and to meet in September 2018 to approve the ATC construction permit. Then, a letter was submitted by the State Secretary of Energy directing the CSN to interrupt the process to allow the government to "study the project". Apparently, the CSN reports were not needed for such study.

In November 2022, the revised version of the 7º PGRR was issued and the CSN emitted a favorable report regarding its terms on December 21, 2022. In this latest version, the approach of a Centralized Storage Facility (ATC) for HLW was abandoned and the use of 7 Individual Storage Facilities (ATI) located at the sites of the NPPs was adopted instead. The CSN backing report did not include any technical or safety justification for such a drastic depart from a long lasting and widely endorsed policy such as the option of a centralized facility.

2. Chronology

The 2nd PGRR, issued in January 1989, considered the Centralized Storage Facility (ATC) as the safest approach for temporary storing of the HLW of the Spanish NPPs. Such assessment was repeated in the 3rd PGRR (July 1991), the 4th PGRR (December 1994), the 5th PGRR (July 1999) . In the 5th PGRR, year 2010 was proposed for having an ATC in place.

In 2004, the Industry Committee of the Congress approved an administrative resolution directing the Ministry to prepare the 6º PGRR with provisions for beginning the necessary activities for the development of an ATC.

The 6th PGRR was published in June 2006. Also in 2006, the Congress directed the government to form a committee for the selection of a site. The committee was formed with members of several ministries and an advisory panel of six renowned experts in relevant disciplines.

In December 2009, a call for siting candidates was published. Thirteen applications were received. A thorough and transparent selection process took place which included the study and resolution of 14.000 allegations. A preselection of 4 candidates was made (Zarra, Ascó, Yebra and Villar de Cañas). Finally, in December 2011, a site in **Villar de Cañas** was chosen, and the corresponding proposal was presented to the government. The proposal was approved in a Minister council on December 31, 2011.

In January 2014, ENRESA presented the documentation package for licensing the site. In July 2015, the CSN emitted a favorable report regarding the radiological impact under operating conditions on the public and the environment although requesting additional data in order to allow the issuance of the Construction Permit. Those requirements were developed by ENRESA between 2015 and 2018. In May 2018, having spent more than one million man-hours in preparing the required documentation, ENRESA presented the 2nd revision of the Preliminary Safety Analysis Report (PSAR).

The CSN instructed to eighteen of its technical and safety departments to analyze the PSAR. Fifteen days before the due date for delivering the corresponding reports, the State Secretary of Energy sent a letter to the CSN directing it to put on hold the authorization process to allow the government to study the project. The evaluation package developed by the technical and safety departments of the CSN was not finished, neither requested, although around fifty thousand man-hours had been spent by CSN staff.

Finally, on November 7, 2022, the revised 7th PGRR was published. In this latest version, the ATC project was canceled, all the associated activities were interrupted, and a decision of pursuing the option of seven individual (ATI or ATD) storage facilities was taken instead. The 7th PGRR, a 126 pages document, states and explains this point in three short paragraphs (page 48).

Not a single mention of a technical, safety or regulatory rationale is provided in support of such a drastic decision. Just a generic statement, without any supporting basis, in the sense that a centralized facility would have strong difficulties in getting social acceptance. Apparently, having seven outdoor storing yards scattered over Spain should be the preferred option for the Spanish public.

3. The ATC Project of Villar de Cañas

As early as in 1989, the CSN considered a centralized facility as the safest alternative for temporary storage of radioactive HLW. For more than thirty years thereafter, the ATC has been considered the optimum solution for Spain as it facilitates decommissioning of reactor sites, and then reduction in the number of operating sites leads to benefits in terms of safety, security and economics. Such perspective has remained unchanged and endorsed by all the successive governments appointed along that period.

In 2006, the endeavor of developing the project was undertaken with an initial phase for selecting a site. A significant effort was made to ensure a technically sound definition of requirements and a transparent process to guarantee equality among the candidates and to address public concerns. Thirteen candidates that had applied for the project were evaluated and around 14.000 allegations were analyzed. After more than five years, the municipality of Villar de Cañas was chosen for the ATC. The selection was approved by the Minister council on December 31, 2011.

ENRESA, the Spanish public company in charge of radioactive waste management, initiated the engineering activities of the project. The reference design for the Spanish ATC project was the HABOG facility in Holland, which has been operating safely, with no incidents whatsoever since 2003.

The base technology is a modular vault dry storage (MVDS) integrated with facilities for buffer storing casks, hot cells for packaging fuel into canisters, cask maintenance and hot laboratories for research. The main building comprises five sections: 1) Reception, 2) Preparation, 3) Unloading, 4) Transfer Tunnel and 5) Handling Hall Storage Area.

The overall design of the ATC has been formulated with multiple safety features and technical/operational capabilities to provide lifetime flexibility. Safety features include passivity, subcriticality, the ability to readily retrieve and re-work storage packages, condition monitoring and inspection, and a protection scheme of multiple barriers, the last one being a 1,5 meters thick containment building designed to withstand seismic events and an aircraft crash.

The ATC project would also include a technological center intended for conducting specific R&D activities related to radioactive waste management. The technological center would be located in another building aside from the main one.

4. The IRRS/ARTEMIS Combined Mission

In 2018, at the request of the Spanish authorities, an international team of 24 senior nuclear and radiation safety experts and 8 IAEA staff met with representatives of the Nuclear Safety Council (CSN) and the Spanish Radioactive Waste Management Agency (ENRESA). The meetings took place in Madrid between March 14 and 26. The purpose of that combined mission (IRRS-ARTEMIS) was to perform a peer review of the infrastructure for safety in Spain on matters of nuclear safety, radiation protection, and management of spent fuel and radioactive waste.

In particular, the ARTEMIS component of the review provided independent expert opinion and advice on radioactive waste and spent fuel management, based upon the IAEA safety standards and technical guidance, as well as international good practices. The IRRS review team was headed by Mr Victor McCree from the USA and the ARTEMIS review team by Mr François Besnus from France.

An integrated report of the combined mission collecting the insights obtained by the review teams as well as recommendations, suggestions and good practices was issued at the end of the review. The content of the ARTEMIS review is covered in the Component II of the report.

In general terms, the combined report provides a positive description of the results derived from the review, with special mention to the preparation, expertise, and dedication of the staff from the involved Ministries, the CSN and ENRESA. The report also underlines the full cooperation demonstrated by the management and staff of Spanish authorities.

Besides mentioning a list of recommendations (20) and suggestions (22), provided with the aim of improving regulatory and safety practices, the report makes a special mention to the process conducted for designing the Central Storage Facility (ATC) for HLW, incorporating the best in class in its design and highlighting it as a Good Practice.

However, the report also formulates the following comment in page 12 of Component II[1]:

“In July 2018, MITECO requested the CSN to suspend the current review of the license application for the construction of the proposed CSF for higher level radioactive waste and spent fuel.

The ARTEMIS team was not provided with evidence that there was any evaluation and/or consideration of the immediate and longer-term safety implications of the decision to temporarily halt the review of the CFS license application. Furthermore, no evidence of stakeholder (including CSN and ENRESA) consultation on this matter was presented to the ARTEMIS team.”

[1] This point is one of the key elements of the present report for DG ENER

5. The 7th General Radioactive Waste Plan

The interruption of the ATC project instructed by the State Secretary of Energy on July 2018 resulted in the related project activities been shut down. The command was never taken back thereafter. ENRESA undertook the preparation of the 7º PGRR. The revised version of the document was issued on November 7, 2022, and endorsed by the CSN board on December 21, 2022, as reflected in the council minutes (Acta 1651).

The 7º PGRR states the definitive cancelation of the ATC project. The alternative approach chosen for temporary storage of HLW and spent fuel is the use of individual repositories at the sites of all decommissioned NPPs, seven in total, until its final transfer to a deep geological facility.

Although such decision has a strong impact in safety, its justification is a single statement given in a sentence of four lines. No safety, engineering or scientific analysis of any kind is provided in support of such a sudden an abrupt departure from a long lasting and deeply studied option as the ATC had been. In contrast, the selection of a site for the ATC had taken several years and thousands of man-hours of analyses.

The rationale of the 7º PGRR for abandoning the ATC option is stated in the following terms: *"…during the process of public information, difficulties of getting social political and institutional consensus have appeared that prevent from pursuing the ATC option…"* (paqe 48, last parragraph).

This statement does not take into consideration any safety matter. Besides, it is formulated without any supporting material. In fact, it collides with several evidences gathered in the long process of selecting the site of Villar de Cañas and developing the ATC project, namely, the approvals of the project by the Town Council, the Province Council and the Region Council. Additionally, the Town Council has recently presented an appeal before the Supreme Court against the cancelation of the project.

6. The Particular Vote of Prof. Javier Dies Llovera

The 7º PGRR was endorsed by the CSN without unanimity. One of the five members of the board, Prof. Dies Llovera, registered a particular vote against such endorsement in Annex I of the CSN meeting notes (Acta nº 1651).

Resume of Prof. Dies Llovera includes 30 years of professorship in the the Nuclear Department of the Polytechnic University of Barcelone, 240 technical articles and the direction of 15 PhD theses in nuclear technology, many of the them in the area of HLW geological storage.

In his particular vote, Prof. Dies Llovera summarizes the historical process of the ATC, highlights the main advantages of the ATC approach with respect to that of the individual facilities and reminds of the international endorsement of the Spanish HLW management process until the interruption of the ATC project.

Prof. Dies Llovera defends that centralizing the HLW in a single storing facility is largely safer than splitting the radioactive waste in seven different places. The ATC is provided with unique safety features, for instance, a 1,5 meters thick containment designed to withstand an aircraft crash and seismic events. Also, the ATC will be operated and maintained by a crew of technical staff that cannot be afforded for each of the individual facilities, once the plants are decommissioned.

Prof. Dies Llovera estimates the centralized facility to be as much as 20 times safer than the set of 7 individual ones, pointing out that the fundamental safety commitment of the ALARA principle requires the safest achievable option to be chosen.

Prof. Dies Llovera also mentions that centralized storage has been recommended in the USA by the “Blue Ribbon Commission on America´s Nuclear Future” in order to maximize safety and facilitate later processes of final geological storage. His particular vote also refers to the peer review made by the above described IRRS-ARTEMIS combined mission.

Prof. Dies Llovera points out that the specific evaluations developed by the eighteen technical areas of the CSN have not been taken into consideration in the preparation of the report made by the CSN management advising the Ministry (MITECO) about the approval of the 7º PGRR.

7. Conclusions

In light of the above-mentioned circumstances, we understand the CSN management has failed to perform according to its responsibility with respect to nuclear safety in managing HLW storing policy and strategy. The decision of abandoning the centralized approach for HLW storage and adopting that of using individual repositories has been taken without the safety analyses that deserve such a crucial matter.

There are significant signs that such decision may represent a regression in terms of public safety and that the application of the ALARA principle has been ignored. Therefore, a complete and solid justification should complement the latest revision of the general plan for radioactive waste (7º PGRR). Besides, the approach of individual repositories implies an important additional budgetary load. Certain sources estimate it in more than two billion euros.

On March 8, 2022, Professor Emilio Minguez, president of the Spanish Nuclear Society, attended the Committee of MITECO ministry and requested an explanation for the lack of technical, safety or regulatory justification for the interruption of the ATC. No explanation was provided for such request. An allegation in similar terms was addressed by one of the signees (Telmo Gabarain) to the Spanish Ombdusman ("El Defensor del Pueblo"). This entity declared the issue not to be a matter of its competences.

We understand that nuclear safety in Europe is a matter of concern for DG ENER and IAEA. In view of the idleness and silence of Spanish authorities regarding this issue, the signees of this letter have decided to escalate it to those international bodies.

8. Signees and Coordination

This submittal has been signed by the following persons, acting as individuals on their own representation. Neither private organizations nor public entities are represented herein. Copies of written signatures can be found in the attached envelope.

Alfonso Álvarez Miranda. Mine Engineer. Expert in technology of NSSS (Nuclear Steam Supply System) major components. Operations Director of ENSA - Equipos Nucleares (7 yrs).

Eduardo Aymerich Huyghues. Industrial Engineering from ETSII Madrid and MBA from IESE. More than 30 year's experience in the nuclear power sector. International Partner ARGOZ Consultants.

José Luis Burgos de la Maza. Electrical Engineer from the University of Seville. Project engineer in three NPPs (ABWR & PWR). Project construction director of several generation plants.

José María Calvo-Sotelo. MSc.in Physics (UCM University) and MBA from Harvard Universty. 25 years experience in power sector. Adjunct professor at IE University. Energy and climate change analyst.

Antonio Colino Martínez. Civil engineering Phd and electrical engineer. President of theSApanish Royal Academy of Engineering, **executive president of ENRESA (8 yrs)**, councelor and **VP of the CSN (8 yrs)**, **first president of the EDRAM** (Int. Association for Safe Disposal of Radioactive Materials), energy advisor of the EU and the IAEA (6 yrs).

Ángeles Diez Moreno. Doctor of Law from Carlos III University. Law Professor specialized in financing and taxing of the energy and environmental fields.

María Teresa Esteban. Industrial engineer. **Winner of 2018 WFEO** Gree Women in Engineering Award. General Director of Environment (5 yrs), **Laureate (2019)** member of the Royal Academy of Engineering, chief engineer of the studies office of the Energy and Industry Ministry, **President of the CSN (6 yrs)**, dean of the Official College of engineers, **2019 National price** of industrial engineers.

Telmo Gabarain Astorqui. Graduate in Physics from University of Navarra. 20 years experience in nuclear power. Business Development Director of Iberinco (Thermal Power) and Iberdrola Renewable Investmens in Latin-America.

Julio Moreno Alonso. Electrical engineer. Professor at University of Burgos conducting final degree and master courses on nuclear technology, project direction and lean manufacturing. Director of the Institute of Engineering of Burgos.

Guillermo Sánchez León. Engineer, Physicist and Doctor in Mathematics. Researcher at the University of Salamanca. 30 years experience in nuclear engineering and radiation physics.

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This submittal has been coordinated by:

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