

NUCLEAR SECURITY IN THE ARGENTINE REGULATORY STANDARDS

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Abstract

Argentina started the nuclear activities in the 1950s, and since then there has been a continuous and wide development process in the nuclear areas. The use of this strategic resource was assumed as a State Challenge due to its multiple applications to the human welfare, related to medical and industrial uses and the electricity production by Nuclear Power Plants (NPPs).

Nowadays, in Argentina, there are more than 1300 nuclear and radiological installations under regulatory control, including 3 NPPs in operation. The National Act N° 24,804 on Nuclear Activity, through its Decree N° 1390, empowered the Nuclear Regulatory Authority of Argentina, (ARN, by its initials in Spanish) with the attribution to develop the corpus of national regulatory standards.

The Argentine regulatory framework has been consolidated since the beginning of the nuclear activity with a graded approach. In 1958, it was published the first Standard on the Use of Radioisotopes and Ionizing Radiations, and then, in 1966 it was published the first edition of the Basics Standards on Radiological and Nuclear Safety. Some years later, the standards called "CALIN" applicable to nuclear facilities were issued. Since 1994 the regulatory activity became fully independent with the creation of the National Board of Nuclear Regulations (ENREN, for its initials in Spanish), the predecessor organization of the current ARN. The experience on regulatory issues was gained through the application of national regulations which took into account the IAEA standards and the ICRP recommendations. Currently, the Argentine regulatory framework, based on a performance approach, covers the regulatory areas of radiological and nuclear safety; safeguards and physical protection of nuclear and radioactive materials, if they are in nuclear facilities as part of regulated practices or in the process of transport. Nuclear security is one of the issues considered for the installations and practices regulated by ARN.

In 2016, it was initiated a detailed review of the corpus of regulatory standards. The objective of the review was to identify gaps in comparison with IAEA Safety Standards requirements, with the mandatory international conventions and, in the particular case of security requirements, with the Convention on the Physical Protection of Nuclear Material (CPPNM) and its Amendment. The standards produced by other recognized regulatory bodies and the experience gained as the result of the licensing and regulatory control of nuclear and radiological facilities is also being considered. The result is the improvement, updating or extension of the scope of the existing standards and the creation of some new standards.

This paper presents the nuclear security requirements status in the Argentine Regulatory Standards. As a result of this research based on the Regulatory Standards, it was possible to find the connection among the different requirements on nuclear security in the Regulatory Standards. This paper will also highlight the updated requirements and explain the importance of including some of them in the corpus of the Nuclear Regulatory Standards in order to strengthen the control measures and to foster the nuclear security culture. The clear understanding of the interrelation of the nuclear security requirements in the Regulatory Standards may optimize all the regulatory activities and their associated resources.

1. NATIONAL REGULATORY FUNCTIONS IN ARGENTINA

Since its creation, 31st May 1950, the National Atomic Energy Commission (CNEA) controlled and assumed the radiological protection and nuclear safety of the installations and practices, which constitutes the “safety” branch, and with the increasing tendency of the nuclear community towards developing the safeguards and physical protection branches, CNEA control responsibilities widened towards the “security” branch.

The National Board of Nuclear Regulations (ENREN, for its initials in Spanish) was established in 1994 and was the predecessor organization of the current Nuclear Regulatory Authority (ARN), born in 1997. In those days, the organization involved in regulatory aspects on ionizing radiation was conceived within the National Atomic Energy Commission (CNEA) and since then it has developed its functions with total independence of its mother organization CNEA, and of all the regulated organizations.

At the time the ARN was created, the corpus of regulatory standards covered “safety” and “security” aspects. The ARN carries out regulatory functions in order to fulfil its objectives of control of nuclear and radioactive materials, its transport and the facilities where production, practices, assays or any other use of the materials are performed. To carry out regulatory activities it is necessary to establish a regulatory framework of Standards and Guidelines. The Standards are mandatory regulatory documents which set out the requirements on safety and security aspects for facilities and practices involving radioactive and nuclear material, and for the staff that operate the facilities or perform such practices. Also, it is indispensable to count with a trained professional inspectorate which will design and carry out the inspection activities to assure that each regulated organization are working properly and complying with the standards issued by the ARN and with an increasing consciousness of the security culture.

At the ARN there is a Unit named Regulatory Standard Unit, (SNR for its initials in Spanish), depending directly of the Board of Directors, empowered with the responsibility of compiling the national regulatory standards based on drafted regulatory requirements produced by the technical regulatory areas, ensuring that the standards are harmonized, up dated and complete.

In Argentina, the compliance of the regulatory standards is understood as a shared compromise between regulated organizations and regulators working at the ARN, to reach the safety and security targets effectively and minimizing risks.

2. NUCLEAR REGULATORY STANDARDS

By the National Act N° 24,804 on Nuclear Activity, the ARN is empowered to elaborate regulatory standards referred to the safety and security regulatory branches. These standards cover aspects of the control of the use of the nuclear and radioactive materials and the installations, licensing, international safeguards and transport of the nuclear and radioactive materials.

The existence of a solid corpus of Argentine standards, harmonized with the IAEA safety and security fundamental principles and guidelines, the ICRP recommendations, and the Convention on the Physical Protection of Nuclear Material, is of vital importance but it is not enough to regulate the activities in the safety and security aspects. To have a set of harmonized regulatory standards is as necessary as to have a staff with professional and well-trained corpus of inspectors with developed criterion to analyse the alternatives to verify the compliance of the regulatory requirements set in the standards and to act professionally and with open mind.

The Argentine regulatory standards are “performance” approach documents. This means that, the objectives are reached following the decisions made by the responsible organization for the design, construction, start up, operation, transport and the decommissioning of the installation considered. The facility, through the Responsible Entity, should demonstrate to the ARN that the technical means proposed to reach the objectives, established in the requirements of the standards, are met.

The ARN also elaborates complementary regulatory non-mandatory guidelines, containing recommendations for the compliance of the standards. The ARN regulatory guidelines main function is to facilitate the compliance of the regulatory standards and show a way to proceed to satisfy the requirements. These documents tend to offer support to regulated organizations. Generally, these non-mandatory documents are developed under request of the regulated organization, when they meet some difficulties in reaching some of the requirements of the standards. As a general rule a regulatory standard may be supported by more than one guideline and not all the requirements developed in a regulatory standard have an explanation or a proposal to be carried out. It may be concluded that there is not a strict correspondence between standards and guidelines and that the guidelines are developed in case of necessity and at any time during the standard lifetime. Guidelines have shown to be very helpful for the compliance of the regulatory standards.

3. NUCLEAR SECURITY REQUIREMENTS IN THE ARGENTINE REGULATORY STANDARDS

Nuclear security requirements are implicitly included in each Argentine regulatory standard because each standard has a common introductory text, as shown above:

... *“The Responsible Entity shall do all the reasonable and compatible with their possibilities in favor of safety of the installations, **complying as a minimum with, the standards and requirements dictated by the Nuclear Regulatory Authority.**”* ...

This introductory common text for the whole Argentine Regulatory Corpus of Standards serves as a connection and includes the nuclear security aspect.

Among the Argentine Standard Corpus, there are two specific standards in force referred to the Physical Protection regulatory branch. They are:

- AR 10.13.1. “Standard on Physical Protection of materials and nuclear installations”, issued in 2002, and (1) y (4)
- AR 10.13.2. “Standard on Nuclear Security of sealed sources”, issued in 2007 (2) y (4)

The standard AR 10.13.1 above mentioned is applicable to the “protected materials” used, stored or transported and to the facilities used for those purposes and the standard AR 10.13.2 is applicable to the management of sealed sources used for medical and industrial purposes.

In Argentina the term “protected material” became very important, that is why it was gradually developed to satisfy local necessities and was included in “Term Explanation” that constitutes a space to explain specific uses of some terms mentioned in the standards.

In standard 10.13.1 “protected material” is explained as:

Protected Material:

- a. Nuclear material: Uranium 233 (233U), Uranium 235 (235U), Plutonium 239 (239Pu), Plutonium 241 (241Pu) and combinations of these nuclides. The Uranium, in the mineral form, or the waste of the mineral and the Uranium with enrichment lower than the natural Uranium, are not included in this definition, considering in all cases the applicable prudent management practice.*
- b. Any other material that the Regulatory Authority decides to include in this definition.*

The Point b. of “protected material” explanation offers to the ARN the possibility to apply measures according to the different necessities, without modifying the standard.

The global Argentine standard corpus consists of 64 standards with a specific codification as shown in the Fig 1. The code related to nuclear security standard is AR 10.13.x.

The codification may be summarized as follows: AR stands for Argentine Republic, the number 10 stands for basic standards, the number 13 is the assigned number to nuclear security meanwhile x numerates the quantity of specific standards on each regulatory branch.

In Argentina the safety aspects are controlled and attended since the creation of the CNEA, in 1950, meanwhile the security regulatory aspects took relevance and strongly were developed during the last three

decades. The regulatory standards related to safety are oriented to different types of facilities and also to the personnel involved in the operation who have to be licensed. Currently, in Argentina, the ARN has more than 1300 nuclear and radiological installations under regulatory control and to achieve an appropriate regulation, it is required a set of standards on safety and security matters.

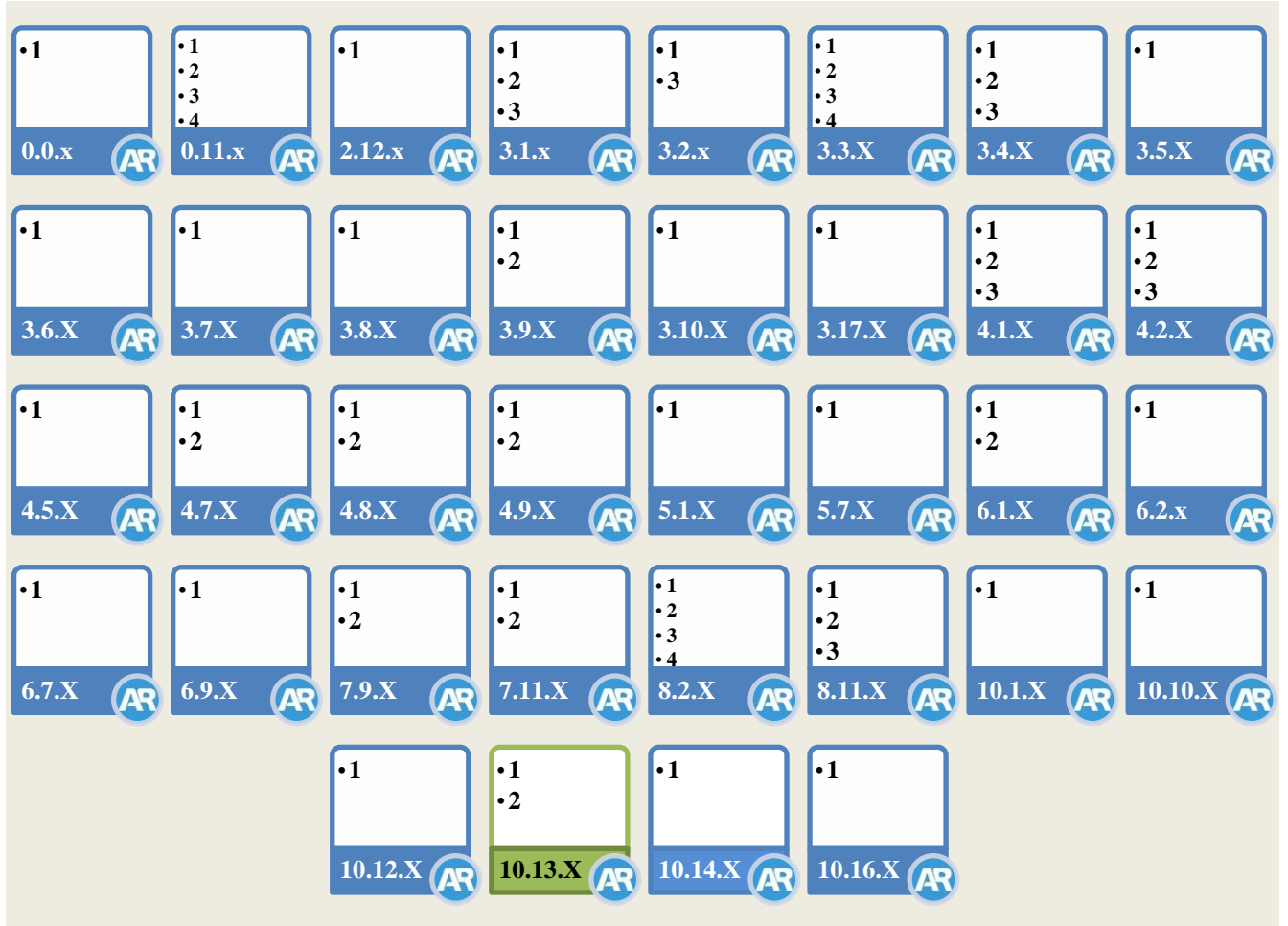


Fig 1 Argentine Standard Corpus consists of 64 standards. The code related to physical protection standard is AR 10.13.x. (4)

4. AR 10.13.1. UPDATE TO STRENGTHEN CONTROL MEASURES AND FOSTER NUCLEAR SECURITY CULTURE

The ARN Regulatory Standards Unit (SNR) follows a specific format and a set of rules to elaborate the standards and so the text of the new version of the AR 10.13.1 standard is fitting them. This methodology was introduced to homogenize the texts of the reviewed or the new standards. As an improvement, in the new version of the standards, an index is inserted and the requirements are organized under sections.

In the process of reviewing or elaborating a new standard, it is preserved the “performance” approach of the standard which is a “signature” of the Argentine regulatory standards. When the need to explain how to

carry out a specific requirement arises, this is taken as an input to elaborate a future corresponding guideline to the specific standard.

Also, as part of an improvement, it was decided to harmonize the vocabulary and update the terms. As an example, in the AR10.13.1 it was used the term “malicious acts” instead of “intentional acts”, “significant facilities” instead of “facilities” or “nuclear facilities”. It was also noticed that in the standard currently in force there were many requirements related to the “graded approach”, although the term itself was not strictly mentioned. It was decided to include and explain that term in the new version of the Standard.

In addition, it was considered very important the inclusion in AR.10.13.1 standard of a requirement establishing that the Responsible Entity had to facilitate the carry out of the regulatory inspections and the auditing activities. Although the performing of these activities was always carried out without any difficulty, it was found necessary to reference this function explicitly.

It was also included among the requirements in the AR 10.13.1 standard that the Responsible Entity shall carry out the periodically reevaluation of the physical protection system.

It was also noted that in the current version of the Standard on Physical Protection of material and nuclear facilities, it was not pointed out that the Responsible Entity shall guarantee the existence of written operative procedures related to physical protection, to be submitted to ARN for periodic revisions and updating, according to the management system. So in the new version of the standard a specific requirement about this will be introduced.

To update the list of terms and to make the AR.10.13.1 standard more understandable, in the new version were added terms such as “design base threat”, “nuclear security culture”, “radioactive inventory”, “nuclear interest material”, “physical protection levels”, “contingency plan”, “graded approach”, and their explanation. It was also overviewed that if some terms were summed up at of the standard it would become more complete.

Some Fundamentals Principles described in the amended Convention on the Physical Protection of Nuclear Material (CPPNM) (3) are being included in the new version of the standard AR.10.13.1, as they are applicable. The inclusion of the Fundamental Principles in the “Physical Protection Standard of materials and nuclear facilities” - AR10.13.1, gives assurance that the international compromises of the country are fulfilled. Table 1 shows the different approach to Fundamental Principles of the Amendment on the CPPNM to the current and the new version of the AR 10.13.1.

Table 1- Fundamental Principles of the Amendment on the CPPNM in the AR 10.13.1 standard

Fundamental Principles of the Amendment on the CPPNM	Topic	Standard
B	“Responsibility during the International Transport”	Current & new version
F	“Security Culture”	new version
G	“Threats”	new version
H	“Graded Approach”	Thoroughly in the current version & strictly in the new version
I	“Depth Defense”	Current & new version
J	“Quality Guarantee”	Not included
K	“Contingency Plans”	Thoroughly in the current version & strictly in the new version
L	“Confidentiality”	Current & new version

The AR 10.13.1 standard was elaborated in 2002 and in those days, “Security Culture” (Fundamental Principle F) was a very new concept and till in the developing phase. That is why the Fundamental Principle F is absent of the standard currently in force and it will definitely be included in the new version of the standard.

The Fundamental Principle J related to “Quality Guarantee” was not considered in the current standard and it will not be specifically included in the new version, but quality aspects are so important that will be included in the national standard framework throughout the new Standard on “Management System for the safety and security of facilities and practices”. The standard on Management Systems will be published in 2020 and it is foreseen that it is going to enter into force in 2021. This standard will include requirements about quality guarantee and control aspects to fulfill Fundamental Principle J.

5. CONCLUSIONS

- The elaboration of regulatory standards is considered an important issue at the Nuclear Regulatory Authority (ARN) of Argentina and that is reflected in having a specific Regulatory Standard Unit (SNR for its initials in Spanish), depending directly of the Board of Directors. This Unit is empowered with the responsibility to produce, keep harmonized nationally and internationally the regulatory corpus of standards.
- The corpus of Argentine regulatory standards is used to verify the compliance of the requirements on safety and security and it is a very helpful tool for the ARN high-qualified inspectors.
- The Regulatory Standard Unit (SNR) has been working on the elaboration of new standards and on the revision of the current standards till in force. One of the revisions is related to Standard AR 10.13.1 “Physical Protection of materials and nuclear installations”, to update it and in order to strengthen the security aspects.
- In Argentina, there are two specific standards on security matters and it was shown that applying them it is possible to make the national control and verifications and comply with the international compromises assumed by Argentina on security matters.
- The decision to include a common introduction in all the Argentine regulatory standards works as a connection among the standards corpus and reinforces the compliance with all the standards including the ones related specifically to security.
- In the process of reviewing the AR 10.13.1 standard, the necessity of developing at least a Guideline to support the compliance of the standard arose and so the Regulatory Standard Unit (SNR) will start this task.
- The clear understanding of the interrelation of the nuclear security requirements in the Regulatory Standards may optimize all the regulatory activities and their associated resources.

REFERENCES

- (1). ARN-AR 10.13.1. Norma de protección física de materiales e instalaciones nucleares/ REVISIÓN 1 (2002)
- (2). ARN-AR 10.13.2. Norma de seguridad física de fuentes selladas / REVISIÓN 1 (2007)
- (3). IAEA - INFCIRC/274/Rev.1/Mod.1 Amendment to the Convention on the Physical Protection of Nuclear Material (2016).
- (4). <https://www.argentina.gob.ar/arn/marco-regulatorio/normas-regulatorias>