GREECE

International Atomic Energy Agency

# Country Programme Framework

# 2024–2027

**This Country Programme Framework for Greece (2024 – 2027) has been signed on behalf of the Government of Greece and the International Atomic Energy Agency**

| On behalf of the Government | On behalf of the International Atomic Energy Agency |
|---|---|
| **Mr. Christos Housiadas**<br>**Chairman of the Greek Atomic Energy Commission (EEAE)** | **Mr Hua Liu**<br>**Deputy Director General**<br>**Head of the Department of Technical Cooperation** |
| **Date** | **Date** |

# CONTENTS

# LIST OF ABBREVIATIONS

| | |
|---|---|
| **ARTEMIS** | Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation |
| **CPF** | Country Programme Framework |
| **EU** | European Union |
| **IAEA** | International Atomic Energy Agency |
| **IRRS** | Integrated Regulatory Review Service |
| **RASIMS** | Radiation Safety Information Management System |
| **SDG** | Sustainable Development Goal |
| **TC** | Technical Cooperation |
| **TCP** | Technical Cooperation Programme |
| **WHO** | World Health Organization |

# EXECUTIVE SUMMARY

Greece has been an IAEA Member State since 1957. Since that year the country has benefited significantly from the IAEA's Technical Cooperation (TC) programme. The Agency's assistance has been channelled within the country, besides the Embassy & Permanent Mission of Greece in Vienna, through the Greek Atomic Energy Commission (EEAE), which is the competent body for the IAEA TC programme according to the national legislation (Law 4310/2014 as amended with the Law No. 4982/2022 and the Law No. 5019/2023).

In the last 20 years Greece is actively participating in and supporting various TC regional programme activities for Europe in areas such as human health, environment, agriculture and animal sciences, safety and security of nuclear materials, etc. The country benefits a lot from exchange of international experience, expertise and training.

The Country Programme Framework (CPF) contained in this document sets out the proposed technical cooperation programme between the International Atomic Energy Agency (IAEA) and Greece for the period 2024-2027. The CPF reflects an agreement on where nuclear science and technology can contribute directly and cost-effectively to Greece's national priorities and needs.

Moreover, Greece places particular emphasis on achieving sustainable development and is strongly committed to the implementation of the 2030 Agenda for Sustainable Development and its 17 SDGs, as they provide an ambitious, visionary and transformative framework for a new, equitable and sustainable development path.

The planned outcomes of the proposed technical cooperation programme under the CPF will contribute to the attainment of SDG 3 – Good Health and Well-Being.

It is stressed that the IAEA TCP plays an important complementary role in Greece's development cooperation with carefully selected priorities. The proposed technical cooperation programme under the current CPF will focus on further strengthening nuclear technology applications and radiation protection. The CPF will be subject to regular reviews of progress throughout its lifetime considering evolving development priorities and incorporating lessons learned, as appropriate.

During the period from 1976 to 2004 over 70 national TC projects were successfully implemented and significant results achieved in cooperation between Greece and the IAEA. The IAEA TC programme for Greece over the years has covered a large spectrum of subjects. The activities have been mainly carried out at the National Centre for Scientific Research (NCSR) "Demokritos". In the area of atomic and nuclear physics 10 national TC projects focused on upgrading neutron activation analysis, spectrometry and accelerator techniques. Modern equipment and expertise were delivered to the specialized institutes of the NCSR "Demokritos".

In the area of nuclear and radiochemistry 17 national TC projects have been implemented. The objectives included technology of radio-pharmaceuticals production and nuclear analytical techniques.

The Agency also assisted the Department of Internal Medicine at the Hippokration Hospital of the Aristotle University of Thessaloniki to upgrade their RIA services by using modern techniques for labelling and producing antibodies, especially monoclonal, and by developing new assays for both common and sophisticated substances of biological and clinical importance.

In the 80's and the early 90's three national TC projects focused on uranium exploration and evaluation of national resources.

Application of isotopes and radiation in food and agriculture were covered by 12 TC projects starting in the early 70ties, and addressing such subjects as use of moisture meter, efficient use of water, improvements in animal production, control of fruit fly in Crete, monitoring and rehabilitation of Caesium polluted areas.

Five TC Projects dealt with radiation medicine and health mainly focusing on improvements in diagnostics by using radiopharmaceuticals. Two TC projects dealt with microbiology and tissue culture. Use of radioisotopes in hydrology and exploration of geothermal waters were covered under 5 TC projects, one of them dealing with C-14 technique. Nuclear safety and radiation protection were addressed through 13 TC projects.

Four projects that were cost shared among the IAEA and the Greek Government substantially improved the monitoring of environmental radioactivity as well as the individual monitoring. As a result of this endeavour, new laboratories, such as the Whole-Body Counter (WBC), the Personnel Monitoring Laboratory, the Secondary Standards Dosimetry Laboratory (SSDL) and the Environmental Radioactivity telemetric Network were established in EEAE.

The main impact of the TC project on environmental monitoring was the enhancement of the capability of the Nuclear Technology Laboratory personnel of the Aristotle University of Thessaloniki to monitor radioactivity in air, water, soil, as well as in other environmental samples.

In the 2024-25 TC cycle, Greece is returning to the national TC programme, and has designed and submitted one new project proposal entitled "Strengthening Environmental Monitoring of Radionuclides and Trace Metals in Air and Water."

Greece is also a substantial contributor to the TC programme. Since 2003 EEAE hosts the Post-Graduate Educational Course on Radiation Protection and Safety of Radioactive Sources (PGEC) which is a comprehensive training programme that targets young professionals at graduate level or equivalent and helps them build a sound basis in radiation protection and the safety of radiation sources. Within the ongoing regional TC project RER9156 "Establishing Education and Training Infrastructure in Radiation Protection," EEAE hosted the PGEC with 19 participants from European and Central Asia countries in the period October 2022-March 2023.

# 1. INTRODUCTION

The CPF set out in this document contains the proposed technical cooperation programme between Greece and the IAEA for the period 2024-2027 and reflects an understanding on where nuclear science and technology can contribute directly and cost-effectively to Greece's national priorities and needs.

The preparation of this CPF was coordinated and monitored by the Greek Atomic Energy Commission (EEAE), involving other relevant governmental bodies and institutions in the identification and formulation of the proposed TC programme under the CPF as well as in the objectives to achieve. EEAE is the main counterpart and the national liaison for all TC matters with the IAEA.

The signing of the Country Programme Framework (CPF), while not legally binding, presents the intended collaboration for the implementation of four year's technical cooperation strategy. The current update of the CPF is based on the previous CPF document and the identified national priorities regarding radiation safety, which have been used for the analysis to identify areas for potential technical cooperation with IAEA. The thematic areas that have been identified as focus for the current national TCP for the next 4 years include radiation safety technical services, nuclear applications particularly environmental monitoring, emergency preparedness and response and radioactive waste management.

# 2. SITUATION ANALYSIS

## 2.1 MAIN RESULTS AND ACHIEVEMENTS OF TECHNICAL COOPERATION ACTIVITIES IN 2004-2005

During the period from 1976 to 2004 over 70 national TC projects were successfully implemented.

The most recent national projects were focused on environmental radioactivity monitoring, the research reactor, radiopharmaceuticals and measuring radionuclide intake of workers.

The above projects were successfully completed and significantly contributed to the continuous strengthening of the national radiation safety capabilities.

For example, the research reactor related project supporting the development of a Regional Neutron Scattering Centre. The upgraded and new facilities benefited researchers in Greece and neighbouring countries, facilitating training for young scientists and fostering collaboration in the field of neutron scattering.

In addition, the project on radionuclide measurements significantly enhanced the accuracy of dose measurements, thereby increasing the safety of radiation workers. Moreover, it enabled EEAE to actively participate in the European Radiation Dosimetry Group (EURADOS) within the internal dosimetry community.

Following the 2002-2004 TC cycle, Greece participated in the TC regional programme in diverse areas focused on:

- radiation protection and environmental monitoring;
- strengthening the regulatory infrastructure; and
- developing and maintaining knowledge in nuclear applications including in human health, radiation processing, and animal disease management.

## 2.2 NATIONAL DEVELOPMENT PRIORITIES AND ACTIVITIES RELEVANT TO THE AGENCY'S TECHNICAL COOPERATION PROGRAMME

As a member of the United Nations and being systematically engaged in development cooperation, Greece adopted Agenda 2030 and the Sustainable Development Goals (SDGs) and the principles for humanitarian and development aid. Greece is engaged in development cooperation through bilateral development cooperation projects, international organizations and development cooperation partners.

Greece identified and endorsed eight national priorities for SDG action, on which the country's 2018 Voluntary National Review (VNR) was based. The sixth national priority is 'strengthening the protection and sustainable management of natural capital as a base for social prosperity and transition to a low-carbon economy'. The policies and measures to achieve this priority include:

- transition to a circular economy model for sustainable production and consumption patterns (SDGs 12, 8 and 9);

- development of an integrated environmental framework to support economic development and investment, while safeguarding and protecting natural capital and biodiversity, in particular:
    - sustainable water resources management (SDG 6);
    - inclusive, safe, resilient and sustainable cities (SDGs 6, 11);
    - sustainable use of seas and marine resources (SDG 14);
    - protection, restoration and sustainable use of terrestrial ecosystems (SDG 15);
- transition to a low-carbon economy and adaptation to the impacts of climate change (SDGs 7, 13).

The priority given to SDGs 6, 7, 11, 12, 13, 14 and 15 with an environmental dimension is based on the notion that Greece's natural environment constitutes not only the identity of the country but is also a key asset for development. Thus, environmental protection is regarded as the basis for ensuring sustainable economic growth — for example, through quality tourism and the production of quality agricultural products and food, as these two sectors are the backbone of the Greek economy and rely on the quality of the natural environment. This is also the basis for social well-being as it safeguards human health and access to high-quality environmental and ecosystem services for citizens.

As Greece is a maritime nation and a coastal state, shipping, fishing, development of offshore energy sources, port and transportation facilities, recreation and tourism are vital economic activities (SDG 14).

The country also recognises the importance of the SDG 3 (good health and well-being). This SDG is also interlinked with the SDG 14, because the health and well-being of coastal populations — especially of island communities, which are sometimes wholly dependent upon fishing and tourism — are linked to the quality of the marine environment.

In this respect, the planned outcomes of the proposed technical cooperation programme under the CPF will contribute to the SDG3 – ensure healthy lives and promote well-being for all at all ages.

The assumptions/risks that could affect or hamper overall program implementation are presented in chapter 3. Potential risks that might have an impact on project implementation are related to financial, and technical resources as well as the Government commitment to support the activities and projects. Special consideration should be given to the roles and responsibilities of the various institutions and organizations involved in radiation safety related activities.

The sections 2.2.1- 2.2.3 of the CPF describe the national priorities and the related needs for assistance from the IAEA TCP in the following thematic areas:

- Nuclear and radiation safety and security,
- Health and nutrition, and
- Water and environment.

Moreover, the section 2.2.4 describes the expected outcomes of these thematic areas.

It is stressed that wherever radiation safety issues are addressed in this document, the related nuclear security aspects are also considered.

## 2.2.1 NUCLEAR AND RADIATION SAFETY AND SECURITY

### *2.2.1.1 BACKGROUND*

***Legislative and Regulatory Framework***

Although there is not a comprehensive nuclear law dealing with the different aspects of nuclear energy, there are various laws, decrees and regulations of a more specific nature governing several aspects of nuclear activities. Law No. 4310/2014 as amended by Law No. 4982/2022 and the Law No. 5019/2023 establishes the current relevant provisions regarding EEAE.

A list of the documents defining the national legislative and regulatory framework concerning radiation safety, emergency preparedness and radioactive waste are presented in Annex 3.

***Competent national body in charge of radiation safety***

The regulatory body in Greece is the Greek Atomic Energy commission (EEAE). An entity named EEAE was initially established by an Act in 1954 ("Atonic Energy Act"). EEAE has been re-established as competent radiation safety authority in 1987 by the Law 1733/1987. An important milestone in the timeline of the regulatory body itself was brought in 2014. With the provisions in Law 4310/2014 (as amended with the Law No. 4982/2022 and the Law No. 5019/2023) ) the earlier framework (Law1733/1987) has been replaced by the current operation framework of EEAE. The basic elements accommodated in the updated framework are summarized below:

- EEAE is explicitly designated as the regulatory competent authority for the regulatory control, the regulation and the supervision of the sector of nuclear technology, radiological and nuclear safety and radiation protection, and its competences are codified in a consolidated text, by completing, extending and clarifying the older provisions;
- EEAE acquires complete administrative and financial effective independence in relation to its regulatory tasks, keeps its scientific character and is given the form of public entity;
- EEAE as regulatory authority is henceforth the licensing administrative authority; inspection procedures and inspectors' role are reinforced;
- legislative enforcement means are provided by specifying administrative and penal sanctions;
- EEAE is provided with the power to conduct hearings and public consultations, and to issue a number of regulations;
- provisions for transparency enhancement, accountability and avoidance of conflict of interests are included;
- provisions ensuring organization's resources and sustainable financial independence are foreseen;
- EEAE can cooperate with research/academic institutions on educational matters.

The current EEAE operation regime is in line with the international and European requirements for radiation protection and nuclear safety regulatory authorities, enhances the effective independent and regulation of this field and addresses the relevant IRRS mission findings.

EEAE's responsibilities include:

- Regulatory – legislative work;

- Inspections for radiation protection and safe operation; issuance of special operating licenses for approximately 2500 ionizing radiation laboratories or/and licensing thereof;
- Keeping the national dose registry;
- Provision of individual dosimetry services and authorization of other dosimetry services;
- Coordination of the environmental radioactivity monitoring program in Greece, operation of the telemetric environmental monitoring network, conduction of spectroscopic analyses in food and commodities and radon measurements;
- Operation of an ionizing radiation calibration laboratory, which has developed the national dosimetry standards and provides calibration services of ionizing radiation devices;
- Preparation of and response to radiological/nuclear emergencies;
- Contribution to combating illicit trafficking in radioactive materials;
- Training in radiation protection and nuclear protection at national and international level;
- Update of the national data base related to radiation protection issues;
- Representation before – participation in committees of national, European and international organizations;
- Participation in European and national research and development programs;
- Public information.

***Peer reviews***

An IRRS follow up mission was successfully completed in 2017. The progress made since the initial mission in 2012 includes, inter alia, the following:

- the update of the regulatory framework,
- the development and implementation of an integrated management system in EEAE
- the implementation of the graded approach in the main regulatory function and
- the enhancement of the national regulatory framework for the management of radioactive waste.

Moreover, 26 out of 28 recommendations and 9 out of 10 suggestions identified in the initial mission were closed.

With the view to continuously improve the safe management of radioactive waste, Greece has invited an Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS mission) to be held in September 2023.

### *2.2.1.2 RADIATION SAFETY TECHNICAL SERVICES*

In order to maintain the quality of the measurement results of radiation measuring devices which are used to ensure radiation safety at national level, it is necessary to ensure their regular control and calibration.

To this end, EEAE has established a Secondary Standard Dosimetry Laboratory (SSDL) that satisfies international requirements, where reliable and high-quality calibration takes place for radiation protection measuring devices used for monitoring, response to a nuclear and radiological emergencies and radiation practices. This improves the quality of measurement results and, therefore, reduces the radiation risk to people and the environment.

The SSDL has developed and maintains the national standards of Gy, Sv, Cb/kg for gamma, X and beta radiation at national level. The calibrations are performed in terms of Air Kerma, Absorbed Dose, Personal Dose Equivalent at depth 10 and 0.07 mm (Hp(10) and Hp(0,07)), Ambient Dose Equivalent at depth 10 mm, H*(10), and Exposure in the fields of radiotherapy, diagnostic radiology and mammography, as well as in radiation protection and individual monitoring.

The laboratory covers the needs for the calibration of ionizing radiation equipment used in radiation facilities, such as in radiotherapy, diagnostic radiology, nuclear medicine departments in hospitals and at industrial facilities.

Since 2000, the laboratory represents Greece in the European Association of National Metrology Institute (EURAMET) in the field of ionizing radiation. In 2002 the Calibration and Measurement Capabilities (CMCs) were registered in the european database for measurement capabilities and qualifications of the European metrology laboratories.

Furthermore, the laboratory participates in intercomparison exercises among standard and sub-standard metrology laboratories in Europe, as well as in metrology scientific projects organized by EURAMET. In 2003, the Hellenic Institute of Metrology (EIM) assigned EEAE's laboratory to be the "designated laboratory" for gamma, X and beta ionizing radiation metrology applications.

However, after more than 20 years of operation, the calibration infrastructure should be updated and enhanced to support not only the everyday routine but also the increased research and training activities. It is noted that so far, the SSDL has hosted numerous fellowships and scientific visits supported by IAEA TC programmes.

***Objective**:*

To upgrade the infrastructure of the existing SSDL operating in EEAE's premises to sustain the quality and broaden the range of the services provided.

***Priorities**:*

Upgrading the infrastructure of the existing SSDL operating in EEAE's premises.

### *2.2.1.3 SAFETY IN RADIOACTIVE WASTE MANAGEMENT*

Greece has established and implements a national programme for the management of radioactive waste (MD 35225/2023 (B' 2638/21.04.2023)).

The parties involved in the implementation of the national programme are in particular:

- the competent Minister of Development (through the General Secretariat for Research and Innovation),
- the Greek Atomic Energy Commission (EEAE),
- the National Centre for Scientific Research (NCSR) "Demokritos",
- the National Technical University of Athens (NTUA), and
- the Aristotle University of Thessaloniki (AUTH).

One of the obligations of the parties involved in the implementation of the national programme is to promote research and development activities to meet related needs (e.g., improving safety of radioactive waste management, disposal methods, etc.). These activities apply at national level (e.g. granting of scholarships), European level (e.g., Horizon), and international level (e.g., IAEA TC).

In this respect:

- EEAE and NCSR "Demokritos" participate in the European Joint Program on Radioactive Waste Management EURAD.
- Scientific and technical staff of organizations involved in radioactive waste management participates in several regional and interegional IAEA Technical Cooperation (TC) programmes, such as:
  - RER/9143 Enhancing Radioactive Waste Management Capabilities;
  - RER/9146 Enhancing Capacities in Member States for the Planning and Implementation of Decommissioning Projects;
  - INT/9182 Sustaining Cradle-to-Grave Control of Radioactive Sources;
  - INT/9183 Regional Practical Training Course on Planning and Implementation of Nuclear Facility Decommissioning and Remediation of Radioactively;
  - RER/9138 Enhancing Capacities in the Member States for Management of Decommissioning Projects;
  - RER/9154 Enhancing the Implementation of Integrated Programmes for the Safe Management of Radioactive Waste;
  - INT/9186 Sustaining Cradle-to-Grave Control of Radioactive Sources- Phase II;
  - INT/2020 Enhancing Capacity Building to Promote Successful Decommissioning and Environmental Remediation Projects.

However, to further facilitate the implementation of the national programme for the radioactive waste management additional research and development activities should take place at national level.

***Objective:***

To facilitate the implementation of the national programme for the management of radioactive waste, ensuring its safe and responsible monitoring, storage and disposal.

***Priorities:***

To enhance the research and development (R&D) capabilities for the safe management of radioactive waste at national level. More specifically:

- To develop a safety case for a disposal and storage facility. This addresses the country's need for a comprehensive safety case encompassing risk assessments, engineering designs, and regulatory compliance to ensure the highest level of safety and security for the long-term management of radioactive waste.
- To include R&D in the safe decommission and dismantle of a research reactor, employing state-of-the-art techniques and best practices. This demonstrates the country's commitment to the responsible radioactive waste management and will pave the way for the decommissioning of similar facilities in the future.
- To address NORM waste stream and improve its safe management, transportation, and disposal. This reflects the need to enhance understanding of NORM waste at national level, thus enabling the implementation of more tailored management strategies.

## 2.2.2 HEALTH AND NUTRITION

### *2.2.2.1 NUCLEAR TECHNOLOGY RESEARCH*

The NCSR "Demokritos", among other facilities, hosts an electrostatic Van de Graaff Tandem 5MV accelerator which is a major scientific instrument of the centre, national universities and research institutes.

The Tandem accelerator has been used for the development of several innovative applications based on the use of ion beams for areas such as medical therapy, analysis of artefacts, fundamental research, etc. The significance of the related scientific research has been recognized by the international scientific community.

However, the NCSR "Demokritos" plans to further advance its innovative research capabilities in nuclear technologies. In this respect it intends to establish the first fully functional PET research facility in Greece in order to strengthen the effectiveness of patient's medical care at national level.

In addition, the NCSR "Demokritos" aspires to function a service facility, unique in Greece and open to the academia, pharmaceutical and chemical industry, to address advanced issues of biological and pharmacological interest.

***Objective**:*

To further advance the research capacity of NCSR "Demokritos" in order to:

- effectively contribute to the enhancement of patient's medical care at national level,
- address advanced issues of biological and pharmacological interest.

***Priorities**:*

The establishment of the first fully functional PET research facility at national level.

### 2.2.3 WATER AND ENVIRONMENT

#### *2.2.3.1 MONITORING OF ENVIRONMENTAL RADIOACTIVITY*

EEAE is the competent authority to monitor environmental radiation at national level, to identify the natural radiation and the range thereof on a regular basis or under extraordinary circumstances, to coordinate a network of collaborating laboratories in emergency response situations and to maintain the respective national records.

Furthermore, EEAE is competent for the prompt notice of the Greek state and the competent European and international organizations in case high radioactivity levels are recorded.

More analytically, EEAE implements (a) the environmental radiation monitoring program and b) the nuclear security program, especially for controlling and combating illicit trafficking of radioactive materials.

In this context EEAE:

- specifies the radioactivity levels through laboratory measurements and the telemetric system,
- maintains the national records of environmental radiation measurements and forwards the results to the Hellenic Statistical Authority and to European and international organizations,
- prepares technical reports on safety and environmental radiological impact,
- participates in European and international networks for early warning,
- conducts in vivo (using biological samples) and in vitro measurements of internal dosimetry.

The detection of radioactivity in the environment is performed at specialized laboratories, properly equipped, such as the EEAE Environmental Radioactivity Monitoring Unit. The selection of the analysis method to be used is determined depending on the kind of sample and the radioactive agent intended to be detected.

EEAE runs laboratory measurements in the context of its supervisory role and its provision of services. Measurements relate to:

- soil, water, food, air filters and other samples, using alpha and gamma spectroscopic analysis and total alpha/beta measurements,
- radiological checks of potable water and water samples from tanks, lakes and drillings for identifying artificial radioisotopes,
- food to be exported from or distributed in Greece
- imported materials and goods,
- building materials and materials to be used for the industrial production of building materials,
- materials with increased natural radiation (Naturally Occurring Radioactive Material, NORM),
- areas with increased levels of natural radiation (phosphogypsum rejecting areas, areas with increased radon level at the interior of residences),

- objects/materials with increased radioactivity detected under scrap monitoring procedures.

The results are stored at the National Radiation Protection Database by EEAE.

The telemetric environmental radioactivity monitoring network consists of two sub-systems: the network of total-gamma in air measurements and the network of atmospheric aerosol measurements.

The network of total-gamma in air measurement consists of 23 dose rate monitoring stations throughout the country. The measurements are transferred to the central management station where are recorded in a database.

The network of the measurements of the aerosol in the atmosphere consists of 3 monitoring stations located in Northern Greece (Alexandroupolis, Serres, Ptolemaida). These stations perform measurements of natural and artificial alpha and beta radiation, as well as gamma spectrometry to detect artificial isotopes e.g., $^{137}Cs$, $^{131}I$. The measurements are integrated every 30 minutes and are recorded in a database at the central station of the network.

All monitoring stations work continuously, 24 hours, 365 days a year. The mean daily values are available at EEAE website, as well as at the European Radiological Data Exchange Platform (EURDEP).

In addition, the Institute of Nuclear & Radiological Sciences & Technology, Energy & Safety (INRASTES) of the NCSR "Demokritos" operates a network of stations for air sampling and measurements. This network complements the one operated by EEAE.

Moreover, the Institute of Oceanography of the Hellenic Centre of Marine Research (HCMR) owns and operates appropriate laboratory and field equipment to perform radioactivity measurements in the marine environment which complement those performed by EEAE.

However, the situation at international level introduces the demand for continuously enhancing the national infrastructures in order to support the effective and efficient implementation of the national environmental radiation monitoring program.

***Objective**:*
To upgrade the national infrastructures for environmental monitoring.

***Priorities:***
To continuously enhance the national infrastructures for environmental monitoring.

### *2.2.3.2 EMERGENCY PREPAREDNESS AND RESPONSE*

In 2019, a detailed assessment of the potential emergency exposure situations with the relevant protection strategies was completed, based on the IAEA GSR Part 7 methodology. The document with this first assessment has been approved by EEAE Board and the General Secretariat for Civil Protection (GSCP) and is used for the update of existing or preparation of new emergency response plans ("Special Response Plans in Case of a Radiological or Nuclear Emergency", referred to as "ESARPEA"). The majority of ESARPEA have been drafted and entered into force.

In the current legislative framework, it is explicitly stated that all authorized parties, including IAEA GSR-1, shall establish an emergency management system (commensurate with the practices carried out in the facilities), including internal emergency response plans (at facility level with links, where appropriate, to the external plan) and shall report to EEAE any abnormal event immediately.

Greece can be affected in the event of a radiological emergency at a nuclear installation of a third country. According to the current emergency management system, EEAE is responsible for:

- the assessment of the potential emergency exposure situations (performed on a five-year basis) and its submission to the General Secretariat of Civil Protection (GSCP) for approval as part of the country's emergency management system;
- the assessment of the situation and proposal of measures to higher level officials as part of the emergency response;
- the assessment of the effectiveness of strategies and implemented actions and proposals for adjusting them as appropriate to the prevailing situation as part of the emergency response;
- the necessary operational preparedness of the telemetric network for radioactivity measurement in the country;
- the activation and coordination of the measurement campaign around the country, in which various laboratories countrywide participate in case of an emergency (the so-called "Network of Collaborating Laboratories").

EEAE also is the contact point for receiving and communicating information to the IAEA and EC emergency-response systems (USIE and ECURIE respectively), organizes emergency response drills and participates in international exercises. EEAE participates in the IAEA "Incident reporting system for research reactors" and the "Incidents and trafficking database" (ITDB). In addition, EEAE has concluded provisions on a bilateral basis for early notification with Bulgaria and Romania.

However, the situation at international level introduces the demand for continuously enhancing the national capabilities in order to respond effectively and efficiently to any potential emergency exposure situation scenarios.

***Objective:***

To enhance the national capabilities for emergency preparedness and response.

***Priorities:***

To continuously enhance the national capabilities for emergency preparedness and response.

### *2.2.4 OUTCOMES OF THE THEMATIC AREAS*

Based on the previous TCP objectives and priorities, the overarching *planned outcomes* of the proposed TCP are:

- Enhanced radiation nuclear and radiation safety and security by:
  - improving the radiation technical services provided at national level,
  - facilitating the implementation of the national programme for the management of radioactive waste.
- Enhanced research capabilities regarding the use of nuclear technologies in the field of health.
- Enhanced capabilities for the protection of the water and the environment through the continuous improvement of infrastructures for:
  - the monitoring of environmental radioactivity,
  - the emergency preparedness and response.

The above outcomes are expected to strongly contribute to SDG 3 - ensure healthy lives and promote well-being for all at all ages.

In support of efforts to strengthen the national radiation safety infrastructure, Greece has provided information in IAEA's Radiation Safety Information Management System (RASIMS). Periodically updating this information in RASIMS will facilitate recording achievements, as well as assessing the effectiveness of actions and progress made.

# 3. RESULTS MATRIX

| Thematic Area: Nuclear and radiation safety and security | | | | |
|---|---|---|---|---|
| **Outcome** | **Baseline** | **Indicators** | **Means of Verification** | **Assumptions/risks** |
| Enhanced radiation nuclear and radiation safety and security by:<br>- improving the radiation technical services provided at national level,<br>- facilitating the implementation of the national programme for the management of radioactive waste. | 1. Identified needs for updating the infrastructures of the SSDL.<br>2. Identified needs for enhancing safety in radioactive waste management. | 1. Number of activities related to the upgrading of the SSDL infrastructure.<br>2. Number of implemented research projects concerning the safety in radioactive waste management. | 1. Implementation reports of approved national projects.<br>2. Annual SSDL reports.<br>3. National reports (CNS, JC, 2011/70/Euratom, etc.) | *Assumptions:*<br>1. The Government's commitment in support to further strengthen national infrastructure on safety.<br>2. The Government's commitment in ensuring the required funds.<br>*Risks*:<br>Insufficient budget allocation to support the programme activities. |
| **Thematic Area: Health and nutrition** | | | | |
| **Outcome** | **Baseline** | **Indicators** | **Means of Verification** | **Assumptions/risks** |
| Enhanced research capabilities regarding the use of nuclear technologies in the field of health. | Identified needs for strengthening research capabilities regarding the use of nuclear technology in the field of health. | Number of implemented research projects concerning the use of nuclear technologies for medical diagnostic and therapeutic purposes. | Implementation reports of approved national projects. | *Assumptions:*<br>1. The Government's commitment in support to further strengthen national infrastructure on safety.<br>2. The Government's commitment in ensuring the required funds.<br>*Risks:*<br>Insufficient budget allocation to support the programme activities. |

| Thematic Area: Water and environment | | | | |
|---|---|---|---|---|
| **Outcome** | **Baseline** | **Indicators** | **Means of Verification** | **Assumptions/risks** |
| Enhanced capabilities for the protection of the water and the environment through the continuous improvement of infrastructures for:<br>- the monitoring of environmental radioactivity,<br>- the emergency preparedness and response | 1. Identified needs for improving of emergency preparedness and response capabilities.<br>2. Identified needs for improving environmental monitoring capabilities. | 1. Number of implemented projects for upgrading the emergency preparedness and response capabilities.<br>2. Number of implemented projects for upgrading the environmental monitoring capabilities. | 1. Implementation reports of approved national projects.<br>2. National reports (CNS, JC, 2011/70/Euratom, etc.) | *Assumptions:*<br>1. The Government's commitment in support to further strengthen national infrastructure on safety.<br>2. The Government's commitment in ensuring the required funds.<br><br>*Risks:*<br>Insufficient budget allocation to support the programme activities. |

## 3.1. RESOURCES SUMMARY TABLE

| **Thematic Area** | **Approximate Cost in €** (A) | **Estimated resources* available in €** (B) | **Resources to be identified/mobilised in €** (A-B) | |
|---|---|---|---|---|
| Nuclear and radiation safety and security | 500,000 | 500,000 | | *(+)* |
| Health and nutrition | 500,000 | 500,000 | | |
| Water and environment | 500,000 | 500,000 | | |
| | **Total estimated overall cost for CPF** | **Total estimated resources* available for CPF** | **Total resources to be identified/mobilised** | |
| | 1,500,000 | 1,500,000 | | *(=)* |
| | **<u>Estimated government cost sharing</u> (included in the above total of resources* available – B)** | | | |
| | **<u>Other estimated extrabudgetary contributions</u> from donors/partners who have expressed interest ((included in the above total of resources* available – B)** | | | |
| | **<u>Estimated in-kind contributions</u> from the Government and other partners/donors that have expressed interest (included in the above total of resources** available – B)** | | | |

(*)-The above stated figures are indicative. Signing of the CPF does not commit to funding of the CPF implementation by the Member State or the IAEA, nor does it suggest the expectation of continued levels of Agency funding. The main purpose is to assist planning and prioritization of the Country Programme Framework.
(**)-This estimate should reflect the total estimated value (in Euros) of in-kind contributions provided by the Member State to carry out the planned programme (in-kind examples: time of staff, infrastructure, materials, equipment, repairs, construction work, sampling costs, shipment costs, etc.)

# 4. PROGRAMME IMPLEMENTATION AND SUPPORT

## 4.1 CPF COORDINATION

The preparation of this CPF was coordinated and monitored by the Greek Atomic Energy Commission (EEAE), as the institution hosting the NLO office, and the Programme Management Officer at the Division for Europe of the IAEA Department of Technical Cooperation. The National CPF Coordinator identified and nominated focal persons in the relevant institutes and laboratories listed in the Results Matrix who participated in the preparation process.

## 4.2 FUTURE REVIEW OF CPF

Future reviews of progress under this CPF will be ongoing throughout the lifetime of this CPF and will be conducted shortly before the end of each TC programme cycle. The knowledge gained from the review of the CPF will serve to better inform the formulation of new project proposals for the following TC programme cycle. The review will consider evolving development priorities at the national level, including the consideration of any significant changes (positive or negative) that have affected the programme.

The review will be led by the Programme Management Officer of Greece within the Division of Europe at the IAEA's Department of Technical Cooperation and the NLO at the Greek Atomic Energy Commission (EEAE). The final review and update towards the following CPF will be made latest in 2026, one year prior to the expiration of this CPF.

## 4.3 PARTNER COORDINATION

Greek Atomic Energy Commission works with multiple development partners. Greece became a member of the International Atomic Energy Agency (IAEA) in 1957. Moreover, as a member of the UN, Greece adopted the 2030 Agenda for Sustainable Development with the SDGs at its core.

It is stressed that currently many Greek institutions and organizations are participating in IAEA's Regional Projects (RER) under the TC programme as well as in Coordinated Research Projects (CRP).

This CPF has been developed based on Greece's priorities regarding nuclear technology applications and radiation safety and the SDGs that Greece has identified for achievement by 2030. More specifically, the planned outcomes of the proposed technical cooperation programme under the CPF will contribute to the attainment of SDG 3 – Good Health and Well-Being. In addition, several international frameworks, policies and conventions have been taken into consideration in the formulation of the CPF.

For the implementation of the proposed programme under this CPF, the following have been identified as key partners:

*National:*

1. Greek Atomic Energy Commission (EEAE)
2. National Centre for Scientific Research (NCSR) “Demokritos”
3. National Technical University of Athens (NTUA)
4. Aristotle University of Thessaloniki (AUTH)
5. University of Ioannina (UoI)
6. Technical University of Crete (TUC)
7. Hellenic Centre for Marine Research (HCMR)
8. General Secretariat of Civil Protection (GSCP)
9. Hellenic National Meteorological Service (HNMS)

The cooperation framework of the above stakeholders is defined in detail in the National Specific Plans for Emergency Preparedness and Response that have been developed and implemented.

*International:*

1. European Commission (EC)
2. International Atomic Energy Agency (IAEA)

# ANNEX 1: PARTNERSHIP MATRIX

| Thematic Area | Outcome in National Plan or Sector Strategy | CPF Outcomes | Links with SDGs | Relevant Partners |
|---|---|---|---|---|
| **Nuclear and radiation safety and security** | 1. Enhanced radiation technical services' capabilities.<br>2. Enhanced safety in radioactive waste management. | Enhanced radiation nuclear and radiation safety and security by:<br>- improving the radiation technical services provided at national level,<br>- facilitating the implementation of the national programme for the management of radioactive waste. | SDG 3 - ensure healthy lives and promote well-being for all at all ages. | *National:*<br>1. Greek Atomic Energy Commission (EEAE)<br>2. National Centre for Scientific Research (NCSR) "Demokritos"<br>3. National Technical University of Athens (NTUA)<br>4. Aristotle University of Thessaloniki (AUTH)<br>5. Hellenic National Meteorological Service (HNMS)<br>*International:*<br>1. European Commission (EC)<br>2. International Atomic Energy Agency (IAEA) |

| Thematic Area | Outcome in National Plan or Sector Strategy | CPF Outcomes | Links with SDGs | Relevant Partners |
|---|---|---|---|---|
| **Health and nutrition** | Enhanced nuclear technology research capabilities in the field of health. | Enhanced research capabilities regarding the use of nuclear technologies in the field of health. | SDG 3 - ensure healthy lives and promote well-being for all at all ages. | *National:*<br>National Centre for Scientific Research (NCSR) "Demokritos"<br>*International:*<br>1. European Commission (EC)<br>2. International Atomic Energy Agency (IAEA) |
| **Water and environment** | 1. Enhanced emergency preparedness and response capabilities.<br>2. Enhanced environmental monitoring capabilities. | Enhanced capabilities for the protection of the water and the environment through the continuous improvement of infrastructures for:<br>- the monitoring of environmental radioactivity,<br>- the emergency preparedness and response. | SDG 3 - ensure healthy lives and promote well-being for all at all ages. | *National:*<br>1. Greek Atomic Energy Commission (EEAE)<br>2. National Centre for Scientific Research (NCSR) "Demokritos"<br>3. National Technical University of Athens (NTUA)<br>4. Aristotle University of Thessaloniki (AUTH)<br>5. University of Ioannina (UoI) |

| Thematic Area | Outcome in National Plan or Sector Strategy | CPF Outcomes | Links with SDGs | Relevant Partners |
|---|---|---|---|---|
| | | | | 6. Technical University of Crete (TUC)<br>7. Hellenic Centre for Marine Research (HCMR)<br>8. General Secretariat of Civil Protection (GSCP)<br>*International:*<br>1. European Commission (EC)<br>2. International Atomic Energy Agency (IAEA) |

# ANNEX 2: LIST OF PARTICIPATING INSTITUTIONS

| | **Institution** | **Role and responsibilities** |
|---|---|---|
| 1. | Greek Atomic Energy Commission (EEAE) | National policy and strategy on radiation safety and protection |
| | | Legislative and regulatory framework |
| | | Legislation drafting |
| | | Authorization, inspection and enforcement of radiation facilities and practices |
| | | Occupational exposure and public exposure control |
| | | Environmental radiation monitoring |
| | | Emergency preparedness and response in case of nuclear and radiological emergency |
| | | Secondary Standard Dosimetry Laboratory |
| | | Radioactive waste management |
| 2. | National Centre for Scientific Research (NCSR) "Demokritos" | Environmental radiation monitoring |
| | | Emergency preparedness and response in case of nuclear and radiological emergency |
| | | Radioactive waste management |
| | | Nuclear technology research |
| 3. | National Technical University of Athens (NTUA) | Emergency preparedness and response in case of nuclear and radiological emergency |
| | | Radioactive waste management |
| 4. | Aristotle University of Thessaloniki (AUTH) | Emergency preparedness and response in case of nuclear and radiological emergency |
| | | Radioactive waste management |
| 5. | University of Ioannina (UoI) | Emergency preparedness and response in case of nuclear and radiological emergency |
| 6. | Technical University of Crete (TUC) | Emergency preparedness and response in case of nuclear and radiological emergency |
| 7. | Hellenic Centre for Marine Research (HCMR) | Emergency preparedness and response in case of nuclear and radiological emergency |
| 8. | General Secretariat of Civil Protection (GSCP) | Emergency preparedness and response in case of nuclear and radiological emergency |

| | Institution | Role and responsibilities |
|---|---|---|
| 9. | Hellenic National Meteorological Service (HNMS) | Emergency preparedness and response in case of nuclear and radiological emergency |

# ANNEX 3: LEGAL FRAMEWORK AND IAEA-RELEVANT TREATIES

## 1. National Legal Framework

The Country's legislation listed below as in force in 2023 and published in the Government Gazette.

*Radiation safety*

1. Law No. 181/1974, Protection against ionizing radiation, Government Gazette Folio No.347/A/20.11.1974.
2. Law No. 4310/2014, Research, Technological Development and Innovation and other provisions (Chapter E' - Nuclear Energy, Technology and Radiation Protection − Greek Atomic Energy Commission (EEAE), articles 39 - 46 & article 90), as it was amended with the Law No. 4982/2022 and the Law No. 5019/2023.
3. Presidential Decree No. 101/2018, Adaptation of the Greek legislation to Council Directive 2013/59/Euratom of December 5, 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionizing radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/ Euratom and 2003/122/ (EE L13/17.1.2014) - Establishment of radiation protection regulations, Government Gazette Folio No. 194/A/20.11.2018.
4. Ministerial Decision No. 45872/2019, Procedures for the regulatory control of practices of ionizing radiation – approval and recognition of services and experts, Government Gazette Folio No. 1103/B/03.04.2019 as it was amended by the Ministerial Decision No. 32083/2022, Government Gazette Folio No. 1552/B/04.04.2022.
5. Ministerial Decision 135966/30.12.2019, Implementation of existing exposure situation strategies, Government Gazette Folio No. 5116/B/31.12.2019.
6. EEAE Decision No. 4a/261/2019, Establishment of mechanisms for the recognition of radiation protection experts, medical physics experts and occupational health services, authorization of dosimetry services and the approval of radiation protection officers, Government Gazette Folio No. 2460/B/21.06.2019 as it was amended by the EEAE Decision No. 2/283/2022, Government Gazette Folio No. 4196/B/08.08.2022.
7. EEAE Decision No. 4b/261/2019, Establishment of the dose constraints for public exposure from planned operation of a specified radiation source, Government Gazette Folio No. 2460/B/21.06.2019.
8. EEAE Decision No. 4c/261/2019, Specific measures for the safe management and control of high activity sealed sources, Government Gazette Folio No. 2460/B/21.06.2019.
9. EEAE Decision No. 4d/261/2019, Submission and access to the results of individual monitoring, Government Gazette Folio No. 2460/B/21.06.2019.
10. EEAE Decision No. 4/266/2020, Description of incidents involving or possibly involving accidental or unintentional exposure during medical exposure to be reported directly to the Greek Atomic Energy Commission, Government Gazette Folio No. 214/B/03.02.2020.

11. Ministerial Decision 43374/4.10.2020, National action plan for addressing long-term risks from radon exposure, Government Gazette Folio No. 1881/B/13.08.2020.

*Emergency preparedness*

1. Law No. 3013/2002, Upgrade of the General Secretariat for Civil Protection, Government Gazette Folio No. 102/A/1.5.2002, as in force.
2. Ministerial Decision No. 1299/2003, Approval of the General Plan for Civil Protection, under the Code Name Xenokratis, Government Gazette Folio No. 423/B/10.04.2003.
3. Presidential Decree No. 101/2018, Adaptation of the Greek legislation to Council Directive 2013/59/Euratom of December 5, 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionizing radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/ Euratom and 2003/122/ (EE L13/17.1.2014) - Establishment of radiation protection regulations, Government Gazette Folio No 194/A/20.11.2018 (Section 5 and Annex XI).
4. General Emergency Response Plan due to Accidents during the Road and Rail Transport of Dangerous Goods in accordance with the ADR/RID Regulations, 1st edition, 30.06.2020.
5. General CBRN threat and incident management plan 'Pandora', 2nd edition, September 2021.
6. Special Response Plans in Case of a Radiological or Nuclear Emergency (ESARPEA) due to severe accident at a nuclear facility abroad, 1st edition, May 2022.
7. Special Response Plans in Case of a Radiological or Nuclear Emergency (ESARPEA) due to accident in facility of category III., October 2022.

*Radioactive waste*

1. Ministerial Decision No. 35225/2023 Legislative, regulatory and organizational framework for the responsible and safe management of spent fuel and radioactive waste - Adaptation of Greek legislation to Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste (OJ L 199/02.08.2011) - National program for the management of spent fuel and radioactive waste.
2. Law No. 4310/2014, Research, Technological Development and Innovation and other provisions (Chapter E' - Nuclear Energy, Technology and Radiation Protection − Greek Atomic Energy Commission (EEAE), articles 39 - 46 & article 90), as it was amended with the Law No. 4982/2022 and the Law No. 5019/2023.
3. Presidential Decree No. 83/2010 of 3 September 2010 transposing Council Directive 2006/117/Euratom of 20 November 2006 on the Supervision and Control of Shipments of Radioactive Waste and Spent Fuel.

*Nuclear installations*

1. Act No. 854/1971, On the terms regarding the establishment and operation of nuclear facilities, Government Gazette Folio No. 54/A/18.03.1971.

2. Presidential Decree No.610, Establishing terms and procedures in licensing Public Power Corporation to construct a nuclear power plant on a specific site, Government Gazette Folio No. 130/A/23.08.1978.

*In early 1980s, a decision was made to exclude nuclear power electricity generation. Therefore, the above two pieces of legislation have never been used and can be considered as archival pieces of legislation.*

3. Presidential Decree No. 60/2012, Establishing a National framework for the nuclear safety of nuclear installations (transposition of the Council Directive 2009/71/ Euratom of 25 June 2009), Government Gazette Folio No. 111/A/03.05.2012.

*Nuclear research reactors*

1. Ministerial Decision 91175/31.05.2017, Amendment of the Decision no. P/112/305/2012 (Β΄ 2877/26.10.2012) Basic requirements – principles of nuclear safety and regulatory control of research reactors (transposition of the Directive 2014/87/Euratom), Government Gazette Folio No. 1991/B/09.06.2017.
2. Ministerial Decision P/112/305/2012, Basic requirements – principles of nuclear safety and regulatory control of nuclear research reactors, Government Gazette Folio No. 2877/B/26.10.2012.
3. Ministerial Decision 84631/07.08.2020, Amendment of the Decision no. P/112/305/2012 (Β΄ 2877) Main requirements – principles of nuclear safety and regulatory control of research reactors as amended by Decision no. 91175/2017 (B' 1991) transposing Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations (L 219 /25.7. 2014).

*Implementation of the International obligations*

1. Law No. 336/1969, Ratification of the Protocol Amending the Convention on Third Party Liability on the Field of Nuclear Energy of 29 July 1960, Government Gazette Folio No. 269/A/16-12-1969.
2. Law No. 1636/1986, Ratification of the Convention on the physical protection of nuclear material, Government Gazette Folio No. 106/A/18.07.1986.
3. Law No. 1758/1988, Ratification of the Protocol Amending the Convention on Third Party Liability on the Field of Nuclear Energy of 29 July 1960, as it was modified by the Additional Protocols of the 28 January 1964, Government Gazette Folio No. 44/A/10.03/1988.
4. Law No. 1937/1991, Ratification of the International Convention in case of a Nuclear Accident or Radiological Emergencies, Government Gazette Folio No. 35/A/13.03/ 1991.
5. Law No. 1938/1991, Ratification of the International Treaty on Early Notification in case of a Nuclear Accident, Government Gazette Folio No. 36/A/13.03.1991.
6. Law No. 2480/1997, Ratification of the Nuclear Safety Convention, Government Gazette Folio No. 70/A/14.05.1997.

7. Law No. 2824/2000, Ratification of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, Government Gazette Folio No. 90/A/16.03.2000.
8. Law No. 3787/2009, Ratification of the Protocol amending the Convention on Third Party Liability in the field of nuclear energy of 29 July 1960, as amended by the additional protocol of 28 January 1964 and by the Protocol of 16 November 1982, Government Gazette Folio No. 140/A/07.08.2009.
9. Law No. 3990/2011, Amendment of the Convention of Physical Protection of Nuclear Materials, Government Gazette Folio No. 159/A/13.07.2011.

*Safeguards and non-proliferation*

1. Law No. 437/1970, Ratification of the nonproliferation treaty signed on the 1 June 1968, Government Gazette Folio No. 49/A/26.02.1970.
2. Safeguards agreement between Greece and IAEA signed on 17.11.1972.
3. Ministerial Decision No. 5408/E3/2362, Control on transfer of nuclear materials, armament and technologies affecting national Defense and Security, Government Gazette Folio No. 730/B/21.09.1993.
4. Law No. 2805/2000, Ratification of the additional protocol, Government Gazette Folio No.50/A/03.03.2000.

## 2. International Treaties under the IAEA Auspices

*Agreements*

| | Title | In Force | Status |
|---|---|---|---|
| P&I | Agreement on the Privileges and Immunities of the IAEA | 1970-11-02 | Acceptance: 1970-11-02 |
| VC | Vienna Convention on Civil Liability for Nuclear Damage | | Non-Party |
| VC/OP | Optional Protocol Concerning the Compulsory Settlement of Disputes | | Non-Party |
| CPPNM | Convention on the Physical Protection of Nuclear Material | 1991-10-06 | Signature: 1980-03-03<br>Ratification: 1991-09-06 |
| CPPNM/A | Amendment to the Convention on the Physical Protection of Nuclear Material | 2016-05-08 | Ratification: 2011-12-13 |

| | | | |
|---|---|---|---|
| NOT | Convention on Early Notification of a Nuclear Accident | 1991-07-07 | Signature: 1986-09-26<br>Ratification: 1991-06-06 |
| ASSIST | Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency | 1991-07-07 | Signature: 1986-09-26<br>Ratification: 1991-06-06 |
| JP | Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention | 2001-08-16 | Signature: 1988-09-21<br>Ratification: 2001-05-16 |
| NS | Convention on Nuclear Safety | 1997-09-18 | Signature: 1994-11-01<br>Ratification: 1997-06-20 |
| RADW | Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management | 2001-06-18 | Signature: 1998-02-09<br>Ratification: 2000-07-18 |
| PVC | Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage | | Non-Party |
| SUPP | Convention on Supplementary Compensation for Nuclear Damage | | Non-Party |

*Technical Cooperation Agreements*

| | Title | In Force | Status |
|---|---|---|---|
| **RSA** | Revised Supplementary Agreements Concerning the Provision of Technical Assistance by the IAEA (RSA) | 1979-07-26 | Party |

*Safeguards Agreements*

| Reg. No | Title | In Force | Status |
|---|---|---|---|
| **884** | Application of safeguards in connection with the Treaty on Non-proliferation of Nuclear Weapons | 1972-03-01 | Signature: 1972-03-01 |

| | | | |
|---|---|---|---|
| **1240** | Application of safeguards in implementation of Article III (1) and (4) of the Treaty on the Non-Proliferation of Nuclear Weapons (with Protocol) | 1981-12-17 | Accession: 1981-12-17 |
| **1769** | Prot.Add. to Agreement between the Rep. Austria, the Kingdom of Belgium, the Kingdom of Denmark, the Rep. of Finland, the Federal Rep. of Germany, the Hellenic Rep., Ireland, the Italian Rep., the Grand Duchy of Luxembourg, the Kingdom of the Netherlands, the Portuguese Rep., the Kingdom of Spain, the Kingdom of Sweden, the European Atomic Energy Community and the IAEA in Implementation of Article III, (1) and (4) of the Treaty on the Non-Proliferation of Nuclear Weapons | 2004-04-30 | Signature: 1998-09-22 |

# ANNEX 4: DETAILS OF PAST TC PROGRAMME ACHIEVEMENTS

- More than 70 TC projects have been completed under the auspices of the TC programme.
- Key areas and major impact include:
  - Environmental monitoring capabilities
  - Individual monitoring capabilities
  - Nuclear applications and radiation protection in medicine
  - Application of isotopes and radiation in food and agriculture.

Some of the main results of past technical cooperation and the key counterpart institutes and partners are presented in the following table.

| Thematic area | Results of past TCPs | Key counterpart institutes and partners |
|---|---|---|
| **Nuclear and Radiation Safety** | 1. Upgraded neutron activation analysis, spectrometry and accelerator techniques.<br>2. Application of isotopes and radiation in food and agriculture.<br>3. Improved environmental radioactivity monitoring capabilities.<br>4. Improved individual monitoring capabilities. | 1. Greek Atomic Energy Commission (EEAE)<br>2. National Centre for Scientific Research (NCSR) "Demokritos" |
| **Health** | 1. Application of technologies for the production of radiopharmaceuticals and nuclear analytical techniques.<br>2. Improved medical diagnostic capabilities with the use of radiopharmaceuticals. | National Centre for Scientific Research (NCSR) "Demokritos" |

**Table 1. List of national projects in 1977-2003 and their implementation status**

| Project Number | Title | Completed in |
|---|---|---|
| GRE1030 | Nuclear Physics | 1978 |
| GRE1031 | Neutron Activation in Multi-Element Analysis | 1985 |
| GRE1032 | Neutron Activation Analysis | 1986 |
| GRE1033 | Upgrading of Neutron Spectrometer | 1995 |
| GRE1034 | Ion Implantation Using a Tandem Accelerator | 1994 |
| GRE1035 | INAA of Trace Elements in Atmosphere of Athens | 1997 |
| GRE1036 | Recommissioning of Neutron Diffractometer | 2000 |
| GRE1037 | National Calibration Laboratory for Ionizing Radiation | 2002 |
| GRE1038 | Environmental Radioactivity Monitoring: Aerosol Measurements | 2004 |
| GRE1039 | Large-Sample Neutron Activation Analysis Facility at GGR-1 Research Reactor | 2004 |
| GRE2010 | Radiopharmaceuticals | 1977 |
| GRE2011 | Radiopharmaceuticals | 1978 |
| GRE2012 | Labelled Compounds | 1979 |
| GRE2013 | Radiopharmaceuticals | 1981 |
| GRE2015 | Radiopharmaceuticals | 1987 |
| GRE2016 | Production of Labelled Organic Compounds | 1985 |
| GRE2017 | Radiopharmacology | 1987 |
| GRE2018 | Cyclotron Facility | 1985 |

| | | |
|---|---|---|
| GRE2019 | Radio immunochemistry | 1987 |
| GRE2020 | Radiopharmaceuticals | 1989 |
| GRE2021 | Nuclear Techniques in Analytical Chemistry | 1997 |
| GRE2022 | Establishment of a XRF Laboratory | 1994 |
| GRE2023 | Chemiluminescence Induced by Internal Radiation | 1994 |
| GRE2024 | Advanced Nuclear Analytical Techniques | 1997 |
| GRE2025 | Upgrading a Nuclear Analytical Laboratory | 1997 |
| GRE2027 | Production of Advanced Radiopharmaceuticals for Diagnostics | 2000 |
| GRE2028 | Radionuclide Transfer in Mediterranean Soil-Plant Ecosystem | 2000 |
| GRE3005 | Exploration for Uranium | 1981 |
| GRE3006 | Nuclear Raw Materials | 1984 |
| GRE3007 | Uranium Exploration and Evaluation | 1991 |
| GRE4007 | Research Reactor Utilization | 1984 |
| GRE4008 | Research Reactor Modernization | 1992 |
| GRE4009 | Research Reactor Upgrading | 1996 |
| GRE5008 | Radioisotopes in Agriculture | 1977 |
| GRE5009 | Radioisotopes in Agriculture | 1977 |
| GRE5010 | Radioisotopes in Agriculture | 1979 |
| GRE5011 | Isotopes in Agriculture | 1980 |
| GRE5012 | Use of Neutron Moisture Meter | 1981 |
| GRE5013 | Studies of Plant Water Use Efficiency | 1984 |

| | | |
|---|---|---|
| GRE5014 | Isotope-Aided Crop Studies | 1989 |
| GRE5015 | Nuclear Techniques in Agriculture | 1989 |
| GRE5016 | Nitrogen-15 Fertilizer Studies | 1987 |
| GRE5017 | Nuclear Technology in Animal Science | 1989 |
| GRE5018 | Control of the Mediterranean Fruit Fly in Crete | 2000 |
| GRE5019 | Monitoring and Rehabilitation of Cesium-Polluted Areas by Phytoremediation | 2001 |
| GRE6004 | Radioisotopes in Medicine | 1977 |
| GRE6005 | Hospital Physics | 1980 |
| GRE6006 | Nuclear Medicine | 1987 |
| GRE6007 | Radiopharmaceutical Quality Control | 1993 |
| GRE6008 | Development of New Techniques with Radioisotopes in-Vitro | 1997 |
| GRE7005 | Microbiology | 1976 |
| GRE7006 | Radioisotopes in Tissue Culture | 1977 |
| GRE8004 | Radioisotope Hydrology | 1978 |
| GRE8005 | Radioisotopes in Hydrology | 1980 |
| GRE8006 | Isotopes in Hydrology | 1991 |
| GRE8007 | Recharging Gammacell 200 Irradiator | 1997 |
| GRE8008 | Isotopes in Geothermal Studies | 1994 |
| GRE8009 | Natural C-14 Measurement by Liquid Scintillation | 1996 |
| GRE8010 | Geothermal Exploration of Soussaki, Methana and Aeghina | 1998 |
| GRE9007 | Computer Programme and Spectroscopy | 1978 |

| | | |
|---|---|---|
| GRE9008 | Reactor Safety | 1983 |
| GRE9009 | Environmental Radioactivity | 1980 |
| GRE9010 | Environmental Radioactivity | 1981 |
| GRE9011 | Environmental Radioactivity | 1987 |
| GRE9012 | Monitoring Background Radiation Levels | 1988 |
| GRE9013 | Environmental Radioactivity | 1991 |
| GRE9014 | Whole Body Counter Commissioning | 1995 |
| GRE9015 | Modernization of Personnel Dosimetry | 1995 |
| GRE9017 | Upgrading of Whole-Body Counter | 1999 |
| GRE9018 | Establishment of Whole-Body Counter | 1996 |
| GRE9019 | Improving Personnel Dosimetry Services by Introducing TLD | 2001 |
| GRE9020 | Gamma Spectroscopy System for Environmental Monitoring | 2001 |
| GRE1040 | Development of a Regional Neutron Scattering Centre | 2003 |
| GRE4010 | Establishing Quality Control for Advanced Radiopharmaceuticals | 2003 |
| GRE9021 | Measuring Radionuclide Intake of Workers | 2003 |