



Republic of Croatia

Report to the Xth Review Meeting of the Convention on Nuclear Safety



Zagreb, June 2025

Acronyms, Abbreviations, and Definitions

Term	Meaning, Definition
ARTEMIS	Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (performed by the IAEA)
AZOP	Personal Data Protection Agency
CNS	Convention on Nuclear Safety
CP	Contracting Party
CPD	Civil Protection Directorate
DS	Disused Sources
EU	European Union
ENSREG	European Nuclear Safety Regulators Group
Fund	Fund for Financing the Decommissioning of the Krško NPP and the Disposal of Krško NPP Radioactive Waste and Spent Nuclear Fuel
HAKOM	Croatian Regulatory Authority for Network Industries
HERCA	Heads of the European Radiological Protection Competent Authorities
IAEA	International Atomic Energy Agency
IMROH	Institute for Medical Research and Occupational Health
IRRS	Integrated Regulatory Review Service (performed by the IAEA)
LILW	Low and Intermediate Level Waste
Mol	Ministry of the Interior
NPP	Nuclear Power Plant
OG	Official Gazette
OG IA	Official Gazette - International Agreements
NI	Nuclear installation
NR	National Report
PWR	Pressurized Water Reactor
RBI	Ruder Boskovic Institute
RM	Review Meeting
RW	Radioactive waste
RWMC	Centre for Radioactive Waste Management
SNF	Spent nuclear fuel
SORNS	State Office for Radiological and Nuclear Safety
SRUUK	Early Warning and Crisis Management System
VVER	Vodo Vodnoj Energetičarskij Reaktor
WAC	Waste Acceptance Criteria



Table of Contents

Introduction	2
Summary	4
PART A: GENERAL PROVISIONS	6
Article 6: Existing Nuclear Installations	7
PART B: LEGISLATION AND REGULATION.....	8
Article 7: Legislative and Regulatory Framework	9
7.0 Introduction	9
7.1 Establishing and Maintaining a Legislative and Regulatory Framework.....	9
7.2 Provisions of the Legislative and Regulatory Framework	12
Article 8: Regulatory Body	14
8.1 Establishment of the Regulatory Body.....	14
8.2 Status of the Regulatory Body	16
Article 9: Responsibility of the Licence Holder	18
PART C: GENERAL SAFETY CONSIDERATIONS.....	19
Article 10: Priority to Safety	20
Article 11: Financial and Human Resources	21
11.1 Financial Resources.....	21
Article 12: Human factors	23
Article 13: Quality assurance	24
Article 14: Assessment and verification of safety	25
Article 15: Radiation Protection	26
Article 16: Emergency Preparedness	28
16.3 Emergency Preparedness for Contracting Parties Without Nuclear Installations	28
PART D: Safety of installations.....	33
Article 17: Siting	34
Article 18: Design and construction	35
Article 19: Operation.....	36
Annexes	37
Annex A References	38
Annex B List of legal documents within the Croatian legislative and regulatory framework ...	40
National Legal Framework	40
Multilateral Agreements	42



Bilateral Agreements.....	43
Annex C Status of IRRS Mission Recommendations and Suggestions	44
Annex D ARTEMIS Mission Recommendations and Suggestions	52



LIST OF FIGURES

Figure 1 Organizational structure of the regulatory body17

Introduction

About This Report

This National Report (NR) fulfils Croatia's obligations under Article 5 of the Convention on Nuclear Safety (CNS). It was prepared by the Ministry of the Interior's Civil Protection Directorate (CPD), the competent authority for radiological and nuclear safety in Croatia as of January 2019.

Croatia is a Category 4 Contracting Party to the CNS. As such, it has voluntarily reported under Articles 7., 8., 9., 10., 11., 15., and 16. i.e. Sub-Article 16.3.

The Republic of Croatia prioritizes nuclear safety and is committed to ensuring the highest standards in this critical area. Croatia became a party to the Convention on Nuclear Safety in 1995 (OG IA, no. 13/95). Croatia actively engages with the International Atomic Energy Agency and greatly appreciates the Agency's essential work in promoting safe nuclear practices worldwide.

Croatia is a Contracting Party to various international nuclear safety conventions, underscoring its commitment to safeguarding public health and the environment. These include the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management (OG IA, no. 3/99), the Convention on the Physical Protection of Nuclear Material (OG IA, no. 12/93, OG IA, no 5/01, and the amended OG IA, no. 5/06), the Convention on Early Notification of a Nuclear Accident (OG IA, no. 12/93, OG IA, no. 1/06), and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (OG IA, no. 12/93, OG IA, no. 1/06). According to Croatia's constitutional provisions, these vital conventions have been integrated into national legislation, reinforcing overall national legal framework for nuclear safety. To ensure effective implementation, Croatia has also transposed specific requirements into national laws and ordinances. This proactive approach not only strengthens the regulatory environment but also demonstrates dedication to the highest safety standards related to nuclear operations.

Croatia does not have any nuclear installations on its territory. However, in the early 1980s, collaboration between the state power utilities of Republic of Croatia and Republic of Slovenia resulted in the construction of the Krško Nuclear Power Plant (NPP) located on Slovenian territory, approximately 10 kilometres from the Croatian border. Currently, two states share nuclear liability and ownership of the Krško NPP. It is important to note that, as the facility is located in Slovenia, the Krško NPP operates under Slovenian jurisdiction, and the Croatian regulatory body has no authority regarding its operation. This unique arrangement highlights the complexities and challenges of cross-border energy cooperation, underscoring the need for clear regulations and shared responsibility in nuclear energy management.

Despite the absence of nuclear installations, Croatia is committed to upholding the standards of nuclear safety by adhering to well-established principles and instruments. This report outlines Croatia's progress in maintaining the achieved objectives of the Convention on Nuclear Safety. This national report comprehensively addresses all obligations and presents outline that reflects the current circumstances. As the 10th report covers the period from August 2022 to August 2025, it aims not only to inform on the progress but also to streamline

the review process by highlighting changes since the previous reporting period. This ensures that reviewers have a complete understanding without the need to revisit earlier documents, facilitating a constructive and practical review.

The report was prepared and structured in accordance with the Guidelines Regarding National Reports under the Convention on Nuclear Safety, INFCIRC/572/Rev.8 from March 2025. For the first time, the new National Report format provided by the CNS Secretariat was implemented, demonstrating Croatia's commitment to efficient and transparent nuclear safety reporting. Section 2 follows an article-by-article approach. Since Croatia is a country without nuclear installations, not all articles of the Convention are applicable. The reporting on specific articles was conducted voluntarily, reflecting Croatia's commitment to transparency and accountability. The reporting on applicable articles addresses various aspects of the obligations to enable a complete and comprehensive review by other Contracting Parties. Each applicable article includes a brief overview of the current status, followed by a discussion of changes since the last report. As Croatia hosted the IRRS Follow-up mission, the findings, recommendations, follow-up actions and current status are provided where applicable. The same applies to the findings of the ARTEMIS mission, which was hosted in 2023.

The main body of the report contains all the key elements of information necessary to evaluate Croatia's adherence to the Convention on Nuclear Safety. To further support this evaluation, additional information is provided in the appendices. Annex B lists the most relevant documents within the Croatian legislative and regulatory framework, while Annex C explains the purpose, scope, results, and follow-up actions of the previously mentioned IRRS mission. Similarly, Annex D outlines the results of the ARTEMIS mission.

Nuclear Programme in Croatia

Croatia has no nuclear installations nor an existing nuclear programme. In the context of the CNS, Croatia is regarded as a category 4 CP. However, Croatia is considering the possibility of developing a nuclear programme. In early 2025, the Ministry of Economy, a competent authority for the national energy policy, established a Working Group on Nuclear Energy. This group is tasked with analysing various energy development scenarios, including the potential of nuclear energy as a low-carbon emissions energy source.

Summary

The Republic of Croatia prioritizes nuclear safety and is committed to ensuring the highest standards in this area. Croatia became a party to the Convention on Nuclear Safety in 1995 (OG IA, no. 13/95).

Croatia does not have any nuclear installations on its territory. However, in the early 1980s, collaboration between the state power utilities of Republic of Croatia and Republic of Slovenia resulted in the construction of the Krško Nuclear Power Plant (NPP) located on Slovenian territory, approximately 10 kilometres from the Croatian border. Currently, two states share nuclear liability and ownership of the Krško NPP. As the facility is located in Slovenia, the Krško NPP operates under Slovenian jurisdiction, and the Croatian regulatory body has no authority regarding its operation. This unique arrangement highlights the complexities and challenges of cross-border energy cooperation, underscoring the need for clear regulations and shared responsibility in nuclear energy management.

Hence, as a Category 4 Contracting Party to the CNS, Croatia has voluntarily reported under Articles 7., 8., 9., 10., 11., 15., and 16. – sub-Article 16.3. As noted in this report, Croatia fulfils all these Articles.

Despite the absence of nuclear installations, Croatia is committed to upholding the standards of nuclear safety by adhering to well-established principles and instruments. This report outlines Croatia's progress in maintaining the achieved objectives of the Convention on Nuclear Safety. As the 10th report covers the period from August 2022 to August 2025, it aims not only to inform on the progress but also to streamline the review process by highlighting changes since the previous reporting period.

In the reporting period major changes refer to the amendment of the Act on Radiological and Nuclear Safety in 2022 that addressed the conversion of the Croatian national currency to EUR. In 2023, the Government of Croatia hosted a the Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS) peer review mission. The mission resulted in 11 recommendations and 5 suggestions. Recommendations refer to regulatory framework, national policy and implementation of the national Strategy for the Management of Radioactive Waste, Disused Sources, and Spent Nuclear Fuel and the National Programme for Implementation of the Strategy, as well as inventory of radioactive waste and spent nuclear fuel. Several recommendations included waste classification, the definition of WAC, the establishment of a Central Registry of Radioactive Waste and Disused Sources, and the operation of existing storage facilities at IMROH and RBI. Additionally, recommendations referred to an update of the site selection criteria for the near-surface disposal facility, a process that was already initiated in 2024.

An essential recommendation, consistent with earlier findings from the IRRS mission and also recognized as a challenge by the 8th and 9th RM, was addressing human resource needs and maintaining staff competence. To foster transparency and accountability, the final mission report is readily accessible to the public on the regulatory body's website.

Summary of Responses to Applicable Challenges and Suggestions

As no Suggestions were identified at Joint 8th & 9th RM, Croatia has addressed the Challenge that remained open from previous RMs as follows:

Challenge 1 from Joint 8th & 9th RM (Article 8)

Implementation of the IRRS Action Plan by the end of 2018, in particular sufficient staff and its competence (from 7th RM, open, and then amended at Joint 8th and 9th RM). An IRRS Follow-up was also conducted in 2019 and actions are still being implemented.

In response to the challenges identified in the previous report concerning staff numbers and their competencies, the regulatory body acknowledges the need for continuous development of human resources, emphasizing the enhancement of its capacities as a key priority for the upcoming period. The national report outlines specific advancements made in staff and competencies during the reporting period, showcasing commitment to fostering a more skilled and effective workforce.

Summary of Other Significant Changes since the Previous Report

In addition to work summarized above to address the Challenge that remained open from previous RM, Croatia has undergone the following changes and made the following improvements:

Article 7

- The Act on Radiological and Nuclear Safety was amended in 2022 to include the conversion of the Croatian national currency to EUR.
- At the request of the Government of Croatia, the IAEA organized an Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS) peer review mission in 2023.

Article 16

- Introduction of national Early Warning and Crisis Management System
- Participation in international exercises



PART A: GENERAL PROVISIONS

Part A consists of Article 6 – Existing Nuclear Installations.

Article 6: Existing Nuclear Installations

Each Contracting Party shall take the appropriate steps to ensure that the safety of nuclear installations existing at the time the Convention enters into force for that Contracting Party is reviewed as soon as possible. When necessary, in the context of this Convention, the Contracting Party shall ensure that all reasonably practicable improvements are made as a matter of urgency to upgrade the safety of the nuclear installation. If such upgrading cannot be achieved, plans should be implemented to shut down the nuclear installation as soon as practically possible. The timing of the shut-down may take into account the whole energy context and possible alternatives as well as the social, environmental and economic impact.

Summary Statement for Article

Croatia has no NIs on its territory and Article 6 is, therefore, not applicable.

The Republic of Croatia shares ownership of the Krško NPP with the Republic of Slovenia. The Bilateral Agreement (OG IA, no. 9/02) [1] defines the mutual obligations between the Republic of Croatia and the Republic of Slovenia.



PART B: LEGISLATION AND REGULATION

Part B consists of three Articles:

Article 7 Legislative and Regulatory Framework

Article 8 Regulatory Body

Article 9 Responsibility of the Licence Holder

Article 7: Legislative and Regulatory Framework

1. *Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of nuclear installations.*
2. *The legislative and regulatory framework shall provide for:*
 - (i) *the establishment of applicable national safety requirements and regulations;*
 - (ii) *a system of licensing with regard to nuclear installations and the prohibition of the operation of a nuclear installation without a licence;*
 - (iii) *a system of regulatory inspection and assessment of nuclear installations to ascertain compliance with applicable regulations and the terms of licences;*
 - (iv) *the enforcement of applicable regulations and of the terms of licences, including suspension, modification and revocation.*

Summary Statement for Article

Although Croatia is a Category 4 CP, it voluntarily reports on its fulfilment of the obligations under Article 7.

7.0 Introduction

Croatia meets the requirements of Article 7 of the CNS with its comprehensive national legislative and regulatory framework for radiological and nuclear safety. As a Member State of the European Union, Croatia directly adopts EU regulation and transposes EU directives into national legislation.

7.1 Establishing and Maintaining a Legislative and Regulatory Framework

Croatian legislative and regulatory framework consists of several acts, governmental regulations, ordinances, policies and strategies, multilateral agreements, bilateral agreements, and other documents. As a member state of the European Union (EU), Croatia directly adopts EU regulations and transposes the directives into its national legislation. The national legislative and regulatory framework is continually evolving to reflect international, regional, and national practices. The responsibility for developing and updating the framework lies with the regulator, while other authorities collaborate according to their specific responsibilities.

The following ministries contribute to national legal and regulatory framework:

- the Ministry of Health (responsible for the public health protection),
- the Ministry of Economy (responsible for national energy policy),

- the Ministry of Physical Planning, Construction and State Assets (responsible for land use, planning, and issuing construction permits),
- the Ministry of Environmental Protection and Green Transition (responsible for environmental protection and environmental impact assessments),
- the Ministry of Sea, Transport and Infrastructure (responsible for the control of transport), and
- the Ministry of Finance (responsible for customs control).

The key primary law governing radiological and nuclear safety in Croatia is ***the Act on Radiological and Nuclear Safety*** (OG, no. 141/13, 39/15, 130/17, 118/18, 21/22 and 114/22) (hereinafter referred to as *the Act*) [2]. This legislation establishes measures for radiation protection and safety and physical protection measures related to nuclear activities and practices that involve ionizing radiation sources. The Act aims to ensure adequate protection of individuals, society, and the environment from the potential harmful effects of ionizing radiation and to ensure the safe performance of practices involving ionizing radiation sources, nuclear activities, and activities related to radioactive waste management. Regarding this reporting period, the Act was amended once more in 2022, addressing the conversion of the Croatian national currency to EUR.

Other interfacing national legislation includes:

- The Act on Fund for financing the decommissioning of the Krško Nuclear Power Plant and the disposal of Krško NPP radioactive waste and spent nuclear fuel (OG, no. 107/07, 21/22) [3],
- Nuclear Damage Liability Act (OG, no. 143/98 and 114/22) [4],
- Dangerous Goods Transport Act (OG, no. 79/07) [5],
- Civil Protection System Act (OG, no. 82/15, 118/18, 31/20, 20/21 and 114/22) [6] and,
- Regulation on Radiation Protection Measures and Activities in Case of Emergency (OG, no. 24/18, 70/20 and 114/21) [7], prescribes the response to emergencies which may occur in practices involving sources of ionizing radiation and nuclear activities, as well as the radiation protection measures and procedures to be taken in case of emergency, (for further information, see Article 16.3).

In addition, Croatia is a Contracting Party to various international nuclear safety conventions, underscoring its commitment to safeguarding public health and the environment:

- the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management (OG IA, no. 3/99) [8],
- the Convention on the Physical Protection of Nuclear Material (OG IA, no. 12/93, OG IA, no 5/01, and the amended OG IA, no. 5/06) [9],
- the Convention on Early Notification of a Nuclear Accident (OG IA, no. 12/93, OG IA, no. 1/06) [10],
- the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (OG IA, no. 12/93, OG IA, no. 1/06) [11], and
- Vienna Convention on Civil Liability for Nuclear Damage of 21 May 1963 (OG, IA no. 1/06) [12].

According to Croatia's constitutional provisions, these vital conventions have been integrated into national legislation, reinforcing overall national legal framework for nuclear safety. To

ensure effective implementation, Croatia has also transposed specific requirements into national laws and ordinances. This proactive approach not only strengthens the regulatory environment but also demonstrates dedication to the highest safety standards related to nuclear operations.

The Republic of Croatia shares ownership of the Krško NPP with the Republic of Slovenia and is responsible for half of the RW and SNF that was generated so far, and that will be generated up to the expiration of the Krško NPP's lifetime. In this context, the Bilateral Agreement (OG IA, no. 9/02) [1] defines the mutual obligations between the Republic of Croatia and the Republic of Slovenia.

The Croatian Parliament has adopted the Strategy for the Management of Radioactive Waste, Disused Sources, and Spent Nuclear Fuel (OG, no. 125/14) (hereinafter: the Strategy) as the national policy [13]. This Strategy outlines the fundamental guidelines and objectives for managing institutional radioactive waste generated in the Republic of Croatia, as well as radioactive waste and spent nuclear fuel from the Krško Nuclear Power Plant. It also stipulates the management principle stating that management of radioactive waste, disused sources and spent nuclear fuel must be organised in a manner that does not impose an unnecessary burden on future generations. The Strategy defines short-term (2 years), mid-term (10 years), and long-term goals (more than 10 years) related to the management of radioactive waste, disused sources, spent nuclear fuel and remediation of NORM locations in Croatia.

In November 2018, the Government adopted the National Program for the Implementation of the Strategy (hereinafter: the National Programme) [14], which is based on the Strategy [13]. The National Programme provides a more detailed interpretation of the requirements and goals outlined in the Strategy and covers the period up to 2025 with an overview of the developments until 2060. It advocates and promotes the application of proven, widely accepted solutions drawn from international best practices. Together the Strategy [13] and the National Programme [14] provide a systematic framework for managing radioactive waste, disused sources and spent fuel. In 2022, the amendments to the National Programme have been adopted by the Government. The National Programme also addresses the remediation of sites in Croatia contaminated with naturally occurring radionuclides and the establishment of a central storage facility as a long-term solution for two types of waste: the radioactive waste generated within the Republic of Croatia from medicine, industry, science, education, and past public use, as well as half of LILW produced by the operation of the Krško NPP. According to the Bilateral Agreement [1], if there is no agreement on a joint solution reached by the end of the regular designed lifetime of the Krško NPP, the parties have to take over the radioactive waste in equal proportions in two years from that time. As of 2023, the Krško NPP received environmental approval to extend its lifetime from 40 to 60 years. i.e. until 2043.

In 2025, we commenced work on the new Strategy, and this document will serve as the foundation for the development of a new National Programme.

7.2 Provisions of the Legislative and Regulatory Framework

Extensive secondary legislation consisting of number of regulations and ordinances, listed in Appendix A, supports the implementation of the Act [2]. The following secondary legislative acts remain the most relevant:

- Ordinance on Nuclear Safety Requirements for a Nuclear Installation Construction (OG, no. 36/16, 79/16 and 108/21) [15] provides general and specific requirements for issuing approval for the construction of a nuclear installation that must be applied to nuclear installations other than nuclear power plants, through a graded approach, to account for the complexity and specificity of each nuclear installation,
- Ordinance on Authorised Nuclear Safety Experts (OG, no. 29/17 and 88/21) [16] provides organizational, technical, technological, and quality assurance requirements to be fulfilled by the organizations with the intend to perform nuclear safety related activities,
- Ordinance on Nuclear Security (OG, no. 38/18) [17] prescribes the type and scale of nuclear security measures, the content of the Nuclear Security Plan and the manner and scope of reporting on occurrences which pose a threat to nuclear security,
- Ordinance on the Scope and Content of the Plan and Program of Measures in the Event of an Emergency and of Informing the Public and Competent Bodies (OG, no. 43/22) [18] prescribes the scope, contents and other matters related to the emergency preparedness and response plans which have to be developed by the users of radioactive sources, organizations that perform nuclear activities and by the operators of nuclear objects,
- Ordinance on the Supervision and Control of Transboundary Shipments of Radioactive Waste and Spent Fuel (OG, no. 11/13) [19] regulates the supervision and control system for transboundary shipments of radioactive waste and spent fuel in line with the Council Directive 2006/117/Euratom,
- Ordinance on the Conditions and Procedure for Issuing and Withdrawing the Approval for Packaging Used for Transport of Radioactive and Nuclear Materials (OG, no. 42/13 and 19/17) [20] regulates the procedure for issuing and withdrawal of the approval for packaging in the transport of radioactive and nuclear materials according to the provisions of the Dangerous Goods Transport Act (OG, no. 79/07),
- Ordinance on the Management of Radioactive Waste and Disused Sources (OG, no. 88/22) [21] includes radioactive waste categorization in accordance with Classification of Radioactive Waste, IAEA GSG-1, 2009; the scope of radioactive waste management center (RWMC) and facilities, requirements for design of radioactive waste and disused sources management facilities; procedure for licensing of radioactive waste management facilities (design, commissioning, operation, closure and decommissioning); harmonisation with IAEA Safety Case and supporting Safety Assessment concept for licensing of RW and DS management facilities; definition of requirements for WAC,
- Ordinance on Dose Limits, Dose Constraints and Individual Dose Assessment (OG, no. 38/18 and 8/22) [22] prescribes the dose limits and dose constraints for exposed

workers, apprentices and students and members of the public, as well as the reference levels in existing and emergency exposure situations and,

- Ordinance on Environmental Radioactivity Monitoring (OG, no. 40/18 and 6/22) [23] regulates environmental radioactivity monitoring, as well as the manner of assessment of the environmental impact assessment of the nuclear facilities or facilities where practices involving ionizing radiation sources are performed.

In 2019, Croatia hosted *the Integrated Regulatory Review Service (IRRS) Follow-up mission* conducted by the IAEA. The mission's main goals were to review the implementation of recommendations and suggestions given to the Government of Croatia during the IRRS Mission in June 2015 [24] and to exchange information and experience related to the areas covered by the IRRS. The Follow-up mission resulted in 17 recommendations and 8 suggestions [25], which remained open after the IRRS mission in 2015. A significant portion of recommendations was oriented towards implementing the integrated management system in the CPD of Mol, along with strengthening human resources and procedures in the Emergency Preparedness and Response (EPR) and inspection departments. The current status of the implementation of these recommendations and suggestions is detailed in the Appendix C.

In 2023, the Government of Croatia hosted *the Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS)* peer review mission. The mission resulted in 11 recommendations and 5 suggestions [26]. Recommendations related to the regulatory framework and national policy included revising the Strategy and National Programme, a process that is already underway. Regarding the implementation of the National Programme, recommendations also addressed arrangements for planning, monitoring, and delivery of the National Programme, including mitigating programme risks and taking corrective actions where appropriate. Several recommendations included waste classification, the definition of WAC, the establishment of a Central Registry of Radioactive Waste and Disused Sources, and the operation of existing storage facilities at IMROH and RBI. Additionally, recommendations referred to an update of the site selection criteria for the near-surface disposal facility, a process that was already initiated in 2024. A key recommendation, consistent with earlier findings from the IRRS mission and also recognised as a challenge by the 8th and 9th RM, is addressing human resource needs and maintaining staff competence.

Summary of Significant Changes since the Previous Report

During the reporting period, Croatia has undergone the following changes and made the following improvements:

- The Act on Radiological and Nuclear Safety was amended in 2022 to include the conversion of the Croatian national currency to EUR.
- At the request of the Government of Croatia, the IAEA organized an Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS) peer review mission in 2023.

Article 8: Regulatory Body

1. *Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 7, and provided with adequate authority, competence and financial and human resources to fulfil its assigned responsibilities.*
2. *Each Contracting Party shall take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy.*

Summary Statement for Article

Croatia fulfils the obligations of Article 8. The Ministry of the Interior, Civil Protection Directorate is the regulatory body for radiological and nuclear safety in Croatia.

8.1 Establishment of the Regulatory Body

The tasks and activities related to radiological and nuclear security fall under the competence of the Civil Protection Directorate (CPD) of the Ministry of the Interior as of 1 January 2019. The CPD of MoI is functionally separated from any other state body or organization dealing with the use of ionizing radiation sources, radioactive waste, or spent fuel management or concerned with the promotion or utilization of nuclear energy. The CPD is committed to carrying out its regulatory duties with independence and responsibility. The responsibilities of the CPD of MoI as a regulatory body are defined in the Act on Radiological and Nuclear Safety [2]. Before 2019, the former regulatory body was the State Office for Radiological and Nuclear Safety (SORNS).

CPD of the Ministry of Interior and its organizational units carry out regulatory, inspection and technical tasks aimed at protecting people and the environment from the harmful effects of ionizing radiation. These activities include implementing radiation protection measures in activities and facilities involving ionizing radiation sources, radioactive waste management, overseeing the trade, transport and handling of nuclear materials, and providing expert assistance in activities for preventing illicit trafficking of nuclear materials, maintaining a nuclear material registry, accounting and control of all nuclear materials, the assistance in the event of a nuclear accident and early exchange of information in the event of an emergency. All these activities ensure the fulfilment of international obligations and commitments, fostering international cooperation with the EU and IAEA. As a regulatory body, the CPD also participates in the European Nuclear Safety Regulators Group and Heads of the European Radiological Protection Competent Authorities (ENSREG) and Heads of the European Radiological Protection Competent Authorities (HERCA).

Organizational structure of the regulatory body (shown in Figure 1) includes **Radiological and Nuclear Safety Sector** responsible for authorisation of practices with ionizing radiation sources; nuclear activities; activities related to radioactive waste and disused sources management; issuing permits for transport and transit of radioactive sources and radioactive waste; conducting independent safety analyses and issuing decisions and

approvals for location, design, construction, use and decommissioning of a nuclear facility. In accordance with the Building Code, the Sector also participates in the procedure for issuing location permits and building permit, and procedure for issuing use permits for facilities related to radioactive waste and disused sources management. This Sector is also tasked with authorizing technical support organizations, radiation protection experts and nuclear safety experts. Other responsibilities include organizing and, if necessary, conducting tests to detect the type and level of ionizing radiation in the environment, food, feed, medications, and everyday items, both under normal conditions and in suspected emergency situations. Additionally, the Sector is responsible for keeping records and coordinating professional education on the implementation of radiological and nuclear safety measures.

The Radiological and Nuclear Emergency staff within the Sector provides expert assistance in the event of a radiological or nuclear emergency. They also participate in organizing the preparedness system for emergencies, preparing and executing necessary expert and technical activities related to preparedness programs. These activities include responding to radiological or nuclear accidents and analysing potential consequences. Additionally, tasks involve drafting the Radiological and Nuclear Hazard Assessment of the Republic of Croatia [27] and approving licensees' preparedness and response plans for radiological emergencies.

Radiological and Nuclear Safety Inspection within the CPD has a crucial role in ensuring public and environmental safety by conducting thorough inspections and monitoring compliance with the provisions of the Act [2] and its related regulations. The Inspection is also responsible for enforcing these regulations.

The Civil Protection International Relations Unit within the CPD facilitates cooperation with both international and national organizations and associations focused on radiation protection and nuclear safety. However, the Sector coordinates technical cooperation activities with the IAEA for all participating entities.

The Article 7.a. Point 4 of the Act [2] mandates the Mol to hire qualified personnel who possess the necessary skills, experience, and expertise to fulfil its responsibilities. Additionally, the Mol may utilize external scientific and technical resources to support its regulatory functions. If needed, the Mol can also engage outside professional expertise to support decision-making, ensuring that it adheres to reliable and transparent standards for radiological and nuclear safety and security, as outlined in current legal provisions. In addition, human resources are a deciding factor in achieving the objectives defined in Section 5 of the Strategy [13].

The training and capacity building of regulatory staff is primarily conducted through the IAEA Technical Cooperation projects and activities. This effort is also supported through collaborations with the European Commission, the US Department of Energy, and other training initiatives. Activities include meetings, workshops, fellowships, and partnerships with national and international universities and scientific institutions. Examples of good practices in capacity and skill building is successful participation of the regulatory body's staff in comprehensive educational programmes such as International School of Nuclear Law jointly organized by the OECD Nuclear Energy Agency and the IAEA, and Postgraduate Educational Course in Radiation Protection and the Safety of Radiation Sources and other training events organized by the IAEA.

In response to the challenges recognized in the previous report regarding staff numbers and their competencies, the regulatory body acknowledges the necessity for continuous development of human resources, emphasizing the enhancement of its capacities as a key priority. The regulatory body section of the Mol has a total planned workforce of 24 professional staff, with 18 that are currently employed. All employed staff members are university graduates in natural sciences, biotechnology, or technical sciences, of which 4 hold doctoral degrees.

8.2 Status of the Regulatory Body

As of January 1, 2019, the competence for radiological and nuclear safety and nuclear security is performed within the Mol in an independent organizational unit, the CPD. The regulatory body's activities are carried out by CPD's internal organizational units: Radiological and Nuclear Safety Sector and the Radiological and Nuclear Safety Inspection.

Reporting obligations include providing updates to the government on the implementation of the National Program as outlined in the Act [2]. Additionally, the Act requires the Minister to submit a report to the government every two years regarding national protection against ionizing radiation and nuclear safety.

8.2 (a) Independence within Government Structure

At the Mol, all regulatory radiological and nuclear safety activities are performed in the Radiological and Nuclear Safety Sector and Radiological and the Radiological and Nuclear Safety Inspection. Ministry of Economy is the competent authority for energy policy in Croatia, guaranteeing that the radiological and nuclear safety regulatory body operates independently and makes unbiased safety-related decisions.

Summary of Significant Changes since the Previous Report

Croatia has no significant changes to highlight under Article 8 during the reporting period, other than the work already summarized above.

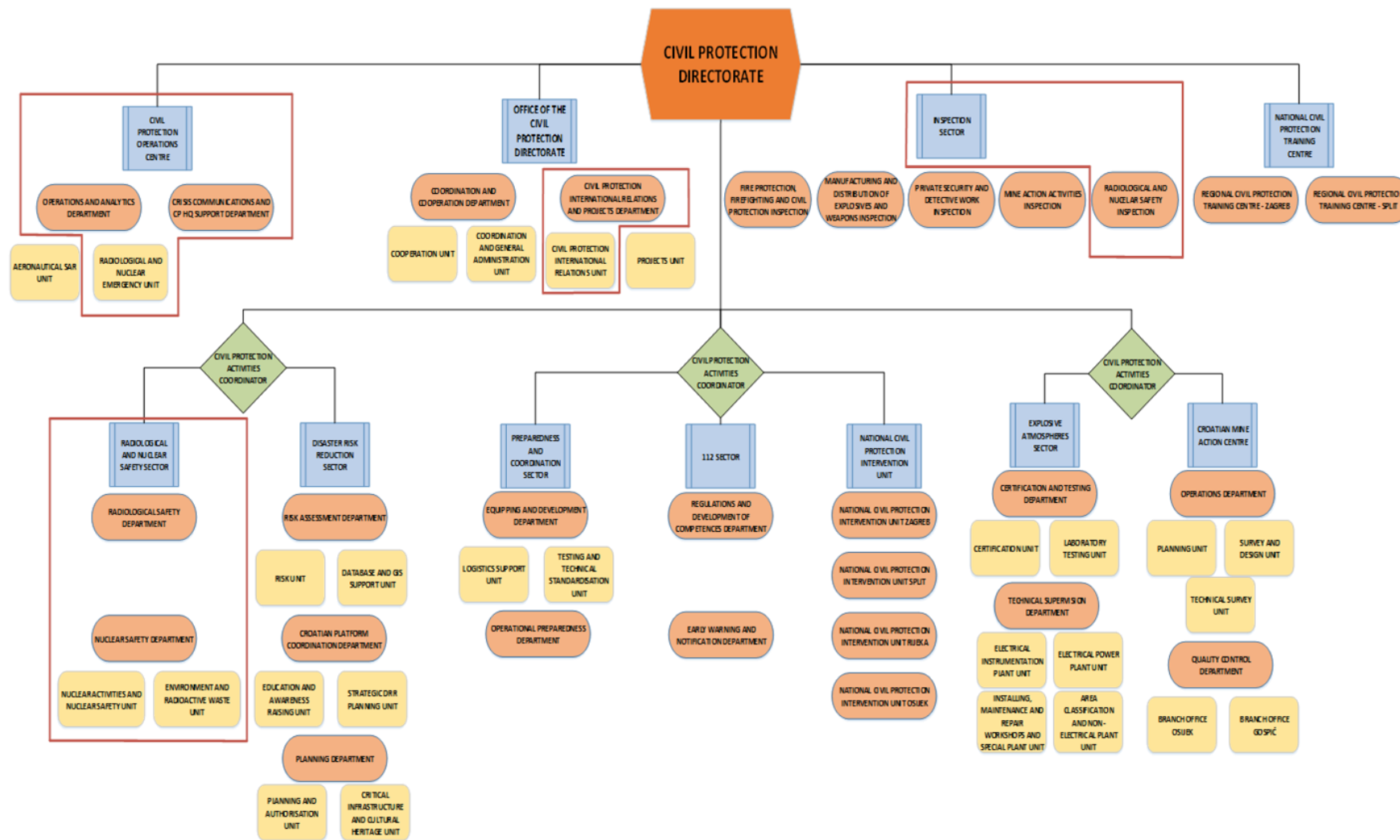


Figure 1 Organizational structure of the regulatory body



Article 9: Responsibility of the Licence Holder

Each Contracting Party shall ensure that prime responsibility for the safety of a nuclear installation rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility.

Summary Statement for Article

Article 9 does not apply to Croatia, as a Category 4 CP.



PART C: GENERAL SAFETY CONSIDERATIONS

Part C consists of seven Articles:

- Article 10 Priority to Safety
- Article 11 Financial and Human Resources
- Article 12 Human Factors
- Article 13 Quality Assurance
- Article 14 Assessment and Verification of Safety
- Article 15 Radiation Protection
- Article 16 Emergency Preparedness

Article 10: Priority to Safety

Each Contracting Party shall take the appropriate steps to ensure that all organizations engaged in activities directly related to nuclear installations shall establish policies that give due priority to nuclear safety.

Summary Statement for Article

Although Croatia is a Category 4 CP, it voluntarily reports on its fulfilment of the obligations of Article 10.

10 (a) Main Requirements and Administrative Arrangements

While Croatia may not have nuclear installations or authorized nuclear activities, the country has established policies to support nuclear safety objectives. A key aspect of these policies is the appointment of authorized nuclear safety experts in accordance with provisions from the Act [2] and the Ordinance on Authorized Nuclear Safety Experts (OG, no. 29/17 and 88/21) [16]. These experts are granted authorization across critical areas, including all nuclear activities, the utilization of nuclear material for energy and research, as well as the safe disposal of radioactive waste and spent fuel. This proactive approach in ensuring availability of independent safety assessments shows Croatia's commitment to safeguarding public health and the environment, even in the absence of existing nuclear facilities.

Summary of Significant Changes since the Previous Report

Croatia has no significant changes to highlight under Article 10 during the reporting period.

Article 11: Financial and Human Resources

1. *Each Contracting Party shall take the appropriate steps to ensure that adequate financial resources are available to support the safety of each nuclear installation throughout its life.*
2. *Each Contracting Party shall take the appropriate steps to ensure that sufficient numbers of qualified staff with appropriate education, training and retraining are available for all safety-related activities in or for each nuclear installation, throughout its life.*

Summary Statement for Article

Although Croatia is a Category 4 CP, it voluntarily reports on its fulfilment of the obligations of Article 11.

11.1 Financial Resources

There are no nuclear installations in Croatian territory. However, Croatia shares the Krško NPP with the Republic of Slovenia. The Bilateral agreement [1] specifies that the management of the radioactive waste and spent fuel originating from Krško NPP is joint responsibility of both countries. To address this, in 2008, the Fund for Financing the Decommissioning of the Krško NPP and the Disposal of Krško NPP Radioactive Waste and Spent Nuclear Fuel (the Fund) was founded. The primary goals and responsibilities of the Fund are outlined in the *Act on the Fund for Financing the Decommissioning of the Krško Nuclear Power Plant and the Disposal of Radioactive Waste and Spent Nuclear Fuel* (OG, no. 107/07 and 21/22) [3] and include the following:

- timely acquisition of half the amount of financial means necessary for implementing the Krško NPP Decommissioning Program and Radioactive Waste and Spent Nuclear Fuel Disposal Program and fulfilment of the Bilateral Agreement [1]. The Croatian Electric Power Utility pays the Fund 9,76 million EUR in quarterly payments. The Croatian Electric Power Utility will continue with these payments while Krško NPP is in operation, or until the planned amount of funds is accumulated, as specified in the valid Decommissioning Program for the Krško NPP and the management of radioactive waste and spent nuclear fuel.
- preservation and increase of the value of assets through effective investments to ensure that the assets are sufficient and that the obligations are not handed down to the next generations
- cooperation with Slovenia in periodical revision of the Krško NPP Decommissioning Program
- implementation of the provisions from the Strategy regarding the disposal of the radioactive waste and spent fuel originating from Krško NPP
- responsible for the management and disposal of the radioactive waste originating from the Croatian territory

- keeping records on available financial and material assets, tributaries of fees for radioactive waste management and the fees received,
- operating the future Radioactive Waste Management Center.

Financing the management of RW, DS and SNF in Croatia is defined under Article 52 of the Act [2]. The work of the legal person that will perform the tasks of storage and disposal of RW and SNF from Krško NPP will be financed from the allocated fund established under the Act on the Fund for Financing the Decommissioning and Management of Radioactive Waste and Spent Nuclear Fuel of the Krško Nuclear Power Plant in line with the Bilateral Agreement [1]. The establishment of the central storage facility for institutional RW and DS generated in the territory of Croatia will be financed from the funds of the Croatian State Budget. According to Article 11, Paragraphs 1, 2 and 5 of the Bilateral Agreement [1], the Contracting parties are obliged, in equal shares, to finance the costs of developing the Decommissioning programme for the Krško NPP, the costs of its implementation, and the costs of drafting the Programme for the disposal of RW and SNF. If the Contracting Parties reach a decision on the joint resolution of disposal of radioactive waste and spent nuclear fuel, those costs will be financed in equal parts. If such an agreement is not reached, the Contracting Parties will each individually bear the costs of all those activities for the implementation of the Programme for the disposal of RW and SNF that are not of joint significance. Each Contracting Party gives a guarantee of solidarity for the obligations of its separate Fund.

The previous report recognized the topic of radioactive waste and spent nuclear fuel management as a challenge. In this reporting period, certain advancements were made in establishing the central storage facility (RWMC). The conceptual design of the RWMC was developed in 2022, followed by the preliminary design in 2024. Currently, activities are underway to obtain location permits, focusing on the State Spatial Development Plan for buildings and spatial interventions of national significance, which includes the RWMC. In 2023, the Environmental Impact Assessment (EIA) scoping procedure related to the RWMC was conducted, involving consultations with neighbouring Bosnia and Herzegovina. As this matter is extensively reported under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, additional details are available in the JC report for the 8th Review Meeting from 2024. [28] Furthermore, the Republic of Croatia hosted the ARTEMIS mission in 2023 [26], and all recommendations and suggestions from that mission and their status are listed in Annex D.

Regarding the regulatory tasks and responsibilities, in accordance with the provisions of the Act [2], the Ministry of Interior (Mol) is allocated a dedicated and appropriate budget to effectively carry out its regulatory responsibilities as outlined in the national framework.

Summary of Significant Changes since the Previous Report

Croatia has no significant changes to highlight under Article 11 during the reporting period.



Article 12: Human factors

Each Contracting Party shall take the appropriate steps to ensure that the capabilities and limitations of human performance are taken into account throughout the life of a nuclear installation.

Summary Statement for Article

Article 12 does not apply to Croatia as a Category 4 CP.



Article 13: Quality assurance

Each Contracting Party shall take the appropriate steps to ensure that quality assurance programmes are established and implemented with a view to providing confidence that specified requirements for all activities important to nuclear safety are satisfied throughout the life of a nuclear installation.

Summary Statement for Article

As a Category 4 CP, the Article 13 does not apply to Croatia.

Article 14: Assessment and verification of safety

Each Contracting Party shall take the appropriate steps to ensure that:

- (i) comprehensive and systematic safety assessments are carried out before the construction and commissioning of a nuclear installation and throughout its life. Such assessments shall be well documented, subsequently updated in the light of operating experience and significant new safety information, and reviewed under the authority of the regulatory body;*
- (ii) verification by analysis, surveillance, testing and inspection is carried out to ensure that the physical state and the operation of a nuclear installation continue to be in accordance with its design, applicable national safety requirements, and operational limits and conditions.*

Summary Statement for Article

Article 14 does not apply to Croatia, as a Category 4 CP.

Article 15: Radiation Protection

Each Contracting Party shall take the appropriate steps to ensure that in all operational states the radiation exposure to the workers and the public caused by a nuclear installation shall be kept as low as reasonably achievable and that no individual shall be exposed to radiation doses which exceed prescribed national dose limits.

Summary Statement for Article

Although Croatia is a Category 4 CP, it voluntarily reports on its fulfilment of Article 15 obligations.

15. National Radiation Protection Implementation

Given that there are no nuclear installations on Croatian territory, radiation exposure of the workers is not considered a significant issue. However, public exposure is possible due to the potential releases from the nuclear installations in the neighbouring countries, primarily from the Krško NPP. In order to ensure there is no exposure to radiation doses exceeding the prescribed national dose limits, a national radiological monitoring program was developed by the Krško NPP. This program includes cooperation with the authorized laboratories from the Ruđer Bošković Institute, Zagreb, Croatia and Institute Jožef Stefan, Ljubljana, Slovenia. The program includes:

- the monitoring of the radioactivity of the liquids discharged from Krško NPP into Sava River (the limits are prescribed (1) for the concentrations of radionuclides, (2) for the activity of tritium, and (3) for the total activity of other radionuclides),
- the monitoring of the radioactivity of the gaseous effluents (the limits are prescribed for the concentration of the radionuclides 500 meters from the containment) and
- the dose assessments for the representative person living in Croatian territory.

The results indicate that the impacts of operational releases from the Krško NPP on human health are practically negligible. Measured activities and activity concentrations are usually at least two orders of magnitude lower than the prescribed limits. A representative person, who is expected to consume 730 litres of water from the Sava River and 16 kilograms of fish caught in that river annually, would receive an effective dose of approximately 0,043 µSv (based on the latest data from Q1 2025). Furthermore, the contribution of the dose from releases at the Krško NPP to the total dose from man-made sources accounts for only a few percent. The results mentioned are available in the quarterly newsletter issued by CPD of Mol and distributed online on the CPD website¹.

In addition to the monitoring program conducted by NPP Krško, which focuses on operational releases, Croatia continuously carries out radiological monitoring of the environment in accordance with Articles 35 and 36 of the Euratom Treaty. This monitoring aligns with

¹ The newsletter is available in Croatian on the Mol, CPD website: <https://civilna-zastita.gov.hr/podrucja-djelovanja/radioloska-i-nuklearna-sigurnost/sluzba-za-nuklearnu-sigurnost/odjel-za-okolis-i-radioaktivni-otpad/bilteni-ne-Krsko/175>

Recommendation 2000/473/Euratom and includes various components of the environment, including air, precipitation, soil, groundwater, surface water, rainwater, drinking water, food, and feedstuff. The number of samples and the locations for sampling are determined annually by national *Environmental Radioactivity Measurement Programs* developed by the CPD as the regulatory body and in accordance with the Ordinance on Environmental Radioactivity Monitoring (OG, no. 40/18 and 6/22) [23]. So far, all measurement results have been consistent with expected values.

Additionally, in order to monitor potential radioactive releases in the Sava River, an environmental monitoring system was installed in 2015 at the site of the Central Wastewater Treatment Plant in Zagreb. This initiative was part of a cooperation agreement with the Belgian government. The system is composed of a gamma-spectrometric probe and a remote control unit.

Summary of Significant Changes since the Previous Report

Croatia has no significant changes to highlight under Article 15 during the reporting period.

Article 16: Emergency Preparedness

- 1) *Each Contracting Party shall take the appropriate steps to ensure that there are on-site and off-site emergency plans that are routinely tested for nuclear installations and cover the activities to be carried out in the event of an emergency. For any new nuclear installation, such plans shall be prepared and tested before it commences operation above a low power level agreed by the regulatory body.*
- 2) *Each Contracting Party shall take the appropriate steps to ensure that, insofar as they are likely to be affected by a radiological emergency, its own population and the competent authorities of the States in the vicinity of the nuclear installation are provided with appropriate information for emergency planning and response.*
- 3) *Contracting Parties which do not have a nuclear installation on their territory, insofar as they are likely to be affected in the event of a radiological emergency at a nuclear installation in the vicinity, shall take the appropriate steps for the preparation and testing of emergency plans for their territory that cover the activities to be carried out in the event of such an emergency.*

Summary Statement for Article

Croatia fulfils the obligations of Article 16., Sub-Article 16.3 outlines the national emergency preparedness and response legal framework and its practical implementation.

16.3 Emergency Preparedness for Contracting Parties without Nuclear Installations

Although the Republic of Croatia has no nuclear installations on its territory, it has established a system for emergency preparedness and response focused on radiological and nuclear emergencies. There are 40 operational nuclear power plants (NPPs) within 1000 kilometres of Croatian national borders. The closest to the Croatian territory are Krško NPP in Slovenia (PWR, 707 MWe) and Paks NPP in Hungary (VVER, 4x440 MWe). The Krško NPP is located approximately 10 kilometres from the border and less than 30 kilometres from the Croatian capital, Zagreb, while Paks NPP is about 75 kilometres from the border. Severe accidents with significant releases at either of these NPPs, particularly at the Krško NPP, could have serious consequences on Croatian territory.

The legal framework defining emergency preparedness and the basis of Croatia's nuclear and radiological emergency management system is the Regulation on Measures for Protection against Ionising Radiation and Actions in Case of Emergency (OG, no. 24/18, 70/20, and 114/21) [7].

The provisions of this Regulation [7] refer to the system for preparedness and response to the following emergencies:

- a) emergency in the nuclear power plant Krško NPP (Republic of Slovenia), Paks NPP (Hungary) and in other nuclear power plants in the world,
- b) emergency on a nuclear-powered vessel located in the internal waters or territorial sea of the Republic of Croatia,

- c) an emergency at a previously known location of a stationary radioactive source of the licensee or a previously known storage location of a mobile radioactive source of the licensee,
- d) emergency during radioactive waste management,
- e) emergency at an undefined location, including transport emergencies, emergency during operations involving mobile sources, detection of an orphan source, terrorist act, loss or theft of a radioactive source, re-entry of a satellite, illicit transport of radioactive sources, radioactive waste and nuclear material, and
- f) radioactive contamination or increased exposure to ionising radiation caused by unknown circumstances or other circumstances.

The Regulation [7] also defines five emergency preparedness categories (in line with IAEA requirements GSR Part 7):

- Facilities belonging to emergency preparedness category I are facilities in which an emergency could result in severe deterministic health effects off the site where practices involving radiation sources are performed that warrant the implementation of urgent and early response measures and other off-site measures;
- Facilities belonging to emergency preparedness category II are facilities in which an emergency may result in radiation doses for the population that warrant the implementation of urgent protection and early response measures and other off-site measures. Threat category II, as opposed to threat category I, does not include facilities in which emergencies could give rise to severe deterministic health effects off the site;
- Facilities belonging to emergency preparedness category III are facilities in which an emergency may result in radiation doses that warrant the implementation of protection measures on the location of the licensee. Threat category III does not include facilities for which planning zones and distances have to be designated;
- Emergency preparedness category IV includes activities and practices that may result in an emergency and warrant the implementation of urgent protection measures in unforeseeable locations.

Threat category IV includes:

- emergencies in transport of radioactive sources, nuclear material and radioactive waste,
- emergencies involving mobile radioactive sources such as ones used in industrial radiography,
- illicit transport of radioactive sources and nuclear materials on road and railroad border crossings and seaports, river ports and airports,
- emergency involving the re-entry of nuclear-powered satellite,
- emergencies related to detection of orphan sources in scrap metal and other locations,
- emergencies which result in radioactive contamination or increased exposure to ionising radiation, and are caused by other circumstances, e.g. vandalism, sabotage and terrorism, and
- transnational emergencies resulting from emergencies on the territory of other countries, in facilities not covered by threat category V;

- Facilities belonging to emergency preparedness category V are facilities belonging to threat category I and II located on the territory of another country, for which planning zones and distances have been designated on the territory of the Republic of Croatia.

The Regulation [7] was enacted in early 2018 and subsequently amended in 2021 and 2022. The concepts of operations included in the Regulation which refer to the accidents in NPPs were based on the IAEA publication *EPR-NPP Public Protective Actions*. For the development of additional concepts of operations, the recommendations provided in the documents *EPR-Method*, *GS-G-2.1*, *TECDOC-1162*, and *TS-G-1.2*, were followed. A graded approach was applied in the development of all operational concepts, meaning that the response is proportional to the severity of the accident. Additionally, response time objectives have been established.

The final list of concepts of operations includes four nuclear (N) and seven radiological (R) emergencies:

- 1) N1 – emergency at Krško NPP,
- 2) N2 – emergency at Paks NPP,
- 3) N3 – emergency in a nuclear power plant at a greater distance,
- 4) N4 – emergency on the nuclear-powered vessels,
- 5) R1 – emergency related to practices involving a fixed radiation source,
- 6) R2 – emergency in radioactive material transport or in practices involving a mobile radioactive source,
- 7) R3 – loss or theft of radioactive sources,
- 8) R4 – discovery of an orphan source, detection of an elevated level of ionizing radiation or contamination,
- 9) R5 – detection of clinical medical symptoms of radiation exposure,
- 10) R6 – terrorist threat or attack involving radioactive material, and
- 11) R7 – re-entry of a nuclear-powered satellites.

Emergency Preparedness and Response Plan of the Republic of Croatia in the Event of a Radiological or Nuclear Emergency [29] was adopted in February 2022. The Plan addresses radiological and nuclear emergencies that could occur within the Republic of Croatia, as well as emergencies in other countries with the potential to cause significant consequences on Croatian territory, including those arising from low probability events. However, the plan does not cover preparedness and response measures for a nuclear attack.

In 2023, the new national Civil Protection Action Plan [30], which includes provisions for radiological and nuclear emergencies, was also adopted 2023.

Article 7 of the Regulation [7] stipulates that the Mol is responsible for conducting the Radiological and Nuclear Hazard Assessment of the Republic of Croatia [27]. The Radiological and Nuclear Hazard Assessment of the Republic of Croatia, a stand-alone document, was drafted and approved in 2018. It includes comprehensive evaluation of the potential radiological emergencies that could occur within the country, as well as nuclear emergencies abroad that could impact Croatia. Additionally, the assessment outlines key elements of the protection strategy for each scenario, guiding the development or update of the Republic of Croatia's Emergency Preparedness and Response Plan in the Event of a Radiological or Nuclear Emergency [29].

Given the challenges highlighted in prior reports, it is important to note that the emergency planning zones and distances have remained the same as those described in the 7th Croatian National Report on the Implementation of the Obligations under the Convention on Nuclear Safety.

Exercises and trainings

Croatia actively participates in exercises organized by the Slovenian regulatory body that focus on accidents at the Krško Nuclear Power Plant (NPP). Additionally, Croatia takes part in exercises related to the use of the Slovenian emergency communications system – known as KID.

Croatia also engages in ConvEx exercises organized by the International Atomic Energy Agency (IAEA). The ConvEx-3 exercises have proven particularly beneficial. The previous 2021 exercise included a scenario based on a severe accident at the Barakah NPP in UAE. In 2025, Croatia participated in another ConvEx-3 exercise that simulated a severe accident at the Cernavodă NPP in Romania, an especially relevant scenario considering the proximity to Croatian territory. Exercises of this type enable Croatia to evaluate its expert team's ability to organize shift work and maintain continuous operations over an extended period.

National Early Warning System for radiological and nuclear emergencies (SPUNN)

The SPUNN system is the national early warning system and a vital part of the national nuclear accident preparedness framework. It allows for alerts to be issued in the event of increased environmental radioactivity levels and provides essential input data for assessing population exposure. In case of a nuclear accident, experts evaluate the potential radiation doses that the population may receive and recommend necessary radiological protection measures.

SPUNN consists of 33 measuring stations and a central unit, where the measurement results are collected, analysed, and stored. Each station continuously monitors the ambient equivalent dose rate from gamma radiation. Additionally, two of the stations measure the activity concentrations of radionuclides in the atmosphere and specific meteorological parameters. The measurement data are sent to the central unit immediately after the end of each measurement cycle. If elevated values are detected, the officer on duty is automatically alerted.

National Early Warning and Crisis Management System (SRUUK)

In 2023, Croatia implemented the Early Warning and Crisis Management System (SRUUK) under Article 110 of *Directive (EU) 2018/1972*, establishing the European Electronic Communications Code (EECC Directive). SRUUK is a national information system aiming to inform citizens about emergencies and possibly share instructions for action in threatened areas via mobile phones and other modern technologies. Mol developed the system in cooperation with the Croatian Regulatory Authority for Network Industries (HAKOM) and the Personal Data Protection Agency (AZOP) to avoid unauthorized data usage. Both institutions gave a positive opinion on the system's technical solution and compliance with data protection regulations.

Through a multi-year preparatory period in which HAKOM, AZOP, and mobile operators participated, an agreement on operators' participation in the system's implementation and operation was signed and agreed upon. With the project participation of all three national telecom operators in the Republic of Croatia, the coverage of the entire country was achieved, and a user base of approximately 100% of mobile users was established to ensure the function of mass broadcasting of notifications. The system's ultimate goal is to quickly and efficiently inform civil protection participants and citizens via mobile phones and other modern technologies on impending dangers and measures that need to be taken to reduce human casualties and material damage.

In addition to sending location-based SMS and Cell Broadcast messages that are received by all mobile phone users in the affected area of the Republic of Croatia and foreign users roaming, it is also possible to send messages to Croatian citizens outside Croatia. The "HR112 Upozorenje"² mobile application has also been developed as part of the system.

Emergency planning zones and distances harmonization process

The emergency planning zones for the Krško Nuclear Power Plant (NPP) in Croatia and Slovenia are still not harmonized. While both countries acknowledge the importance of a coordinated response in the event of an emergency, their efforts to reconcile these zones have not yielded results. However, during these attempts, both nations significantly enhanced their understanding of each other's emergency preparedness and response systems, as well as improved communication.

Regarding the harmonization of implementation of protective actions in case of emergency at NPP Krško, efforts are currently being made to ensure as much coordinated response as possible with non-harmonized planning zones to cover the period until the harmonization is achieved. While it might be possible to reach a certain level of coordination this way, a fully aligned response cannot be guaranteed. In addition, the differences in the planning zones tend to increase the complexity of the emergency preparedness arrangements, which will probably result in increased resources spent on both sides. Because of all this, harmonizing within a reasonable timeframe should stay the priority.

Summary of Significant Changes since the Previous Report

During the reporting period, Croatia can report on the following changes:

- Adoption of updated national Civil Protection Action Plan that includes radiological and nuclear emergencies in 2023
- Introduction of national Early Warning and Crisis Management System that also addresses nuclear or radiological emergencies
- Participation in international emergency and preparedness exercises

² „HR112 Upozorenje“ app name translates to „HR112 Warning“



PART D: Safety of installations

Part D consists of three Articles:

Article 17 Siting

Article 18 Design and construction

Article 19 Operation

Article 17: Siting

Each Contracting Party shall take the appropriate steps to ensure that appropriate procedures are established and implemented:

- (i) for evaluating all relevant site-related factors likely to affect the safety of a nuclear installation for its projected lifetime;*
- (ii) for evaluating the likely safety impact of a proposed nuclear installation on individuals, society and the environment;*
- (iii) for re-evaluating as necessary all relevant factors referred to in subparagraphs (i) and (ii) so as to ensure the continued safety acceptability of the nuclear installation;*
- (iv) for consulting Contracting Parties in the vicinity of a proposed nuclear installation, insofar as they are likely to be affected by that installation and, upon request providing the necessary information to such Contracting Parties, in order to enable them to evaluate and make their own assessment of the likely safety impact on their own territory of the nuclear installation.*

Summary Statement for Article

Article 17 does not apply to Croatia, as a Category 4 CP.

Article 18: Design and construction

Each Contracting Party shall take the appropriate steps to ensure that:

- (i) the design and construction of a nuclear installation provides for several reliable levels and methods of protection (defence in depth) against the release of radioactive materials, with a view to preventing the occurrence of accidents and to mitigating their radiological consequences should they occur;*
- (ii) the technologies incorporated in the design and construction of a nuclear installation are proven by experience or qualified by testing or analysis;*
- (iii) the design of a nuclear installation allows for dependable, stable and easily manageable operation, with specific consideration of human factors and the man-machine interface.*

Summary Statement for Article

Article 18 does not apply to Croatia, as a Category 4 CP.

Article 19: Operation

Each Contracting Party shall take the appropriate steps to ensure that:

- (i) the initial authorization to operate a nuclear installation is based upon an appropriate safety analysis and a commissioning programme demonstrating that the installation, as constructed, is consistent with design and safety requirements;*
- (ii) operational limits and conditions derived from the safety analysis, tests and operational experience are defined and revised as necessary for identifying safe boundaries for operation;*
- (iii) operation, maintenance, inspection and testing of a nuclear installation are conducted in accordance with approved procedures;*
- (iv) procedures are established for responding to anticipated operational occurrences and to accidents;*
- (iv) necessary engineering and technical support in all safety-related fields is available throughout the lifetime of a nuclear installation;*
- (v) incidents significant to safety are reported in a timely manner by the holder of the relevant licence to the regulatory body;*
- (vi) programmes to collect and analyse operating experience are established, the results obtained and the conclusions drawn are acted upon and that existing mechanisms are used to share important experience with international bodies and with other operating organizations and regulatory bodies.*
- (viii) the generation of radioactive waste resulting from the operation of a nuclear installation is kept to the minimum practicable for the process concerned, both in activity and in volume, and any necessary treatment and storage of spent fuel and waste directly related to the operation and on the same site as that of the nuclear installation take into consideration conditioning and disposal.*

Summary Statement for Article

Article 19 does not apply to Croatia, as a Category 4 CP.



Annexes

Annex A

References

- [1] Bilateral Agreement in the Act on the Ratification of the Agreement between the Government of the Republic of Croatia and the Government of the Republic of Slovenia on regulating status and other legal relations related to investment, exploitation and decommissioning of the Krško Nuclear Power Plant and a joint statement regarding the signing of the Agreement between the Government of the Republic of Croatia and the Government of the Republic of Slovenia on regulating status and other legal relations related to investment, exploitation and decommissioning of the Krško Nuclear Power Plant (OG IA, no. 9/02)
- [2] Act on Radiological and Nuclear Safety (OG, no. 141/13, amended 39/15, 130/17, 118/18, 21/22 and 114/22)
- [3] Act on Fund for Krško NPP Decommissioning, Radioactive Waste and Spent Nuclear Fuel Management (OG, no. 107/07 and 21/22)
- [4] Nuclear Damage Liability Act (OG, no.143/98 and 114/22)
- [5] Dangerous Goods Transport Act (OG, no. 79/07)
- [6] Civil Protection System Act (OG, no. 82/15, 118/18, 31/20, 20/21 and 114/22)
- [7] Regulation on Radiation Protection Measures and Activities in Case of Emergency (OG, no. 24/18, 70/20 and 114/21)
- [8] Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management (OG IA, no. 3/99)
- [9] Convention on the Physical Protection of Nuclear Material (OG IA, no. 12/93, OG IA, no 5/01, and the amended OG IA, no. 5/06)
- [10] Convention on Early Notification of a Nuclear Accident (OG IA, no. 12/93, OG IA, no. 1/06)
- [11] Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (OG IA, no. 12/93, OG IA, no. 1/06)
- [12] Vienna Convention on Civil Liability for Nuclear Damage of 21 May 1963 (OG, IA no. 1/06)
- [13] Strategy for the Management of Radioactive Waste, Disused Sources, and Spent Nuclear Fuel (OG, no. 125/14)
- [14] National Programme for Implementation of the Strategy for Management of Radioactive Waste, Disused Sources and Spent Nuclear Fuel (adopted in November 2018)
- [15] Ordinance on Nuclear Safety Requirements for Nuclear Installation Construction (OG, no. 36/16, amended 79/16, 108/21)
- [16] Ordinance on Authorized Nuclear Safety Experts (OG, no. 29/17 and 88/21)
- [17] Ordinance on Nuclear Security (OG, no. 38/18)
- [18] Ordinance on the Scope and Content of the Plan and Programme of Measures in the Event of an Emergency and of Informing the Public and Competent Bodies (OG, no. 43/22)
- [19] Ordinance on the Supervision and Control of Transboundary Shipments of Radioactive Waste and Spent Fuel (OG, no. 11/13)
- [20] Ordinance on the Conditions and Procedure for Issuing and Withdrawing the Approval for Packaging Used for Transport of Radioactive and Nuclear Materials (OG, no. 42/13 and 19/17)
- [21] Ordinance on the Management of Radioactive Waste and Disused Sources (OG, no. 88/22)



- [22] Ordinance on Dose Limits, Dose Constraints and Individual Dose Assessment (OG, no. 38/18 and 8/22)
- [23] Ordinance on the Environmental Radioactivity Monitoring (OG, no. 40/18 and 6/22)
- [24] Integrated Regulatory Review Service (IRRS) Mission to the Republic of Croatia Report (2015)
- [25] Integrated Regulatory Review Service (IRRS) Follow-Up Mission to the Republic of Croatia Report (2019)
- [26] Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (Artemis) Mission to Republic of Croatia, Final Report (2023)
- [27] Radiological and Nuclear Hazard Assessment of the Republic of Croatia (SORNS, 2018)
- [28] Joint Convention National Report for 8th RM
- [29] Emergency Preparedness and Response Plan of the Republic of Croatia in the Event of a Radiological or Nuclear Emergency (MoI, 2022)
- [30] Civil Protection Action for the Republic of Croatia (OG, no. 107/23)

Annex B

List of legal documents within the Croatian legislative and regulatory framework

National Legal Framework

Acts:

- Act on Radiological and Nuclear Safety (OG, no. 141/13, amended 39/15, 130/17, 118/18, 21/22 and 114/22)
- Nuclear Damage Liability Act (OG, no.143/98 and 114/22)
- Civil Protection System Act (OG, no. 82/15, 118/18, 31/20, 20/21 and 114/22)
- Dangerous Goods Transport Act (OG, no. 79/07)
- Act on Fund for Krško NPP Decommissioning, Radioactive Waste and Spent Nuclear Fuel Management (OG, no. 107/07 and 21/22)

Governmental regulations:

- Regulation on Measures for Protection Against Ionising Radiation and Activities in Case of Emergency (OG, no. 24/18, 70/20 and 114/21)

Ordinances:

- Ordinance on Health Conditions of the Exposed Workers and Persons Being Educated to Work with the Ionising Radiation Sources (OG, no. 66/18 and 36/22)
- Ordinance on Notification, Registration, Approvals and Trade of Ionising Radiation Sources (OG, no. 54/18 and 6/22)
- Ordinance on Conditions and Measures for the Protection Against the Ionising Radiation in Performing the Activities with Ionising Radiation Sources (OG, no. 53/18 and 6/22)
- Ordinance on Conditions for Application of Ionising Radiation Sources for the Purpose of Medical and Non-medical Irradiation (OG, no. 42/18 and 8/22)
- Ordinance on Education Necessary for Handling Ionising Radiation Sources, Application of Radiological Safety Measures and Managing the Technical Processes in Nuclear Installations (OG, no. 42/18)
- Ordinance on the Environmental Radioactivity Monitoring (OG, no. 40/18 and 6/22)
- Ordinance on authorisations of the Technical Support Organisations to Perform Tasks Related to the Radiological Safety (OG, no. 40/18 and 104/21)
- Ordinance on Dose Limits, Dose Constraints and Individual Dose Assessment (OG, no. 38/18 and 8/22)
- Ordinance on Content and Conditions, Criteria and Approval of the Remediation Plan (OG, no. 38/18 and 147/21)

- Ordinance on Nuclear Security (OG, no. 38/18)
- Ordinance on Radiation Protection Experts (OG, no. 36/18)
- Ordinance on the Management of Radioactive Waste and Disused Sources (OG, no. 88/22)
- Ordinance on the Content, Scope and Frequency of the Reports on the Operation of the Nuclear Installation (OG, no. 94/17 and 96/21)
- Ordinance on the Periodicity, Content, Scope and Implementation of the Periodic Safety Reviews of the Nuclear Installations (OG, no. 94/17 and 103/21)
- Ordinance on the Content of a request for Approval for the Start or End of Operation or Decommissioning of a Nuclear Installation (OG, no. 47/17)
- Ordinance on the Validation of a Location for a Nuclear Installation (OG, no. 38/17 and 98/21)
- Ordinance on the Required Documents and their Content for Approval of Nuclear Activities (OG, no. 29/17 and 100/21)
- Ordinance on Content of the Request for Approval for the Commissioning of Nuclear Installation (OG, no. 29/17)
- Ordinance on the Safety Analysis Report for Nuclear Installations (OG, no. 29/17)
- Ordinance on Authorized Nuclear Safety Experts (OG, no. 29/17 and 88/21)
- Ordinance on Establishing Quality Assurance Programme for Management of Nuclear Facilities (OG, no. 29/17)
- Ordinance on Nuclear Safety Requirements for Nuclear Installation Construction (OG, no. 36/16, amended 79/16, 108/21)
- Ordinance on Official ID Card and Badge of Radiological and Nuclear Safety Inspectors (OG, no. 48/21)
- Ordinance on the Conditions and Procedure for Issuing and Withdrawing the Approval for Packaging Used for Transport of Radioactive and Nuclear Materials (OG, no. 42/13 and 19/17)
- Ordinance on the Supervision and Control of Transboundary Shipments of Radioactive Waste and Spent Fuel (OG, no. 11/13)
- Ordinance on the Scope and Content of the Plan and Programme of Measures in the Event of an Emergency and of Informing the Public and Competent Bodies (OG, no. 43/22)
- Ordinance on the Manner and Procedure for Supervision During Import or Export of Material for Which There is Justified Suspicion of Contamination by Radionuclides or of Containing Radioactive Sources (OG, no. 114/07)

Strategies and implementation programs:

- National Energy Strategy (OG, no. 25/20)

- Strategy for Management of Radioactive Waste, Disused Sources and Spent Nuclear Fuel (OG, no. 125/14)
- Radiological and Nuclear Safety Strategy for the period 2017-2025 (OG, no. 65/17)
- Civil Protection Action for the Republic of Croatia (OG, no. 107/23)
- Disaster Risk Assessment for the Republic Of Croatia (adopted in March 2024)
- National Programme for Implementation of the Strategy for Management of Radioactive Waste, Disused Sources and Spent Nuclear Fuel (adopted in November 2018)
- Emergency Preparedness and Response Plan of the Republic of Croatia in the Event of a Radiological or Nuclear Emergency (adopted in February 2022)

Other documents:

- Decision on Areas/Zones for the Implementation of Urgent Protective and Rescue Measures and on Threat Perimeters (SORNS, 2018)
- Radiological and Nuclear Hazard Assessment of the Republic of Croatia (SORNS, 2018)

Multilateral Agreements

- Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (OG IA, no. 12/93)
- Convention on Nuclear Safety (OG IA, no. 13/95)
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (OG IA, no. 03/99)
- Convention on the Physical Protection of Nuclear Material (OG IA, no. 05/01, amended 05/06)
- Vienna Convention on Civil Liability for Nuclear Damage (OG IA, no. 01/06)
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (OG IA, no. 01/06)
- Convention on Early Notification of a Nuclear Accident (OG IA, no. 01/06, amended 05/06)
- Treaty on the Non-Proliferation of Nuclear Weapons (OG IA, no. 5/01)
- Agreement between the Kingdom of Belgium, the Kingdom of Denmark, the Federal Republic of Germany, Ireland, the Italian Republic, the Grand Duchy of Luxembourg, the Kingdom of the Netherlands, the European Atomic Energy Community and the International Atomic Energy Agency in Implementation of Article III (1) and (4) of the Treaty on the Non-Proliferation of Nuclear Weapons and Protocol Additional to the Agreement between the Kingdom of Belgium, the Kingdom of Denmark, the Federal Republic of Germany, Ireland, the Italian Republic, the Grand Duchy of Luxembourg, the Kingdom of the Netherlands, the European Atomic Energy Community and the International Atomic Energy Agency in Implementation of Article III (1) and (4) of the Treaty on the Non-Proliferation of Nuclear Weapons (OG IA, no. 3/16).

- Act on Ratification of the Agreement between the Republic of Croatia and the International Agency for Atomic Energy on the application of guarantees concerning the Treaty on the Non-proliferation of Nuclear Weapons and Protocol to the Treaty (OG IA, no.13/94)
- Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters, Aarhus, of 25 June 1998 (OG IA, no. 01/07)
- Act on the Ratification of the Additional Protocol to the Agreement between the Republic of Croatia and the International Agency for Atomic Energy on the application of guarantees concerning the Treaty on the Non-Proliferation of Nuclear Weapons (OG IA, no. 7/00)
- Act on the Ratification of the International Convention on the Suppression of Acts of Nuclear Terrorism (OG IA, no. 4/07)
- European Agreement on the International Carriage of Dangerous Goods by Road (ADR) (OG IA, no. 5/08, 11/08, 6/09, 2/11 and 3/13)

Bilateral Agreements

- Agreement Between the Republic of Croatia and the Republic of Slovenia on the Early Exchange of Information in the Event of a Radiological Emergency (OG, no. 06/98, amended 3/00)
- Agreement Between the Government of the Republic of Croatia and the Government of the Republic of Hungary on the Early Exchange of Information in the Event of a Radiological Emergency (OG, no. 11/99)
- Agreement Between the Government of the Republic of Croatia and the Government of the Republic of Slovenia on Regulating the Status and Other Legal Relations Pertaining to Investments, Use and Decommissioning of the Krško Nuclear Power Plant (OG, no. 09/02)
- Protocol on the Means of Information and Data Exchange Between the State Regulatory Agency for Radiological and Nuclear Safety of Bosnia and Herzegovina and the State Office for Radiological and Nuclear Safety of the Republic of Croatia (2013)
- Arrangement between the State Office for Radiological and Nuclear Safety of the Republic of Croatia and the United States Nuclear Regulatory Commission for the Exchange of Technical Information and Cooperation in Nuclear Safety Matters (September 2018)

Annex C

Status of IRRS Mission Recommendations and Suggestions

AREA		RECOMMENDATIONS (R) AND SUGGESTIONS (S)		STATUS (June 2025)
1	RESPONSIBILITIES AND FUNCTIONS OF THE GOVERNMENT	R1	The Government should establish a national policy and strategy for safety in accordance with Requirement 1 of GSR Part 1.	Closed
		R2	The Government should complement the framework for safety with: provisions for ensuring the continuity of responsibility where activities are carried out by several persons or organizations successively; provisions related to a graded approach; provisions on criteria for release from regulatory control; provision that stipulates that compliance with regulations does not relieve the person or organization responsible for a facility or an activity of its prime responsibility for safety.	Closed
		R3	The Government should provide SORNS with human and financial resources enabling SORNS to completely fulfil its statutory obligations for regulatory control.	Open
		S1	The Government should consider organizing training and refresher courses in a way that do not compromise effective independence of SORNS.	Closed
		R4	The Government should implement the provisions for the safe management of radioactive waste in particular with the construction and operation of the Central National Storage Facility in compliance with the Strategy for the Management of Radioactive Waste, Disused Sources and Spent Nuclear Fuel.	Open
2	GLOBAL SAFETY REGIME	R5	SORNS should established and maintain process and procedures for analyzing and disseminating the lessons learned from national and international operating experience and regulatory experience to be used by SORNS, other authorities and authorized parties.	Open

3	RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY	R6	SORNS should have sufficient resources and optimize them in order to discharge its responsibilities and perform its functions in a manner commensurate with the radiation risks associated with facilities and activities.	Closed
		R7	SORNS should prepare and implement comprehensive training plans in order to improve knowledge, skills and abilities to perform all the functions and responsibilities.	Open
		S2	SORNS should consider performing systematic periodic screening/review of radiological and nuclear safety legislation, to ensure keeping regulatory safety requirements complete and up-to-date.	Closed
4	MANAGEMENT SYSTEM OF THE REGULATORY BODY	R8	SORNS should appoint an individual with the authority to coordinate and develop the integrated management system and to raise issues relating to the management system to the senior management.	Open
		R9	SORNS should develop an integrated management system in line with IAEA safety standard GS-R-3.	Open
		S3	SORNS should consider revising its strategic plan to expand the requirements on management system from the quality assurance programme to the integrated management system.	Open
		S4	SORNS should consider preparing the plan for establishment, development, and implementation of an integrated management system where the priorities are stressed out such as defining responsibilities for the management system, defining key processes related to inspection, licensing, etc. and defining the interactions among the processes.	Open
5	AUTHORIZATION	R10	The Government should establish a regulatory system for protection and safety that includes notification process, with criteria for when notification only is sufficient.	Closed
		S5	SORNS should consider developing a system of authorization commensurate with the radiation risks associated with the facility or activity taking into account a graded approach.	Closed

		R11	SORNS should develop and approve Ordinance regarding the detailed requirements for licensing the site, construction, operation and closure radioactive waste management facility as prescribed in the 2013 Act.	Closed
6	REVIEW AND ASSESSMENT	R12	SORNS should establish process and procedures governing the review and assessment activities for all types of facilities and activities under their regulatory control, taking into account graded approach.	Closed
		S6	SORNS should consider introducing pre-licensing verification of the contents of the documents submitted for review and assessment of an application for authorization to confirm credibility of submitted documents, where appropriate.	Open
7	INSPECTION	R13	SORNS should establish inspection programme that commensurate with the radiation risks associated with the facility or activity in accordance with a graded approach that covers all areas relevant to safety and radiation protection and implement this programme.	Closed
		R14	The Government should empower SORNS inspectors to carry out announced inspections.	Closed
		R15	SORNS should review the draft “Manual for conducting inspection supervision” to cover all elements of inspections and approve it.	Closed
		S7	SORNS should review its inspection programme and include tests and measurements as a method of inspection.	Open
8	ENFORCEMENT	R16	SORNS should establish detail procedures for determining and exercising enforcement actions. All inspectors and other staff of SORNS should be trained in, and knowledgeable about, the procedures.	Closed
		S8	SORNS should consider providing inspectors with legal support to carry out enforcement actions.	Closed
9	REGULATION AND GUIDES	S9	SORNS should consider developing guides to help users striving to achieve the high levels of safety.	Closed

		S10	SORNS should establish within its regulatory framework processes and procedures for reviewing and revising regulations, taken into account internationally agreed standards and the feedback of relevant experience.	Open
		S11	SORNS should consider reviewing its ordinances for compliance with GSR Part 3.	Closed
10	EMERGENCY PREPAREDNESS AND RESPONSE	R17	SORNS should revise and strengthen its regulatory framework in EPR consistently with IAEA Safety Standards to also include inspection, enforcement and evaluation of some of operator's exercises and should implement a graded approach.	Open
		R18	SORNS should require that operators develop and implement a system for classifying all potential nuclear or radiological emergencies and for activation of an adequate level of emergency response consistently with IAEA Safety Standards.	Closed
		S12	SORNS should consider setting response time objectives for notification of an emergency and for activation of an emergency response.	Closed
		R19	The Government should review and revise the responsibility of SORNS to manage the on-site emergency response, to implement urgent protective actions on-site in relation to facilities and activities under the responsibility of an operator and, in this regard, to provide public information as a single source.	Closed
		R20	SORNS shall require operators to implement clear command and control system to manage effectively the on-site emergency response.	Closed
		S13	SORNS should consider requesting that operators establish formal arrangements or protocols with off-site emergency services providing the operator with an assistance and support during the on-site emergency response.	Closed
		S14	SORNS should consider continuing its efforts to coordinate and harmonize emergency planning zones with their Slovenian counterparts in relation to Krsko NPP in line with relevant IAEA Safety Standards.	Open

		S15	SORNS should consider updating the intervention levels and generic action levels for taking protective actions set forth in Ordinance 59/13 taking account of the latest IAEA Safety Standards.	Closed
		R21	SORNS should develop a regulatory guide to facilitate systematic development of on-site emergency arrangements by operators and an internal process to facilitate its systematic review and assessment of the operator's emergency plan and programme.	Open
		R22	SORNS should develop its own emergency arrangements consistently with IAEA Safety Standards to fulfill its roles in emergency response.	Open
		S16	The Government should consider reviewing and revising the roles and responsibilities assigned to SORNS in emergency response in order to avoid compromising SORNS regulatory responsibilities and taking into account IAEA Safety Standards as well as the responsibilities of other State bodies and organizations.	Closed
11.1	CONTROL OF MEDICAL EXPOSURES	R23	SORNS, in coordination with The Ministry of Health, should initiate arrangements for assigning responsibilities for justification. SORNS should also ensure that only justified practices are authorized.	Closed
		R24	The Ministry of Health and SORNS should issue the necessary guidelines, in cooperation with the relevant professional and scientific bodies, in accordance with the requirement of GSR Part 3.	Open
		R25	The Government should recognize medical physicists as a profession at a national level and develop specialization in medical physics with objective to ensure the radiation protection of patients.	Partially closed
		R26	SORNS should review its regulation to supplement the responsibilities of medical physicists so that they are fully integrated in all medical practices in accordance with GSR Part 3.	Closed
		S17	SORNS should consider making provisions for informing carers, comforters and patients, in particular breast feeding women, about the radiation risks, in accordance with GSR Part 3.	Closed

		R27	SORNS should ensure that the existing requirements for optimization are fully implemented in all medical practices and that requirements regarding responsibilities of medical physicists, quality assurance, quality control and calibration are in accordance with the IAEA standards.	Open
		R28	SORNS should ensure that the existing requirements for reviews and records related to medical exposure are implemented in all medical practices and supplement its Ordinances to improve assessment and recording of patient doses in accordance with GSR Part 3.	Open
		R29	SORNS should ensure that all requirements related to unintended and accidental medical exposure are implemented in compliance with the requirement of GSR Part 3.	Closed
		S18	Since SORNS has not received any unintended or accidental exposure reports to date, SORNS should consider supporting this notification process through developing guidelines or/and training of medical staff and medical physicists.	Closed
11.2	OCCUPATIONAL RADIATION PROTECTION	R30	SORNS should put in place a programme of inspection of authorized TSOs as part of their annual inspection programme to establish that all authorized TSOs are maintaining the prescribed requirements of their authorizations.	Open
		R31	SORNS should initiate in consultation with the relevant government departments and state agencies the development of a formal recognition for qualified experts and an additional requirement for TSOs to have a qualified expert on their staff should be included in SORNS process for authorizing TSOs.	Closed
		R32	The Government should define the concept of an emergency worker taking into account the IAEA safety standards and should establish a programme for managing, controlling and recording the doses received in an emergency by emergency workers. This programme should be implemented by response organizations, licensees and SORNS.	Closed

		S19	SORNS should consider reviewing and revising its regulatory system for existing exposure situations with a view to implementing only those relevant requirements for occupational exposure of exposed workers.	Closed
		S20	SORNS should consider revising Article 23 (3) of the Ordinance on Measurement of Personal Doses, Examination of Ionizing Radiation Sources and Working Conditions and on Reports and Registers (OG 41/12) in accordance with IAEA Safety Guide RS-G-1.3 Section 8.	Closed
		S21	SORNS, in light of the introduction of the new dose limit for the lens of the eye and the development of the radioactive waste management programme, should consider introducing arrangements so that a national capability for extremity dose assessment <i>H_p</i> (0.07) and <i>H_p</i> (3) together with a national capability for internal dosimetry is available. The relevant ordinance on Measurement of Personal Doses, Examination of Ionizing Radiation Sources and Working Conditions and on Reports and Registers (OG 41/12) should be revised in accordance with IAEA Safety Guides.	Closed
11.3	CONTROL OF RADIOACTIVE DISCHARGES AND MATERIAL FOR CLEARANCE, ENVIRONMENTAL MONITORING ASSOCIATED WITH AUTHORIZED PRACTICES FOR PUBLIC RADIATION PROTECTION PURPOSES CONTROL OF CHRONIC EXPOSURES	R33	SORNS should review their regulatory framework with regards to liquid and gaseous radioactive discharges and ensure the optimization of protection and safety is achieved and discharge limits imposed on licensees that cover such discharges.	Closed
		R34	SORNS should ensure that monitoring programmes are developed and implemented in accordance with IAEA standards and supported by its regulatory framework.	Closed
		S22	SORNS should consider implementing a calibration programme for all of its monitoring and measuring instruments.	Closed
		R35	The Government should ensure that existing exposure situations that have been identified are evaluated to determine which occupational exposures and public exposures are of concern from the point of view of radiation protection, in accordance with IAEA standards.	Closed



		R36	SORNS should revise their Ordinances to address the remediation process of areas contaminated with residual radioactive material in accordance with IAEA standards.	Closed
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Annex D

ARTEMIS Mission Recommendations and Suggestions

Area		Recommendations (R), Suggestions (S) or Good Practices (G)		Status (as of June 2025)
1.	NATIONAL POLICY AND FRAMEWORK FOR RADIOACTIVE WASTE AND SPENT FUEL MANAGEMENT	R1	The Ministry of the Interior should initiate without delay a revision of the Strategy and National Programme to provide clarity and consistency for planning, communication and decision making, including on the roles of the relevant organizations, planning assumptions and programme milestones.	Open
		R2	The Ministry of the Interior should ensure that the storage facilities at IMROH and RBI are required to comply with safety requirements, including clear allocation of ownership of waste and sources, and responsibilities for safety and monitoring of the facilities.	Open
		R3	The Ministry of the Interior should undertake inspections of all facilities that store sources and waste, including IMROH and RBI.	Open
		R4	The Ministry of the Interior should update site selection criteria for the near surface disposal facility.	Open
2.	NATIONAL STRATEGY FOR RADIOACTIVE WASTE AND SPENT FUEL MANAGEMENT	R5	The Ministry of the Interior, in consultation with the Fund and other relevant Governmental Bodies, should enhance arrangements for the planning, monitoring and delivery of the National Programme, including measures for identifying, reporting and mitigating programme risks, and for taking corrective actions as appropriate.	Open
		S1	The Government should consider urgently providing arrangements for the safe and secure centralized storage of institutional waste in Croatia.	Open
		S2	The Fund should consider identifying back-up strategies for waste storage in case the disposal facility is not ready to accept the waste at the point when Croatia is obliged to accept it from the Krško NPP.	Open
3.	INVENTORY OF SPENT FUEL AND	S3	The Ministry of the Interior should consider revising the waste classification in Article 4 of the Ordinance on management of radioactive waste and disused sources to provide well-defined boundaries between waste classes and to support mapping	Open

Area		Recommendations (R), Suggestions (S) or Good Practices (G)		Status (as of June 2025)
	RADIOACTIVE WASTE		between the waste classes and disposal arrangements defined in the National Strategy.	
		R6	The Ministry of the Interior should complete the Central Registry of Radioactive Waste and Disused Sources and take it into use.	Open
4.	CONCEPTS, PLANS AND TECHNICAL SOLUTIONS FOR SPENT FUEL AND RADIOACTIVE WASTE MANAGEMENT	R7	The Fund should finalise WAC for the RWMC storage facilities at the Čerkezovac site and submit them to the regulator for approval in a timely fashion to allow receipt and safe storage of the waste packages.	Open
		S4	The Ministry of the Interior, in consultation with other relevant bodies, should consider developing guidance on siting a geological disposal facility.	Open
5.	SAFETY CASE AND SAFETY ASSESSMENT OF RADIOACTIVE WASTE AND SPENT FUEL MANAGEMENT ACTIVITIES AND FACILITIES	R8	The Ministry of the Interior should develop guidance stating regulatory expectations for safety assessments to support authorization of radioactive waste storage and disposal facilities.	Open
		R9	The Ministry of the Interior should require safety demonstrations to be developed for the storage facilities at IMROH and RBI.	Open
		S5	The Fund should consider revising its plans to allow enough time for the development and regulatory review of the safety assessment at the level of detail that is necessary to apply for the RWMC location permit.	Open
7.	CAPACITY BUILDING FOR RADIOACTIVE WASTE AND SPENT FUEL MANAGEMENT – EXPERTISE, TRAINING AND SKILLS	R10	The Government should urgently address the human resource needs of the regulatory body in the short term for the environmental impact assessment review and licensing review for the RWMC. The government should also plan to provide sufficient human resources for future phases of the radioactive waste management programme. Planning should be provided for developing and maintaining staff competence through formal training.	Open
		R11	The Fund should continuously evaluate the particular human resource needs in meeting its responsibilities for safe management of radioactive waste and spent fuel, both for the short and long term. The Fund should develop a plan for staff recruitment and retention, and maintenance of competence through training and/or research,	Open



Area		Recommendations (R), Suggestions (S) or Good Practices (G)		Status (as of June 2025)
			development and demonstration. That plan should be mapped to the needs, objectives and milestones of the radioactive waste management programme.	