

**First National Report by Portugal as Required  
under Article 9.1 of Council Directive  
2009/71/EURATOM  
(July 2014)**

*Regulatory Commission  
For the Safety of Nuclear Installations*

**Report as required under Article 9.1 of Council Directive  
2009/71**

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## **Frequently used Acronyms**

APA	Portuguese Environment Agency (Agência Portuguesa do Ambiente)
BSS	Basic Safety Standards
CNS	Convention on Nuclear Safety
COMRSIN	Regulatory Commission for the Safety of Nuclear Installations (Comissão Reguladora para a Segurança das Instalações Nucleares)
CTN	Campus Tecnológico e Nuclear
DGEG	General Directorate of Energy and Geology (Direcção Geral de Energia e Geologia)
DGS	General Directorate of Health (Direcção Geral da Saúde)
EC	European Commission
EU	European Union
HEU	Highly Enriched Uranium
IAEA	International Atomic Energy Agency
ITN	Nuclear and Technological Institute (Instituto Tecnológico e Nuclear)
IST	Instituto Superior Técnico
JC	Joint Convention
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)
MEC	Ministry of Education and Science, previously Ministry of Science, Technology and Higher Education (Ministério da Educação e Ciência)
RPI	Portuguese Research Reactor (Reactor Português de Investigação)
SAR	Safety Analyses Report

**Report as required under Article 9.1 of Council Directive  
2009/71/EURATOM of June 25<sup>th</sup>**

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**A. Introduction**

This report gives an overview on the present Portuguese nuclear policy, legislation and new measures taken in order to transpose and implement the Nuclear Safety Directive.

Portugal has a single civilian nuclear installation, as defined in the Council Directive 2009/71/Euratom, article 3 (1)(a), a research reactor facility. That being said, and for the sake of transparency and cooperation with European Commission, the present report provides information on the present status of the national regulatory infrastructure related to Nuclear Safety, as well as on the only nuclear facility, the Portuguese Research Reactor (RPI).

The RPI is a pool-type research reactor constructed by the US company AMF Atomics in the late fifties under the US program “atoms for peace”. It is similar to the research reactors HOR in the Netherlands and GRR-1 in Greece, although it operates at a power of only 1 MW. Since February 2012, the RPI is operated by the Instituto Superior Técnico (IST), after the previous operator, the State Laboratory “Instituto Tecnológico Nuclear” (ITN), became part of IST through Decree-Law 29/2012 of February 9<sup>th</sup>. The former ITN is now denominated “Campus Tecnológico e Nuclear” (CTN) and constitutes the 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 that since July 25<sup>th</sup> 2013 is part of the University of Lisbon (ULisboa) as a result of the merge between 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 Education and Science (MEC), which also supervised the former ITN as a State Laboratory.

The President of IST reports directly to the Minister on issues relating to the RPI.

Portugal completed the transposition of the Council Directive 2009/71/EURATOM, of June 25<sup>th</sup> 2009, through the publication of two Decree-Laws, the Decree-Law 30/2012, of February 9<sup>th</sup> and the Decree-Law 262/2012, of December 17<sup>th</sup>, and the nomination by the Prime Minister of the three Commissioners that are the members of the board of the regulatory authority.

The Decree-Law 30/2012 of February 9<sup>th</sup> created the Regulatory Commission for the Safety of Nuclear Installations (COMRSIN) and establishes its attributes and responsibilities. On March 28<sup>th</sup> 2012 the Prime Minister appointed the three commissioners that were assigned the task to build the modus operandi for COMRSIN, compatible with the means that were made available by the government given the financial restrictions imposed on Portugal by the Troika (EU, ECB and IMF).

Among its first tasks, COMRSIN had to propose a legal diploma specifying the obligations of the operators of nuclear installations. This legislation was published in Decree-Law 262/2012, of December 17<sup>th</sup>, which sets up the obligations the license holders for the operation of nuclear installations have to comply to continuously improve their safety under the supervision of the regulatory authority.

With these three important legal changes Portugal transposed the Directive 2009/71/EURATOM and is now in compliance with its requirements.

At present Portugal has no plan for the construction of a nuclear power plant for the production of electricity or, for that matter, any other type of nuclear installation. The sole research reactor can operate with the current LEU fuel until 2016, at which date the reactor has to stop using this fuel in order to return it to the US by the end of 2019 under an agreement between the two countries. No decision has yet been made on the future of the RPI. The RPI runs under a license valid for the current fuel.

## **B. Summary**

Portugal completed the transposition of the Directive 2009/71/EURATOM, of June 25<sup>th</sup> 2009, through the publication of two Decree-Laws, the Decree-Law 30/2012, of February 9<sup>th</sup> and the Decree-Law 262/2012, of December 17<sup>th</sup>, and the nomination by the Prime Minister of the Commissioners that are the members the board of the regulatory authority.

The Decree-Law 30/2012 of February 9<sup>th</sup> created the Regulatory Commission for the Safety of Nuclear Installations (COMRSIN) and establishes its attributes and responsibilities. On March 28<sup>th</sup> the Prime Minister appointed the three commissioners that were assigned the task to implement the COMRSIN *modus operandi*, compatible with the means that were made available by the government given the financial restrictions imposed on Portugal by the Troika (EU, ECB and IMF).

COMRSIN proposes a legal diploma specifying the obligations of the operators of nuclear installations. This legislation was published in Decree-Law 262/2012, of December 17<sup>th</sup>; it sets up the obligations the license holders for the operation of nuclear installations have to comply to continuously improve their safety under the supervision of the regulatory authority.

With these three important changes Portugal is now in compliance with directive 2009/71/EURATOM.

The present report is designed to be a stand-alone, complete and transparent report. Emphasis will be made on the changes that have taken place since the 2009/71/Euratom Directive and on the difficulties that we face at present to implement the international requirements for a regulatory authority on nuclear safety in a way that is commensurable with the dimension of the Portuguese nuclear program.

In the mean time, Portugal has also transposed the 2011/70/Euratom directive, of July 19<sup>th</sup> 2011, which sets the community framework for the responsible and safe management of spent fuel and radioactive waste through the publication of Decree-Law 156/2013 of November 5<sup>th</sup>. COMRSIN has its attributes enlarged to accommodate this new responsibility.

## **C. Reporting Article by Article**

### **Article 4 – Legislative, regulatory and organizational framework**

As mentioned in the introduction, Portugal has a pool-type research reactor, with 1 MW power, which is installed in the campus of CTN/IST, under the direct control of the President of IST who may delegate on the Vice President for CTN/IST. Fresh and spent fuel storage is included in the RPI facility, although at present there is no spent fuel in storage. Since the beginning of the RPI operation in 1961 and up to now no incident has been ever detected or reported.

Given that the risks associated with the operation of the RPI are considerable smaller than those resulting from a nuclear power plant (NPP) for the production of electricity, and that Portugal has no plan to even consider the construction of a NPP, we have taken a graded approach to the transposition of Directive 2009/71/Euratom. It was, therefore, considered inappropriate to build a complex legal system like the one existing, for example, in our neighboring Spain together with an oversized regulatory body to oversight a nuclear program based on a 1 MW research reactor. Nevertheless, Portugal has the necessary legal framework to make sure that the operator of the RPI runs a safe operation, complies with Portuguese law and IAEA recommendations.

Portugal created for the first time a regulatory body to overlook the safety of nuclear installations “Comissão Reguladora para a Segurança das Instalações Nucleares” (COMRSIN) through Decree-Law 30/2012 of February 9<sup>th</sup>. COMRSIN has 3 commissioners appointed by the Prime Minister for periods of five years. COMRSIN proposed the Decree-Law 262/2012 of December 17<sup>th</sup> that sets the obligations of operators of nuclear installations to continuously improve their safety under the supervision of the regulatory authority, including the obligation to operate under a valid license.

COMRSIN operates with the administrative support of the Ministry of Education and Science, but it is deemed independent from any other body in terms of regulatory decisions.

Portugal has ratified the Convention on Nuclear Safety (CNS) and the Joint Convention (JC).

**Article 4.1.a** COMRSIN is responsible for proposing nuclear safety requirements. The Government approves them after discussing with Science, Health, Environment, and Industry ministries.

**Article 4.1.b** Both Decree-Law 30/2012 and Decree-Law 262/2012 state clearly that nuclear installations cannot operate without a valid license. The only nuclear installation we have has a valid license for operation with the current LEU fuel. COMRSIN is solely responsible for issuing new licenses and change, suspend or revoke the present one in case the safety of the RPI is in any way compromised. The Decree-Law 262/2102 establishes fines for operators that operate without a valid license.

**Article 4.1.c** The supervision of a nuclear installation is done through announced and unannounced visits and inspections as well as through constructive dialog with IST, the operator of the RPI. The CTN/IST has substantial experience on nuclear science and technology, including nuclear safety and radiologic protection. Nevertheless, their role as TSO for COMRSIN on nuclear regulatory issues is limited because they are themselves operators.

**Article 4.1.d** COMRSIN under Decree-Law 30/2012 and Decree-Law 262/2012 has the legal power to enforce measures that are meant to improve nuclear safety, either through constructive dialog with the operator or through the application of fines depending of the severity of the offense. In extreme cases the license may be suspended, revoked or not renewed until corrections are made.

**Article 4.2** Given the nature of the nuclear installation we are dealing with in Portugal, i.e., a 1 MW research reactor operated by an engineering faculty and run by a staff of about 25 people, some of which with a PhD in physics or engineering, we feel that COMRSIN can do this through regular visits and constructive dialog with the operator and the operation team.

## **Article 5 – Competent regulatory authority**

Through Decree-Law 30/2012 of February 9<sup>th</sup> the competences of COMRSIN are:

- a) Promote the development of legislation and regulations in the field of nuclear safety, aiming at 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 high standards of nuclear safety and preserving and promoting the 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 Nuclear Non-Proliferation Treaty and the Additional Protocol.

**Article 5.1** There is in Portugal one single regulatory authority. The COMRSIN has been in place since the appointment of the three commissioners in March 28<sup>th</sup> 2012. As mentioned above, COMRSIN has been legally structured in Decree-Law 30/2012 as an independent body, although operating under the administrative support of the Ministry of Education and Science, but it is deemed independent from any other body in terms of regulatory decisions.

**Article 5.2** COMRSIN is functionally separate from any other body or organization concerned with the promotion, or utilization of nuclear energy, which is nevertheless non-existent. It is also functionally separate from IST, the operator of the only nuclear installation in the country.

**Article 5.3** COMRSIN, due to limitations imposed on the Portuguese government by the Troika, given the financial crises of the last three years, is not a legal body with administrative and financial independence, since it has to use the administrative support of the Secretaria Geral of the Ministry of Education and Science (SG/MEC). Therefore our budget, staff and legal matters are managed through SG/MEC within a framework of constructive dialog between the President of COMRSIN and the Director General of SG/MEC. We expect this situation to be temporary and last until the end of 2014 mid 2015. COMRSIN has sufficient financial resources but lacks legal and technical expertise at the level of

staff members. The situation is in the process of being resolved but is still pending authorization from the Ministry of Finance. Therefore, by the end of 2015 we expect to have up to five staff members covering all required legal and technical expertise. We expect a few of them to have a PhD in nuclear physics or engineering as well as an expert on nuclear law.

We also expect by that time to become a fully independent body with administrative and financial autonomy. From the financial view point the budget for COMRSIN is below 100k€, but as staff members are hired it will rise to 1M€ by the end of 2015, particularly if the commissioners get paid for the job they perform, instead of being appointed without any financial compensation at the present time. This means that they have to get permission from their respective civil service employer to perform an additional task to the one they already have.

Due to conflict of interest in the field of nuclear safety COMRSIN cannot depend on CTN/IST as a TSO, although they have some of the most competent nuclear science and engineering experts in the country. Given the limited number of experts in Portugal one cannot segregate within CTN/IST experts for COMRSIN alone and others for CTN/IST as operator of the RPI. Therefore most of the tasks fall on the Commissioners at present.

**Article 5.3.a** COMRSIN proposed and got approved by the government Decree-Law 262/2012 that sets the obligations of operators of nuclear installations to continuously improve their safety under the supervision of the regulatory authority, including the obligation to operate under a valid license. The Decree-Law 262/2012 establishes that CTN/IST has one year, after the entry in force of the Decree-Law, to demonstrate to COMRSIN that it is complying with all the obligations set in that Decree-Law. COMRSIN just finished reviewing all operating, managing procedures and internal regulations and protocols and issued a report suggesting improvements and posing some questions, in order to ensure that the operator is fulfilling the obligations established by this Decree-Law.

**Article 5.3.b.c.d** Decree-Law 262/2012 has a number of provisions through which COMRSIN may enforce the license holder to demonstrate how it meets the nuclear safety requirements, verify, by assessment and inspection, that the operator continuously improves safety and has a management system that gives due priority to nuclear safety. As a regulatory body undergoing an installation process with limited number of resources, we do not have many examples to demonstrate our enforcing capacity but we can say that relations with the operator have been cordial, constructive and professional. We have access to the operation manuals and protocols, to the maintenance schedules and yearly reports, to the radiologic protection reports, to the managing

structure and to the emergency procedures. All these items have been recently evaluated, including the safety analyses report (SAR). The Decree-Law 262/2012 imposes fines when faults or problems are detected; the regulatory authority has the competence to impose a shut down of the reactor, revoke a license on a temporary or permanent basis.

## **Article 6 – License holders**

Decree-Law 262/2012 that entered into force on December 17<sup>th</sup> 2012, follows IAEA safety criteria and foresees the following obligations:

- 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.
- The operator is responsible for the safe management of the fuel and of the radioactive waste, including the waste in storage or elimination facilities.
- The operator has to have the human, material and financial resources that are adequate to the safe operation of the installation.
- 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.
- 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 decision making processes are based on the graded approach, an emergency plan, a maintenance plan and a safety analyses report, all of which have to be submitted to the regulatory authority for approval.
- The operator has the prime responsibility for the periodic safety review of the installation and for the continuous improvement of safety.
- The research reactors operators, in addition, are obliged to create and maintain a “Safety Commission” that is independent from the management and operator teams.
- In the specific case of the RPI, IST/CTN must have a Safety Analysis Report (SAR), which will be subject to validation by COMRSIN at the time of the first certification of compliance with Decree-Law 262/2012. In the SAR the operator has to show that the operation complies with the international good practices recommended by 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 dismantling procedures.

- The operator is required to update the SAR whenever it considers necessary or if requested by COMRSIN.
- Besides the SAR, each year the operator presents an annual report to the regulatory authority, which in the case of a research reactor is previously submitted and analyzed by the “Safety Commission”. COMRSIN has the right to inspect the facility at any time, announced or non-announced.
- 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.
- The operator has the duty of notifying COMRSIN of any modification or of any event occurred in the nuclear installation relevant to the safety.

COMRSIN has recently review all documents and procedures related to management, operation and radiological control of RPI, as well as the SAR. COMRSIN has issued some recommendations and raised a few questions that need to be clarified by the operator. Nevertheless IST now and the former ITN before have an excellent safety record on the operation of the RPI.

Concerning the funds to buy new fuel or decommissioning the RPI, the Decree-Law 29/2012 of February 9<sup>th</sup> states that funds for both matters will be provided by the Government in due time.

As mentioned recently in the sixth CNS report by Portugal, the updating of the Portuguese legislation in the sector of radiological protection and radioactive waste, not directly associated with a nuclear installation, and in particular in connection with the transposition of the EU BSS Directive 96/29/Euratom and EU Directive 97/43/Euratom, took place through several Decree-Laws which were subject to partial revisions and tacit derogations. Hence, it remains cumbersome to have a clear picture of the specific legislation currently in force. A major step in clarifying the legal framework related to the safe management of radioactive waste and spent fuel was taken recently by the transposition of Directive 2011/70/EURATOM of July 19<sup>th</sup> through Decree-Law 156/2013 of November 5<sup>th</sup> which, as mentioned before, attributes to COMRSIN the regulatory authority on these matters. Further improvement may come when the recent BSS directive gets transposed to Portuguese law.

## **Article 7 – Expertise and Skill in nuclear safety**

COMRSIN, together with other stake holders and other competent authorities, has the responsibility to prepare 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.

Given that the regulatory authority is still in an installation process, we report here on how the operator IST trains its staff member on nuclear safety related issues.

Only personnel properly trained and qualified are authorized to operate the RPI. The operating personnel must be competent to perform their assigned work and understand the safety consequences of their actions. All licensed operators at the facility shall participate in an approved operator requalification program as the condition for their continued assignment to operator duties. The Manager organizes annual training programs and tests every three years. The content and calendar of the tests is approved by the President of IST or the Vice-President for CTN/IST.

The RPI personnel shall receive training on the Internal Emergency Plan of the RPI and its supporting documentation and on the basic skills to apply in emergency scenarios as appropriate. Drills and exercises shall be used to complement the training and, at the same time, monitor the readiness of emergency equipment and response capabilities. Emergency exercises shall be held regularly according to the time schedules appropriately defined.

Reactor Operators undergo a formal training course that includes theoretical and practical classes on Radiological Protection and Radiation Detection, covering the aspects set forth in Decree-Law 167/2002. At the end of the semester the trainees have a written examination, followed by an interview to discuss the results of the evaluation. In the second semester the different systems of the reactor are introduced through a three-step approach: Classroom introduction of the system (ventilation, water treatment, control system, etc.); Facility walkthroughs, in operating and non-operating conditions; Chores or guided work in small groups.

The actual on-the-job training is performed in the following two semesters. The trainees are gradually introduced in the operation of the reactor, under the supervision of a senior operator. At the end of the fourth semester there is a written examination on the facility and a practical examination.

## **Article 8 – Information to the public**

Information to the public is at present given through a COMRSIN website both in Portuguese and English: [www.comrsin.pt](http://www.comrsin.pt). The website is still under construction and contains already a number of documents explaining the attributes and responsibility of the regulatory authority.

The operator IST also has a website [www.itn.pt/sec/rpi/](http://www.itn.pt/sec/rpi/), but information is oriented towards research and services. The COMRSIN in its recent review has advised IST to make a public oriented website where safety related information is given to the public.

COMRSIN is planning on having a press release sometime until the end of the year, when its website has gained more information.