

CONVENTION ON NUCLEAR SAFETY

NATIONAL NUCLEAR SAFETY REPORT
ANSWERS TO QUESTIONS OR COMMENTS - **ARGENTINA** - 2023

ARGENTINEAN NATIONAL REPORT
FOR THE CONVENTION ON NUCLEAR SAFETY
ANSWERS TO QUESTIONS OR COMMENTS - 2023



This report demonstrates how Argentina has implemented its obligations under the Convention on Nuclear Safety. The report follows closely the guidelines, regarding form and structure, that were established by the contracting parties under Article 22 of the Convention.

This Report is produced by the Autoridad Regulatoria Nuclear (Nuclear Regulatory Authority) on behalf of Argentina. Contributions to the report were made by representatives from Nucleoeléctrica Argentina S.A. (NA-SA) and Comisión Nacional de Energía Atómica (CNEA)

ARGENTINEAN NATIONAL REPORT
FOR THE CONVENTION ON NUCLEAR SAFETY
Ninth Report - **ANSWERS TO QUESTIONS OR COMMENTS**

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ANSWERS TO QUESTIONS OR COMMENTS

NATIONAL NUCLEAR SAFETY REPORT – 2022

No. 1

COUNTRY: BRAZIL

CNS-REF.-ART.: Article 14

PAGE OF REPORT:

CHAPTER OF NAT. REPORT: 3.14.2.2

What is the impact on the level of risks arising from the updating of the databases for the CNA I and CNA II NPP?

The "Centralized Reliability and Events Database" (ZEBD) issued by the Technical Association of Large Power Plant Operators (VGB) in 2012 was used to update the Level 1 PSA of CNA UI-II. This database gathers and analyses operating experience gained at a large number of nuclear power plants (NPPs). It encompasses nineteen (19) German NPPs along with Borssele NPP in the Netherlands and Goesgen-Daeniken NPP in Switzerland. Therefore this database contains better reliability component data than the databases (Deutsche Risikostudie Kernkraftwerke, Phase B issued in 1990 or IAEA-TECDOC 478 from 1988) used in earlier versions of the level 1 PSA.

Regarding the inclusion of plant-specific data derived from the operating experience, in some cases the previously used generic data were improved. However, in other cases the inclusion of operating experience led to an increase in the failure probabilities. Among the later cases it is worth mentioning the reliability of the external power supply.

Various improvements and changes to the model were implemented together with the database update; therefore it is difficult to straightforwardly estimate its impact on risk level.

No. 2

COUNTRY: BRAZIL

CNS-REF.-ART.: Article 14

PAGE OF REPORT:

CHAPTER OF NAT. REPORT: 3.14.2.2

What are the risk criteria used in the decision-making process?

As part of a broader regulatory system, the Nuclear Regulatory Authority does not have any Regulatory Standard/Guide addressing risk-based decision making. Nevertheless, for some particular cases like, request for plant modifications, deferral of preventive maintenance activities, etc., it was accepted the use by the Licensee of US-NRC RG 1.174 "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" as an approach for justification of the proposal and development of the submission. In addition, the guidelines and methodologies suggested in IAEA-TECDOC-1436 "Risk informed regulation of nuclear facilities: Overview of the current status", IAEA-TECDOC-1909 "Considerations on Performing Integrated Risk Informed Decision Making" and EPRI-3002020763 "Consideration of Defense-in-Depth and Safety Margins in Risk Informed Decision Making", are adopted as well.

No. 3

COUNTRY: BRAZIL

CNS-REF.-ART.: Article 14

PAGE OF REPORT:

CHAPTER OF NAT. REPORT: 3.14.2.2

What are the risk criteria for instantaneous risk?

The project to adapt the model and implement it to a risk monitor is under development. The instantaneous risk level that will be used as a limit has not been established yet, this must be agreed with the regulatory body (ARN). It is estimated that the considerations and limits proposed in the following references will be used to evaluate the temporary risk increases: EPRI PSA Applications Guide (EPRI TR-105396) and NUMARC 93-01 "Industry guideline for monitoring the effectiveness of maintenance at Nuclear Power Plants". In the aforementioned references it is considered that a configuration with $ICDP > 10^{-05}$ (Incremental Core Damage Probability - ICDP) should not be reached voluntarily.

No. 4

COUNTRY: SLOVAKIA

CNS-REF.-ART.: Article 8

PAGE OF REPORT: 40

CHAPTER OF NAT. REPORT: 3.8

Are there any extra tools for prevention and resolution of conflicts of interest to ensure the independence of competent regulatory authority in your legislation? If yes, please specify them. If not, please, clarify the way how this issue is solved. Especially in case of rotation of staff with executive responsibility between the licence holders/nuclear industry and regulatory body (both directions).

The Argentine legislative framework includes the Law N° 25.188, "Ethics in the exercise of the public functions" for dealing with the conflict of interest in those situations in which the law presumes that the impartiality and independence of judgment of the person exercising a public function is affected. The Law also establishes prohibitions to carry out certain private activities.

No. 5

COUNTRY: SLOVAKIA

CNS-REF.-ART.: Article 9

PAGE OF REPORT: 60-61

CHAPTER OF NAT. REPORT: 3.9

In relation to the strengthening the capabilities of licence holders to ensure that prime responsibility for the safety of a nuclear installation rests with the holder of the relevant licence could you, please, explain how is evaluated the adequacy of financial resources of licence holders? Are defined any criteria?

ARN hasn't defined any specific criteria to directly evaluate the adequacy of financial resources of Licensees. However there are in place indirect ways to assess it mainly derived from the requisites of the AR 10.6.1 standard, "Management System for Safety in Nuclear Installations and Practices" and the License's conditions. AR 10.6.1 standard is aligned in this regard with GSR Part 2, requirement 9: Provision of resources.

One of the License's conditions is the regular submission to ARN of the report resulting from the internal audit of the management system, including the provision of resources, performed by the Responsible Entity (NA-SA Headquarter) to the operator. Through this audit report, ARN reviews and assess whether the operator has obtained the resources necessary to conduct its activities and to discharge its responsibilities for ensuring safety at each stage in the lifetime of the plant.

No. 6

COUNTRY: SLOVAKIA

CNS-REF.-ART.: Article 9

PAGE OF REPORT: 60-61

CHAPTER OF NAT. REPORT: 3.9

Concerning to the strengthening the capabilities of licence holders to ensure that prime responsibility for the safety of a nuclear installation rests with the holder of the relevant licence could you, please, clarify whether you have established any special provisions/rules/procedures of the licensees' responsibility for the activities of the related contractors and subcontractors with impact on nuclear safety? If yes, please, specify.

AR 10.6.1 standard "Management System for Safety in Facilities and Activities" states that the management system of the License holder shall include "mechanisms to assess, qualify and perform audits to the supply chain and to the selection and contractual process of suppliers".

For more information, please see in the National Report the following sections:

- 3.12.1. SYSTEM TO DETECT, CORRECT AND PREVENT HUMAN ERRORS, last paragraph (1)
- 3.13.2.1. QUALITY SUPERVISION OF EXTERNAL SUPPLIERS RELATED TO OPERATION, REFURBISHMENT AND CONSTRUCTION OF NPPs.
- 3.13.3.1. QUALITY SUPERVISION OF EXTERNAL SUPPLIERS RELATED TO DESIGN AND CONSTRUCTION OF CAREM PROJECT
- 3.19.8.1. FEEDBACK FROM LOCAL OPERATING EXPERIENCE, 9th paragraph (2)

(1) 3.12.1, last paragraph:

"Another aspect to take into account in the prevention of human errors is related to the measures taken by the Licensee regarding the contractors in order to ensure their adequate competence and safety culture. Towards this objective, the technical assistance services to the NPPs are given by competent companies whose personnel have qualifications, knowledge and experience about domestic NPPs. Also the new personnel at any level are trained with the necessary knowledge before starting to work in the nuclear field."

(2) 3.19.8.1, 9th paragraph:

"In CNE, as defined in the OPEX procedure, all personnel working at the plant, including contractors, have the obligation of reporting any "inappropriate condition" detected by issuing an inappropriate condition report (ICR). Those "Inappropriate Conditions" are screened daily by the Management who define if they need to be corrected and coded for trend "Finding / Minor Event" or declared as "Event / Minor Event" and analysed."

No. 7

COUNTRY: PAKISTAN

CNS-REF.-ART.: Article 6

PAGE OF REPORT: 19

CHAPTER OF NAT. REPORT: 3.6.2

It is mentioned that prototype reactor (CAREM), a domestically designed small modular reactor (SMR), is under construction. Argentina may like to share some details of the licensing experience of SMR.

Argentina has participated in the drafting of the IAEA-TECDOC-2003 "Lessons Learned in Regulating Small Modular Reactors, Challenges, Resolutions and Insights". This document is a good reference to know more details about the Argentine experience in the licensing of the CAREM 25 reactor.

No. 8

COUNTRY: CHINA

CNS-REF.-ART.: Article 14

PAGE OF REPORT: 90

CHAPTER OF NAT. REPORT: 3.14

It's stated that "During past 7th review process, Argentina specified that containment venting filtration system was under assessment at CNA I & II NPPs."

Question: Do the "containment venting filtration system" and "independent filtration containment venting system" mentioned in the report refer to the same thing? If yes, it is recommended to use the same term.

Yes, it refers to the same system. This suggestion will be taken into consideration.

No. 9

COUNTRY: CHINA

CNS-REF.-ART.: Article 12

PAGE OF REPORT: 72

CHAPTER OF NAT. REPORT: 3.12.1

It's stated that "In this case the key elements are the quality of the report on the occurred events, the rigour in the investigation of their root causes and the corrective actions carried out."

Question: Could you share more information about the measures to ensure the 'rigour' in the investigation for human error related events?

According to the plant procedures, the personnel that was involved in the event could not be part of the team in charge of the event analysis. The quality of the event analysis is carried out by several groups and persons: the analyst chief, the experts of the Operating Experience Division, the opex board (NPP Senior Managers) and for some of them, the Independent Nuclear Oversight group performed an independent review.

Each of these revisions may require enhancements, reanalysis, or modifications.

No. 10

COUNTRY: CHINA

CNS-REF.-ART.: Article 12

PAGE OF REPORT: 77

CHAPTER OF NAT. REPORT: 3.12.1.2

It's stated that "At CNE, the Human Performance Program consists of the following: CNE's Human Performance Simulator."

Question: Could you share more information or give examples about the application of Human Performance Simulator identified in Article 12? Further information will benefit the determination of whether or not this simulator could be a good practice in the industry.

A Human Performance simulator was built with the objective of improving the continuous learning processes, the qualification in human performance and reinforce the expected behaviours of Embalse Nuclear Power Plant personnel.

For each scenario developed in each session of Reinforcement of Good Practices carried out at the simulator, support is requested from an interdisciplinary team integrated by Maintenance, Operations, Safety and Radioprotection personnel in order to analyse the training needs in search of performance gaps. Internal OPEX, results of Task Observations and WANO AFIs are also taken into account.

An interdisciplinary team made up of 4 to 6 participants/students (one of them fulfils the role of supervisor and the rest of them fulfil the role of executors of the task) participate of each simulator session.

The procedures and/or documentation used during the scenarios are the same used at the plant with the incorporation of intentional errors to observe the behaviour of the participants/students.

The instructors record the participants/students behaviours and feedback on observed strengths and weaknesses is given at the end of the session.

No. 11

COUNTRY: HUNGARY

CNS-REF.-ART.: General

PAGE OF REPORT: 12-14, 92-95

CHAPTER OF NAT. REPORT:

According to the cited pages of CNS Report 9, the to-be-installed corium-barriers are going to be a temporary preventative solution against large or early releases in DEC-B (severe accident with core melt) of CNA I plant, and depending on ongoing evaluation, also CNA II plant. In the case of CNA I the barrier construction is being integrated into the long time operation program.

Is there any information that can be shared regarding the corium-barriers, their fitting, the expected delay of containment failure with and without the barrier, visualization of the retrofit? Does the regulatory body have an action plan regarding the oversight of critical steps of the corium-barrier retrofit?

As mentioned in the report, the main design concept is to delay containment bypass as long as possible, in order to allow for sufficient time for protective actions for the public to be implemented, in accordance with WENRA Guidance Document F 4.14 for retrofitting on existing reactors for DEC-B.

The material specification of such walls, as well as the determination of expected integrity is under development by NA-SA and CONICET (specialists in ceramics materials have been contacted). The preliminary proposal is to construct this walls of Zirconia. The material selection is in line with international experience gained from MCCI and Core Catchers experimental analysis.

The regulatory body doesn't have an action plan for the oversight the implementation of corium barrier. It will be developed in a later phase of the project, when the documentation is submitted to ARN.

No. 12

COUNTRY: HUNGARY

CNS-REF.-ART.: 18.1

PAGE OF REPORT: 12-14, 92-95

CHAPTER OF NAT. REPORT:

Regarding CNA I, the Report states: „In CNA I, the sump design, volume, relative location of the reactor pressure vessel and safety injection pump suction lines, is such that in the event of a Severe Core Damage accident, if total meltdown of the core plus main internals is considered, the volume of corium could be contained inside a set of newly installed walls that would avoid direct contact with safety injection pump suction lines.” as well as „The underlying concept of Corium-Barriers is that they are not required to remain in place in the very long term, but only as long as the containment would eventually fail by other means (e.g. overpressure due to slow pressurization).”

Do these sentences together mean that, as of yet, CNA I has the possibility of early containment breach in case of total core melt?

In Atucha reactors there are two main groups of severe accident scenarios. Those of LOCA with ECCS failure and SBO/TLFW. Due to the presence of the moderator, SBO scenarios are much slower than the first one. Once RPV breach, corium reaches ECCS suction lines and containment is

bypassed. It must be pointed out that "early" is a broad definition and in case of Atucha only few scenarios would fall into this category.

No. 13

COUNTRY: HUNGARY

CNS-REF.-ART.: Chapter 1

PAGE OF REPORT: 3, 38

CHAPTER OF NAT. REPORT: 1.3

“Activities related with the CNE’s Life Extension Project, to extend the plant life for another 25 years of full power operation as well as to increase the electrical power in about 35 MW, were carried out and concluded. During the refurbishment outage different design changes were introduced to improve safety, including post Fukushima requirements for severe accidents. The refurbishment shutdown started on December 31st, 2015 and the start-up began in January 2019, reaching full power for the realization of commissioning tests by the end of April 2019. Operating License was issued in August, 2019.”

Based on Report 9, at the CNE plant, the power uprate of 35 MW and the lifetime extension project was concluded with the issuing of the Operating License. Up until now, has the power uprate impacted the operation in any unforeseen way? Is there any relation between, or has the uprate brought up notable operational safety questions regarding the 25 years of extension? Particularly, since the answer given in the 2019 CNS report (No. 89).

The design changes necessary to achieve the expected power increase that were made during the life extension of Embalse, have not had a negative or unforeseen impact on the normal operation of the plant, nor have they raised doubts regarding long-term safety. It should be noted that the power uprate was mostly due to improvements in the Balance of Plant. The reactor power was increased by 2.4% bringing it to design value of the nominal power of a standard Candu 6. This was achieved by increasing the transfer area of the steam generators by 25%, by replacing the steam generators.

No. 14

COUNTRY: ITALY

CNS-REF.-ART.: Article 12

PAGE OF REPORT: 72

CHAPTER OF NAT. REPORT: 3.12.1

Does ARN perform in factory (contractors) inspections to control the quality of systems and components relevant for nuclear safety, or the in factory inspections are performed only by NPP operators?

AR 10.6.1 standard “Management System for Safety in Facilities and Activities” states that the management system of the License holder shall include “mechanisms to assess, qualify and perform audits to the supply chain and to the selection and contractual process of suppliers”.

In order to verify regulatory requirements, in general ARN performs inspections and audits to Responsible Entity, not to supplier. The Responsible Entity is in charge of assuring that the supplier management system is implemented.

In certain cases ARN can perform regulatory audits and visits to manufacturer shops and factories. Those regulatory audits and visits are focused on the license holder activities, to verify in practice the way that responsible entities verify supplier management’s system.

No. 15

COUNTRY: ITALY

CNS-REF.-ART.: Chapter 1

PAGE OF REPORT: 9

CHAPTER OF NAT. REPORT: 1.4.2.3

“The Regulatory Body agreed with the Vienna Declaration on Nuclear Safety in the understanding that it is the permanent goal of Nuclear Safety to prevent accidents with radiological consequences and to mitigate such consequences should they occur. In this sense, ARN decided to address the Vienna Declaration by incorporating it as a high level goal of a full-scope to review the national normative framework.

The goals of the normative framework review are the following:

- **Overall review of Argentina normative framework is based on ARN regulatory experience as well as the international knowledge and the Vienna Declaration. This review would include the updating of the standards in force and the development of new ones, when necessary.**
- **Harmonize ARN Regulatory Standards with IAEA’s Standards, according to the Convention on Nuclear Safety and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.**
- **Facilitate the presentation and exchange of information on Argentine’s Standards, as part of the preparation for the next Integrated Regulatory Review Service (IRRS), that will be carried out in Argentina.”**

Please give information about the actual state of the process of reviewing the national normative framework, describing the principal actions put in place and the time planning for the full development and coming into force of the update national regulatory framework.

ARN identified the need to revise existing standards and guides as well as to develop new standards and guides especially for NPPs.

In relation with the actual state of the process, some delays have occurred due to COVID restrictions and additionally, the retirement of qualified staff in the Regulatory Standard Division.

Due to this, ARN is working on those standards that have priority for its application and in the increase of resources in the Division.

Once the Division’s resources are normalized, the new program will be defined.

No. 16

COUNTRY: ITALY

CNS-REF.-ART.: Article 8

PAGE OF REPORT: 45

CHAPTER OF NAT. REPORT: 3.8.3.1.1

“Nevertheless, ARN continues fulfilling its responsibility with its own staff in conjunction with the use of Technical Support Organizations (TSO). Joint tasks developed by ARN in collaboration with different TSO, are also used as an opportunity to incorporate knowledge and experience by junior and senior professionals. As can be seen in section 3.8.7., ARN has several agreements with local and international support institutions. One of the conditions of the agreements is that the institutions involved do not provide assistance to the licensees in the same area.”

Please give information about the number and list of the TSOs and clarify the relationship between TSOs and ARN, describing the field of action of each TSO and the role of ARN.

ARN doesn’t have a fixed list of nominated TSOs. The nomination is decided in a case by case basis when there is a gap between the installed in house capacity and the required one for performing the regulatory assessment/inspection.

As any governmental organization, ARN is subject to the public control regime. In this context, ARN can contract a TSO according to the administrative procedures applicable to all Argentinean governmental organizations. The candidates must fulfill the requirements established for governmental suppliers which include the demonstration of provable experience in the subject of the requested technical support and has to ensure confidentiality and exclusivity as well.

ARN uses the “work packages” methodology for the definition of the activities to be done by the TSOs. In these work packages, it is specified the scope of the assessment / inspection, the standards to be considered, the acceptance criteria, etc. It is also important to mention that ARN retains the whole responsibility for regulatory actions and decisions.

Some examples of the institutions/organizations that are (or were) ARN's TSO, are the following ones:

1. International:
 - a. SANDIA National Laboratories (USA) for PSA level 3,
 - b. TÜV NORD/SÜD (Germany) for review & assessment in Mechanical/ I&C/ Electrical/ System Processes areas and on-site inspections,
 - c. GRS (Germany) for neutronic and thermalhydraulic calculations, PSA level 2,
 - d. TECNATOM (Spain) for ageing management review of structures and components, equipment qualifications, plant design comparison against KTA standards,
 - e. Battelle Memorial Institute (USA) for break preclusion and leak before break demonstration.
2. National:
 - f) National University of San Juan (UNSJ – Instituto Aldo Bruschi) for seismic hazard reevaluation and plant seismic margin,
 - g) National University of Litoral-Santa Fe (UNL) for RPV structural integrity and other mechanical issues, review & assessment in civil area.

No. 17

COUNTRY: ITALY

CNS-REF.-ART.: Article 16

PAGE OF REPORT: 127

CHAPTER OF NAT. REPORT: 3.16.5

How is the termination of the emergency managed in the NPP emergency plan/National pan? Has the transition phase been included in these plans?

Considering the necessary arrangements for the management of the termination of an emergency and the transition phase towards recovery, the government is working to formalize the process with the purpose to assure that the measures will be implemented. This is being done in accordance to IAEA GSR Part7, taking into account the need for the resumption (as far as practicable) of social and economic and in addition, evaluating the experiences and lessons learned from other international nuclear accidents and the recommendations obtained from these events.

No. 18

COUNTRY: ITALY

CNS-REF.-ART.: Article 16

PAGE OF REPORT: 127

CHAPTER OF NAT. REPORT: 3.16.5

With reference to the statement “At present, there are emergency plans in force in the municipalities involved in the predefined emergency zones. In addition, ARN continues to work with the Sub Secretariat for Comprehensive Risk Management and Civil Protection on the new structure of a national plan that covers all areas for the scenario of a nuclear accident”.

What scenarios are included in the national plan? Only accidents in domestic nuclear installation are considered or other scenarios such as transport accidents, transboundary emergencies or malicious acts are taken in consideration?

As it was said in the National Report, ARN is working with the government on the new structure of the national plan. In this national plan, it will be considered not only the case of a nuclear emergency originated in the facility itself, but also from other internal or external threats that could lead to a nuclear emergency.

Currently, among the commonly evaluated scenarios the case of an emergency of the types mentioned in the question are outside the nuclear area. Nevertheless, ARN has a procedure for radiological emergency situations that involves, if necessary, other response organizations and a radiological emergency intervention system, which is active and has a permanent 24-hour guard, covering radiological emergencies such as transport accidents, as well as other events related to malicious acts.

No. 19

COUNTRY: ITALY

CNS-REF.-ART.: Article 16

PAGE OF REPORT: 125-127

CHAPTER OF NAT. REPORT: 3.16.4

With reference to par 3.16.4 in which the urgent protective actions to be adopted in case of an emergency in a domestic NPP are described, what reference levels and generic criteria for taking protective action been established in the national legislation?

For the management of urgent protective actions, the criteria adopted (and applied) are automatic measures that are initiated after the release of radioactive material outside the containment. This is when the event occurring within the NPP has consequences for the population. This means that the Nuclear Emergency Operating Center is organized and the different local representatives are summoned to carry out the application of preventive measures automatically.

In this way, communication/information to the public, access cut-offs, distribution of stable iodine tablets to the population, evacuation of the public in the 3 km area around the plant, etc. and other protective measures are applied automatically as a preventive mechanism.

This is exercised every year with the participation of the agencies and response groups convened in a timely manner. The reference levels will be taken from the considerations established in the protection strategies recommended by the IAEA, as well as in other international documents on EPR.

No. 20

COUNTRY: ITALY

CNS-REF.-ART.: Article 15

PAGE OF REPORT: 113

CHAPTER OF NAT. REPORT: 3.15.2

The national report states that tritium was detected in several samples (downwind moisture condensate samples, downstream samples, locally produced vegetable and milk). Could you clarify what are the dose limits for the public?

The Annual Regulatory Limit is 1 mSv/year.

Considering all radionuclide emissions from Argentine NPPs to the environment through liquid and gaseous discharges, the annual dose to the representative person was a small fraction of such limit in each reported year (2019-2021).

No. 21

COUNTRY: ITALY

CNS-REF.-ART.: Article 15

PAGE OF REPORT: 115

CHAPTER OF NAT. REPORT: 3.15.5.1

Could you better define the dose limits to workers?

Dose limits for workers are defined as follows (Standard AR 10.1.1):

- The effective annual dose limit is 20 mSv. This value shall be considered as the average in 5 consecutive years (100 mSv in 5 years), not exceeding 50 mSv in any single year.
- The equivalent dose limit of 20 mSv year for crystalline, taking this value as the average in five consecutive years (100 mSv in five years), not exceeding 50 mSv in one year.
- The equivalent dose of 500 mSv year for skin and extremities.

The dose limit is applicable to the sum of the dose due to external exposure in the period under consideration plus the committed dose from intakes in the same period.

No. 22

COUNTRY: ITALY

CNS-REF.-ART.: Article 15

PAGE OF REPORT: 112

CHAPTER OF NAT. REPORT: 3.15.1

Could you better describe how the radiological monitoring of the environment is carried out? Are the results of the environmental monitoring made delivered to the public?

ARN requires NPPs' operators to annually submit a Radiological Environmental Monitoring Program establishing the environmental matrix to be sampled, sampling points' location, sampling frequency and radionuclides to be measured. The results arising from the execution of such program are informed quarterly to the ARN. Likewise, ARN prepares its own Radiological Environmental Monitoring Program every year, with a similar structure to the one required to NPPs' (generally with a lower sampling frequency for specific matrices or less sampling points). The aim of ARN's Monitoring Program is to validate NPPs' results. ARN's own results are published in the Institutional website (with public access) together with a brief explanation of the monitoring program.

No. 23

COUNTRY: AUSTRALIA

CNS-REF.-ART.: Chapter 2

PAGE OF REPORT: 12

CHAPTER OF NAT. REPORT: 2.3

Paragraph four, under CNA I - Corium-Barrier to improve Containment long term integrity
The sentence: "The Corium bypass-delay walls are not meant to be in operation long-term"
suggests that the corium barriers have a short operative lifespan but improve containment integrity long-term. Could you elaborate on this?

As such, we assume that the underlying concept of Corium-Barriers is to delay containment bypass, which would eventually occur in the present design.

As mentioned in the report, the main design concept is to delay containment bypass as long as possible, in order to allow for sufficient time for protective actions for the public to be implemented, in accordance with WENRA Guidance Document F.4.14 for retrofitting on existing reactors for DEC-B.

No. 24

COUNTRY: AUSTRALIA

CNS-REF.-ART.: General

PAGE OF REPORT:

CHAPTER OF NAT. REPORT:

You mention the CAREM prototype reactor currently under construction, but the fourth NPP (currently under construction) is not mentioned in this section.

As it is mentioned in the National report, the fourth NPP (Atucha III NPP) will be a HPR-1000 Chinese design reactor and its construction hasn't started yet. In page 16, section 2.8, it is stated that the licensing activities will be initiated by the beginning of 2024 with the submission of the PSAR (Preliminary Safety Analysis Report). The construction activities will start after the issuance (by ARN) of the Construction License.

No. 25

COUNTRY: AUSTRALIA

CNS-REF.-ART.: Article 9

PAGE OF REPORT: 61

CHAPTER OF NAT. REPORT: 3.9.3.7

Does the review in this section refer to the communications infrastructure or the systems/processes/plans in place for emergency preparedness and response? Was this a review of emergency communication plan?

The review of this section refers to the communications infrastructure, process, and plans established for emergency preparedness and response. It was a review of the emergency communication plan.

No. 26

COUNTRY: AUSTRALIA

CNS-REF.-ART.: Article 14

PAGE OF REPORT: 92-95

CHAPTER OF NAT. REPORT: 3.14.2.1.3.1

Same issue as above regarding the clarity of purpose for the Corium-barriers.

As mentioned in the report, the main design concept is to delay containment bypass as long as possible, in order to allow for sufficient time for protective actions for the public to be implemented, in accordance with WENRA Guidance Document F.4.14 for retrofitting on existing reactors for DEC-B.

No. 27

COUNTRY: AUSTRALIA

CNS-REF.-ART.: General

PAGE OF REPORT:

CHAPTER OF NAT. REPORT:

Appreciate the track changes for ease of review

Argentina appreciates your suggestion. We will consider it in future National Reports.

No. 28

COUNTRY: INDIA

CNS-REF.-ART.: Chapter 2

PAGE OF REPORT: 12

CHAPTER OF NAT. REPORT: 2.2

It is mentioned in the report that during the pre-SALTO follow-up mission to Atucha I in 2021, one of the recommendations of pre-SALTO mission (of 2018) regarding 'long-term human resources plan that addresses organizational requirements for LTO' was assessed as 'insufficient progress'. Could Argentina provide information regarding specific challenges encountered in addressing the human and organizational aspects for LTO?

One of the main challenges is the age of the professional people that have to retired before the implementation of the tasks related to the Atucha I LTO project, foresee to start in September 2024. NA-SA started after the pre-SALTO mission 2021 (January 2022) some actions about Knowledge Management. The Knowledge Management Section was created under the HR Manager and the company Tecnatom was contracted to work on the improvement of critical knowledge transfer of the Corporate Engineering Dept. In addition, the NA-SA HR Manager and the System Manager are working on the improvement of the E-Learning tool. For those activities, NA-SA has also the support of CNEA.

Related to the organizational aspects, NA-SA defined that the organization of the Atucha I LTO project is under a new Dept. created for the NA-SA Nuclear Projects. The main goal is to have more independence from the Corporate and dedicated to the LTO project, since the last organization depended of the Engineering Dept.

No. 29

COUNTRY: INDIA

CNS-REF.-ART.: Chapter 2

PAGE OF REPORT: 14

CHAPTER OF NAT. REPORT: 2.4

It is mentioned in the national report that CAREM 25 is under construction. Could Argentina provide details on regulatory oversight process for the activities related to construction of SMR, especially during the process of manufacturing of the modular components outside the site location? The emergency preparedness measures, if any, considered for this reactor may also be provided.

As it was said, Argentina is currently constructing the CAREM 25 prototype reactor which has high level design characteristics.

For the construction of this reactor, regulatory inspections are carried out by ad-hoc inspectors following the Inspection Program which was developed taking into consideration that CAREM is a FOAK (first of a kind) reactor.

In the future, during the Operation stage, the inspections will be carried out by Resident Inspectors like in the other operational NPPs.

Regarding the erection of structures and components (SCs), ARN established an inspection plan focused on items relevant for safety. Currently, the SCs that have the most impact on regulatory activities, according to the degree of progress in construction, are civil works and the reactor pressure vessel.

ARN only conducts inspections and audits to the Responsible Entity, not to vendors or suppliers. The Responsible Entity oversees assuring that the supplier management system program is implemented, and the defined design criteria are accomplished. ARN reviews the mandatory documentation presented, to define and plan the inspection tasks.

Regulatory Audits are planned and carried out by ARN personnel to analyze the organization management system, to examine the degree of compliance with the provisions in the mandatory documentation.

Regarding to Emergency plan, the construction site of CAREM 25 reactor prototype is located next to the Atucha Nuclear Complex. From the beginning of the construction and commissioning project of CAREM 25, the licensee contacted to Responsible Entity of Atucha (Nucleoeléctrica Argentina S.A. - NA-SA) to agree on measures of mutual coordination and assistance between the two organizations at the Atucha's site. As a result, the licensee of CAREM 25 (CNEA) and NA-SA signed a Framework Agreement on November 11, 2009, in order to establish the aforementioned formal relations of mutual cooperation and assistance, including site logistics and community relations.

During the construction stage, the aforementioned agreement covers the preparation of the site and the construction of the CAREM 25 facilities, without the introduction of nuclear material. All the personnel that carry out their tasks in the site of the construction of CAREM 25 will submit to the authority of the NA-SA during the management of nuclear emergencies, for this purpose it was agreed that the CAREM 25's site is incorporated into the NA-SA emergency plan.

Regarding effective means of communication, it is worth mentioning that the participation of CNEA personnel performing tasks on the premises during the Atucha NPPs emergency drills, allowed the identification of mutual coordination measures in the implementation of warning, transport, and training systems.

No. 30

COUNTRY: INDIA

CNS-REF.-ART.: Chapter 2

PAGE OF REPORT: 16

CHAPTER OF NAT. REPORT: 2.6

It is mentioned that ARN has considered in its decision making regarding phase B of long term operation, the remaining overall plant risk based on assessments, as derived from the Integrated Implementation plan. Could Argentina provide details of the methodology for assessment of overall plant risk based on Integrated Implementation Plan?

The integrated implementation plan contains the final list of safety improvements that have to be implemented for a safe continued operation. The list was developed by the plant using a methodology accepted by ARN for assessing, categorizing, ranking and prioritizing all safety improvements needed to address negative findings from the safety review. The methodology for doing this was developed based on the risk matrix stated in the IAEA SRS-12, "Evaluation of the Safety of Operating Nuclear Power Plants built to Earlier Standards - A common Basis for Judgement". The risk matrix uses as input the robustness of the Defence in Depth at each one of the plant states and the severity of the incident/accident (potential consequences) in terms of damage to the plant and radioactive releases.

For the assessment of the robustness of the Defence in Depth, IAEA SRS-46, "Assessment of Defence in Depth for Nuclear Power Plants" was used but it was updated for the due consideration of the design extension conditions following the IAEA TECDOC 1791.

No. 31

COUNTRY: INDIA

CNS-REF.-ART.: Article 7

PAGE OF REPORT: 32

CHAPTER OF NAT. REPORT: 3.7.2.2

It is stated in the National Report "there was a substantial evolution in a Standard related to the Licensing of NPPs during the period of 2019-2022. This is a new specific standard, in development, in the Normative Framework." Could Argentina provide details regarding comparison of the requirements in the new standard vis-a-vis the IAEA safety standards?

The upgrade to the NPP Licensing Standard includes an integration of the requirements into a single Standard, as the requirements were previously distributed into several other Standards.

The new version, still under development, will be completely aligned with IAEA Safety Standards.

No. 32

COUNTRY: INDIA

CNS-REF.-ART.: Article 14

PAGE OF REPORT: 88

CHAPTER OF NAT. REPORT: 3.14.2

It is stated in the National Report "for old plants some original operation safety criteria were different from those used nowadays, thus it is necessary to make an additional effort in order to take into account the application of new safety criteria." Could Argentina elaborate measures taken for safety assessment of old plants to meet the new safety criteria, in addition to retrofits to the plant systems and revision in safety analysis?

NA-SA developed a safety assessment based on the PSR and on the comparison between its current design and the modern national and international standards. A set of solutions to the identified gaps were defined and the risk associated with their non-implementation was evaluated. Then an implementation schedule was generated based on safety implications as well as feasibility. Finally, the improvement in safety that the plant will achieve after the implementation of these solutions was demonstrated.

For example, some improvements arising from the PSR performed for the CNA I Long Term Operation are as follows:

- Installation of post accident monitoring instrumentation, including instrumentation to monitor the concentration of hydrogen in the containment.
- Replacement of the Emergency Core Cooling System filters in order to protect the pumps from foreign materials produced during LOCA events.
- Segregation of safety systems.

No. 33

COUNTRY: INDIA

CNS-REF.-ART.: Article 18

PAGE OF REPORT: 151

CHAPTER OF NAT. REPORT: 3.18.3.1.1

It is mentioned "Passive components control for spent fuel storage pool system" was identified to deal with beyond design basis accidents or to mitigate their radiological consequences in CNA I. Could Argentina provide more details on this safety improvement?

A control was implemented to regularly review/check the functionality of the vacuum breaker/siphon systems associated with the piping of the cooling systems or inventory control of the pools storage.

No. 34

COUNTRY: SPAIN

CNS-REF.-ART.: Article 19

PAGE OF REPORT: 169

CHAPTER OF NAT. REPORT: 3.19.8.1

It is said that the external hazards considered are periodically reviewed according to the frequency revision as established in the mandatory documentation. Could you elaborate a bit more about the review frequency and process?

In Argentina, the operating licenses are granted for a fixed period, typically of 10 years, after which the Licensee has to perform a comprehensive periodic safety review (PSR) in accordance with IAEA SSG-25 as a pre-requisite for the renewal process. Following SSG-25, safety factor 7 refers to hazard analysis which is aimed at reviewing the adequacy of plant protection against external, as well as internal, hazards.

For each one of operating plants, the review methodology of safety factor 7 is described in the so called "basis document" that governs the conduct of PSR and the further regulatory review. The

ultimate outcome of PSR is the update of the current licensing basis by enhancing the plant safety level. Regarding the external hazards, this last may imply the revision of the severity of representative external hazards that may affect plant safety or even more, to enlarge the list of external hazards by considering new ones.

No. 35

COUNTRY: SPAIN

CNS-REF.-ART.: Article 6

PAGE OF REPORT: 25

CHAPTER OF NAT. REPORT: 3.6.4.3.1.

It is said that one of the improvements implemented related to the CNE life extension project was to improve the seismic capacity of the Emergency Power Supply and Emergency Water Supply systems. Could you provide more details on these specific improvements?

IMPROVEMENT OF THE EMERGENCY POWER SUPPLY SYSTEM (EPS)

Purpose: Provide electrical Power for Reactor safety Shutdown and Core Cooling when Electrical Distribution Systems of the Plant are unavailable. Provide coverage when a combination of a LOCA with a Seism event is postulated.

Old design: 2 DG 50 kW located on Service Building. Supply Emergency Original Loads: SDS2, Contention, ECC valves, Illumination and Fire Fighting system. New design: 2 DG 1600 kW 6,6 kV in a New SQ building

New loads: 3432 PM1/PM2 ECCPumps, 3461 PM1 / PM2 EWS Pumps, 3432 MV75 ECC motorized valve 3461 MV13 EWS motorized valve.

IMPROVEMENT OF EMERGENCY WATER SUPPLY SYSTEM (EWS)

Changes: Replacement of 2 Motor Pump 75 HP 38L/s for 2 new electrical pumps 200 Hp 110 l/s (SQ electrical supply from EPS). Possibility of H2O Supply to 3432-HX1 (ECC Hx). Main injection valves redundancy (2 + 2 in parallel).

Both systems and the buildings were qualified for a peak ground acceleration of 0.39 g.

No. 36

COUNTRY: AUSTRIA

CNS-REF.-ART.: Article 8

PAGE OF REPORT: 56-58

CHAPTER OF NAT. REPORT: 3.8.8

Despite a lot of effort has been spent to deal with a sudden and very demanding pandemic situation moving many activities to on-line, how has the first training of personnel to be licensed been performed?

During 2020 the annual retraining of licensed personnel was carried out according to the annual plan introducing some changes in its schedule and its modality. The training that was originally planned to be delivered in a classroom was performed in a virtual modality across the year. The simulator training was rescheduled to the end of 2020 and beginning of 2021. All the operation crews completed their annual retraining according to the plan. During 2020 some people that were on training to get regulatory authorizations, complete their training through a combination of presental/virtual modality that was approved by the Regulatory Body.

No. 37

COUNTRY: AUSTRIA

CNS-REF.-ART.: Chapter 2

PAGE OF REPORT: 13-14

CHAPTER OF NAT. REPORT: 2.3

Which is the impact and possible modifications necessary to be taken on the Atucha I and Atucha II SAMG considering the deployment of the corium barrier?

As required by any modification in Systems and Components intended for use during severe accidents, a thorough review of SAMGs must be done before commissioning, so that necessary modifications in the documentation are put in place. In this case, corium barrier is a passive component that will not require operator intervention, therefore expected modifications are minor.

No. 38

COUNTRY: AUSTRIA

CNS-REF.-ART.: Article 6

PAGE OF REPORT: 21

CHAPTER OF NAT. REPORT: 3.6.3.1.2

How has the operational history of the plants been taken into account in the ageing management programmes?

The ageing management programmes (AMPs) for Argentinean NPPs are developed consistently with the nine attributes of an effective AMP as defined in IAEA SSG-48. In this document, attribute 8 refers to the consideration of operating experience feedback.

With the purpose to adequately consider the operating experience in the AMPs, ARN requires that the plant must have in place an effective process to analyze the operational experience in the framework of "understanding ageing" in order to identify and analyze internal/external events relevant to ageing and provide feedback to ageing management process. According to this process, the analysis of operational experience is done (and reported to ARN) in a quarterly basis.

No. 39

COUNTRY: AUSTRIA

CNS-REF.-ART.: Article 6

PAGE OF REPORT: 22

CHAPTER OF NAT. REPORT: 3.6.4.1

What is the design basis for the dry storage building? How have the interfaces with existing buildings, systems and processes been addressed and possibly resolved?

As far as earthquake is concerned, the design basis for the dry storage building is a seismic category 1 adopted, and the maximum acceleration for the statics studies is 0.10g.

Regarding tornado, the design basis is a tornado Fujita scale 3 with the next features:

- Maximum wind speed 92.12 m/s
- Wind rotation speed 75.0 m/s
- Maximum travel speed 18.6 m/s
- Minimum travel speed 1.9 m/s
- Radius of maximum turning speed 45 m
- Pressure drop 0.1 bar
- Pressure drop rate 0.4 bar/s

In relationship of the interfaces, the dry storage building is connected with the spent fuel pool building. During the construction of the new building a temporary wall was mounted in the radiological control

area because part of the wall of the spent fuel pool building must have be removed. On the other hand, some systems such as the ventilation system and the drain system are connected with the existing system of the spent fuel pool building, furthermore both building use the same crane.

No. 40

COUNTRY: AUSTRIA

CNS-REF.-ART.: Article 7

PAGE OF REPORT: 32

CHAPTER OF NAT. REPORT: 3.7.2.2

Is there a priority list for the development of a new standard? Do you have a timetable for implementation?

A few years ago, ARN defined a priority list to update the regulatory standards framework.

Due to Covid restrictions and significant number of retirements in the recent years, there is a delay in relation to the original planned timetable. Because of this, ARN is working on the development of those standards that have priority for its application.

The new timetable will be adjusted according with the normalizing of human resources and priorities defined.

No. 41

COUNTRY: AUSTRIA

CNS-REF.-ART.: Article 8

PAGE OF REPORT: 43

CHAPTER OF NAT. REPORT: 3.8.3

Can you please provide some information on the strategy to ensure a smooth transition of staff at ARN?

The operational groups promote the training of personnel and the management of internal knowledge of ARN personnel (training based on the experience of senior professionals) so that human resources have the appropriate skills and expertise to fulfil with the missions and functions of each sector.

Since year 2017 the ARN has set in place the strategic training plan that is updated and improved since then. In addition, the ARN approves an annual training plan that involves the training needs required at different levels. This plan is a priority in the ARN and the enhancing the skills, capabilities, and knowledge of employees is promoted.

In addition, the ARN has a plan of personnel needs that is updated every year. This document is elaborated based on the present and future needs of each area, prioritizing the technical professional needs. This document allows stablishing the definition of personnel needs for the next 3 years.

When new staff is hired, the practice at ARN is to develop a profile document where the definitions about the competences required, experience and knowledge requirements are clearly specified on a case-by-case basis.

No. 42

COUNTRY: AUSTRIA

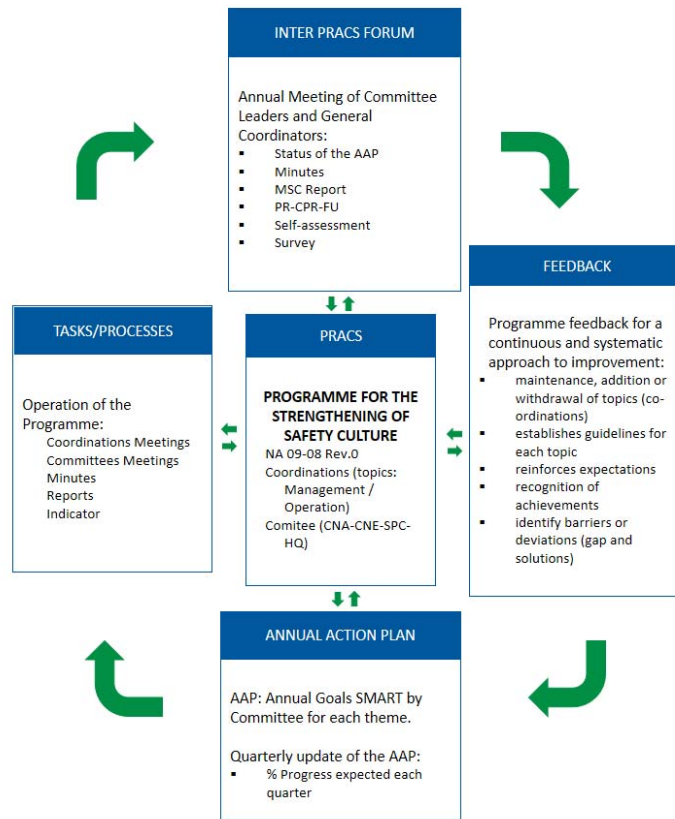
CNS-REF.-ART.: Article 10

PAGE OF REPORT: 66

CHAPTER OF NAT. REPORT: 3.10.2.2

Can you please provide some information on the flow of documents associated with PRACS? Who receives the results of such an assessment? Are there any comments and feedback to the utility?

Below you will find the flow process of PRACS that includes the documentation:



The results of the programme are received by:

- Plants Committees (Atucha and Embalse NPPs):
- managers and deputy managers
- Corporative Committee: managers and deputy managers
- Plant Services Committee: managers and deputy managers

Coordinators of each topic: personnel designated responsible for each topic. Feedback and comments are taken into account in the Inter PRACS Forum to define the Annual Goals for the Annual Action Plans.

No. 43

COUNTRY: AUSTRIA

CNS-REF.-ART.: Article 14

PAGE OF REPORT: 95

CHAPTER OF NAT. REPORT: 3.14.2.1.3.2

Can you please provide some information regarding the updated status on the assessment of main and secondary control room habitability?

The scope is still under discussion by the Regulatory Authority.

No. 44

COUNTRY: AUSTRIA

CNS-REF.-ART.: Article 15

PAGE OF REPORT: 113-116

CHAPTER OF NAT. REPORT: 3.15.2, 3.15.3, 3.15.4

Are improvements planned to reduce the release of tritium from operating NPPs?

CNA have made efforts to improve the tritium indicators. This can be divided in two main aspects. First, the use of moisture filtering masks was implemented in both unit to perform specific and short tasks in rooms where the tritium concentration is between 10 and 30 DAC. Experience shows that internal exposure due to tritium can be reduced by up to 30% in this kind of task.

In the other hand, a plan of mini and micro leaks of D₂O and improvements in the configurations of venting system have been implemented. As a result, an amount of tritium in air less than the historical average value has been reached.

Regarding the reduction of tritium releases/emissions, Embalse is working on technical-economic evaluations of identified suppliers about the possibility of installing a detritiation plant in the site.

- Feasibility studies are being carried out to change the design of the transfer systems for ion-exchange resins, both for primary heat transport system and moderator system. The quick couplings of these systems are original to the plant and have many obsolescence problems.
- Considering the reduction of tritium releases/emission as a reduction in the number of uncontrolled spills or their minimization:
 1. Online tritium monitoring equipment is being acquired to be strategically installed in certain strategic rooms that present regular leaks. Early detection of a leak allows minimizing spills, doses to personnel and more emissions into the environment.
 2. The desiccant bed replacement and the preventive maintenance of the plant Dryers are being carried out prior to each planned outage.
 3. Two portable dehumidifiers were purchased, which are installed for all planned outages in order to keep the air in the Reactor Building as dry as possible.

No. 45

COUNTRY: AUSTRIA

CNS-REF.-ART.: Article 18

PAGE OF REPORT: 159

CHAPTER OF NAT. REPORT: 3.18.3.4.3

Can the licensing model applicable to CAREM be extended to a next SMR?

The ARN has established an “ad-hoc” licensing scheme for the construction and preliminary tests of CAREM 25. This “ad-hoc” scheme is mainly driven by the CAREM characteristic of being a prototype reactor (see section 3.18.3.4.3). For the following stage of the lifetime, this is nuclear commissioning, the licensing model has to be turned out to the conventional model for facing a safe commissioning stage after construction and preliminary test have been satisfactorily finished.

In this context, if the question is related to a next SMR reactor with similar technology to CAREM and, taking into account national stakeholders, the current licensing process for any Argentine nuclear power reactor can be applicable.

For more information, Argentina is actively participating in the IAEA's Normalization, Harmonization and Standardization initiative (NHSI), with the aim of increasing cooperation between regulators and leveraging peer reviews of new technologies, related to SMR licensing.

No. 46

COUNTRY: UNITED STATES OF AMERICA

CNS-REF.-ART.: Article 18

PAGE OF REPORT: 159

CHAPTER OF NAT. REPORT: 3.18.3.4

In Section 3.18.3.4.3 of the 9th Report, Argentina indicated that an update of the licensing model/process for the Commissioning stage in the lifecycle was needed, citing that the decision was driven by the evolution of the CAREM project and the experience gained in other licensing projects (Atucha II NPP, Embalse NPP Long-Term Operation). Could you please elaborate on any specific experience from CAREM or other projects led to this need for change?

In the licensing process in Argentina, the commissioning stage refers to the start of nuclear tests, after completion of the construction stage and preliminary tests. The beginning of this stage requires the issuance of the Commissioning License by the regulatory body.

The projects mentioned in the National Report were carried out quite recently, so an attempt was made to capitalize the experience obtained and apply it to the next stage of the licensing process for the CAREM 25 reactor. One example of this experience learned is related to the organizational structure of the licensee, including the arrangements for ensuring training and qualification of personnel, fitness for duty and licensing of staff for certain positions.

No. 47

COUNTRY: FRANCE

CNS-REF.-ART.: Article 6

PAGE OF REPORT: 19

CHAPTER OF NAT. REPORT: 3.6

Even if CNA II is recent, is it planned to develop a aging management program considering the operating experience of CNA I and CNE?

Yes. In Argentina, for the issuance of the operating license it is necessary that the Licensee submits the AMPs among other mandatory documentation. This is also de case of CNA II.

Regarding the consideration of operational experience form other plants, ARN requires that the plant must have in place an effective process to analyze the operational experience in the framework of "understanding ageing" in order to identify and analyze internal/external (may be from CNA I or CNE) events relevant to ageing and provide feedback to ageing management process. According to this process, the analysis of operational experience is done (and reported to ARN) in a quarterly basis.

No. 48

COUNTRY: FRANCE

CNS-REF.-ART.: Article 6

PAGE OF REPORT: 19

CHAPTER OF NAT. REPORT: 3.6

What is the impact on safety or operating of the upper guide buckling? When will the modifications UG5 be in place?

The risk lies in the breakage of the guide tube, affecting the generation and its subsequent outage.

There is no nuclear risk since it does not affect safety functions.

During normal plant operation, through the vibration control system, the state of the reactor internals is monitored and a deviation from normal parameters could indicate a rupture. During planned outages, which are performed once a year, the reactor internals are inspected. A damaged guide tube and the need to replace it may be discovered.

As of today, 21 guide tubes have been intervened, 7 remain to be replaced and 3 of them are in process.

No. 49

COUNTRY: FRANCE

CNS-REF.-ART.: Article 7

PAGE OF REPORT: 31

CHAPTER OF NAT. REPORT: 3.7

The table 3.7.2 presented the guides concerning NPP? Is there any guides on human factors, safety culture, counterfeit and fraudulent items and suppliers?

The existing regulatory guides shown in Table 3.7.2. are applicable to NPPs and other nuclear and radiological installations.

Requirements related to human factors, safety culture and supply of services and products are included in the new Standard AR 10.6.1, Rev. 0 "Management System for Safety of Installations and Practices", which applies to all regulated installations by ARN.

No. 50

COUNTRY: FRANCE

CNS-REF.-ART.: Article 7

PAGE OF REPORT: 28

CHAPTER OF NAT. REPORT: 3.7

Could you develop the modification regime for the ones impacting the safety? how is authorized by the ANR? does the ANR do it between two PSR?

According to the regulatory framework, requirements are established, both in regulations as well as in licensing conditions, that all permanent design changes to a facility, with a significant impact on safety must be approved by the Regulatory Body. These requirements envelop both design changes to structures, systems or components, and also changes to documentation, procedures, etc.

Design changes significant to safety are identified by the Responsible Entity according to criteria developed to meet the regulatory requirements. The Responsible Entity is required to have in place a Technical Review Committee, independent from the operating organization, which must assess the proposed design change, prior to submittal to the Regulatory Body. Permanent design changes which have undergone these required stages, and thus submitted to the Regulatory Body are independently assessed by the regulator as extensively as deemed necessary, with no limitation on the time frame needed to achieve an independent opinion. Whenever the assessment process yields a positive opinion for the design change, the Regulatory Body proceeds to issue a formal approval for it.

Approval from the Regulatory Body is required prior to implementation of design changes, so the assessment process described is not bound to a PSR, and regularly happens in the periods between PSRs.

For temporary design changes, also with safety significance, requirements are less stringent. The Responsible Entity must assess the impact on safety of the design change, just the same. But implementation does not require approval from the Regulatory Body. The requirement in this case, is that the Responsible Entity must inform the Regulatory Body about the temporary design change in sufficient advance as to allow the Regulatory Body sufficient time to eventually assess the proposal before implementation.

No. 51

COUNTRY: FRANCE

CNS-REF.-ART.: Article 8

PAGE OF REPORT: 47

CHAPTER OF NAT. REPORT: 3.8.3.1.5

Is there any feedback done on the virtual modes formations, the technical conference online, the virtual courses?

Every year the students fill out a survey with the purpose to improve the courses from their opinions about a series of relevant variables on the performance of the courses.

The results of surveys belonging to Specialization Career in Radiological Protection (PGEC) for the year 2021 (virtual mode) and for the year 2022 (face-to-face) are presented below:

PGEC (2021):

- For the 2021 version the following results were obtained:
 - Upon request to evaluate the course in general, the average qualification was 8.7 points, a score somewhat higher than that achieved in 2019, the last version prior to the pandemic and entirely face-to-face
- Strengths highlighted by the students:
 - The use of virtual tools
 - The content dictated
 - The quality of teachers
 - Administrative attention to students
 - The quality of technical visits

The only element to improve was the distribution of times. Since it is an intensive course, it is an opinion that is also usually expressed in face-to-face mode.

PGEC (2022):

- The average evaluation of the Specialization career was: 9.2 points/10
- Strengths highlighted by the students:
 - The content dictated
 - The use of virtual tools
 - The quality of teachers

Again, the students express that the distribution of time is an element to improve.

No. 52

COUNTRY: FRANCE

CNS-REF.-ART.: Article 8

PAGE OF REPORT: 56

CHAPTER OF NAT. REPORT: 3.8.8

Could you develop the inspection program elaboration?

According to a recently established planning methodology, the Inspection Programme for operating NPPs defines the baseline needs for regulatory oversight. The inspection activities that the Regulatory Body considers necessary are structured and planned in an annual basis. The Annual Inspection Plan is the instrument that governs inspection activities. A newly developed procedure provides guidelines for systematic development of the Annual Inspection Plans, in order to assure that inspection activities provide reasonable certainty that the Responsible Entity complies with all applicable regulatory requirements.

Even though many inspection activities involve field verifications, given the intrinsically limited nature of resources, a fundamental objective of the Inspection Programme must be the verification that the

Responsible Entity has in place an effective process for self-detection of deviations, including all programmes and procedures needed to maintain safe continued operation. In broad lines, the structure of the Inspection Programme establishes all thematic areas grouping specific aspects to inspect, and a generic periodicity of inspection. This structure is periodically revised, trying to reflect a continuous improvement process of the inspection activities. In setting the inspection objectives for a given year, the planning process must consider all thematic areas of the Inspection Programme and previous inspection activities already executed, findings, operative experience, etc.

The Annual Inspection Plan for a given year and facility is populated according to the guidelines provided by the structure of the Inspection Programme, taking into account the inspection objectives set for the year, particular operating states of the facility, upcoming activities such as outages, emergency drills, design changes, etc. The Annual Inspection Plan establishes the baseline inspection activities that need to be performed during the year. This plan is developed during the last quarter of the previous year and updated during the implementation year, according to particular regulatory needs that might arise. The specific time frame during which the inspection activities are executed is flexibly defined by the inspection groups, according to their needs, demands, availability, etc.

No. 53

COUNTRY: FRANCE

CNS-REF.-ART.: Article 12

PAGE OF REPORT: 72

CHAPTER OF NAT. REPORT: 3.12.1

Could you detail what is the CNE human performance simulator, and, what modifications have been done base on the human reliability analysis?

The human performance simulator is a facility that has been in operation for the last 2 years and improvements are currently being studied. It is a building that has different environments to develop different scenarios based on real situations. For example, there are places to hold pre-job meetings, benches with valves to simulate interventions, drums with water for practices with submersible pumps, a mock-up access to a controlled area to simulate tasks with radiological risk.

After compliance with the 2023 Good Practices Reinforcement Sessions Program, a comparison will be made of the causes of work events and accidents that occurred before the construction of the simulator compared to those that occur throughout the year 2022, to identify if the behaviours to correct or improve obey to the same causes detected in the Human Factors Simulator. This analysis will result in an action plan.

No. 54

COUNTRY: FRANCE

CNS-REF.-ART.: Article 14

PAGE OF REPORT: 89

CHAPTER OF NAT. REPORT: 3.14.2.1.3

Could you explain the criteria used to chose the 6 scenarii of plant damage?

CNA - The paragraph refers to the early stages of the SAMP in which preliminary six scenarios were selected taking into consideration previous knowledge of PSA L1 scenarios leading to core damage and mainly recommendations of scenarios that were usually taken into consideration for PWRs and relevant plant design features.

The following scenarios with additional component failures were considered:

- Loss of power supply.
- Uncontrolled depressurization of the primary.
- Loss of river water cooling system.
- Steam generator pipe rupture.
- Breakage of live steam lines inside the containment.
- Small LOCA

CNE - The criteria used to establish the 6 core damage states during a severe accident was proposed by COG during the development of the Joint Project "JP-4056" (based on the severe accident program developed for PWR's / WOG). These states are theoretical representations of the evolution of core damage in CANDU reactors (very difficult to identify during a real accident) and are used in order to explain the variations of the different symptoms used to manage a severe accident in this type of reactor.

No. 55

COUNTRY: FRANCE

CNS-REF.-ART.: Article 14

PAGE OF REPORT: 93

CHAPTER OF NAT. REPORT: 3.14.2.1.3.1

The authority develop instruction T-18 on river drought. Could you precise how the global warming is taken into account here and in general, in relation with response to article 17? Could you also precise the difference between instruction T-18 and instruction 3.03.03?

There are procedures to approach extreme weather events (tornadoes, river flooding or low water level, etc.) that may appear most often or with a greater intensity due to the global warming. The plant is in contact with the National Water Institute (INA) in order to receive reports on extreme river floods or low water level forecasts. Furthermore, twice a day the weather forecast is received for the next 24 hours including information as regards rainfalls, wind speed, probability of tornadoes and maximum and minimum temperatures. The frequency of these reports increases in case of likelihood of occurrence of extreme weather events.

The CNA I Operations Manual (MDO) Instructions, T-18 (Unusual decrease in the Paraná River level), T-17 (Operation in Paraná River flooding conditions), and the CNA II Operations Manual (MDO) Instruction 3.03.03 (Paraná river flooding or low water level) are similar regarding the river levels in which action must be taken, they are only different in the format and actions that are specific to each Unit, such specific actions are based on differences in design criteria of both units.

No. 56

COUNTRY: FRANCE

CNS-REF.-ART.: Article 14

PAGE OF REPORT: 95

CHAPTER OF NAT. REPORT: 3.14.2.1.3.1

Analysis are performed to improve containment integrity, especially corium barriers concept. What is your schedule for a potential implementation? Next PSR?

For CNA I, corium-barrier is due to be implemented during the life extension outage, whereas for Atucha II, since the design of the barrier is more complicated (bigger filtering area of the ECCS System and more complex geometry), additional studies are required.

No. 57

COUNTRY: FRANCE

CNS-REF.-ART.: Article 15

PAGE OF REPORT: 115

CHAPTER OF NAT. REPORT: 3.15.4

Are there any specific rules on the releases (batch, level of the lake, opening of the valves of the dam) in the lake in the Embalse case?

The regulatory requirements for liquid discharges are the authorized discharge values (annual, quarterly and daily).

The releases are done by batches, as the storage tanks fill up and the characterization of the liquids allows it.

No. 58

COUNTRY: FRANCE

CNS-REF.-ART.: Article 16

PAGE OF REPORT: 125

CHAPTER OF NAT. REPORT: 3.16.3

What happens in the case of early releases? In case of red alarm, how are the decisions made?

The communication and information to the population will be carried out immediately, and will indicate that the nuclear power plant is in emergency and that measures will be provided to mitigate the situation.

A possible release of radioactive material without the response initiation phase (green alert) is a very particular case. The possibility of release and the amount of radioactive material are intimately linked to the decisions that will be taken, in virtue of the protective measures that need to be implemented at that moment.

For this situation the main mechanism is the information to the population. The next step will be the evaluation of the situation in order to take the corresponding protective measures.

The decision to evacuate based on the radiological conditions prevailing at the time of the decision may vary taking into account the population involved, the weather conditions, the situation of the reactor and its safety systems, among other aspects.

It will also depend on the prediction of the possible consequences in the course of the hours of the containment status and the development of the first countermeasures.

By virtue of this, the aim will be to avoid the development of serious health consequences (deterministic effects) and to control, as far as possible, the increase of stochastic effects, as well as other unfavorable effects for the environment and society.

The criteria adopted take into account urgent protective measures and early protective measures, taking into consideration other actions that may be required.

The generic criteria to be adopted in the event of a release in case of a red alarm without the possibility of organizing the first countermeasures will obey the situation prevailing at that time and will move from the preventive criterion of early protective measures to the criterion of urgent countermeasures without delay, applying dosimetric criteria with the aim of reducing potential health effects on response workers and members of the public.

No. 59

COUNTRY: FRANCE

CNS-REF.-ART.: Article 16

PAGE OF REPORT: 126

CHAPTER OF NAT. REPORT: 3.16.4

Are there technical criteria (environment measurement, calculated dose...) that would lead the responsible authority to order/recommend the ingestion of iodine or to start a distribution? Is there an age limit to be concerned by the iodine intake?

The distribution of stable iodine tablets is a necessary practice carried out in each of the external emergency plan application exercises, in case of a nuclear accident, carried out by one of the response forces, which practice it year after year.

This preventive measure is carried out taking into account the population possibly involved in the event of a nuclear emergency within a radius of 10 km around the site.

Although the distribution of stable iodine tablets is one of the established automatic countermeasures, only the ingestion of stable iodine tablets is indicated at the appropriate time in the event of a release of radioactive material into the atmosphere in order for this measure to be effective.

There is no established age limit. The amounts of iodine to be administered are age related (over 12 years old, children from 3 to 12 years old, infants from one month old to 3 years old, and infants up to one month old).

No. 60

COUNTRY: FRANCE

CNS-REF.-ART.: Article 16

PAGE OF REPORT: 125

CHAPTER OF NAT. REPORT: 3.16.4

Is there any evacuation plan for the UPZ?

If evacuation is necessary, it will be carried out taking into account the values obtained from measurements and environmental radiological monitoring. This evacuation will be organized according to the scenario defining the emergency situation, the results of the situation analysis and the appropriate strategy, which will be supplemented as necessary.

No. 61

COUNTRY: FRANCE

CNS-REF.-ART.: Article 17

PAGE OF REPORT: 135

CHAPTER OF NAT. REPORT: 3.17.2.2

What are the conclusions of the report concerning the risks of the break of the Embalse Río Tercero dam and the consequences of this break? Does the dam have a peculiar inspection program?

The study carried out concludes that, for the usual, unusual and extreme hydraulic load states, the dam is stable and resistant at all its possible levels of failure. This means that, taking into account its shape and construction characteristics, the failure of the dam is not considered probable.

The control and supervision of the safety of the dam is performed by the National Safety Regulatory Body –ORSEP- together with the provincial authority –APRHI

No. 62

COUNTRY: FRANCE

CNS-REF.-ART.: Article 18

PAGE OF REPORT: 159

CHAPTER OF NAT. REPORT: 3.18.3.4.3

What are the modifications of the CAREM project made in 2019, their impact on safety? Did these require a review of the licensing documents by the ANR?

The 2019 modification mentioned in section 3.18.3.4.3 is related to the licensing process for the CAREM 25 reactor carried out by the Nuclear Regulatory Authority and applies it to the next stage of the licensing process for the CAREM 25 reactor (commissioning). This modification did not have any safety impact.

No. 63

COUNTRY: FRANCE

CNS-REF.-ART.: Article 19

PAGE OF REPORT: 164

CHAPTER OF NAT. REPORT: 3.19.3.1

Could you detail the preventive maintenance program of CNA II? is there a link with the conservation of the equipments?

The in-service inspection program establishes the components that are monitored by non-destructive testing. This document is based on ASME and KTA standards. The scope includes the primary core cooling system, moderator system and auxiliary systems related to residual heat removal. The monitoring of the systems is by volumetric, superficial and visual test.

Yes, the In-service inspection is linked with the conservation of the equipment. Its objective is to evaluate the components to verify the presence of degradation mechanisms that can cause the loss of function of the component.

No. 64

COUNTRY: FRANCE

CNS-REF.-ART.: Article 19

PAGE OF REPORT: 165

CHAPTER OF NAT. REPORT: 3.19.5

The organization of the operating manuals is different for CNA I and CNA II. Is there a benchmark between both organizations available?

CNA I started operating in 1974 and draw up its operations manuals with a certain format and structure. In the CNA II case, that started operating in 2014, the operations manuals were written and organised taken into account the format of German Nuclear Power Plants of similar designs.

There is a continuous learning between operating area of Atucha I and Atucha II due to both report to the same manager.

No. 65

COUNTRY: FRANCE

CNS-REF.-ART.: General - Suggestion

PAGE OF REPORT:

CHAPTER OF NAT. REPORT:

SUGGESTION: For the CNA I and CNA II reactors, solutions to reduce releases under accident conditions have been found and implemented. However, their implementation is not effective, and questions may be asked about the completeness of the solutions proposed by the operator. The operator and the ANR could continue to work on the relevance of the FCVS for CNA II, for example.

Argentina appreciates France's suggestion.

No. 66

COUNTRY: FRANCE

CNS-REF.-ART.: Article 15

PAGE OF REPORT: 112

CHAPTER OF NAT. REPORT: 3.15.1

In the introduction on the article 15 p. 112, you mentioned that the regulatory Body sets authorized values to the environmental releases of NPPs for relevant radionuclides. In the part 3.15.4, on the reactor CNE, you mentioned a problem of failed fuels with an increase of releases. Effectively, it's possible to see an increase of a factor around ten for gaseous discharges in Iode or noble gases in 2019 compare to 2021. It seems however that these discharges are below the authorized values. Could you precise the values of the authorized discharges, and their impact on the people? Do you consider a need or not to modify these values? Besides, in the part 3.15.4.2 you mentioned the existence of "guideline levels". Could you explain the differences between the authorized values and the guidelines levels?

The authorized discharge values are understood as an operative restriction and are derived from the hypothetical representative person estimated doses due to optimized gaseous and liquid discharges, considering an appropriate flexibility margin that guarantees the protection of the public without interfering with the operation of the facility.

As a reference, the authorized annual discharge value for tritium in liquid discharges is 1,1E+15 Bq. The authorized discharge values are derived from specific mathematic models and must be verified periodically based on the update of dosimetric factors, changes in the habits, customs and location of the hypothetical representative person, as well as modifications in the models.

Radionuclide activity concentration in environmental samples such as surface and ground water, are compared with guidance levels (as available) such as those presented in Chapter 9 of the WHO's Guidance for Drinking-Water Quality. Comparisons are made even though not all sampled water is drinking-water, but is a reliable reference for the public.

No. 67

COUNTRY: SWEDEN

CNS-REF.-ART.: Chapter 2

PAGE OF REPORT: 28

CHAPTER OF NAT. REPORT: 2.3

The strategy of RPV external cooling was abandoned. Instead a "corium barrier" is planned for. What measures and plans are in place today to handle a potential SA?

Both NPPs have a full set of SAMGs. They include both preventive and mitigate countermeasures. Preventive countermeasures are those usually found in the industry (primary and secondary feed and bleed, water injection into primary system). In case of core melt, primary system injection would be selected to cool a degraded core and, in case of RPV breach, water would eventually reach the sump, where the corium would relocate, providing therefore additional cooling to delay MCCI or containment breach. It must be also pointed out that a full set of containment challenge guidelines have been developed and are put in place.

No. 68

COUNTRY: SWEDEN

CNS-REF.-ART.: Chapter 2

PAGE OF REPORT: 14

CHAPTER OF NAT. REPORT: 2.4

The regulatory body is in the process of licencing the new CAREM 25 reactor. To what extent have rules and regulations had to be updated in order to handle the licencing of a SMR?

There was no need to change the regulations for the licensing of CAREM 25 prototype reactor. However, in the years after the start of the construction project, ARN began a process of reviewing the Argentine Regulatory Standards.

ARN is in an ongoing process of harmonization between the Argentinean Regulatory Standards and the new versions of IAEA Safety Standards. Nevertheless, Argentine Regulatory Standards are already consistent with IAEA's corresponding standards in general terms, considering that ARN has adopted a non-prescriptive approach.

No. 69

COUNTRY: SWEDEN

CNS-REF.-ART.: Article 8

PAGE OF REPORT: 59

CHAPTER OF NAT. REPORT: 3.8.3

For clarification: The distribution of "professional staff" is provided. What percentage of the total of 363 personell count as professional staff?

The percentage of profesional staff is 57%. The professional staff have, as a minimum, a bachelor degree, mostly from STEM (Science, Technology, Engineering and Math) careers.

No. 70

COUNTRY: BULGARIA

CNS-REF.-ART.: Article 12

PAGE OF REPORT: 72

CHAPTER OF NAT. REPORT: 3.12.1

What is the field training on the use of different error prevention techniques like and how is it conducted?

Training for field personnel, mainly belonging to Operations, Maintenance and Radiological Protection areas, is carried out in the classroom prior to the start of the sessions in the human performance simulator. Then, during the exercise in the simulator, the application of the expected techniques is observed. In the steps of the task and at closure, feedback is given to the team or person.

In addition, when incoming personnel carry out initial training in "functioning and operation of nuclear power plants", there is a "human performance" module within the agenda.

No. 71

COUNTRY: BULGARIA

CNS-REF.-ART.: Article 12

PAGE OF REPORT: 73

CHAPTER OF NAT. REPORT: 3.12.1.1

How is the reinforcement of expectations and practices of fieldwork that complements the requirements regulated by the initial and continuous training programs performed?

There is a continuous training program that includes techniques for Task Observers to align workers with the work expectations and practices.

No. 72

COUNTRY: SOUTH AFRICA

CNS-REF.-ART.: Article 17

PAGE OF REPORT: 136

CHAPTER OF NAT. REPORT: 3.17.2.3.2.

How often are the natural hazards, in particular seismic and tsunami hazards re-evaluated and what criteria are used to determine the frequency of re-evaluation?

There is no a fixed criteria for the frequency of the re-evaluation of natural external hazards but in practice it is used the opportunity of performing the periodic safety review (PSR).

In Argentina, the operating licenses are granted for a fixed period, typically of 10 years, after which the Licensee has to perform a comprehensive PSR in accordance with IAEA SSG-25 as a pre-requisite for the renewal process. Following SSG-25, safety factor 7 refers to hazard analysis which is aimed at reviewing the adequacy of plant protection against external, as well as internal, hazards.

For each one of operating plants, the review methodology of safety factor 7 is described in the so called "basis document" that governs the conduct of PSR and the further regulatory review. The ultimate outcome of PSR is the update of the current licensing basis by enhancing the plant safety level. Regarding the external hazards, this last may imply the revision of the severity of representative external hazards (if new standards were issued or as lessons learned from accidents like Fukushima Daiichi) that may affect plant safety or even more, to enlarge the list of external hazards by considering new ones.

No. 73

COUNTRY: SOUTH AFRICA

CNS-REF.-ART.: Article 13

PAGE OF REPORT: 81

CHAPTER OF NAT. REPORT: 3.13.2

What is the current status of the ISO 9001:2015 and ISO 14001:2015 certificates? Have they further been extended?

The ARN currently does not have any process certified under ISO 9001:2015 or ISO 14001:2015. It only maintains accredited by the Argentine Accreditation Agency (OAA), under the ISO/IEC 17025:2017 Standard, the Multisite Testing Laboratory (LE 269) and the Calibration Laboratory (LC 029).

No. 74

COUNTRY: SOUTH AFRICA

CNS-REF.-ART.: Article 15

PAGE OF REPORT: 117

CHAPTER OF NAT. REPORT: 3.15.5.1

Has Argentina adopted the revised dose limits to the lens of the eye? If so, is it implemented and has measurement been conducted?

Yes, Argentina has adopted the revised dose limits to the lens of the eye. Requirement number 65 of the Standard AR 10.1.1 "Basic Radiation Safety Standard" establishes that:

The Responsible Entity shall ensure that the following dose limits for workers are not exceeded:

- a. an effective dose of 20 mSv per year. This value shall be considered as the average over 5 consecutive years (100 mSv in 5 years), not exceeding 50 mSv in any single year
- b. an equivalent dose to the lens of the eye of 20 mSv per year. This value shall be considered as the average over 5 consecutive years (100 mSv in 5 years), not exceeding 50 mSv in any single year
- c. an equivalent dose to the skin or to the extremities of 500 mSv per year.

In NPP, dosimeters for the lens of the eye are not usually used, instead of a conservative estimation can be done through the TLD tablets that determine the Hp(0.07) dose magnitude, corresponding to the beta surface dose, because all tasks in controlled area are carried out with protective glasses.

No. 75

COUNTRY: SOUTH AFRICA

CNS-REF.-ART.: Article 7

PAGE OF REPORT: 28

CHAPTER OF NAT. REPORT: 3.7.1

What regulatory control has been applied for the manufacturing of SSCs.

According to AR 10.6.1 standard "Management System for Safety in Facilities and Activities" the Licensee shall include in the management system "mechanisms to assess, qualify and perform audits to the supply chain and to the selection and contractual process of suppliers".

Following this, ARN performs inspections and audits to the Licensee, not to supplier, vendors or manufacturer shops. The Licensee is in charge of assuring that the supplier management system is implemented.

However, in certain cases ARN can perform regulatory audits and visits to manufacturer shops in order to verify in practice the way that Licensee verifies supplier management's system.

No. 76

COUNTRY: SOUTH AFRICA

CNS-REF.-ART.: Article 7

PAGE OF REPORT: 28

CHAPTER OF NAT. REPORT: 3.7.1

Are there any unique features in the CAREM design that would require updates in the regulatory framework. If yes would you describe them

No, CAREM doesn't have unique features that would require updates in the regulatory framework. However, it can be mentioned that ARN has established an "ad-hoc" licensing scheme for the construction and preliminary tests of CAREM 25. This "ad-hoc" scheme is mainly driven by the CAREM characteristic of being a prototype reactor (see section 3.18.3.4.3). For the following stage of the lifetime, this is nuclear commissioning, the licensing model has to be turned out to the conventional model for facing a safe commissioning stage after construction and preliminary test have been satisfactorily finished.

No. 77

COUNTRY: SOUTH AFRICA

CNS-REF.-ART.: Article 9

PAGE OF REPORT: 61

CHAPTER OF NAT. REPORT: 3.9.4

Is the regulator able to verify that the perception of risk of the public reflects the intent of the communication

Risk perception is relevant to the communication process. The analysis of risk perception feeds the communication strategy with stakeholders. There are several methods to assess risk perception such as surveys, information and consultation actions with stakeholders, etc.

ARN in conjunction with the operator, NA-SA, conducts annual informative meetings and training sessions for the population living in the vicinity of the nuclear power plants. The emergency drills are used as an opportunity for performing either radial or face-to-face interviews with public in which ARN answer the questions posted by the public. These activities promote a dialogue that provides information about the public's concerns and perceptions on the risk and is a feedback for improving the communication process. ARN performs an analysis of the perception of risks and redefine the strategy of communication if needed.

According to ARN's Strategic Plan 2021-2025, ARN plans to carry out an image diagnosis that will evaluate, among other points, the public perception of risks.

CONVENTION ON NUCLEAR SAFETY
ANSWERS TO QUESTIONS OR COMMENTS