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Comissão Reguladora para a Segurança das Instalações Nucleares
portugal

Convention on Nuclear Safety
Seventh National Report by Portugal
(August 2016)

Regulatory Commission
for the Safety of Nuclear Installations

Convention on Nuclear Safety

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Frequently used Acronyms

APA	Portuguese Environment Agency (Agência Portuguesa do Ambiente)
BSS	Basic Safety Standards
CIPRSN	Independent Commission for Nuclear Safety and Radiological Protection (Comissão Independente para a Protecção Radiológica e Segurança Nuclear)
CNS	Convention on Nuclear Safety
CTN	*Campus* Tecnológico e Nuclear
DGEG	General Directorate of Energy and Geology (Direção-Geral de Energia e Geologia)
DGS	General Directorate of Health (Direção-Geral da Saúde)
EC	European Commission
EU	European Union
HEU	High Enriched Uranium
IAEA	International Atomic Energy Agency
ITN	Nuclear and Technological Institute (Instituto Tecnológico e Nuclear)
IST	Instituto Superior Técnico
LEU	Low Enriched Uranium
MA	Ministry of Environment, Spatial Planning and Energy, previously Ministry of Environment, Spatial Planning and Regional Development (Ministério do Ambiente, do Ordenamento do Território e da Energia)
ME	Ministry of Economy , previously Ministry of Economy and Innovation (Ministério da Economia)
MS	Ministry of Health (Ministério da Saúde)
MCTES	Ministry of Science, Technology and Higher Education, previously Ministry of Education and Science (Ministério da Educação e Ciência)
RPI	Portuguese Research Reactor (Reactor Português de Investigação)

Convention on Nuclear Safety
7th National Report by Portugal
(August 2016)

A. Introduction

This report gives an overview on the present Portuguese nuclear policy, legislation and new measures relating to Nuclear Safety and Radiation Protection.

Portugal has no nuclear installations, as defined in the Convention on Nuclear Safety (CNS), and all exploration of uranium ore was terminated in the year 2000. Consequently, only some of the obligations resulting from the CNS are relevant to the Portuguese National Report. That being said, and for the sake of transparency and international cooperation, the present report provides information on the present status of the national regulatory infrastructure related to Nuclear Safety and Radiation Protection, as well as on the only existing "nuclear" facility, the Portuguese Research Reactor (RPI), applying to it the CNS reporting requirements on the basis of comity since the RPI is not a nuclear installation as defined in the CNS.

The CNS was signed by Portugal on the 3rd of October 1994. The Portuguese Parliament approved the CNS for ratification by Resolution 9/98, of January 22nd 1998, and the Presidential Decree 9/98, of March 19th 1998, ratified it. On May 20th 1998 the instrument of ratification was deposited, and the Convention entered into force on the 18th of August 1998.

As already reported at the 6th CNS Review Meeting, the regulatory structure in Portugal changed as a result of the publication of Decree-Law 30/2012, of February 9th, that created the Regulatory Commission for the Safety of Nuclear Installations (COMRSIN), leading, for the first time in Portugal, to the existence of an independent regulatory body for nuclear safety. The governing structure of COMRSIN involves three Commissioners who are appointed by the Prime Minister for a five-year term. COMRSIN is now responsible for preparing the CNS report and representing Portugal at the Review Meetings as part of the Portuguese delegation.

The RPI is a pool type research reactor (1 MW) operated, since February 2012, by the Instituto Superior Técnico (IST), when the previous operator, the State Laboratory "Instituto Tecnológico Nuclear" (ITN), became part of IST through Decree-Law 29/2012 of February 9th. The former ITN is now called "*Campus* Tecnológico e Nuclear" (CTN) and constitutes a Campus of IST for Nuclear Technology. Throughout

this report we use the acronym CTN/IST to denote this Campus of IST.

IST is the Faculty of Engineering, which, since July 25th 2013, is part of the University of Lisbon (ULisboa) as a result of the merge of two major universities in Lisbon: the University of Lisbon (UL) and the Technical University of Lisbon (UTL). The new university is a public body under the Ministry of Science Technology and Higher Education (MCTES).

The President of IST reports directly to the Minister of Science, Technology and Higher Education on issues relating to the RPI.

In the sixties, Portugal initiated efforts to install a Nuclear Power Plant, but soon abandoned this project after strong opposition from the public in 1976. The Energy Plan revised in 1984 included a nuclear option that was never implemented. Since then, Portugal has demonstrated no desire to pursue the production of electric energy from nuclear power generation. It should be noted, nonetheless, that in recent years there was more than one private attempt at starting a national debate on the arguments for and against nuclear power production. Although Portugal has no government plans to build nuclear installations as defined in the CNS, it agrees with the international principles aimed at enhancing the nuclear safety culture. For this reason, Portugal strongly supports the CNS and all the related international reporting activities.

In accordance with the CNS reporting guidelines, only activities concerning articles 7, 8 and 16 will be reported and information about the activities covered by articles 9, 10 and 15 will be provided. As mentioned before, on the basis of comity, a few lines on the RPI, article 6, are also included.

B. Summary

As reported in the Sixth Review Meeting, Portugal completed the transposition of the Council Directive 2009/71/EURATOM, of June 25th 2009, which establishes a Community framework for the nuclear safety of nuclear installations, through the publication of two Decree-Laws (Decree-Law 30/2012 and Decree-Law 262/2012), and the appointment by the Prime Minister of the Commissioners responsible for the regulatory authority.

Decree-Law 30/2012 of February 9th created the Regulatory Commission for the Safety of Nuclear Installations (COMRSIN) and established its attributes and responsibilities. On March 28th the Prime Minister appointed the three commissioners who were assigned the task of implementing the COMRSIN *modus operandi*, compatible with the means that were made available by the government given the financial restrictions imposed on Portugal by the Memorandum of Economic and Financial Policies, which was signed in May of 2011 between Portugal and the International Monetary Fund, the European Commission and the European Central Bank. Although the Memorandum of Understanding is not in force since May of 2014, many restrictions on the *modus operandi* are still in place today.

Also, among its responsibilities, COMRSIN had the incumbency of proposing a legal diploma stating the obligations of the operators of any nuclear installation, including research reactors. This proposal was approved by the Portuguese Government and was published in Decree-Law 262/2012, of December 17th, which sets out the obligations of the license holders for the operation of nuclear installations, including their duty to continuously improve safety under the supervision of the regulatory authority.

With these three important changes made in the regulatory and legal infrastructure mentioned above, Portugal has complied with Directive 2009/71/EURATOM, as recognized by European Commission.

In February 2016, the RPI underwent a safety assessment in the framework of an Integrated Nuclear Safety Assessment of the Research Reactor's mission run by the International Atomic Energy Agency. On May 11th 2016 the operation of the reactor was halted for the yearly maintenance. The recommendations of the panel were adopted by COMRSIN in the regulatory decision 1/2016 of April 4th and accepted by IST, which will submit to COMRSIN an Action Plan demonstrating how the recommendations can be *de facto* implemented using the financial and human resources that are needed. Together with the regulatory decision, COMRSIN sent a letter to IST on April 4th 2016 which states that it is desirable and ethical to halt the operation of the RPI until the Portuguese Government approves the National Program for the safe management of the spent fuel and radioactive waste, in order to implement Council Directive 2011/70/EURATOM. One expects the National Program to be approved by the Council of Ministers until the end of the current year.

Regarding the spent fuel of the RPI, until recently, the policy *vis-à-vis* spent fuel has been its return to the United States of America under a take back program sponsored by the Department of Energy after a few years of storage in the pool of the reactor. Nevertheless, because IST desires to pursue the operation of the reactor beyond May

12th 2016, date beyond which the present fuel can no longer be used if the corresponding spent fuel is to be received by the USA prior to May 12th 2019, Portugal may have to find an alternative solution, in order to dispose of the spent fuel. IST is pursuing consideration on this matter in order to justify to the Portuguese Government the benefits of continuing operation of the RPI for about 10 more years and the change in the radioactive waste policy.

In 2013, Portugal transposed Council Directive 2011/70/EURATOM, of July 19th 2011, which establishes a Community framework for the responsible and safe management of spent fuel and radioactive waste, into its legal framework through Decree-Law 156/2013, of November 5th. COMRSIN was attributed regulatory and licensing authority over the safe management, storage and transportation of spent fuel and radioactive waste into, through and out of Portugal. As required by Directive 2011/70/EURATOM, COMRSIN has prepared the National Program for the safe management of spent fuel and the safe management of radioactive waste, which underwent a Strategic Environmental Evaluation procedure before being submitted to the Government on July 19th 2016.

At present, Portugal is in the process of transposing Council Directives 2013/59/EURATOM, of December 5th 2013, laying down basic safety standards for protection against the dangers arising from exposure to ionizing radiation, and 2014/87/EURATOM, of July 8th 2014, which amends Council Directive 2009/7/EURATOM.

The present report will avoid repeating what has been described in detail in previous reports, but it is designed to be a stand-alone, complete and transparent report. Emphasis will be made on the changes that have taken place and on the difficulties that are faced to implement international requirements associated with good practices on nuclear safety in a way that is commensurable with the dimension of Portuguese nuclear program.

Reporting Article by Article

Article 6 – Existing nuclear installations

As mentioned in the introduction, Portugal has no nuclear installations as defined in the CNS. However, Portugal has a pool type research reactor (1 MW), which is installed in the campus of CTN/IST, under the direct control of the President of IST, who reports directly on this issues to the Minister of Science, Technology and Higher Education (MCTES). The reactor operates with LEU fuel loaded in 2007 and at present there is no spent fuel stored in the pool of the RPI or anywhere else in Portugal.

Since the beginning of the RPI's operation, in 1961, and up to now, no incident has ever been detected or reported. Nevertheless, given that the RPI has operated for more than 50 years and that the last extensive upgrade took place over 20 years ago, in 2015 COMRSIN asked the IAEA for an independent safety assessment of the RPI in the framework of an Integrated Safety Assessment of Research Reactor (INSARR) mission. COMRSIN requested that the INSARR mission specifically address the ageing of systems, structures and components (SSC) of the RPI.

The INSARR mission took place between 22 and 26 of February 2016 and the report by the panel made a number of safety recommendations. As a result of this report, COMRSIN issued Regulatory Decision 1/2016 of April 4th, whereby the operator IST is compelled to find the necessary financial and human resources to implement all the INSARR mission recommendations. The operator was also requested to present to COMRSIN by September 2nd 2016 an Action Plan for the implementation of the INSARR recommendations. Full disclosure of the INSARR mission recommendations is made public in COMRSIN's website under http://www.comrsin.pt/pt/rpi-missao-insarr.

Article 7 – Legislative and Regulatory framework

Article 7 (1) – Establishing and maintaining a legislative and regulatory framework

The CNS was signed by Portugal on the 3rd of October 1994. The Portuguese Parliament approved the CNS for ratification by Resolution 9/98, of January 22nd 1998, and Presidential Decree 9/98, of March 19th 1998, ratified it. On May 20th 1998, the instrument of ratification was deposited, and the Convention entered into force on the 18th of August 1998.

Likewise, in 2009, Portugal became part the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Decree 12/2009 of the Ministry of Foreign Affairs, of April 21st, approved Portugal's accession to the Joint Convention. The Convention has entered into force for Portugal on the 13th of August 2009.

As already reported in the Sixth Review Meeting Portugal has updated its legislation on nuclear safety in order to comply with Directive 2009/71/EURATOM of June 25th 2009, which sets out the community framework for the safety of nuclear installations. This resulted in the publication of the two Decree-Laws described below.

The first one, Decree-Law 30/2012, of February 9th, creates the Regulatory Commission for the Safety of Nuclear Installations (COMRSIN), leading for the first time in Portugal to the existence of an independent regulatory body for nuclear safety, whose members are appointed for a five-year term by the Prime Minister. Its attributions and responsibilities are:

- Promote legislation and regulations on nuclear safety;
- Monitor and inspect nuclear installations in all phases of development from site choice to dismantling;
- Issue or revoke licensing at all stages, assuring a high level of nuclear safety and promoting and preserving the continuous improvement of nuclear safety;
- Authorize and inspect the safe transportation of fresh or irradiated fuel, radioactive sources and their corresponding waste when the source or the destination is a nuclear installation;
- Promote and participate in international cooperation;
- Supervise activities and installations subject to safeguards.

Further details on the creation of COMRSIN will be provided under Article 8.

The second one, Decree-Law 262/2012, of December 17th, sets out the obligations of the license holders for the operation of nuclear installations, including their duty to continuously improve safety under the supervision of the regulatory authority. Further details are provided in Article 7 (2)(i).

With Decree-Law 30/2012, a number of previous Decree-Laws were fully or partially

revoked:

a) Decree-Law 48 568 of September 4th 1968;
b) Decree-Law 49 398 of November 24th 1969;
c) Decree-Law 487/72 of December 5th;
d) Paragraph *a*) of article 13 of Decree-Law 165/2002 of July 17th;
e) Ordinance 3527 of August 9th 1968, changed by Ordinance 512/70 of October 14th.

Executive Order 10A/MCT/96, of March 13th 1996, containing the Safety Standards of the RPI established back in 1996 was revoked effectively one year after the publication of Decree-Law 262/2012. Part of this safety standards were established in Decree-Law 262/2012 and other part were adopted by IST in its RPI internal Regulations.

With these two Decree-Laws, Portugal became in full compliance with the Directive 2009/71/EURATOM, of June 25th 2009, as recognized by the European Commission, and with the requirements of the CNS.

Following the publication of Decree-Law 156/2013, of November 5th, transposing Directive 2011/70/EURATOM of July 19th 2011, COMRSIN was attributed regulatory and licensing authority over the management, storage and transportation of spent fuel and radioactive waste. Therefore, at present, Portugal complies with CNS and Joint Convention requirements on the safe management of nuclear installations and the safe management of spent fuel and radioactive waste. More details about national legislation, implementation of safety requirements and regulatory review shall be provided under Article 7(2)(i) below.

As also mentioned in the Sixth CNS report by Portugal, the updating of the Portuguese legislation in the sector of radiological protection, in particular resulting from the transposition of the EU BSS Directive 96/29/EURATOM and of EU Medical Exposures Directive 97/43/EURATOM, took place through partial revisions and tacit derogations by several Decree-Laws. Hence, on occasion, it remains cumbersome to have a clear picture of the specific legislation currently in force without consulting a legal expert. In addition, Decree-Law 165/2002 has distributed the usual competencies of a single regulatory body for radiological protection between different Ministries. The regulatory infrastructure created in 2002, with the partial transposition of Directives 96/29/EURATOM and 97/43/EURATOM, did not meet the international requirements of an Independent Regulatory Body. Consequently, the need for an improvement of the national regulatory structure was identified, leading to the creation of the Comissão Independente para a Proteção Radiológica e Segurança das Instalações Nucleares (CIPRSN) in 2005 (Decree-Law 139/2005), but since this Commission was not truly a regulatory authority and its *modus operandi* faced insurmountable political and administrative obstacles, it was effectively terminated in 2013. Therefore, Portugal still needs to improve its regulatory structure and legislation in the area of radiological protection which may take place

when Council Directive 2013/59/EURATOM, of December 5th 2013, is transposed into the Portuguese legal framework.

Article 7(2)(i) – National safety requirements and regulations

Second tier regulations in Portugal were adopted subsequently to the creation of COMRSIN through Decree-Law 262/2012 of December 17th, which establishes the duties of operators to continuously improve the safety of nuclear installations. Decree-Law 262/2012, which enters into force on December 17th 2013, follows IAEA safety criteria and states that:

a) No nuclear installation may operate without a proper license issued by the regulatory authority for all phases, from site choice to decommissioning (article 8(b) of Decree-Law 30/2012);
b) The operator has the prime responsibility for the safety of the installation under the control of the regulatory authority; this responsibility cannot be delegated or transferred (article 12(1) of Decree-Law 30/2012 and article 4 (2) of Decree-Lw 262/2012);
c) The operator is responsible for the safe management of the fuel and of the radioactive waste, including the waste in storage or elimination facilities (article 5 of Decree-Law 262/2012);
d) The operator has to have the human, material and financial resources that are adequate to the safe operation of the installation (article 12(5) of Decree-Law 30/2012 and article 23(1) of Decree-Law 262/2012);
e) Principles such as transparency, defense in depth, priority to nuclear safety at all times, registration of all documents, classification of all structures, systems and components, including control software in terms of their importance for the safety of the installation are required from the operator (articles 6, 9, 12, 17, 18 and 29 of Decree-Law 262/2012);
f) The operator is also required to have a safety policy, a safety management system that gives priority to nuclear safety at all times and where the decision making process is based on the graded approach (articles 16 to 18 of Decree-Law 262/2012);
g) The operator has the prime responsibility for the periodic safety review of the installation and for the continuous improvement of safety (article 32 of Decree-Law 262/2012);
h) Research Reactors shall have a "Safety Commission" that is independent from the management system (article 20 of Decree-Law);
i) All nuclear installations must have a Safety Analysis Report (SAR) that is subject to approval by COMRSIN. In the SAR the operator has to show that the operation complies with the safety standards recommended by the IAEA and with the national requirements for nuclear safety and radiological control. The SAR has to include sufficient information on the nuclear installation, its operating conditions, its safety and waste management systems, its emergency plans and decommissioning procedures (article 30 of Decree-Law 262/2012);

j) The operator is required to update the SAR whenever necessary or if requested by COMRSIN (article 30 (6) of Decree-Law 262/2012);
k) Besides the SAR, each year the operator shall present an annual report to be assessed by the "Safety Commission" and subsequently submitted to COMRSIN, which has the right to inspect the facility at any time, announced or non-announced (article 31 of Decree-Law 262/2012);
l) The operator has the duty of full cooperation with the regulatory authority, namely providing access to the installations and to any information that may be requested (article 7 (1)(2) of Decree-Law 262/2012);
m) The operator has the duty of notifying COMRSIN of any modification or of any event occurred in the nuclear installation (article 7 (3) of Decree-Law 262/2012);
n) A system of penalties is in place to respond to possible violations of the law (article 34 to 37 of Decree-Law 262/2012).

Concerning the safety of radioactive waste and spent fuel management, major changes have also taken place as a result of the transposition of Council Directive 70/2011/EURATOM into the Portuguese legal framework through Decree-Law 156/2013. These changes took place, not only at the level of the attributions of the regulatory authority for the safety of nuclear installations, COMRSIN, but also in what concerns the requirements that public and private entities (health, research and industrial facilities), that are licensed by Direção-Geral de Saúde (DGS) to use radioactive materials, have to comply with, in order to get from COMRSIN a license for managing and/or storing radioactive waste for more than 30 days.

The present legal framework sets up COMRSIN as the sole regulatory body in charge of licensing, inspecting and regulating the safety of spent fuel management and the safety of radioactive waste management and storage installations, as well as the responsibility to apply clearance and exclusion levels to radioactive materials as legally defined in the Ministerial Order 44/2015, of February 20th, and authorizing the transportation of radioactive waste and spent fuel into, through and out of Portugal. The clearance and exclusion levels mentioned above are the same as in Table A of Council Directives 2013/59/EURATOM, of December 5th 2013.

All public and private entities that use radioactive materials are required to follow new procedures for the disposal of radioactive waste, and are subject to fines if they do not. Entities that store radioactive waste for more than 30 days need to apply for a valid license issued by COMRSIN, and have the prime responsibility that cannot be delegated or transferred for the waste they produce. COMRSIN has published a document on its web site where producers of radioactive waste may get advice on the safe management of their waste and how to get a license from COMRSIN: http://www.comrsin.pt/index.php/pt/gestao-segura-residuos.

The new National Program for the safe management of spent fuel and radioactive waste, as required by Council Directive 2011/71/EIRATOM, has been submitted by COMRSIN to the Government on July 19th 2016 after undergoing Strategic Environmental Evaluation as required by EU regulations. Approval by the Council of Ministers is expected until the end of 2016.

Article 7(2)(ii) – System of licensing

Under article 8 (b) of Decree-Law 30/2012, all nuclear installations, from site choice to decommission, require a proper license. This includes nuclear power plants, research reactors, enrichment and reprocessing plants, and nuclear fuel cycle facilities. The licensing authority since February 9th 2012 is COMRSIN.

The RPI, as the sole nuclear installation in Portugal, was first licensed in 2005 by the Ministry of Economy (ME) who granted the operating license on December 27th 2005, by Ministerial Order of the Directorate General of Energy and Geology (DGEG) of the ME.

As mentioned for the first time in the report for the CNS First Review Meeting in 1999, in the context of international initiatives to enhance non-proliferation measures, safeguards and nuclear security, and to combat nuclear terrorism, Portugal declared its interest to participate in the "United States Foreign Research Reactor Spent Nuclear Fuel Acceptance Program" of the Department of Energy of the United States of America (DOE). A commitment was made to abandon the use of High Enriched Uranium (HEU) by May 12th 2006 (deadline that shifted to May 31st 2007) and to return the HEU fuel before the 12th of May 2009.

A project for the conversion of the core of RPI from HEU to Low Enriched Uranium (LEU) fuel was initiated, and an application for the authorization of core conversion was filed before the licensing authority. The project was carried out in the framework of an agreement between the IAEA, the Portuguese Republic and the United States of America, with the technical support of the IAEA and the financial assistance of the United States of America. The agreement was adopted in Vienna, on December 20th 2006.

The RPI received fresh LEU fuel on February 14th 2007, from the French supplier AREVA.

The conversion was done by the operator of the RPI, the former ITN, under IAEA Technical Cooperation Project POR/4/016, with the assistance of an independent expert from the Institut de Radioprotection et Sûreté Nucleaire (IRSN) in France and the Argonne National Laboratory (ANL), a research laboratory in the United States. In the framework of the core conversion and the reactor licensing, the RPI underwent a thorough safety analysis. The Safety Analysis Report was prepared, based on the IAEA safety recommendations (e.g. the Safety publication: Safety Series Nr. 35-G1, "Safety Assessment of Research Reactors and Preparation of the Safety Analysis Report", as well as the "IAEA Research Reactor Core Conversion Guidebook" Tec. Doc. 643). Additionally, the former ITN prepared an analysis of the "site characteristics",

including an estimation of the RPI's gaseous and liquid effluents, as well as a report on radiological safety in the RPI.

The Safety Analysis Report for the core conversion of the RPI was accepted by the IAEA, which confirmed its support for the core conversion on the 27th of June 2007. In this context, new discharge limits for effluents of the RPI were internally adopted and proposed, on July 27th 2007, by the "Reactor Safety Commission" of the RPI (see below the reply to article 7(2)(iii)). These limits were made official through an amendment to the license of the RPI granted by DGEG on August 6th 2007.

The license for the operation of the RPI issued by DGEG at that time is valid for the lifetime of the present LEU fuel.

In September 2007, the reactor was converted from HEU to LEU (with less than 20% of U-235 – specifically, U3Si2-Al – and a uranium density of 4.8 g/cm3). The core conversion was completed in October 2007.

After that, the former ITN prepared the shipment of the obsolete HEU fuel, and performed radiological shielding calculations for the optimization of spent fuel loading into the transport cask. All HEU fuel, fresh and spent, was returned to the United States in August 2008, under strict security measures.

Currently, there is no spent fuel or radioactive waste stored in the reactor.

As mentioned above, at present, the RPI falls under the regulatory and licensing authority of COMRSIN, according to Decree-Law 30/2012. After promulgation of Decree-Law 262/2012, IST was given one year to demonstrate to COMRSIN that it was complying with the new law. This was done by December 17th 2013 whereby IST submitted all documents needed for the review. COMRSIN issued a number of recommendations that were followed by IST, namely improving transparency *vis-à-vis* the public in general and supplying the Internal Emergency Plan to the National Authority for Civil Protection (ANPC) so that an External Emergency Plan could be prepared by the this authority in case a beyond design basis accident takes place at the RPI. This process is in place and several meetings between the entities were made.

Nevertheless, given that IST wants to continue operation of the RPI beyond the May 12th 2016 deadline imposed by the "United States Foreign Research Reactor Spent Nuclear Fuel Acceptance Program" of the DOE to stop using the present LEU fuel in order to receive it back by May 12th 2019, COMRSIN decided to ask the IAEA for an INSARR mission in order to perform a safety assessment of the reactor in the context of an ageing facility where several systems, structures and components have been operating for more than 50 years. Although the reactor has undergone a major refurbishment more than 20 years ago, and has been maintained regularly according to a maintenance plan described in the SAR, the INSARR mission report identified a number of issues that require intervention. Therefore, COMRSIN issued the Regulatory Decision 1/2016 of April 4th whereby the operator IST is compelled to find the necessary financial and human resources to implement all the INSARR

mission recommendations according to a given set of priorities. The operator was also requested to present to COMRSIN by September 2nd 2016 an Action Plan for the implementation of the INSARR recommendations.

If IST does not properly implement the recommendations of the INSARR mission, COMRSIN has the right to suspend the operating license or to apply fines.

Article 7 (2) (iii) – System of regulatory inspections and assessment

Under Portuguese Law, the competencies to verify the implementation of regulatory measures and terms of licenses (inspections and assessment of installations) are in general distributed between different ministries and other state entities as demonstrated in Article 15 reporting. Nevertheless in the case of all nuclear installations and on the management, storage and transportation of radioactive waste and spent fuel, COMRSIN is the sole entity in charge of inspections, assessment and authorizations.

As of December 17th 2013, the RPI is subject to Decree-Law 262/2012 that follows IAEA safety criteria and foresees the obligations that are already mentioned in the paragraph 7(2)(i).

Article 7(2)(iv) – Enforcement of applicable regulations and terms of licenses

In the case of all nuclear installations as well as of the management, storage and transportation of spent fuel and radioactive waste, COMRSIN may take any of the following enforcing actions:

- Propose corrective measures.
- Suspend operations.
- Shut down of the installation, temporarily or definitely.
- Qualify detected faults and report them to the competent authorities so that the corresponding fines are applied; fines may be as high as 44.891,82€ due to limitations in the legal system under which Decree-Law 262/2012 was adopted.
- Revoke or change the scope of the license following a fully transparent approach and well justified reasons based on a fair assessment of the safety of the installation.

The first regulatory decision by COMRSIN came as a result of the INSARR mission report. As mentioned before and also under Article 8 reporting, COMRSIN is a four year old regulatory body that is understaffed and underfunded due to financial and

organizational constraints imposed by the financial and economical restrictions at the time of its creation; this situation has not changed since then. Therefore it has not had the time to accumulate the necessary experience and know how to act without external support and/or advice. This is the reason why COMRSIN asked the IAEA for an INSARR mission and based on the INSARR mission report issued a regulatory decision.

Article 8 – Regulatory body

Article 8(1) – Establishment of the regulatory body

Portugal has a complex regulatory framework characterized by the existence of various authorities, with competencies in the area of radiation protection and nuclear safety being allocated to different Ministries (as per Decree-Law 165/2002; see reporting under Article 15). Except for COMRSIN, all the other licensing authorities are administratively connected to government bodies in charge of running the activities that are subject to regulation. In almost all cases these licensing authorities are understaffed.

To resolve the absence of a regulatory body for nuclear safety and to comply with Council Directive 71/2009/EURATOM, COMRSIN was created in 2012 as an independent regulatory authority to supervise and regulate the safety of nuclear installations. According to Decree-Law 30/2012 COMRSIN is managed by three commissioners appointed by the Prime Ministers for a five-year term. Given the financial situation in Portugal at the time, and the consequent limitations imposed by the Memorandum of Economic and Financial Policies, which was signed in May of 2011 between Portugal and the International Monetary Fund, the European Commission and the European Central Bank on the creation of new Government bodies, COMRSIN does not have the financial, technical and legal resources that are needed to make it an effective regulatory body. COMRSIN relies on administrative support from Secretaria Geral da Educação e Ciência (SGEC) and hires experts on a yearly basis, pending authorization from the Ministry of Finances, but is independent of the SGEC chain of command since the Commissioners, in effect, report to the Prime Minister and, on matters of safety, are independent from any other Government entity. COMRSIN is responsible for licensing, inspecting and regulating all nuclear installations from site choice to decommission but its ability to perform effectively is, at times, compromised by limitations on the financial and human resources it can dispose of at a given moment and its ability to train the people it needs to perform its responsibilities.

To make things even more challenging, COMRSIN was attributed, through Decree-Law 156/2013, the responsibility for licensing, inspecting and regulating the safe management, storage and transportation of radioactive waste and spent fuel. In this Decree-Law, the Government committed itself to restructure COMRSIN within six month from publication, in order to allow the regulatory body to have the legal structure needed to hire permanent staff members and carry out its responsibilities without the financial, legal and administrative support from SGEC. Nevertheless, three years have gone by and the situation has not changed.

COMRSIN is allowed by law to request the cooperation of national institutions and experts whenever necessary to provide additional technical support. COMRSIN has

on a regular basis requested IST technical advice on a number of issues concerned with radioactive waste characterization. IST, as the operator of the RPI and the Pavilhão de Resíduos Radioativos (PRR), the sole elimination facility for low level waste (LLW) and intermediate level waste (ILW), concentrates in Portugal most of the expertise in the field of nuclear science and technology, radioactive waste management and radiation protection.

Nevertheless, due to a conflict of interest in the field of nuclear safety and waste management, COMRSIN may not always depend on IST as a Technical Support Unit (TSO). Given the limited number of experts in Portugal, one cannot segregate within CTN/IST experts for COMRSIN alone, and others for the operator of the RPI and the PRR. Therefore, most of the tasks have fallen on the Commissioners in the last four years and on independent experts hired on a temporary basis, and not always at full pay.

However, overall Portugal has the necessary radiation protection expertise to be able to fully comply with the BSS and other international requirements.

At present, the competences of COMRSIN under Decree-Laws 30/2012 and 156/2013 are:

a) Promote the development of legislation and regulations in the field of nuclear safety, aiming the continuous improvement of instruments to regulate the activity.
b) Assess and monitor the safety of nuclear installations in all phases, from site selection to design, construction, commissioning, operation or dismantling, issuing the corresponding licenses to perform the activity, according to a high standard high of nuclear safety, preserving and promoting continuous improvement of nuclear safety.
c) Inspect, require demonstration of compliance with national requirements of nuclear safety and the terms of the respective license, and take enforcement action, if needed, including amendments in the license and operating conditions or procedures and order temporary or definitive closure of installations, imposing the required measures to protect workers, the population in general and the environment against the risks of exposure to ionizing radiation resulting from the construction, operation or shut down of nuclear facilities.
d) Authorize and monitor the safety and security of the transportation of nuclear fuel, fresh or spent, and radiation sources from or to nuclear installations;
e) Cooperate with the competent authorities in the preparation of plans for education and training of human resources of nuclear installations and of entities related with nuclear safety, to preserve and develop the required qualifications and skills in the field of nuclear safety.

f) Promote and engage, in conjunction with competent authorities, cooperation with foreign counterpart institutions and with specialized international organizations and agencies, ensuring national representation in groups and committees of areas of its responsibilities and to elaborate reports whose submission results from external obligations assumed by the country.
g) Participate in the preparation of international agreements and of scientific and technical cooperation in the field of their assignments, in articulation with competent authorities.
h) Undertake surveillance and inspection of installations or activities subject to a safeguards regime and physical protection, under the Non-Proliferation Treaty Nuclear and the Additional Protocol;
i) Licensing, evaluating, monitoring and inspecting facilities and activities relating to the management of spent fuel and radioactive waste (encompassing all phases, from initial choice of site to decommissioning);
j) Authorizing and inspecting transports of spent fuel and radioactive waste in Portugal;
k) Characterizing and classifying radioactive materials as radioactive waste;
l) Applying exemption levels, on a case by case basis;
m) Ordering the collection of radioactive waste for storage and disposal;
n) Authorizing the elimination of radioactive waste;
o) Imposing fines for infringements of rules relating to licensing or safety (through the relevant member of Government), suspending or canceling licenses and ordering provisional measures;
p) Preparing and continuously updating an inventory of radioactive waste on national territory;
q) Making available to workers and the general public the necessary information concerning the management of spent fuel and radioactive waste;
r) Drafting and proposing to the Government legislation in this domain, as well as approving regulations whenever empowered to do so by law;
s) Cooperating with the relevant authorities and international organizations, validating data relating to spent fuel and radioactive waste to be communicated to international organizations (except in the case of radiological emergencies), taking part in the preparation of international agreements within this domain.

Article 9 – Responsibility of the license holder

As already mentioned under article 7(2)(iii) above, the license holder of the RPI is IST (CTN/IST). The license currently in force was issued in December of 2005 by DGEG of the ME and is valid for the duration of the present LEU fuel. Nevertheless, COMRSIN may suspend or revoke such license in case there is a compelling and a well-documented safety reason to do so, namely the non-compliance with the recent regulatory decision to implement the recommendations of the INSARR mission report mentioned above.

The Safety Rules for the operation of the RPI were initially adopted by Ministerial Order 10A/MCT/96, of the Minister of Science and Technology. As mentioned above this Ministerial Order was revoked on December 16th 2013 and COMRIN became the sole regulatory authority responsible for inspecting and regulating RPI as defined in Decree-Law 262/2012 mentioned above.

By December 17th IST, as the operator of the RPI, had to demonstrate to COMRSIN that it was able to comply with the new legislation, submitting to COMRSIN all documents needed for the review. This included the Safety Analysis Report, the Annual Reports of operation for the past two years, internal regulations and procedures for operations and maintenance, internal emergency plan and management system. COMRSIN issued a number of recommendations that were followed by IST, namely improving transparency *vis-à-vis* the public in general and supplying the Internal Emergency Plan to the National Authority for Civil Protection (ANPC) so that an External Emergency Plan could be prepared by the competent authority in case a beyond design basis accident takes place at the RPI. Due to persistent delays at the ANPC, the RPI still lacks an External Emergency Plan.

Article 10 – Priority to safety

The concept of "priority to safety" was not expressly mentioned in the Portuguese law prior to Decree-Law 262/2012 of December 17th. With the new law "priority to safety" is reinforced and embedded in the principles of the law as well as in the safety management system that the IST has implemented and submit do the regulatory authority as mentioned above.

Article 15 – Radiation Protection

As previously indicated under Article 7, Portugal is currently revising its legislation relating to radiological protection. The precise shape and scope of this revision has not yet been decided, but it may come to involve a general revision and codification of the legal framework for radiological protection, in the context of the transposition of Council Directive 2013/59/EURATOM, of December 5th 2013, which is a codification Directive. This revision will necessary include amendments to substantive provisions but also, to some extent, to the regulatory structure, in light of the obligations imposed by the Directive.

The following are the laws currently in force, including partial and tacit derogations of old provisions by new ones:

a) Decree-Law 348/89, of October 12th
Establishes rules for protection against ionizing radiation.

b) Regulatory Decree 9/90, of April 19th
Regulates the provisions of Decree-Law 348/89.

c) Regulatory Decree 29/97, July 29th
Transposes Council Directive 90/641/EURATOM, of 4 December, and regulates the protection of external workers intervening in areas requiring protection against ionizing radiation.

d) Decree-Law 165/2002, of July 17th
Revises partially Decree-Law 348/89 and establishes the new competencies of all authorities connected to radiological protection and nuclear safety, partially transposing Council Directive 96/29/EURATOM, of May 13th 1996. With this Decree-Law a new regulatory infrastructure is created, but the main regulatory competencies for safety in the public sector are attributed to the operators. In particular, the general rule becomes that any activity involving the use of ionizing radiation sources has to be authorized by DGS. However, this framework has been, in part, tacitly derogated by subsequent laws. For nuclear safety in nuclear installations, for example, this Decree-Law has been revoked partially by the Decree-Law 30/2012 that created the regulatory authority for that sector, COMRSIN.

e) Decree-Law 167/2002, of July 18th, amended by Decree-Law 215/2008, of November 10th, and by Decree-Law 184/2015, of August 31st
Regulates the licensing and functioning of service providers in the field of radiological protection, partially transposing Council Directive 96/29/EURATOM, particularly relating to measurement of exposure and training.

f) Decree-Law 180/2002 of August 8th, amended by Decree-Law 72/2011 of June 16th
Transposes Directive 97/43/EURATOM on the application of ionizing radiation during medical diagnosis and treatment. This Decree-Law introduces special requirements for the licensing and operation of radiodiagnostics, radiotherapy and nuclear medicine facilities.

g) Decree-Law Decree-Law 138/2005, of August 17th
Establishes a national environmental monitoring system to measure the level of radioactivity in air, water and soil, in compliance with the monitoring and reporting requirements (under Articles 35 and 36 of the EURATOM Treaty, and in accordance with the Recommendation of the European Commission of June 8th 2000 (COM/473/EURATOM)). The monitoring system is managed by the CTN/IST (ex ITN), which also prepares a respective annual report ("Relatório de Vigilância a Nível Nacional").

h) Decree-Law 140/2005, of August 17th
Partially transposes Directive 96/29/EURATOM, specifically its provisions concerning exemption from prior authorization or reporting of activities. It does so by referring to the applicable provisions of the said Directive.

i) Decree-Law 197/2005 of November 8th
Revises Decree-Law 69/2000 of May 3rd, that foresees the rules applicable to environmental impact assessments and transposed Directives 85/337/CE, 97/11/CE and 2003/35/CE. Requires a prior assessment of the environmental impact to be carried out before the eventual authorization of nuclear installations, as defined in the CNS.

j) Decree-Law 38/2007 of February 19th
Adopts a new legal regime for exposure of workers and the public to ionizing radiation arising from inadequate control of high-activity sealed radioactive sources and orphan sources and transposes Council Directive 2003/122/EURATOM, of 22 December 2003. It is not applicable to medical exposures, since there is a specific regime for such exposures: Decree-Law 180/2002, of 8 August 2002. Under Decree-Law 38/2007, the holder must obtain from the CTN/IST prior authorization for the possession of such a source.

k) Decree-Law 222/2008, of November 17th
By means of this Decree-Law, Portugal concluded the transposition of Council Directive 96/29/EURATOM, of 13 May 1996, specifically the BSS for the protection of the health of workers and the general public against dangers arising from ionizing radiation.

l) Decree-Law 227/2008, of November 25th
Transposes article 38 of Council Directive 96/29/EURATOM, of May 13th 1996, which requires the establishment of a system of qualified experts and technicians. This Decree-Law also creates the "program for the training of qualified experts and qualified technicians".

This Decree-Law establishes a common basic training and education framework for all areas of activity, but does not exclude specific approaches in specific sectors of application of ionizing radiation: the medical or industrial sector, education and research. This Decree-Law is regulated by Ministerial Order 195/2015, of June 30th.

The new approach takes into account three levels of professional qualifications in radiological protection:

Level 1: Qualified Expert (QE);
Level 2: Qualified Technician (QT);
Level 3: Operator Technician (OT).

The QE establishes radiation protection and safety programs in accordance with the relevant national requirements. He also supervises radiation protection and safety within facilities.
The QT ensures that all work involving exposure to radiation is carried out in compliance with the established programs.
The OT must follow the instructions established in the radiation protection and safety program during its routine work.
It should, however, be highlighted that this Decree-Law does not set out the general conditions under which facilities are required to include QEs or QTs in their staff. Such requirements are defined in separate legislation, which essentially states that these requirements must be decided by the respective licensing authority on a case-by-case basis.

m) Decree-Law 198/2009, of August 26th
Transposes EU Council Directive 2006/117/EURATOM, of November 20th 2006, on the transfer between member countries, third countries and member countries and transportation within Portugal of radioactive waste and spent fuel. This Decree-Law has been tacitly revoked in part by Decree-Law 30/20012, of February 9th, when the transportation takes place to or from a nuclear installation. With Decree-Law 156/2013 of November 5th, COMRSIN takes over from CTN/IST as the national authority for granting authorizations and for verification of the correct implementation of the Directive in all situations involving the transportation of radioactive waste and spent fuel to, from and within Portugal.

n) Decree-Law 56/2012, of March 12th
Designates the APA (Portuguese Environment Agency) as the entity responsible for the continuous alert network of radioactivity in the environment.

This legal framework was entirely modeled on EC Directives. Its content and compliance with the requirements of the CNS is, therefore, easy to assess by comparison with the relevant provisions of EC Law.

The distribution of competencies for licensing of facilities and activities in the field of radiological protection may be briefly summarized as follows:

a) The Directorate General of Health of the Ministry of Health (DGS), as the

authority with general and subsidiary competence to authorize any facility/activity/equipment involving the use of ionizing radiation (unless the competence is specifically awarded to another authority), and specifically for facilities and activities using ionizing radiation for medical purposes, or for industrial or agricultural purposes, services in the area of protection against ionizing radiation (e.g. training, dosimetry, radiation measurements, safety assessments and inspections) and for food irradiation facilities;

b) COMRSIN for radiological protection aspects integrated into the licensing of nuclear facilities, radioactive waste management and spent fuel facilities and transport thereof;
c) CTN/IST for sealed sources and equipment including sealed sources, as well as for transport of radiation sources not awarded to other authorities;
d) The Directorate of Energy and Geology of the Ministry of Economy for uranium ore extraction/processing facilities (none currently in operation).

Competencies for surveillance, inspection and enforcement for these activities is generally distributed to the same authority awarded the licensing power, notwithstanding the possibility of requesting technical support from other public bodies. CTN/IST is also entrusted with supervision of radiological protection at universities and research centers.

Generally, enforcement powers of these authorities include the power:

(i) To propose preventive measures to avoid harm or danger;
(ii) To order the immediate suspension of the operation or use of facilities/equipment/activities using/producing radiation;
(iii) To seize material and equipment; and
(iv) To impose fines.

CTN/IST further plays a crucial role in the national radiological protection system by assisting the competent authorities in the enforcement of these rules, namely in what concerns inspections, and by ensuring basic metrology and calibration services (Ministerial Order 1106/2009, of September 24th, adopted the regulation for the metrological control of measuring instruments for ionizing radiation, under Decree-Law no. 291/90, of 20 September; Order 1665/2014, of February 5th, awards to IST competencies associated to metrological control, under Ministerial Order no. 1106/2009). It is also responsible for ensuring the collection, storage and safety of discovered orphan sources (Decree-Law 38/2007).

Presently, the central registry of radiation doses received by workers is centralized and kept by the Social Security Institute, which delegates its management to IST.

The Directorate General of Health may call on the assistance of an advisory body, the National Commission for Radiological Protection, made up of representatives from other institutions and Ministries.

APA (the Portuguese Environment Agency) is the entity responsible for the management and operation of the network to permanently measure environmental radioactivity, as well as to detect abnormal increases. It also plays a key role in Environmental Impact Assessments.

Radiological Protection in the RPI

Radiological protection in the RPI was implemented until December 16th 2013, according to the "Regulation for the Exploration of the RPI", as per Ministerial Order no. 10A/MCT/96, by the "Occupational Health Unit", which is responsible for radiological protection of workers in the reactor, for the safety of all operations that involve a potential risk, for the control of radiation fields, for the control of radioactive contamination of the workplace and for the management and control of effluents and waste.

As of December 17th 2013, RPI and its operator CTN/IST have to comply with Decree-Law 262/2012, aside from the general national legal framework described above, as well as EU law directly applicable or with direct effect in the Portuguese legal order. Decree-Law 262/2012 *inter alia* requires compliance with IAEA safety standards, integrating them into the Portuguese legal order (see, e.g., articles 16(10) and 30).

Article 16 – Emergency Preparedness

Article 16 (1) – Emergency plans and programs

Although no nuclear power plants exist in Portugal, there are other sources of concern that require emergency plans, such as accidents arising from:

- The research reactor.
- Industrial radiography.
- Industrial irradiation.
- Nuclear medicine, radiotherapy, etc.
- Foreign nuclear installations.

The following laws constitute the current legal framework related to emergencies:

a) Decree 36/80, of May 30th
Ratifies a Portugal-Spain agreement specifically covering the matter, concerning nuclear installations near to the border between the two countries – in a strictly legal approach, however, it should be noted that there are no installations presently existing that fall under that category and to which, therefore, this agreement could be applied.

b) Decree Law 36/95, of February 14th
This Decree-Law transposes Directive 89/618/EURATOM concerning information of the general public on applicable health protection measures and on actions to be taken in the case of a radiological emergency.

c) Decree-Law 165/2002, of July 17th
Establishes most of the competences of authorities connected to radiological protection, partially transposing Council Directive 96/29/EURATOM, of 13 May 1996, but also pertains any intervention in radiological emergencies or prolonged exposures following a radiological emergency; it creates CNER, the National Radiological Emergency Commission.

d) Decree Law 174/2002, of July 25th
Regulates the procedures to be adopted in the case of radiological emergency, transposing Title IX of Directive 96/29/EURATOM.

e) Technical Cooperation Protocol between Agência Portuguesa do Ambiente, Autoridade Nacional de Proteção Civil, Instituto Superior Técnico da Universidade de Lisboa, of Portugal, and Consejo de Seguridad Nuclear, of Spain, on Radiological and Nuclear Emergencies, signed in 30 of July 2015.

The population should be informed about the consequences of a nuclear accident and the actions that should be adopted in case of such an event. This obligation results from Decree-Law 36/95 and from Directive 89/618/EURATOM.

Most of the provisions regarding radiological emergency result from Decree-Laws 165/2002 and 174/2002 that state:

Whenever a radiological emergency occurs in Portugal, the holder of an installation where the accident occurs should notify the ANPC.

If the nuclear accident occurs outside Portugal the competent entity for receiving notifications (contact point) is APA.

ANPC has the obligation of acting as a contact point for notifications regarding radiological emergencies occurring in the country or within territory under Portuguese jurisdiction, of ensuring the development and testing of external emergency plans for radiological emergencies or prolonged exposure and of providing information to the population according to the legislation applicable.

IST has the obligation of participating in the actions of intervention in radiological emergencies or prolonged exposure, if requested, in accordance with applicable laws in force;

APA has the obligation of proposing, if necessary, corrective measures to ensure the protection of environment and populations in the event of a radiological emergency or prolonged exposure to environmental contamination.

According to the above mentioned Decree-Laws, and depending on the circumstances, a Technical Intervention Authority (ATI) may be called in to intervene. The functions of this Authority are assumed by:

a) DGS, in radiological emergencies within installations except those concerning mining activities and other installations in the nuclear fuel cycle or radioactive waste management and storage which fall under COMRSIN.

b) APA, in radiological emergencies from which a risk to the general public or to the environment may arise (i.e. emergencies with potential or actual effects external to the installation), including risks deriving from the previous exercise of mining activities concerning radioactive material.

c) CTN/IST, in radiological emergencies taking place in the transport of radiological material or caused by the loss of sealed radioactive sources or by the discovery of orphan sources.

d) In all other cases the ATI is be nominated by the Minister of the Interior.

Within the scope of its competences, the ATI is responsible for the coordination of interventions, from the notification of a radiological emergency to the end of the actions of all intervening entities.

However, it is up to the ANPC to execute emergency plans, as mentioned above.

In order to prepare the above mentioned interventions, each facility must prepare internal emergency plans and periodically test them according to the conditions set out in the licenses of the respective facilities or installations. The tests are the responsibility of a Qualified Technician (QT), under the supervision of a Qualified Expert (QE), whenever facilities have been required to have such experts in their staff (in accordance with Decree-Law 227/2008 – see response to article 7(2)(i)A above). Whenever the internal emergency plans identify a risk of exposure or radiological contamination that may extend outside the perimeter of the installation, the APA must be given an opportunity to issue an opinion.
Regarding external emergency plans (outside of facilities), the ANPC has the power to prepare and to periodically test these plans. In 2014, after reviewing the RPI for compliance with Decree-Law 262/2012 of December 17th, COMRSIN has requested the ANPC to prepare an external emergency for the RPI, after IST has provided its internal emergency plan and APA has issued a report supporting the need for such emergency plan that, to this date, is still missing.

The National Commission for Radiological Emergencies (CNER) and the National Commission for Civil Emergency Planning have a general advisory role in all these procedures. Moreover, CNER has the obligation of integrating immediately, in an emergency situation that affects or may affect areas of the national territory, the Emergency Operations Centre of Civil Protection, in order to monitor the situation and to prepare the information to be communicated to the population.

With respect to international emergencies, Portugal participates in the respective international activities of the Nuclear Energy Agency NEA (International Nuclear Emergency Exercises INEX) and IAEA (such as Convention Exercises ConvEX).

Article 16(2) – Information of the public and neighboring States

Decree-Law 36/95 sets out the requirements for information of the public and other States in case of a radiological emergency, transposing in full the requirements of Directive 89/618/EURATOM.

Decree-Law 36/95 distinguishes between information of the population prior to an

emergency (prevention) and the information of the population actually affected by a radiological emergency, including special provisions on information as soon as an effect is foreseen. It also addresses information of persons who might be involved in an intervention. The specific requirements of the information to be provided are in line with those of Directive 89/618/EURATOM.

The ANPC is the entity responsible for providing this information. The coordination of the intervention and the evaluation and register of the consequences of a radiological emergency, as well as the effective intervention, are also competences of the ANPC.

In all these proceedings, the ANPC is assisted by DGS, CNER and CNPR (National Commission for Radiation Protection).

In order to be able to give information according to the obligations under the Convention on Early Notification of a Nuclear Accident, of which Portugal is part, and also according to Council Decision no. 87/600/EURATOM, Portugal installed an environmental monitoring network named RADNET, that is managed under supervision of the Portuguese Environment Agency (APA). It has 13 stations (10 in the mainland, 1 in Madeira and 1 in the Azores, and 1 in Talavera La Real, Badajoz, Spain), plus 3 mobile or portable units. Each station includes two Geiger-Müller detectors, one for low levels of radiation (5 to 10 mGy/h) and another for higher values (0,5 to $5x10^3$ mGy/h), enabling a continuous detection of gamma radiation in the air.

Portugal has also a monitoring station installed in Spain, in Talavera La Rael near Badajoz and in "Penhas Douradas" (Serra de Estrela Mountains) is installed one fixed monitoring station of the Spanish monitoring network REVIRA. These stations are used for data comparison and are operational since 1996.

This national detection system is connected to a communication network between the EC and the Member States, through the "European Community Urgent Radiological Information Exchange" ECURIE. Communication about radiological information is exchanged with ECURIE not continuously, but only in case of an emergency. Portugal participates also in the European platforms EURDEP (European Radiological Data Exchange Platform) and RODOS (Real Time On-Line Decision Support for Nuclear Off-site management).

Article 16(3) – Emergency preparedness for Contracting Parties without nuclear installations

Portugal has no nuclear installations as defined in the CNS. The nuclear installation

located nearest to the Portuguese Border is the Almaraz Power Plant in Spain, at a distance of about 100 km from the border. There are no nuclear installations in the immediate vicinity of the border.

Decree 36/80, of May 30th, ratifies a Portugal-Spain agreement specifically covering the matter concerning nuclear installations near the border between the two countries – in a strictly legal approach, however, it should be noted that there are no installations presently that fall under that category and to which, therefore, this agreement could be applied.

The Portugal-Spain agreement reproduces essentially the obligations deriving from the Early Notification Convention.

In 30 of July of 2015, a Bilateral Agreement between the CSN-Consejo Seguridad Nuclear (Spain) and ANPC, APA and IST was signed. This Bilateral Agreement establishes that: all efforts will be done by the authorities to develop mechanisms for fast communication in case of an accident or incident where potential trans-boundary effects may take place. The first meeting took place in the end of the last year.

D. Annexes

1. List of nuclear installations

Portugal only has a research reactor, the Portuguese Research Reactor "RPI".

2. Data on nuclear installations

The RPI is a 1MW pool type Material Testing research reactor. On 21 January 1957, the Portuguese Government gave green light for the acquisition of this equipment and the reactor went operational on 25 April 1961. In the period from 1961 up to now the reactor was almost always operational, with some reduced periods of shutdown. The reactor was formally licensed in 2005 and was converted from HEU to LEU in 2007. The license has been issued for the duration of the present LEU fuel. Recently the RPI underwent a safety assessment by the IAEA under an INSARR mission requested by COMRSIN. The reactor is used for research, education and training. The RPI facility is integrated in the *Campus* Tecnológico Nuclear of Instituto Superior Técnico that is the Engineering School that is part of the University of Lisbon (ULisboa). No incident has ever been detected and reported.

3. Reference to national laws and regulation

All relevant national laws and regulations were mentioned in the report.

4. References to official national reports

The following relevant reports have been mentioned throughout this Report, where appropriate:

- Safety Analysis Report for the core conversion of the RPI (2007).
- Safety Analysis Report of RPI.
- Annual RPI report, (presented to the "Reactor Safety Commission" and subsequently submitted to the regulatory authority COMRSIN. Annual activity report of CTN/IST (including description of RPI safety activities).
- Annual report of CTN/IST on the activities related to the national monitoring system to measure the level of radioactivity in air, water and soil.
- Regulatory Decision 1/2016 of April 4th that enforces the recommendations of the INSARR mission in a prioritized form.

5. References to international review missions

There were no official international review missions.

In August 2002 an inspection was carried out by the European Commission to verify the compliance with the transposition of Directive 96/29/EURATOM, also focusing

on nuclear safety and emergency preparedness issues.

In November 2006, another inspection was carried out by the European Commission, assessing the implementation of prior safety recommendations (following the 2002 inspection) for the RPI and the conclusion of the licensing procedure of the RPI. The emergency measurement network, managed by APA, was also surveyed at this time.

In February 2016 an Integrated Safety Assessment of Research Reactor mission took place at the request of COMRSIN to the IAEA.

E. Related Data

- Diplomatic Conference to adopt CNS: 14-17 June 1994
- Signature by Portugal: 3 October 1994
- National Ratification by Portugal: 19 March 1998
- Deposit of Ratification 20 May 1998
- Entry into force in Portugal 18 August 1998
- Accession of EURATOM 31 January 2000
- Entry into force for EURATOM 30 April 2000
- 1st organizational meeting: 29-30 September 1998
- 1st Review Meeting: 12-23 April 1999
- 2nd organizational meeting: 25-26 September 2001
- 2nd Review Meeting: 15-26 April 2002
- 3rd organizational meeting: 28-30 September 2004
- 3rd Review Meeting: 11-22 April 2005
- 4th organizational meeting: 24-26 September 2007
- 4th Review Meeting *: 14-25 April 2008
- 5th organizational meeting: 29-30 September 2009
- 5th Review Meeting: 4-15 April 2011
- 6th organizational meeting: 30-31 August 2012
- 6th Review Meeting: 24 March- 4 April 2014

(*) Review Meeting without participation of Portugal