



**REPUBLIC OF CROATIA**

**CROATIAN REPORT ON NUCLEAR SAFETY**

**1<sup>ST</sup> CROATIAN NATIONAL REPORT ON THE  
IMPLEMENTATION OF THE COUNCIL DIRECTIVE  
2009/71/EURATOM**

**of 25 June 2009  
establishing a Community framework for the nuclear safety of  
nuclear installations**

Zagreb, July 2014

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## **1. INTRODUCTION**

After joining EU in 2013 the Republic of Croatia adopted all the relevant EU legislative, including the Council Directive 2009/71/EURATOM of 25 June 2009, establishing a Community framework for the nuclear safety of nuclear installations. According to the Article 9. of this Directive, Croatia submits First Croatian National Report on the Implementation of the Council Directive 2009/71/EURATOM.

Today Croatia has no nuclear installations on its territory. In the early eighties of the last century state power utilities of Croatia and Slovenia constructed the Krško nuclear power plant (Krško NPP) on the territory of the Republic of Slovenia. Presently, two states share the nuclear liability and the ownership of the Krško NPP. In March 2003 the Agreement between the Government of the Republic of Croatia and the Government of the Republic of Slovenia on regulation of status and other legal relations regarding the investment, use and dismantling of Nuclear Power Plant Krško was signed.

Concerning Krško NPP licensing and operation, the Croatian regulatory body was the authority competent to provide appropriate consents. Nowadays, the Croatian regulatory body does not play any role concerning this issue. The Slovenian regulatory body, Slovenian Nuclear Safety Authority, is in charge to license Krško NPP operators, to review operation and modifications as well as to carry out regulatory inspections.

Croatia does not have intention to build a nuclear power plant in the short term period, although Croatian Energy Strategy foresees the possibility for construction of the first NPP in Croatia after 2020. At this moment there is no plan to include sites for nuclear power plants in the general land use plan of the Republic of Croatia.

## **2. COMPLIANCE WITH CHAPTER 2, ARTICLES 4.–9. OF THE DIRECTIVE**

### ***2.1. Article 4. Legislative, regulatory and organisational framework***

The Act on Radiological and Nuclear Safety (141/13) establishes measures for safety and protection against ionising radiation and measures for physical protection in performing nuclear activities and practices involving sources of ionising radiation, with the aim of ensuring adequate protection of individuals, society and the environment, in the present and in the future, from harmful effects of ionising radiation, and ensuring the safe performance of practices involving ionising radiation sources, nuclear activities, radioactive waste disposal and the physical protection of ionising radiation sources and nuclear facilities.

This Act contains provisions that are aligned with the following acts of the EU:

- Regulation of the Council (Euratom) No 1493/93 of 8 June 1993 on

- shipments of radioactive substances between Member States (Official Journal 148, 19.6.1993),
- Commission Regulation (Euratom) No 302/2005 of 8 February 2005 on the application of Euratom safeguards (OJ 54, 28.2.2005),
  - Commission Regulation (Euratom) No 66/2006 of 16 January 2006 exempting the transfer of small quantities of ores, source materials and special fissile materials from the rules of the chapter on supplies (OJ 11, 17.1.2006),
  - Council Directive No 89/618/Euratom of 27 November 1989 on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency (OJ 357 , 7.12.1989),
  - Council Directive No 90/641/Euratom of 4 December 1990 on the operational protection of outside workers exposed to the risk of ionizing radiation during their activities in controlled areas (OJ 349, 13.12.1990),
  - Council Directive No 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation (OJ 159, 29.6.1996),
  - Council Directive No 97/43/Euratom of 30 June 1997 on health protection of individuals against the dangers of ionizing radiation in relation to medical exposure, and repealing Directive 84/466/Euratom (OJ 180, 9.7.1997),
  - Council Directive No 2003/122/Euratom of 22 December 2003 on the control of high-activity sealed radioactive sources and orphan sources (OJ 346, 31.12.2003),
  - Council Directive No 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel (OJ 337, 5.12.2006),
  - Council Directive No 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations (OJ 172, 2.7.2009),
  - Council Directive No 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste (OJ 199, 2.8.2011).

The following legislation is based on the 2013 Act:

1. Ordinance on the scope and content of the plan and programme of measures in the event of an emergency and informing the public and competent bodies (O.G. 123/2012),
2. Ordinance on the supervision and control of transboundary shipments of radioactive waste and spent fuel (O.G. 11/2013),
3. Ordinance on the physical security of radioactive sources, nuclear material and nuclear facilities (O.G. 38/2012),
4. Ordinance on the conditions and measures of ionizing radiation protection for

- performing operations involving radioactive sources (O.G. 41/2013),
5. Ordinance on measurement of personal doses, examination of ionising radiation sources and working conditions, and on reports and registers (O.G. 41/2012 and 89/2013),
  6. Ordinance on authorisations and licences for use and movement of ionising radiation sources (O.G. 71/2012 and 89/2013),
  7. Ordinance on the authorisation of expert technical services to carry out professional tasks of protection against ionising radiation (O.G. 72/2011),
  8. Ordinance on the training required for handling ionising radiation sources and the implementation of measures for protection against ionising radiation (O.G. 63/2011),
  9. Ordinance on medical requirements to be fulfilled by exposed workers and apprentices and students undergoing training or education for working with ionising radiation sources (OG 80/2013)
  10. Ordinance on dose limits (O.G. 59/2013),
  11. Ordinance on the official identity card and badge of the radiological and nuclear safety inspector (O.G. 28/2011),
  12. Ordinance on the environmental monitoring of radioactivity (O.G. 121/2013),
  13. Regulation on measures for protection against ionising radiation and interventions in case of emergency (O.G. 102/2012) (promulgated by Croatian Government based on SORNS proposal).

Currently a number of ordinances and regulation supervised from some previous acts still remain in force, until the new ones are promulgated and issued by the director of the SORNS pursuant to the Act. These ordinances are as follows:

1. Ordinance on conditions for nuclear safety and protection with regard to the siting, design, construction, use and decommissioning of a facility in which a nuclear activity is performed (O.G. 71/2008),
2. Ordinance on performing nuclear activities (O.G. 74/2006),
3. Ordinance on the special conditions for authorisation of legal entities to perform specific expert practices in the field of nuclear safety (O.G. 74/2006),
4. Ordinance on the method of removal of radioactive contamination, disposal of the radioactive source or undertaking other indispensable measures in order to reduce the damage to people and the environment or eliminate further threats, hazards or damages (O.G. 53/2008),
5. Regulation on conditions and method of disposal of radioactive waste, spent sealed radioactive sources and ionising radiation sources which are not intended for further use (O.G. 44/2008).

Based on the Croatian Constitution, all the announced and ratified international treaties also form an integral part of the Croatian legislation and can be applied directly. So the following international legal instruments, to which Croatia is a party, should be mentioned as a part of Croatian legislative framework:

- Vienna Convention on Civil Liability for Nuclear Damage,
- Convention on the Physical Protection of Nuclear Material,
- Convention on Early Notification of a Nuclear Accident,
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency,
- Convention on Nuclear Safety,
- Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention,
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

Also related to SORNS is:

1. Ordinance on the conditions and procedure for issuing and withdrawing the approval for packagings used for transport of radioactive nuclear materials (O.G. 42/2013) (promulgated by SORNS on the basis of Dangerous Goods Transport Act (O.G. 79/2007).

All this legislative is fully harmonized with EU treaties, regulations and directives.

Also, as a part of Croatian legislative framework it is worth to mention the bilateral agreements with Slovenia and Hungary on the early exchange of information in the event of a radiological emergency as it is recommended by the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency.

## **2.2. Article 5. Competent regulatory authority**

State Office for Radiological and Nuclear Safety (SORNS) is founded by the Act on Radiological and Nuclear Safety as an independent regulatory authority responsible for activities relating to radiological and nuclear safety and security and cooperation with relevant international institutions. The SORNS reports directly to the Government of the Republic of Croatia and the Director of SORNS has been appointed by the Government. The SORNS is funded from the state budget only.

In the field of nuclear safety, the SORNS is dealing with regulatory, inspection and technical tasks, tasks related to the early exchange of information in case of nuclear emergencies, assistance in the event of a nuclear accident, international co-operation in the field of nuclear safety, safety of nuclear facility, trade, transport and handling of nuclear materials, accounting for and control of all nuclear facilities and materials, physical protection of nuclear facilities and materials, expert assistance in activities for preventing illicit trafficking in nuclear material, liability for nuclear damage, quality assurance and other tasks defined in positive legislation.

Besides the General Affairs Division, the SORNS is divided into two sectors: Radiological Protection and Nuclear Safety and Inspection. Currently the SORNS

has 24 employees and according to the systematisation total number is 50 employees (Figure 1)

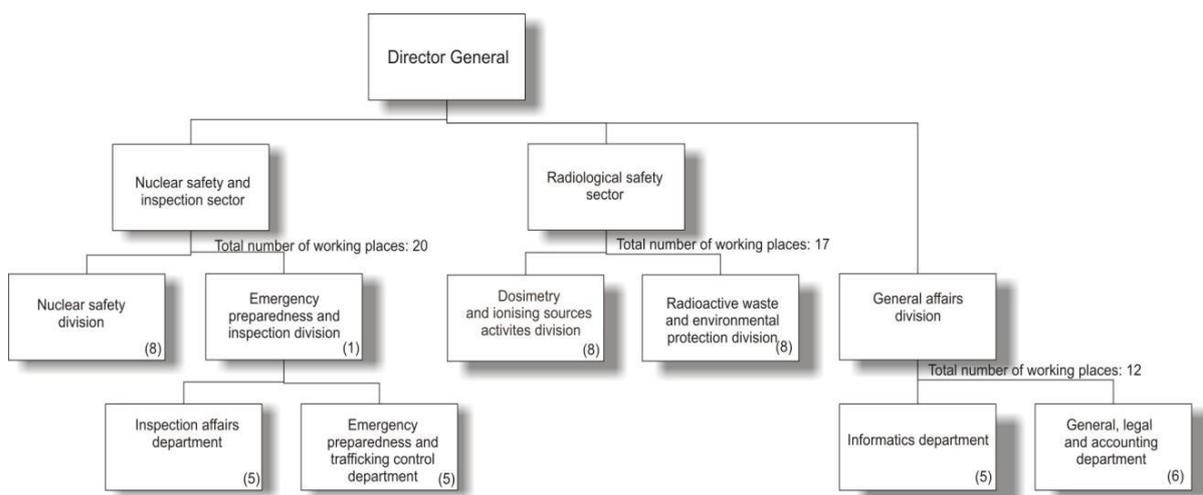


Figure 1: Organizational scheme of SORNS

For the purpose of implementing measures for nuclear safety and protection against ionising radiation SORNS performs the following tasks:

1. approve performance of nuclear operations
2. approve performance of operations involving sources of ionizing radiation
3. approve procurement, import, export, transport and transit of ionizing radiation sources
4. approve use of ionizing radiation sources
5. conduct independent safety analyses and issue decisions or approvals regarding the location, design, construction, use and decommissioning of an installation in which a nuclear operation should be performed
6. take part in the procedure for issuing location permits and building permits and in the procedure for issuing use permits for structures that accommodate ionizing radiation sources or in which operations involving ionizing radiation sources are carried out in accordance with a special regulation
7. approve and supervise professional activities of authorised professional technical services and authorised nuclear safety experts
8. organise and supervise, and where necessary also carry out tests on the presence of the type and intensity of ionizing radiation in the environment, food, feed and general use items under regular conditions and in cases of suspected emergency
9. keep records on the licences, approvals, decisions and certificates which it has issued within the scope of its authority, and keep and supervise registers on ionizing radiation sources, holders of approvals for performance of operations involving ionizing radiation sources and nuclear operations,

- beneficiaries, exposed workers, levels of irradiation of exposed workers and levels of irradiation of persons subject to medical exposure and of other persons
10. conduct inspection activities related to supervision of implementation of the provisions of this Act and regulations adopted on the basis thereof
  11. develop technical platforms for training curricula and programmes for regular and additional education as well as for refreshment of knowledge in the field of radiological safety
  12. ensure expert assistance in the implementation of the regulation on the measures for protection against ionizing radiation and interventions in emergency cases
  13. inform the media, competent bodies, organisations, associations and international institutions on emergencies connected with ionizing radiation sources
  14. provide expert assistance and cooperation in activities aimed at preventing illicit trafficking in nuclear and other radioactive material to state administration bodies competent for such activities
  15. monitor safety conditions at nuclear power plants in the region and conduct assessments of the threat of nuclear accidents in those plants, in particular in the Krško Nuclear Power Plant in Slovenia and Paks Nuclear Power Plant in Hungary
  16. provide dosimetric assessments of the exposure to ionizing radiation of exposed workers, of the population subject to medical exposure and exposure to ionizing radiation originating from environmental radionuclides
  17. fulfil the commitments which the Republic of Croatia has assumed according to international conventions, contracts and agreements pertaining to the protection against ionizing radiation, nuclear safety, nuclear damage and the application of protective measures aimed at non-proliferation of nuclear weapons
  18. cooperate with international and national organisations and societies active in the area of radiological and nuclear safety, and appoint its own expert representatives to take part in the work of such organisations and societies or to monitor their work
  19. coordinate technical cooperation with the International Atomic Energy Agency for all the participants from the Republic of Croatia
  20. stimulate and support scientific research and development activities, encourage development, statistic and other research in accordance with demands and requirements pertaining to the development of radiological and nuclear safety in the Republic of Croatia
  21. issue instructions for the implementation of international recommendations and standards, and design standards and methods for monitoring the state of

radiological and nuclear safety

22. perform management of the central storage installation

23. carry out other activities falling under its competence pursuant to this Act, regulations adopted on the basis thereof and other regulations.

Inspectional supervision over the implementation of this Act and subordinate legislation adopted on the basis thereof shall be performed in the first instance by the inspectors for radiological and nuclear safety of the SORNS (hereinafter referred to as: the inspectors). Against a first-instance decision issued by an inspector an appeal may be filed to a special commission whose members shall be appointed by the Government of the Republic of Croatia, and an administrative dispute may be initiated against a second-instance decision.

The Office, as a state administration body, shall be competent for activities pertaining to radiological and nuclear safety and shall perform activities pertaining to storage of radioactive waste and disused sources originating from the territory of the Republic of Croatia in the central storage installation.

According to the Regulation on Measures for Protection Against Ionising Radiation and Interventions in Case of Emergency (O.G. 102/2012) SORNS:

1. State Office for Radiological and Nuclear Safety designates the areas/zones for implementing urgent protection and rescue measures and threat perimeters based on the Republic of Croatia's Risk Assessment for threat categories I and II,
2. identifies the List of facilities that fall under threat category III in the territory of the Republic of Croatia,
3. in case of threat categories III, IV and V, in line with the scope of the emergency and situation on the site of the emergency, sets out and implements urgent protection and rescue measures and required interventions,
4. in case of threat categories I and II, proposes to the Government of the Republic of Croatia temporary or permanent relocation of population,
5. sets out decontamination of persons, as well as buildings, agricultural, public and other areas and other environmental remediation measures in the area affected by the consequences of an emergency,
6. in case of an emergency assesses the need for carrying out extraordinary measurements for the purpose of monitoring environmental radioactivity,
7. carries out information of public, international organisations, neighbouring countries and European Commission on emergencies.

According to The Dangerous Goods Transport Act SORNS:

1. issues the approval for packaging for the carriage of radioactive substances and nuclear material,
2. issues the authorisation for the carriage of radioactive substances and nuclear material.

The Regulation of the Government of The Republic of Croatia from 2012 defined the structure and the total number of posts in SORNS as 50. This number was not reached at the beginning. Also, drain of personnel was high in this period, but recently SORNS employed five new experts what significantly improved its performance. Total number of employees in SORNS today is 24, that is 48 per cent of planned number. Besides this, seven young engineers are temporarily employed as a support and we expect some more employments in near future, but exact timeframe is still not known. Currently, all the jobs that have to be performed are rearranged among existing SORNS personnel.

For the purpose of providing assessments of the state of radiological and nuclear safety in the Republic of Croatia and for the purpose of overseeing the work of the State Office for Radiological and Nuclear Safety in the area of performance of activities of storage of radioactive waste and spent sources originating from the territory of the Republic of Croatia in the central storage facility, the Council for Radiological and Nuclear Safety is established as an advisory body of the Croatian Parliament.

The Council carries out the following activities:

- a) gives opinion on proposed acts regulating radiological and nuclear safety, proposed subordinate legislation to be adopted pursuant to the provisions of this Act, as well as other subordinate legislation necessary for its implementation,
- b) submits proposals and opinions to the Croatian Parliament regarding:
  - the state of radiological and nuclear safety in the Republic of Croatia,
  - the development strategy for nuclear safety,
  - the organisation of nuclear and radiological safety in the Republic of Croatia,
  - international cooperation in the area of nuclear and radiological safety,
  - in particular accession to and implementation of international treaties in this area,
  - other aspects of nuclear and radiological safety in the Republic of Croatia,
  - gives opinion and proposes ways to improve the performance of the disposal of radioactive waste and spent sources originating in the territory of the Republic of Croatia.

The Council has seven members, one of whom is a president.

Current situation is that the Council members are still not appointed by the Parliament.

### **2.3. Article 6. Licence holders**

A nuclear installation shall not be constructed, tested, commissioned or used in any other way unless all the approvals and licences pursuant to the Act on Radiological and Nuclear Safety have been issued by the SORNS.

The holder of a use permit for the nuclear installation is responsible for nuclear safety of the installation, including safety when handling radioactive substances, radioactive waste or spent nuclear fuel located or generated in the aforementioned installations.

The list of documents which, in the procedure of issuance of the approval, prove that the conditions stipulated by this Act are fulfilled, is prescribed in an ordinance issued by the director of the SORNS. The approval shall be issued for a maximum period of ten years.

Selection of an area for the location of a nuclear installation shall be carried out on the basis of a special safety analysis, which shall be used to assess the following:

- all the factors in the area where a nuclear installation should be located which may affect nuclear safety of the installation during its operating lifetime, and
- effects of the operation on the population and the environment.

The list of factors in the area selected for the location of a nuclear installation that may impact nuclear safety and the detailed content and scope of the analysis shall be stipulated in an ordinance issued by the director of the SORNS in cooperation with the minister in charge of environmental protection.

Along with the application for issuing a location, building and use permit for a nuclear installation, the legal person intending to construct the nuclear installation must submit an approval issued by the director of the SORNS.

Construction of the installation shall include the following:

- construction, reconstruction and decommissioning of a nuclear installation,
- execution of construction works which affect nuclear safety in an area of limited use due to a nuclear installation.

Nuclear safety criteria for issuance of the approval for the construction of a nuclear installation shall be prescribed by the director of the SORNS.

Along with the application for issuing the approval mentioned before, the legal person intending to construct a nuclear installation shall, in addition to the project documentation, submit a preliminary safety report and the opinion of an authorised nuclear safety expert on the nuclear safety measures for the construction or decommissioning of the installation.

Also, the legal person intending to construct a nuclear installation shall ensure that the preliminary safety report is amended should any changes of the status referred to by the preliminary safety report arise in the course of construction of the installation or during the period of its trial operation.

The SORNS shall approve the preliminary safety report. Details of the content of the project documentation and the preliminary safety report shall be prescribed in an ordinance issued by the director of the SORNS.

Along with the safety report the investor shall submit a physical protection plan as

a separate and confidential document in accordance with regulations on confidentiality of information.

Prior to its putting into regular operation, every nuclear installation must undergo a period of trial operation. In order to start a period of trial operation of a nuclear installation, it shall be necessary to obtain the approval from the director of the SORNS. Also, along with an application for obtaining the approval to start the period of trial operation, it shall be necessary to submit the final safety report and the opinion of an authorised nuclear safety expert on the nuclear safety measures and other prescribed documentation. The final safety report and other submitted documentation shall be approved by the director of the SORNS in the procedure of issuing the approval to start the period of trial operation.

The SORNS may withdraw the approval for performance of nuclear operations if it has established that the licence/approval holder or beneficiary does not meet the requirements prescribed by this Act and subordinate regulations adopted on the basis thereof.

The holder of the approval and the beneficiary are responsible for the implementation of radiological and nuclear safety measures and bear costs of their implementation.

#### ***1.4. Article 7. Expertise and skills in nuclear safety***

Throughout the operating lifetime of a nuclear installation, the holder of the approval must ensure a sufficient number of qualified workers with suitable education, training and additional training for performance of all activities carried out in a nuclear installation and for implementation of nuclear safety measures.

The activities and tasks pertaining to the management of technological processes in a nuclear installation and to the supervision of such management shall be carried out by workers who meet the requirements related to professional qualifications stipulated in an ordinance issued by the director of the SORNS.

The holder of the approval for a nuclear installation must ensure regular refreshment of professional knowledge of qualified workers and check their competency.

#### ***1.5. Article 8. Information to the public***

As Croatia has no nuclear installations on its territory, there are no workers performing nuclear activities. Nearest to the territory of the Republic of Croatia are Krško NPP (PWR, 707 MWe, Slovenia) and Paks NPP (VVER, 4x440 MWe, Hungary). Krško NPP is situated 10.6 km from the western border, and Paks NPP 74.1 km from the northern border. Samobor (population around 15.000) is 22 km distant from Krško to the south-east, Zaprešić (population around 23.000) 24 km,

and Zagreb (population around 1.000.000) 38 km. Beli Manastir (population around 11.000) and Osijek (population around 150.000) are 90 and 120 km away respectfully from Paks NPP to the south.

Even though it is not located on Croatian territory, Krško NPP is proclaimed as Threat Category I (According to IAEA Threat categorisation) because of proximity to Croatian territory. Presently Croatia and Slovenia share the nuclear liability and the ownership of the Krško NPP.

Consequently, information to the population in relation to the regulation of nuclear safety, and especially on protection and rescue measures in case of an emergency, shall be the duty of all participants in the emergency response system in accordance with their competences. Education shall be focused on basic facts about radioactivity and its effects on human beings and on the environment, on various types of radiological hazards and their consequences for the general public and the environment, on extraordinary measures envisaged to alert, protect and assist the general public in the case of a radiological hazard.

The population that could be affected by the consequences of a particular emergency shall, without submitting a request, be provided information on the protection and rescue measures intended for them and on actions they should take in case of such an emergency. Information shall be permanently available to the general public and updated and circulated regularly and in case of significant changes. Information to the public and media representatives on the occurred emergency under threat category I and II and on potential hazards and required protection and rescue measures shall be implemented without delay by the National Protection and Rescue Directorate in co-operation with SORNS.

Information to the public and media representatives on the occurred emergency under threat category III, IV and V and on hazards and potentially required protection and rescue measures shall be implemented without delay by SORNS.

The distribution of calendars with children's artistic works on the subject of power plants and the influence of energy sector on the environment is also important to mention as one of the SORNS' activities for informing of the population in the Urgent Protective Action Planning Zone (UPZ) about the Croatian Emergency Preparedness System. Additional information about the possible protective measures is given in the calendar. The calendar itself is distributed among all primary-school pupils of the UPZ.

## **2.6. Article 9. Reporting**

Croatia submits the first report to the Commission in the timeframe requested by Article 9 of Directive 2009/71/EURATOM.