GOVERNMENT OF GEORGIA

INTERNATIONAL ATOMIC ENERGY AGENCY

COUNTRY

PROGRAMME FRAMEWORK

2015 - 2019

On behalf of the Government of Georgia:

Signature

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I. INTRODUCTION

The Country Programme Framework (CPF) has proven to be a useful and insightful tool for organizing technical cooperation activities with the Member States. This has also led to a better planning, coordination and financing of high priority national programmes, making the implementation of projects more effective and producing significant results. The main objective of the CPF document for Georgia is to identify and agree on areas for Technical Cooperation with the International Atomic Energy Agency (IAEA) that are of high priority for the country. It is intended to define the TC programme that will have a clear impact, be end-user oriented and enjoy strong government support and commitment. Thus the resulting TC programme will reflect the CPF document and allow the Agency to make an important contribution through addressing sustainable development problems of the country. The current CPF focuses on improvements in the areas of social policy and human health, governmental, legal and regulatory infrastructure for radiation safety, radioactive waste management, science and technology, covering the period 2015-2019.
Success of the development challenges that the country faces in its development programmes depend both on shortage of resources, technology and knowhow transfer that is needed to cope with all the problems. Therefore in the context of peaceful use of nuclear energy the Government emphasised the importance of technical cooperation by signing of revised supplementary agreement concerning the provision of technical assistance by the IAEA to Georgia (19.09.2001.). Continuation of cooperation under the IAEA TC programme is considered as a vital component of the national policy in nuclear field, and as a vehicle helping solve existing acute problems and possible triggering dynamics of technological progress.

The first CPF was signed during the General Conference in 2000 and the second one in 2005 whereby sources securing, human health and upgrading radiation protection infrastructure where identified as the priorities for Technical Cooperation with the Agency. The present CPF document reflects the new developments and needs that have occurred since the last CPF document for Georgia was agreed. It is the Government commitment to continue technical cooperation in the areas important for national development, extend the use of nuclear technology in broad spectrum of applications and assure radiation protection and safety. Additional areas of focus are strengthening the regulatory infrastructure in line with international obligations and harmonizing national nuclear undertakings with international legislation and requirements.

II. NATIONAL DEVELOPMENT PRIORITIES AND ACTIVITIES RELEVANT TO THE AGENCY'S TECHNICAL COOPERATION PROGRAMME

II.1. Governmental, legal and regulatory infrastructure for radiation safety

The existence of an independent and effective regulatory authority provided with appropriate infrastructure, resources (including staff and budget) and sufficiently empowered by the legislation to implement its regulatory functions is acknowledged to be a precondition for the safe and secure use of nuclear technology and its applications in the country and a requirement for the development of technical cooperation with the IAEA in this field.

Ministry of Environment and Natural Resources Protection of Georgia is the state regulator for nuclear and radiation safety. Operating within the Ministry, the Department for Nuclear and Radiation Safety (DNRS) (former Service) of the Ministry provides comprehensive control over nuclear and radiation safety. The law "On Nuclear and Radiation Safety" issued in 1999 has been replaced with new Law "On Nuclear and Radiation Safety" in March 20, 2012. By the Law on Nuclear and Radiation Safety obligation for adoption of secondary regulations is defined (article 53). Several regulations already enacted during the year 2014. All others planned to be adopted till 2016. In parallel to this, process of review and improvement of existing regulations is ongoing. Safety fundamentals and requirements, especially the relevant set of General Safety Requirements (GSR) of the IAEA safety standards shall be applied regarding radiation safety, control of radiation sources, including

licensing, review and assessment, inspection and enforcement of all applications of radiation and nuclear technologies.

II.2. Energy and Energy Policy

As the economy of Georgia continuous its growth, the domestic consumption is expected to grow. Thus, the energy sector remains among top priorities for the Government and it continues to further reform and improve the functioning of the sector to make it even more productive and sustainable. The Government has decided to diversify energy sources for sustainable social and economic development. In that context considered to increase of use the renewable energy sources and initiate preliminary discussions on the potential of nuclear power. As an alternative to the currently prevailing use of hydro power in the country, nuclear energy is a subject for consideration among other sources of energy.

II.3. Social Policy and Human Health

Over the past decade the health care system in Georgia has undergone substantial transformation, including reforms in the organization, financing and delivery of health services. Major shifts were also made to the medical education system. The country through increased domestic investments and significant international assistance has attained critical achievements vis-a-vis health-related Millennium Development Goals (child survival, national responses to HIV, TB and Malaria). However Georgia is still facing a number of critical challenges in the core building blocks of the health system that needs urgent attention and strengthened cooperation at both the national and international levels.

Additional policy, regulatory and capacity building interventions are necessary for ensuring universal coverage and equitable access to high quality care to meet the basic healthcare needs of the Georgian population. This requires optimizing the health financing system, building highly skilled human resources, improving quality of service delivery and enhancing the health information system. Ministry of Labor, Health and Social Affairs is responsible for social policy and human health in the country. Monetary social assistance and health insurance are two footings on which social integration, access to medical service and public health are based upon. A new stage of health care reform is to be based on 2014-2020 Georgia State Conception on Health Care "Universal Health Care and Quality Management for Patient Rights Protection" approved by an order of the Government of Georgia N 724 (December 26, 2014).

II.4. Radioactive waste Management

Strengthening the system for radioactive waste management remains a priority issue for Government. After the breakdown of the Soviet Union, large numbers of radioactive sources abandoned by the former Soviet army in various parts of Georgia were misplaced or stolen causing human injuries and radiation threat. Although about 90% of the territory has already been searched, there are indications that some orphan sources could still be unallocated.

Before 2007, Georgia did not have a storage facility for radioactive sources and the users kept the disused sources on temporary basis in their premises. This situation created significant problems keeping disused and recovered orphan radioactive sources safe and secure. In 2004, the President of Georgia issued Order No. 840 which prescribed the establishment of a temporary Centralized Storage Facility (CSF) at the Applied Research Center (former Nuclear Center) of the Institute of Physics. The storage facility was dedicated to safely keep the following type of radioactive waste:

- Radioactive waste from scientific-research and nuclear reactor decommissioning;
- Recovered orphan radioactive source;
- Disused radioactive sources;

Any other type of radioactive waste which is appropriate for safe storage in this facility.

About 30 km from Tbilisi, there is located the Saakadze Disposal Site, which was closed in 1988, although the last disposal of a disused 60Co medical source happened in 1995. The disposal facility is of "near-surface" so called "Radon" type where waste is placed in a "sandwich" of layers of waste, concrete and soil. There is no detailed record of the radioactive waste (or disused sources) buried in the facility. The disposal site is currently under the state ownership and in the list of properties of the Ministry of Economy and Sustainable Development. The project on physical security and infrastructure upgrade of Saakadze radioactive waste disposal, supported by the Governments of UK and Georgia is finished and further steps on decision making activities to be conducted by the Government of Georgia on introduction of overall radioactive waste management infrastructure which does not exist so far. In parallel to this special investigation EU is assessing the safety conditions of CSF and the disposal. Further activities are planned to issue safety assessment report for both facilities. Establishment of radioactive waste management system is to be coincide with introduction of relevant legislation in face of the law on radioactive waste management which is anticipated till the end of the year 2015.

II.5. *Science and Technology*

Science & technology in Georgia has a basis of several scientific institutions that were founded during the USSR era and were linked with the military R&D programmes of the country. Since independence the new strategic purposes and priorities of science have been defined. The Legal Entity of Public Law (LEPL), Rustaveli National Science Foundation was established by the order of the Minister of Education and Science of Georgia (June 28, 2010) and it is the successor of the LEPL Georgian National Science Foundation and the LEPL Foundation for Georgian Studies, Humanities and Social Sciences (Rustaveli Foundation). The Foundation is designed to ensure the rational spending of financial means, intended for science, making the unified science financing system and establishing public trust as well as monitoring stakeholders' activities of State Scientific grants and introducing the report to the Ministry of Education and Science about new scientific products and expected economic effects on data, based on the grant financing. The Foundation is supporting projects in different areas including engineering, high-technology materials, physics and chemistry, life and medical studies, earth science and environment and agrarian sciences.

Due to reforms in science and education all former scientific-research institutes merged in groups according to thematic areas and moved under umbrellas of State Universities.

III. RELEVANT INTERNATIONAL DEVELOPMENT ASSISTANCE

Since independence Georgia has received assistance through support programmes of a number of international organizations, such as the World Bank (WB), IMF, UNDP, WHO, UNEP, EU and EBRD. Especially regarding radiation safety and nuclear applications, Georgia has received considerable assistance from the US and has also been included in the EU European Neighborhood Policy along with other countries of the South Caucasus; this opens up significant new cooperation opportunities with the EU. The Projects covered a broad spectrum of subjects. Georgia carries out active collaboration with IAEA, USA, France, Italy, Sweden, Turkey and other partner states.

The UN Development Assistance Framework (UNDAF) for the period 2011-2015 defines the United Nations' areas of collaboration with the Government of Georgia and outlines the three interrelated thematic areas in which the UN system can most effectively respond to the priorities and needs of the country:

1. Poverty Reduction to advance inclusive development, employment creation and access to health, education and essential social services, especially for vulnerable groups;
2. Democratic Development to promote balanced, independent, fair and participatory governance systems and processes at all levels, based on the Rule of Law, human rights and equality principles;

3. Disaster Risk Reduction to build up Georgia's resilience to disasters through prevention and minimizing damage and loss in case of emergencies.

The country through increased domestic investments and significant international assistance has attained critical achievements vis-a-vis health-related Millennium Development Goals. However Georgia is still facing a number of critical challenges in the core building blocks of the health system that needs urgent attention and strengthened cooperation at both the national and international levels. Beyond the cooperation of Georgia and the IAEA, collaborative programmatic linkages with other UN Agencies that have a lead mandate in areas such as health and environment (WHO and UNEP) will be expanded.

Beyond the cooperation of Georgia and the IAEA the following bilateral agreements were issued with other donor states and organizations:

1. **Agreement between the Department of Energy of United States of America and the Ministry of Energy and Natural Resources of Georgia concerning Cooperation to Enhance the Security of Georgia's Radioactive Sources**

The Agreement was signed on September 7, 2011 under the umbrella of Agreement between the United States of America and Georgia Concerning Cooperation in the Area of the Prevention of Proliferation of Weapons of Mass Destruction. Tasks:

- Consolidation of (more than 10 Ci);
- And security upgrades of high activity radiation sources on their workplaces and while storing in the centralized storage facility.

As an example, gamma sources recovery and radioactive waste management is a subject of cooperation with several countries including USA, EU and particularly UK. In 2010 the USA assisted the country in retrieving gamma sources from an RHM Gamma-20 (Russian "РХМ Гамма-20") facility at the former Institute of Plant Protection in Tbilisi. The work was successfully completed and the sources transferred to the Centralized Storage Facility. All high activity sources (above 10 ci) already consolidated to the CSF with the support of the US DoE.

2. **Implementing agreement between the Department of Energy of United States of America and the Ministry of Internal Affairs of Georgia on Cooperation to Prevent of Smuggling of Nuclear and other Radioactive Material**

The Agreement was ratified by the Parliament of Georgia on March 17, 2006. Task: Implementation of SLD (Second Line Defense) program for Georgia which is mainly addressed to the enhancement of capabilities to detect and seize the illicit trafficking of nuclear and radioactive material on state border.

3. **Collaboration agreement between the European (Atomic Energy) Community and the Ministry of Energy and Natural Resources of Georgia**

The Agreement is in the process of approval by the EURATOM (unilaterally signed from Georgian side on April 2012). Task: Joint analysis of nuclear material removed from criminal and other illegal activities.

IV. OVERVIEW OF AGENCY PAST AND PRESENT TECHNICAL COOPERATION ACTIVITIES IN GEORGIA

Georgia became Member State of the IAEA in February 1996 and has been receiving technical assistance since 1997 and since that enjoyed participation in TC programme under 17 completed and 8 active national TC projects. It also took part in many regional projects of wide spectrum of subjects for Europe region. From January 2000, technical assistance of above US$8 million was provided in the form of equipment, expert knowledge and

staff training. The following areas have received priority attention: human health, radiation and nuclear safety and security, general atomic energy development, radioactive waste management, isotope hydrology. In that period around 392 specialists (experts, speakers, trainees) have visited Georgia, around 201 Georgians were trained through fellowships and scientific visits and another 291 through regional and/or interregional group activities, mostly in radiation protection and regulatory infrastructure, radiological emergency preparedness, physical protection and nuclear security, nuclear applications in the health sector and hydrology.

The completed and ongoing national TC projects in Georgia address the most urgent and priority tasks of the country in the nuclear field and those can be summarized as follows:

IV.1. Main results of past technical cooperation activities

Search Sr-90 and other Large Orphan Sources:

After the breakup of the former Soviet Union, large radioactive sources that had been abandoned by the former Soviet army in various parts of Georgia were misplaced or stolen, causing human injuries and posing a serious radiation threat to the public. Identified by Government as an urgent national security issue, the search for orphan sources became a high priority. Starting in the late 1990s, a number of radiological incidents took place. To cope with the problem two actions were implemented:

1. Analytical and monitoring equipment provided and the necessary training to enable Georgia to locate, transport and store lost and destroyed sources;
2. An interim storage facility was prepared, with a view to future upgrading the long term storage of radioactive sources.

Starting in 2002, a number of orphan radioactive sources were found and stored in a building located at the site of a decommissioned research reactor. The last mission to search for orphan radioactive sources took place in 2006 and in the mountainous region of Racha, some 300 km North-west of the capital Tbilisi secured two abandoned and potentially dangerous radioactive devices. About 300 radioactive sources have been recovered in Georgia since the mid-1990s among them Sr-90 sources from thermo-generators. Prevention of Illicit Trafficking of Nuclear and Radioactive Materials: Georgia's unique geographical location is combined with a high risk for illicit trafficking of radioactive materials. Therefore prevention of illegally transported nuclear materials across country territory is the Government priority so that the IAEA contributed by the provision of radiation detection equipment and training. Nuclear Security Fund was used for that purpose.

Emergency Preparedness and Response to Radiological Emergencies: Emergency preparedness and response plan for nuclear or radiological emergencies is under development and planned to be enacted in 2016. Besides, the Georgia State Response Plan to Natural and Man-made Emergencies, adopted by the order of the President of Georgia N 415 (August 26, 2008) includes Emergency Function 11 for radiological emergencies. Capabilities to respond to a nuclear or radiological emergency were enhanced. Equipment was provided by the IAEA, EU and USA for environmental monitoring and personal protection, including personal dosimeters for gamma and X-ray radiation, digital hand held spectrometers and dose rate meters with nuclide identification, portable contamination monitors, telescopic probes and computer facilities. Decommissioning of the IRT-M Research Reactor is ongoing: The IRT-M reactor of the Institute of Physics, Georgian Academy of Sciences with thermal power 2 MW (later on upgraded to 8 MW) was put in regular operation in 1959. In 1990 the Academy of Sciences of Georgia, taking into account the limited residual work resource and large investments necessary for evaluation of seismic stability of the reactor, decided to decommission it. The option was immobilizing the most radioactive lower part of the reactor tank and inner cavities of horizontal experimental channels with concrete thereby encapsulating the radioactive waste. All decommissioning activities were conducted under IAEA TC projects GEO/4/002 – “Conversion of Research Reactor to the Low Power Facility”, GEO/3/002 – “Decommissioning of the IRT-M Research Reactor” and GEO/3/004 – “Decommissioning the Reactor Site at the Andronikashvili

Institute of Physics". The reactor was grouted in concrete and its final configuration reached in August 2002 with the support of IAEA TC project. The cooling system of the reactor and all other auxiliary system in the reactor building were dismantled. The overpass connecting the reactor building with cryogenic station was also dismantled. All generated parts were hermetically closed without cleaning activity and put into the storage facility. Some small parts characterized with comparably high activity were immobilized into concrete. (Special concreted drums). Further reactor decommissioning requires establishing of waste treatment capability. All generated waste should be treated and conditioned. The waste that will be generated within the next step of decommissioning also will requires some treatment. Therefore the decommissioning activity was interrupted until the small waste treatment facility is established at the reactor site.

Establishing a Radioactive Waste Management Infrastructure is based on: The order of president of Georgia No. 840 September 18, 2004 prescribed the establishment of the storage facility on territory of Applied Research Center (former Nuclear Center) of Institute of Physics. The established Centralized Storage Facility (CSF) was used to collect all disused sources and radioactive waste form whole country and kept at CSF safely. CSF was modified under IAEA TC project GEO/3/003- "Establishing a Waste Management Infrastructure" and by support of US government.

Development and Upgrading of Radiotherapy Services:

Universal Medical Center has returned to public sector and management is under governmental control. There is one unit of external beam radiotherapy machine with Co-60 unit, manufactured by the Czech company - TERAGAM and one unit of High Dose Rate (HDR) brachytherapy, manufactured by the German company - IBT BEBIG. Universal Medical Center has one active project on upgrading brachytherapy service and in frame of the project Universal Medical Center received additional parts to upgrade the system in order to implement wide spectrum of treatment possibilities for the benefit of cancer patients.

High Technology Medical Center – University Clinic (HTMC) was the first hospital in Georgia equipped with 2 linear accelerator machines and 1 additional linear accelerator is planned to be established in 2015. On the basis of the appointed hospital cancer patient can get Tele-therapy, HDR brachytherapy for gynecological and urological (prostate cancer) treatment as well as LDR brachytherapy application with I-125 permanent seeds.

Research Institute of Clinical Medicine - current priority is an implementation and development of radiotherapy services. Two tele-therapy and one brachytherapy units are operational there. Varian "True Beam" with the wide spectrum of Photon and electron energy was installed late in 2013. The future cooperation with international organizations such as IAEA, ESTRO, and EFOMP certainly will be of great importance for the Institute in reference to selection of necessary equipment and getting special accessories, also in terms of training of the personnel (Physicians, physicists, operators).

Center of Cellular Technologies and Therapy is considered as a perspective for the high level diagnostic and treatment possibilities, because of the high level professionals and appropriate infrastructure by means of all necessary basic and supportive departments for radiotherapy procedures. In the nearest future Center of Cellular Technologies and Therapy is planning to obtain tele-therapy and brachytherapy units. Brachytherapy unit will be oriented to broad spectrum of nosology, but mainly it will focus on Head and Neck brachytherapy will be the only one hospital offering H&N cancer treatment possibilities to patients.

Development and Upgrading of Diagnostic Nuclear Medicine:

Upgraded radionuclide diagnostic methods were established at the nuclear medicine department of the Institute of Radiology and Interventional Diagnostics (IRID). In vivo nuclear medicine was promoted through the introduction of SPECT imaging, teaching and training on planar gamma camera imaging, and installation and

acceptance testing of the SPECT gamma camera procured to the IRID. An airflow bench, dose calibrator, Tc-99m-generators, radiopharmaceuticals, labelling kits, and a rectangular 57Co flood source for the gamma-camera were also provided. The IRID is now carrying out a whole spectrum of routine nuclear medicine procedures including bone scan, thyroid scan, nephro-scintography, myocardium perfusion studies, lung perfusion, RBS scan, liver scan, parathyroid scan, lympho-scintography, and brain SPECT for patients suffering from cardiovascular, nervous, malignant, and infectious diseases by providing them with better diagnosis and treatment possibilities.

Nuclear Medicine Department of the Research Institute of Clinical Medicine is equipped with radionuclide diagnostics. In vivo nuclear medicine was promoted through the introduction of SPECT imaging, teaching and training on planar gamma camera imaging, and installation and acceptance testing of the SPECT gamma camera procured. An airflow bench, dose calibrator, 99mTc-generators, labeling kits, and a rectangular 57Co flood source for the gamma-camera were also provided. The Research Institute of Clinical Medicine is now carrying out a whole spectrum of routine nuclear medicine procedures including bone scan, thyroid scan, nephro-scintography, myocardium perfusion studies, lung perfusion, RBS scan, liver scan, parathyroid scan, lympho-scintography, and brain SPECT for patients suffering from cardiovascular, nervous, malignant, and infectious diseases by providing them with better diagnosis and treatment possibilities. On the basis of the nuclear medicine department at the clinic, implementation of the radioiodine treatment is planned.

At HTMC Nuclear Medicine Department was established in 2012 which provides radioactive iodine therapy to treat thyroid cancer as well as thyroid malfunction. At the same time it is carrying out diagnostic procedures with 131I and 99mTc using Gamma-Camera. PET/CT was established in this department in August 2012 and diagnostic procedures for cancer patients are performed since then with FDG. Even there is a possibility in the country to perform PET/CT diagnostic procedures, the biggest problem was to obtain FDG and remains unsolved. As the half-life of 18F is too short, problem of its import in timely manner sets high cost for this service and makes it available only for limited number of patients. The program also intends to include the establishment of new cyclotron facility which will solve this problem and provide opportunity for the establishment of new PET/CT scanners on the basis of already existing Nuclear Medicine departments.

There is a fully equipped nuclear medicine department at the N. Kipshidze Central Clinical Hospital of Tbilisi State Medical University, with qualified Medical and supportive staff operating SPECT/CT machine (GE INFINIA) for diagnostic purposes in nuclear medicine department. The hospital confirmed its intension to support the nuclear medicine department operation, including radioiodine therapy and for this reason the hospital is developing all needed infrastructure.

Center of Cellular Technologies and Therapy is working on implementation of nuclear medicine imaging and radioiodine treatment. Currently the clinic is on the stage of construction of new building for those purposes. Special attention is given to training of personal.

Secondary Standards Dosimetry Laboratory (SSDL):

A laboratory for the calibration of x-ray and gamma dosimeters was created at the National Institute for Metrology and Standardization. Calibration performed for low-level gamma dosimeters and alpha and beta dosimeters, as well as systems for calibration of radiometers and spectrometers. QC/QA assessed calibration and verification services were established for radiation measurement in-line with international measurement standards. Radiation measurements will be metrological and accurate through the use of the newly calibrated instruments. An operational national SSDL now provides services for spectrometers, dosimeters and radiation monitors.

Environmental Isotope Assessment to Improvement of the Sustainable Management of Groundwater Resources:

Institute of Geophysics of Tbilisi State University evaluated the origin and subsurface pathways of groundwater captured for drinking water supply of the city of Borjomi in Central Georgia. Water monitoring and sampling campaigns provided information on the isotopic and chemical composition of groundwater in springs and nearby rivers. Demonstrated usefulness of isotope techniques, complemented by other methods and applied with a thorough understanding of the principal geological features of the area took place and implemented in a good collaboration between the principal Georgian counterparts (the Ministry of Science and Education and the Ministry of Environmental Protection and Natural Resources) and the local water managers.

The obtained results will be used for building a knowledge base for groundwater management plans along the Southern slope of the Greater Caucasus. These plans might complement and expand the current drinking water concepts in areas which are today largely confronted with over-exploitation or deterioration of captured groundwater.

Assistance from the IAEA, realized through the national TC projects GEO8003 – "Environmental Isotope Assessment to Improvement of the Sustainable Management of Groundwater Resources" and GEO7001 "Supporting Environmental Isotope Assessment to Improve the Sustainable Management of Groundwater Resources" had crucial role on the establishment of sustainable management of groundwater resources.

Nuclear Power

Development of the national infrastructure for the potential introduction of nuclear power is the overall objective with the purpose to understand the "Milestones Approach" to nuclear power development. This includes review of the IAEA relevant 19 infrastructure issues related to the possible application, appropriation and use of nuclear power in Georgia, with the goal of developing a preliminary national energy planning study for long-term planning and modelling that considers the possible use of nuclear power.

Enhanced the Capabilities of Remote Radiation Monitoring Stations:

Remote Radiation Monitoring Stations: Monitoring capabilities of radiation related meteorological data enhanced using modern remote monitoring and analysis systems.

Currently Georgia is non-nuclear country. The nearest reactor in operation is located at about 120 KM from the Southern border-VVER-440 reactor in Metzamor, Armenia. As there are no nuclear installations on the territory of Georgia, the radiological early warning network is focused on the borders.

Enhanced monitoring capabilities of radiation related meteorological data by using modern remote monitoring and analysis systems are employed at 7 stations: Batumi, Akhalkalakhe, Bolnisi, Telavi, Mestia, Tbilisi and Kutaisi.

The installation of the remote radiation system is completed. The system is operating under the National Environment Agency of the Ministry of Environment and Natural Resources Protection and enables background radiation monitoring by 24/7 regime.

International Nuclear Information System:

Georgia joined INIS in 2002 and has established its national INIS center. However, modest participation in INIS has been seen. Further support from the government of Georgia to the national INIS center is of paramount importance to derive maximum benefits from the INIS system. In particular, to ensure full coverage, and preservation, of the national literature related to the peaceful applications of nuclear science and technology and submit its input to the INIS at the IAEA, and to promote INIS and reach potential end users, as well as contributors in Georgia, including universities students. In this area the country will continue its cooperation with IAEA, which might include on-the-job training on the different aspects of INIS operation at well-established national INIS center.

IV.2. The ongoing IAEA technical cooperation programme for Georgia

The ongoing TC programme for Georgia includes 7 national TC projects and participation in 59 regional TC projects for Europe region. The subjects of national projects cover a broad spectrum as follows:

Upgrading Brachytherapy Services at the Universal Medical Centre (UMC)
There are about 10,000 patients examined and treated annually at the Universal Medical Centre (former National Cancer Centre - NCC) in Georgia, which represents about 40% of oncology patients from all around the country. Currently, only gynecological patients receive treatment at the UMC in Tbilisi with a HDR (High Dose Rate) brachytherapy unit. Approximately 400 to 500 patients from all over the country are served annually. Brachytherapy treatment was implemented at the UMC a few decades ago and there is some good experience there in gynecological cancer and rectal cancer treatment. However, the NMC brachytherapy department needs support to upgrade the HDR after loading system from 5 to 24 channels including applicators and accessories. There is also need to establish Quality Assurance at the UMC Radiotherapy Department and train staff (Medical Physicists, Radiation Oncologists, RTTs and also trainers for RTTs and Radiographers) for brachytherapy treatment of various sites so that patients receive good quality treatment with 3D modalities. Thus the project GEO/6/008 – "Upgrading Brachytherapy Services at the National Cancer Centre" will bring the benefit to a large group of cancer patients. Well qualified medical and technical personnel, trained in modern methods of brachytherapy will be able to share the experience and knowledge gained with the other specialists in Georgia.

Water resources
An active project GEO7002 –"Using Isotope and Hydrochemical Techniques for the Assessment of Water Resources" is under implementation. Successfully completed projects GEO/8/003 "Using Isotope Techniques to Assess Water Resources in Georgia" and GEO/7/001 "Supporting Environmental Isotope Assessment to Improve the Sustainable Management of Groundwater Resources" proved that these istopic techniques are technically sound to address water resources issues in country.
One of the priority issues is completion of investigation of water resources in the East Georgia where large deficit of water supply exists. Eastern Georgia encounters, due to its climate, a big deficit of 1040 million m3 of water for irrigation and domestic use. Therefore investigation of groundwater dynamics at the southern slope of Greater Caucasus is very important issue to address water supply. It should be considered that about half of the renewable artesian basins and confined groundwater systems in Georgia can be seen as belonging to the southern slope of the Greater Caucasus. The waters recharged on the southern slopes of the Greater Caucasus may be considered the alternative groundwater resources for the communities in the Alazani basin and the adjacent foothills.

Legislation
Strengthening the regulatory regime for nuclear and radiation safety to enhance the inspection and enforcement system regulation of nuclear and radiation activities in Georgia is mainly based on following legislative documents: Law on Nuclear and Radiation Safety and Law on Licenses and Permits. Besides, the following regulations as a technical regalements enforced: Order of Government # 28 "Radiation safety limits on the

territory of Georgia", order of Government # 83 "Radiation protection norms for radiological medical diagnostics and treatment", order of Government # 438 "Rules and limits on use of radiopharmaceuticals in medicine and establishment of radioisotope laboratories", order of Government # 34 "Basic sanitary rules on handling of radioactive material and other sources of ionizing radiation", order of Government # 689 "Rules on inventory of sources of ionizing radiation, radioactive waste and authorization, categorization of the sources of ionizing radiation", order of Government # 756 "Rules on radiation monitoring of scrap metal". Other regulations adopted by the order of Minister of Environment and Natural Resources Protection. Namely: # 75 "Rules on inspection of nuclear and radiation activities" and # 150 "Rules on response to illicit trafficking of nuclear and radioactive material". In the other hand, no specific regulations are issued for waste management, transport, security measures, medical applications, or other areas. Few safety thematic areas (such as occupational exposure, quality management and others) are still not covered. Those regulations are planned to be in place by January 1, 2016. There are administrative and criminal penalties in place to deal with non-compliances in the field of radiation and nuclear safety.

Radioactive Waste management

Georgia does not have any capability to conduct full scale radioactive waste treatment activity. Therefore some generated waste (especially waste generated by dismantling of nuclear research reactor) is stored safely, but requires final treatment and conditioning. For instance all contaminated pipes are hermetically closed, but not cleaned due to absence of special devices and techniques need for effective decontamination capability and satisfy the safety requirements within the cleaning process. Ongoing project GEO/9/011 "Establishing Radioactive Waste Processing for Simple Treatment and Conditioning of Waste Including Disused Sealed Sources" considers establishing of small facility for radioactive waste treatment. The facility is mainly intended for decontamination of parts of decommissioned nuclear research reactor. The operation of this facility is necessary to continue the reactor decommission (further phase considers dismantling of cryogenic station, which contains volume of contaminated vessels under the current cycle TC project GEO/9/012 "Decommissioning of Auxiliary Systems of Nuclear Research Reactor").

The special investigation of Centralized Storage Facility (CSF) and near surface disposal (closed) has been done under EU project G.4.01.08 – "Survey and strategic assessment of Georgian radioactive waste disposal and interim storage sites". The project results will be used for the next project G.4.01.09 – "Support to the operators in the preparation of safety assessment reports for Georgian radioactive waste disposal and interim storage sites" to issue safety assessment reports for both facilities.

V. ENVISIONED COUNTRY PROGRAMME OUTLINE

Georgian government focuses its effort on developing of the country economy and infrastructure according to the internationally recognized standards. Nuclear technology is seed in various areas such as medical science and technology, radioactive waste management, medical applications etc. Therefore there is a need to develop infrastructure for nuclear technology application and providing appropriate safety and security measures in this regard. As a result, the expansion of using nuclear application is foreseen in future. Effective implementation of these programs needs to establish priorities to identify the main areas of future activity. Those areas can be identified as a followings:

- Further developing of a comprehensive legislative framework;
- Strengthening of the regulatory infrastructure for nuclear and radiation safety;
- Establishment of a radioactive waste management system;
- Upgrading radiotherapy;
- Introduction and improvement of diagnostic and therapeutic nuclear medicine;
- Enhancement of QA/QC in application of nuclear technologies
- Strengthening of capabilities for emergency preparedness and response to radiological emergencies
- Upgrade of human resources in nuclear and radiation safety

Particular subjects in the above mentioned areas should be addressed in terms of the following near- and mid-term programs:

V.1 Near-Term Programme:

V.1.1. Strengthening of the Regulatory Infrastructure for Nuclear and Radiation Safety

Nuclear and radiation safety infrastructure is mainly based on the activities of national Regulatory Authority. Effective regulatory infrastructures are an essential part of the global safety regime. Harmonized and integrated implementation of the international safety standards and undertakings are result of strengthen and modernized national Regulatory Authority.

V.1.2. Radioactive Waste Management and Decommissioning

Radioactive waste management, decommissioning and environmental remediation are Government priorities. The Institute of Physics being part of Tbilisi State University (under supervision of the Ministry of Education and Science) operates Centralized Storage Facility (CSF). The near surface disposal was closed in 1988. Under IAEA TC project GEO/9/011 - "Establishing Radioactive Waste Processing for Simple Treatment and Conditioning of Waste Including Disused Sealed Sources" new small-scale facility for radioactive waste processing is being establish. Country needs to adopt legislative documents for waste management system. The most important components for this system are the country policy for radioactive waste management, where all general trends and issues for radioactive waste management are defined, and the country strategy, where the main tools for implementation of the country policy are defined. IAEA supported Georgia for reviewing of the draft law "On Radioactive Waste Management". The law will establish the country policy for radioactive waste management and will set basic requirements for effective institutional arrangements necessary for state overall management of radioactive waste. Other legal requirements (classification of radioactive wastes, main rules for handling with radioactive waste and other) should be also developed.

After completion of EU project G.4.01.09 - "Support to the operators in the preparation of safety assessment reports for Georgian radioactive waste disposal and interim storage sites" the safety status of CSF and disposal will be clear. Provision of safety assessment reports is planned for beginning of year 2015.

Georgia had one nuclear research reactor IRT-M belonged to the Institute of Physics. The reactor is under decommissioning process. Within IAEA TC projects GE/3/002- "Decommissioning of the IRT-M Research Reactor" and GEO/3/004 - "Decommissioning the Reactor Site at the Andronikashvili Institute of Physics" the reactor physical hall (cooling and other auxiliary systems of the reactor) and special connection overpass between the reactor hall and cryogenic system were dismantled. Further dismantling was temporary stopped due to necessity to handle the generated waste. The project GEO/9/011 - "Establishing Radioactive Waste Processing for Simple Treatment and Conditioning of Waste Including Disused Sealed Sources" considers processing of the radioactive waste generated during the reactor dismantling activities. The reactor further decommissioning should be continued by dismantling of cryogenic station.

Decommissioning of Auxiliary System of Nuclear Research Reactor: The project GEO9012 - "Decommissioning of Auxiliary Systems of Nuclear Research Reactor" is under implementation and focus on support of dismantling of Helium workshop of IRT-M Cryogenic station.

V.1.3 Upgrading of Cancer Management

Improvement of the health care system remains a matter of prime importance for the Government for which the Ministry of Labor, Health and Social Affairs is responsible. In that regard, the Government's policy regarding enhancing diagnosis of disease and cancer treatment using radiation and nuclear medicine techniques will be specified. While attention is being focused on re-equipping of medical institutions and development of advanced medical technology, the Government might seek the IAEA support through its Program of Action for Cancer Therapy (PACT) to address other challenges related to cancer control and cancer management, such as infrastructure gaps and plans to build capacity and long-term support for continuous education and training of professionals working in the area of cancer, as well as for community-based civil society action to fight cancer.

The first imPACT mission executed by IAEA and WHO experts took place in July 2014. University Clinic, High-Technology Medical Center, Department of Radiation Oncology has or adequate on reasonable improved capability for diagnosis and treatment of patients suffering from cancer. Since August 2009, in unique effort Radiation Oncology department started introducing modern radiation therapy techniques (three-dimensional conformal radiation therapy -3D CRT) for the first time in Georgia. Owing to these efforts, the quality of both curative and palliative radiation therapy treatments, given either alone or in combination with other treatment modalities in oncology (surgery, chemotherapy) has been significantly improved. Facilities, recently established for 3D CRT include: 2 Linear Accelerators - Clinac 600C and Clinac 2100iX (Varian Medical Systems Inc); TPS - Eclipse Version 8.6; MV Portal Imaging device for Image guidance; Full package of CIVCO immobilization System; Full package of PTW dosimetry system; Further advances are deemed necessary for patients with both tumors located in specific body parts, those that are known to be good examples of the effective use of novel technologies - intensity-modulated radiation therapy - IMRT - in prostate, pancreatic cancer, some mediastinal lesions, H&N, some brain lesions and other cancer localizations, as well as for patients with recurrent (previously irradiated with 2D planning system) cancers treated in other institutions in the country. It is foreseen that this situation may be overcome by introducing this modern aspect of radiation therapy of cancer. This approach will improve the therapeutic benefit of patients undergoing radiation therapy due to better tumor coverage and lower toxicity for surrounding normal structures.
Upgrading of Cancer Management at High Technology Medical Center, University Clinic - TC project GEO/6/009 "Upgrading cancer management at the High Technology Medical Centre, University Clinic" is under implementation.

V.2.The mid-term program

V.2.1 Further development of legislative infrastructure

At present, the legislative framework of Georgia addressed to the nuclear and radiation safety and security issues are as following:

- Law on Nuclear and Radiation Safety, #15912rs, 20.03.2012;
- Law on Licenses and Permits, # 1775rs, 24.06.2005;
- Order of Government # 28 "Radiation safety limits on the territory of Georgia", 03.01.2014;
- Order of Government # 83 "Radiation protection norms for radiological medical diagnostics and treatment", 16.01.2014;
- Order of Government # 438 "Rules and limits on use of radiopharmaceuticals in medicine and establishment of radioisotope laboratories", 31.12.2013;
- Order of Government # 34 "Basic sanitary rules on handling of radioactive material and other sources of ionizing radiation", 03.01.2014;
- Order of Government # 689 "Rules on inventory of sources of ionizing radiation, radioactive waste and authorization, categorization of the sources of ionizing radiation", 19.12.2014;
- Order of Government # 756 "Rules on radiation monitoring of scrap metal", 31.12.2014;
- Order of Minister of Environment and Natural Resources Protection # 75 "Rules on inspection of nuclear and radiation activities", 01.10.2013;
- Order of Minister of Environment and Natural Resources Protection # 150 "Rules on response to illicit trafficking of nuclear and radioactive material", 08.12.2014.

The revision of Law on Nuclear and Radiation Safety was conducted in 2014. The main purpose of the revision is upgrading and correction of requirements for inspection and enforcement process of nuclear and radiation activities. At the same time some changes of appropriate article of the law enables the Regulatory Authority correct the dates of approval of secondary regulations till the end of the year 2015.
until January 1, 2016 the following legislative documents should be adopted and enforced:

- Law on radioactive waste management;

- Emergency preparedness and response plan;
- Radiation safety limits and requirements for practices utilizing the sources of ionizing radiation;
- Radiation safety requirements for medical application of ionizing radiation;
- Radiation safety requirements for industrial and scientific-research application of ionizing radiation;
- Rules on personal radiation monitoring;
- Rules on transportation of radioactive material;
- Regulation on security and physical protection of facilities and sources of ionizing radiation;
- Rules on implementation of safeguard and non-proliferation activities;
- Main requirements for QA and QC for application of sources of ionizing radiation;

After ratification of the law on radioactive waste management, the following secondary regulations to be adopted after January 1, 2016:

- Rules on treatment of radioactive waste;
- Rules on decommissioning of nuclear and radiation facilities;

Main requirements to high risk radiation facilities safety assessment and safety assessment reports should be ready.

Project(s) to be considered:

- Set of short-term expert missions until January 1, 2016 beyond of active national projects of corresponding TC cycle;
- Expertize of national secondary legislation on radioactive waste management.

V.2.2 Strengthening of the Regulatory Infrastructure for Nuclear and Radiation Safety

Nuclear and radiation safety infrastructure is mainly based on the activity of National Regulatory Authority (RA). Department of Nuclear and Radiation Safety (DNRS) of Georgian Ministry of Environment and Natural Resources Protection executes Regulatory Authority functions for nuclear and radiation activity in Georgia, therefore further enhancing of DNRS capability to conduct state effective regulation of nuclear and radiation activity field meets the country policy for general development. Activity of RA is generally depends on the following main factors:

- Rights and functions of RA (its effective independence)
- Structure of RA
- Legal basement for regulation of nuclear and radiation activity
- Competence of RA workers
- Equipment needed for the activity

Rights and functions of RA, and its structure are defined by Georgian Law On Nuclear and Radiation Safety and Decree on Department for Nuclear and Radiation Safety of Ministry of Environment and Natural Resources Protection approved by the order of Minister of Environment and Natural Resources Protection # 142 (3 October, 2014). Regulation of nuclear and radiation activities in Georgia is mainly based on following legislative documents: law “on Nuclear and Radiation Safety”, low on licenses and permits, and secondary regulations (radiation safety limits sanitary rules for workers with radioactive substances and using X-ray in medicine). Since 1 October 2013 “Rules on Inspection of Nuclear and Radiation Activities” is in place. No specific regulations are issued for waste management, transport, security measures, and others. New version for national basic safety standards and norms was drafted by IAEA support (to replace order of Government # 28 “Radiation safety limits on the territory of Georgia”,). Therefore it is very important to issue new secondary regulations according to the GSR Part 3 especially general requirements, regulations for waste management, transport, medical exposure etc. The new regulations should be in place till January 1, 2016 and will support the activity of DNRS as well as set the basement for regulatory infrastructure within the country.

RA is equipped by different measurement technique provided by the IAEA, EU and US supported programs and projects. Further development of RA workers competency is foreseen by participation in IAEA trainings, post-graduate courses and workshops supported by the IAEA, EU and other donor states/ organizations

The following are priority areas for technical cooperation on strengthening the relevant regulatory infrastructure:

- Assessment of the completeness of the existing regulatory framework and identification of needs in drawing up new regulatory documents and/or improving existing documents;
- Elaboration of regulatory requirements needed for regulation of nuclear and radiation activities in Georgia;
- Strengthening independence and empowering the regulatory body to fully implement its regulatory functions by setting an appropriate legal framework fully compliant with IAEA standards and ensuring by law the availability of resources to put in place an effective licensing, review and assessment, inspection and enforcement program;
- Strengthening of the DNRS infrastructure and capacity to monitor and self-assess effectiveness of work based on the use of performance indicators and using modern information technology;
- Advanced training of the staff of DNRS as well as licensees in the field of nuclear and radiation safety;
- Development of a State system for monitoring occupational and medical exposure;
- Further capacity building in the area of occupational exposure of workers, including compliance with the Agency's safety standards (TC regional program).

To meet these objectives the technical cooperation program of Georgia will have to be supplemented with active participation of key Georgian counterparts in relevant regional projects aimed to reinforce nuclear and radiation safety regulatory infrastructure. As a result of implementation of the medium-term program, it is expected that a legal and regulatory framework will be created, along with an effective regulatory body fully capable of carrying out independently regulatory functions as regards all activities in Georgia related to radiation safety.

Project(s) to be considered:
Upgrade of Georgian national legislative base for regulation of nuclear and radiation activities and further strengthening of the regulatory infrastructure.

V 2.3 Knowledge Management and Sustainability of Nuclear Technologies

Georgia has many years of experience in broad spectrum of nuclear technologies including the utilization of the research reactor, those, However, most of the specialists changed their activities and/or retired. Majority of country's technical basis and scientific and research laboratories are outdated. In order to interrupt the deterioration process, as a first step it is intended to strengthen the education and research laboratories at Georgian Technical University and Tbilisi State University, Developing syllabuses and providing appropriate equipment to laboratories are necessary to support educational process for graduate of nuclear physicists and nuclear engineers.

Project(s) to be considered:
Upgrading the education of specialists is in the field of nuclear and radiation technologies and safety.

V 2.4 Radioactive Waste Management System

Further development of waste processing facility is foreseen. Government decree # 1599 from November 27, 2013 reflects government's position and establishes the process to create radioactive waste management infrastructure in Georgia. It is considered that all infrastructure elements of radioactive waste management such as acceptance, storage, processing and disposal should be collected under unique state organization. Therefore, it is anticipated that both radioactive storage and disposal facilities would be operated by one legal entity. Besides, it is foreseen to use the radioactive waste disposal site for arraigning of a new disposal capabilities.
Project(s) to be considered:

Upgrading of processing and disposing infrastructure for radioactive waste (including DSRS).

V 2.5 Radiation-based Technologies for Human Health Improvement

The future TC programme will include, within a comprehensive cancer control program, further introduction and upgrading of interventional radiology for the diagnosis of disease and treatment of patients and the development of radiation protection legislation for medical exposure (regulations, safety guides etc.), its application, the establishment of national recommended dose levels, improvement of the regulatory control of medical sources and practices, improvement of the QA/QC system for diagnostic radiology, radiotherapy and nuclear medicine and the introduction of a clinical audit system. The establishment and upgrading of a national analytical laboratory providing QA services in radiation metrology and radiation protection is also important.
In view of the progress already made, it is planned that the medium-term program will comprise the following types of activities:

1. **Developing/Improving of Radiation Therapy and Radiation Diagnostic Service**:
There is one active national TC project ongoing at the Universal Medical Center intending to contribute to the project implementation by purchasing of ultrasound machine.
High Technology Medical Center – University Clinic (HTMC) is the first hospital equipped with 2 Linear Accelerator machines in Georgia and 1 more Linear Accelerator is planned to be established in 2015. There is Tele-therapy, HDR brachytherapy as well as LDR brachytherapy application with I-125 permanent seeds are available at the HTMC.
Research Institute of Clinical Medicine is also implementing and developing of Radiotheraphy services. 2 linear accelerators are operational since 2014.The future cooperation with international organizations such as IAEA, ESTRO, EFOMP, and EAGLE is considering as having great importance for selection of necessary equipment and accessories, also in terms of training of the personnel (physicians, physicists, technicians).
Center of Cellular Technologies and Therapy is considered as a perspective high level Diagnostic and treatment possibilities, because of the high level professionals and appropriate infrastructure by means of all necessary basic and supportive departments for radiotherapy procedures. In the nearest future Center of Cellular Technologies and Therapy is planning to obtain tele-therapy and brachytherapy units. Brachytherapy unit will be oriented all nosology, but mainly it will focus on H&N brachytherapy which will be the only one hospital offering H&N cancer treatment possibilities to patients.
There is also considerable problem regarding exchange of patient's information between hospitals and there is a need for implementation of Radiology Information System (RIS). Training in External Beam Radiotherapy, brachytherapy, Nuclear Medicine imaging and radioisotope treatment is needed as well.

2. **Developing of Diagnostic and Therapeutic Nuclear Medicine Service**:
There is a need to expand capabilities for radioactive iodine therapy on the basis of already existing nuclear medicine departments and on the basis of new hospitals as this kind of treatment is performed only in one hospital (HTMC), which is unsufficient taking into account the number of thyroid cancer cases and therefor, the need of appropriate treatment in the country. Besides, the HTMC is planning the establishment of new cyclotron facility which will make space for establishment of new PET/CT scanners on the basis of already existing nuclear medicine departments.
There is a fully equipped nuclear medicine department at the N. Kipshidze Central Clinical Hospital of Tbilisi State Medical University, with qualified medical and support staff operating on SPECT/CT machine for diagnostic purposes. The hospital confirmed its intension to extend the nuclear medicine department capabilities by introducing of Iodine131 t treatment.
Center of Cellular Technologies and Therapy is working on implementation of Nuclear medicine imaging and Iodine131 treatment.

3. **Strengthening Radiological Protection of Patients and Medical Staff with establishing QA/QC procedures on Radiation diagnostic and treatment units.**

Medical facilities utilizing the radiation diagnostic and treatment technologies are on the way of implementation of QA/QC systems to create documented reduction of unnecessary radiation exposure in imaging procedures (radiology and nuclear medicine), avoidance of radiation injuries in X-ray interventional procedures and avoidance of accidental exposure in therapeutic procedures.

4. Developing Oncology Service:
Oncology is considered as a high priority by the Government of Georgia. Government took responsibility to support financially all cancer patients without age limit, herewith it is important to develop relevant infrastructure in accordance to the modern standards and to establish monitoring and registry system of all patients.

5. Developing Human Resources. In Accordance with developing of medical technologies there is a need to follow development with increasing skills and knowledge of medical staff (physician, physicist, radiation technicians).

V 2.6 Emergency Preparedness and Response to Radiological Emergencies
Experience from responding to emergencies clearly demonstrated the importance and the need for an efficient response system including infrastructural and functional components, emergency plans, procedures, and internally consistent operational criteria. Without standard procedures, protective actions can result in confusion and possibly leading to severe socioeconomic and political consequences. Furthermore, there is a heightened awareness of the need to strengthen arrangements to respond to emergencies that could arise from criminal or terrorist activities involving nuclear and other radioactive materials. This was clearly stated by EPREV mission held in Georgia in April 2011.
Implementing emergency plan, elaboration of the appropriate legislation; developing training programmes for personnel to deal with nuclear accidents and radiological emergencies and developing appropriate radiation monitoring programs, procedures and standards is the Government priority. Implementation of appropriate safety standards relating to preparedness for and response to nuclear or radiological incidents and emergencies, independently of the cause and training for the application of those standards is essential component of the program.
The emergency response plan to radiological emergencies is part of the decree of the President of Georgia # 415 on Emergency Response to Natural and Man-made Emergencies as a "function 11" (August 26, 2008). Nevertheless this is twinned with chemical emergency response plan. Therefore the plan is not fully specific for radiation emergencies. Adoption of Emergency Preparedness and Response Plan to Radiological Emergencies by January 1, 2016 will establish overall frame coordination for response organization activities. Development of human resources and provision with modern equipment is a vital part of full implementation of emergency response infrastructure.

Project(s) to be considered:
Upgrading emergency preparedness and response capabilities to radiological emergencies.

V.3. General Support Activities

The stated program is based on the country policy to upgrade nuclear and radiation safety and security level to protect human and environment from harmful effect ionization radiation. All envisioned activities are defined considering completed projects and their results, and goals to be achieved to enhance radiation safety level in Georgia. The CPF program elements are also linked to the Georgian UNDAF for 2010-2015 and beyond.
Georgia usually receives support from different donors to upgrade its radiation safety system. The main donors are USA, EU, UK, Sweden and others. The main support of TC program is carried out by IAEA. The envisioned program considers cross-reference with other support. For instance on the field of radioactive waste management Georgia received support from EU under projects G.4.01.08 and G.4.01.09. All results of these projects are foreseen to be used in the activities stated on CPF. The country has system for effective implementation of envisioned program. The system includes:

- State management system
- Regulatory infrastructure
- Necessary competence (skilled personnel)
- Basic equipment needed to conduct the activity.

Annex 1 - Resource Estimates and Forecasts

			EUR
1.	These figures should be based on a historical reference figure from past approved national programmes (average of previous TC Programme Cycles 2012-2013), as an indicative planning figure[1] for the period of coverage.		EUR700,000
	Estimated government cash contribution[2] (footnote a/) for the planning period		EUR600,000
	Estimated government in-kind contribution[3] for the planning period		EUR1,200,000
	Total estimated resources		EUR2,500,000
2.	Preliminary estimates for the agreed programme/projects reflected in the CPF		
	(i)	Development of Regulatory Infrastructure For Nuclear and Radiation Safety	EUR800,000
	ii)	Radiation Medicine Quality Assurance Strategy in Georgia	EUR600,000
	iii)	Upgrading of processing and disposing infrastructure for radioactive waste (including DSRS)	EUR1,500,000
	iv)	Upgrading Emergency Preparedness and Response Capabilities to Radiological Emergencies	EUR600,000
	Total estimated costs		EUR3,500,000
3.	Total estimated resource (1) less total estimated costs (2)		EUR1,000,000
4.	Estimated resource requirements (estimated costs less footnote a/)		EUR1,000,000

[1] The country indicative planning figure does not obligate the Agency to provide such funding, nor does it suggest the expectation of continued levels of Agency funding. The sole purpose is to assist planning and prioritization of the country framework.

[2] The indicative government cash contribution does not commit the government to the stated amount, but indicates the intent and likelihood of such support.

[3] In-kind contributions represent the value assigned to non-cash contributions such as providing experts, training courses, and infrastructure. Planning for in-kind contribution can also include bilateral trade and intergovernmental cooperation agreements in the respective programme area.

Annex 2 – Plan of Action
Detailed Plan of Action

CPF Referenced Planning Opportunities (project ideas)	Proposed Action	Responsibility for Action	Expected Output	Time Frame	Resource Requirements	Project Concept Number
1. Development of Regulatory Infrastructure For Nuclear and Radiation Safety	1. Analyze of achieved results and defining the road map for further activity 2. Conducting of the planned activity (according to the developed road map) 3. Analyze the project results, defining of weaknesses and update of road map for further activity. It should be emphasized that the project implementation is very essential for providing nuclear and radiation safety level within the country in accordance of international norms and standards.	Ministry of Environment and Natural Resources Protection, Department of Nuclear and Radiation Safety	Upgraded regulatory infrastructure to meet modern requirements for radiation safety conditions.	2016-2017	Expert mission, trainings	GEO2014001
Radiation Medicine Quality Assurance Strategy in Georgia	1. To create the medical exposure quality control management unit 2. To create training centre for medical 3. To support nuclear and	Ministry of Labor Health, and Social Affairs	Road map for implementation of QA/QC on the institutional level	2016-2017	Expert mission, trainings	GEO2014002

	radiation safety and patient protection quality control services 4. To create technical service providers capacity development					
Development of Waste Processing Facility Capability To Treat Radioactive Waste including Liquid Radioactive waste	New capability of radioactive waste treatment facility to treat waste established	Ivane Javakhishvili Tbilisi State University	To organize radioactive waste management system in accordance of IAEA standards and requirements.	2016-2017	Expert mission, trainings, technical support	GEO2014003
Upgrading Emergency Preparedness and Response Capabilities to Radiological Emergencies	Revision and update of existed procedures, Staff training, equipment supply	Ministry of Environment and Natural Resources Protection	New capabilities for emergency preparedness and response introduced	2018-2019	Expert mission, trainings, technical support	
Development of Radiation Based technologies for human health improvement	Staff training, consultancy for equipment selection, equipment supply	Ministry of Labor, Health and Social Affairs	New capabilities for cyclotron, PET/CT and radiotherapy introduced	2018-2019	Expert mission, trainings, technical support	

ANNEX 3 – Compilation of Treaties under the Auspices of the International Atomic Energy Agency signed by the Republic of Georgia

In the international context, the Republic of Georgia has signed, ratified/approved the following treaties, agreements and conventions:

Multilateral Agreements

	Title	In Force	Status
P&I	Agreement on the Privileges and Immunities of the IAEA		Non-Party
CPPNM	Convention on the Physical Protection of Nuclear Material	2006-10-07	accession: 2006-09-07
CPPNME	Amendment to the Convention on the Physical Protection of Nuclear Material		acceptance: 2012-04-05
NOT	Convention on Early Notification of a Nuclear Accident	2010-11-05	accession: 2010-10-06
ASSIST	Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency		Non-Party
JP	Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention		Non-Party
NS	Convention on Nuclear Safety		Non-Party
RADW	Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	2009-10-20	accession: 2009-07-22
RSA	Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the IAEA (RSA)	2001-09-19	Signature: 2001-09-19

Safeguards Agreements

Reg.No	Title	In Force	Status
1754	Agreement between the Republic of Georgia and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons	2003-06-03	Signature: 1997-09-29
1755	Protocol Additional to the Agreement between the Republic of Georgia and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons	2003-06-03	Signature: 1997-09-29

During the CPF implementation period of time (2015-2019) following Conventions are planned to be ratified:

1. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency;
2. Convention on Nuclear Safety.