

The background features a light blue gradient with a fine grid of white dots. Overlaid on this are several abstract elements: a network of thin, light blue lines connecting various points; several thick, vibrant blue curved lines that sweep across the page; and a collection of squares in various shades of blue and grey, some with a subtle drop shadow effect, scattered across the layout.

# **IAEA ANNUAL REPORT 2016**

## **Additional Annex Information**

# THE ANNUAL REPORT FOR 2016

Additional Annex Information

**Table A27. Coordinated research projects initiated in 2016**

**Nuclear Power**

- Organizational Cultural Basis for Successful Performance in Nuclear Power Plants

**Nuclear Fuel Cycle and Materials Technology**

- Management of Severely Damaged Spent Fuel and Corium
- Spent Fuel Performance Assessment and Research — Phase IV
- Ageing Management Programmes for Dry Storage Systems

**Capacity Building and Nuclear Knowledge for Sustainable Energy Development**

- Assessments of the Potential Role of Nuclear Energy in National Climate Change Mitigation Strategies

**Nuclear Science**

- Updating Photonuclear Data Library and Generating a Reference for Photon Strength Functions
- Accelerator-driven System (ADS) Applications and Use of Low-enriched Uranium in ADSs
- Ion Beam Induced Spatio-temporal Structural Evolution of Materials: Accelerators for a New Technology Era
- Accelerator Simulation and Theoretical Modelling of Radiation Effects — SMoRE-II

**Food and Agriculture**

- Nuclear Techniques for a Better Understanding of the Impact of Climate Change on Soil Erosion in Upland Agro-ecosystems
- Application of Nuclear and Genomic Tools to Enable for the Selection of Animals with Enhanced Productivity Traits
- Quantification of Intake and Diet Selection of Ruminants Grazing Heterogeneous Pasture Using Compound Specific Stable Isotopes
- Early Detection of Transboundary Animal Diseases (TADs) to Facilitate Prevention and Control through a Veterinary Diagnostic Laboratory Network (VETLAB Network)
- Improved Field Performance of Sterile Male Lepidoptera to Ensure Success in SIT Programmes
- Mutation Breeding for Resistance to Striga Parasitic Weeds in Cereals for Food Security

**Water Resources**

- Isotopes to Study Nitrogen Pollution and Eutrophication of Rivers and Lakes
- Use of Isotope Hydrology to Characterize Groundwater Systems in the Vicinity of Nuclear Power Plants
- Use of Long-lived Radionuclides for Dating Very Old Groundwaters

**Environment**

- Radioanalytical and Isotopic Studies of Climate Trends and Variability in Marine Paleo-records
- Study of Temporal Trends of Pollution in Selected Coastal Areas by the Application of Isotopic and Nuclear Tools

**Radioisotope Production and Radiation Technology**

- Therapeutic Radiopharmaceuticals Labelled with New Emerging Radionuclides ( $^{67}\text{Cu}$ ,  $^{186}\text{Re}$ ,  $^{47}\text{Sc}$ )
- Copper-64 Radiopharmaceuticals for Theranostic Applications
- Development of Radiometric Methods and Modelling for Measurement of Sediment Transport and Dispersion of Particles and Pollutants from Outfalls

**Nuclear Security**

- Enhancing Computer Security Incident Analysis at Nuclear Facilities

**Table A28. Coordinated research projects completed in 2016**

**Nuclear Power**

- Review and Benchmark of Calculation Methods on Piping Wall Thinning due to Erosion-corrosion in Nuclear Power Plants
- Improved Understanding of the Irradiation Creep Behaviour of Nuclear Graphite
- Benchmark Analysis of an EBR-II Shutdown Heat Removal Test
- Examining the Techno-economics of Nuclear Hydrogen Production and Benchmark Analysis of the IAEA HEEP Software

**Nuclear Fuel Cycle and Materials Technology**

- Near Term and Promising Long Term Options for Deployment of Thorium Based Nuclear Energy

**Capacity Building and Nuclear Knowledge for Sustainable Energy Development**

- Assessing Interdependencies between Energy, Water, Land-use and Climate Change
- Techno-economic Evaluation of Options for Adapting Nuclear and other Energy Infrastructure to Long-term Climate Change and Extreme Weather

**Nuclear Science**

- Applications of Synchrotron Radiation for Environmental Sciences and Materials Research for Development of Environmentally Friendly Resources
- Utilization of Ion Accelerators for Studying and Modelling of Radiation Induced Defects in Semiconductors and Insulators
- Utilisation of Accelerator-based Real-time Methods in the Investigation of Materials with High Technological Importance
- Improvement of Portable Instruments and Analytical Techniques for in Situ Applications
- Investigations on Materials under High Repetition and Intense Fusion Pulses
- Utilization of the Network of Small Magnetic Confinement Fusion Devices for Mainstream Fusion Research

**Food and Agriculture**

- Genetic Variation on the Control of Resistance to Infectious Diseases in Small Ruminants for Improving Animal Productivity
- The Use of Enzymes and Nuclear Technologies to Improve the Utilization of Fibrous Feeds and Reduce Greenhouse Gas Emission from Livestock
- The Use of Irradiated Vaccines in the Control of Infectious Transboundary Diseases of Livestock
- Climate Proofing of Food Crops: Genetic Improvement for Adaptation to High Temperatures in Drought Prone Areas and Beyond
- Enhancing the Efficiency of Induced Mutagenesis through an Integrated Biotechnology Pipeline

**Human Health**

- Nuclear Techniques to Assess Body Composition in Children and Adolescents as a Risk Factor in the Development of Chronic Diseases
- Clinical use of Myocardial SPECT Imaging and CT Angiography in Coronary Artery Disease
- Strengthening of “Biological dosimetry” in IAEA Member States: Improvement of Current Techniques and Intensification of Collaboration and Networking Among the Different Institutes

### **Water Resources**

- The Use of Environmental Isotopes to Assess Sustainability of Intensively Exploited Aquifer Systems
- Environmental Isotope and Age Dating Methods to Assess Water Quality in Rivers Affected by Shallow Groundwater Discharges

### **Radioisotope Production and Radiation Technology**

- Development and Preclinical Evaluations of Therapeutic Radiopharmaceuticals Based on Lu-177 and Y-90 Labeled Monoclonal Antibodies and Peptides
- Accelerator-based Alternatives to Non-HEU Production of Mo-99/Tc-99m
- Radiometric Methods for Measuring and Modelling Multiphase Systems Towards Process Management
- Radiation Treatment of Wastewater for Reuse with Particular Focus on Wastewaters Containing Organic Pollutants

### **Management of Radioactive Waste**

- Processing Technologies for High Level Waste, Formulation of Matrices and Characterisation of Waste Forms

### **Nuclear Security**

- Identification of High Confidence Nuclear Forensics Signatures for the Development of National Nuclear Forensics Libraries

**Table A29. Publications issued in 2016**

**Nuclear Power**

- Ageing Management of Concrete Structures in Nuclear Power Plants — IAEA Nuclear Energy Series
- Application of Field Programmable Gate Arrays in Instrumentation and Control Systems of Nuclear Power Plants — IAEA Nuclear Energy Series
- Building a National Position for a New Nuclear Power Programme — IAEA Nuclear Energy Series
- Climate Change and Nuclear Power 2016 — Non-serial Publication
- Commissioning for Nuclear Power Plants — IAEA Safety Standards Series (in Russian)
- Country Nuclear Power Profiles — Non-serial Publication
- Design of Electrical Power Systems for Nuclear Power Plants — IAEA Safety Standards Series
- Design of Instrumentation and Control Systems for Nuclear Power Plants — IAEA Safety Standards Series
- Energy, Electricity and Nuclear Power Estimates for the Period up to 2050 — Reference Data Series
- Evaluation of the Status of National Nuclear Infrastructure Development — IAEA Nuclear Energy Series
- Guía para la Elaboración de un Programa de Creación y Desarrollo de Competencias de Reguladores de Reactores Nucleares — IAEA TECDOC (in Spanish)
- Guidelines on Devising a Programme for Competence Acquisition and Development among Nuclear Regulators — IAEA TECDOC
- Impacts of Electricity Market Reforms on the Choice of Nuclear and Other Generation Technologies — IAEA TECDOC
- Industrial Involvement to Support a National Nuclear Power Programme — IAEA Nuclear Energy Series
- INPRO Methodology for Sustainability Assessment of Nuclear Energy Systems: Environmental Impact of Stressors — IAEA Nuclear Energy Series
- Licensing the First Nuclear Power Plant —INSAG Series (in Russian)
- Modelling Nuclear Energy Systems with MESSAGE: A User's Guide — IAEA Nuclear Energy Series
- Nuclear Power and Sustainable Development — Non-serial Publication
- Nuclear Power Plant Outage Optimization Strategy: 2016 Edition — IAEA TECDOC
- Nuclear Power Reactors in the World — Reference Data Series
- Operating Experience with Nuclear Power Stations in Member States in 2015 — Operating Experience with Nuclear Power Stations in Member States (CD-ROM)
- Preparing and Conducting Review Missions of Instrumentation and Control Systems in Nuclear Power Plants — IAEA TECDOC
- Procurement Engineering and Supply Chain Guidelines in Support of Operation and Maintenance of Nuclear Facilities — IAEA Nuclear Energy Series

**Nuclear Fuel Cycle and Materials Technology**

- Accident Tolerant Fuel Concepts for Light Water Reactors — IAEA TECDOC
- Decommissioning of Facilities — IAEA Safety Standards Series (in Arabic)
- High Burnup Fuel: Implications and Operational Experience — IAEA TECDOC (CD-ROM)
- In Situ Leach Uranium Mining: An Overview of Operations — IAEA Nuclear Energy Series
- Managing the Unexpected in Decommissioning — IAEA Nuclear Energy Series
- Uranium 2016: Production and Demand — Joint IAEA–OECD/NEA publication

**Capacity Building and Nuclear Knowledge for Sustainable Energy Development**

- Application of the Management System for Facilities and Activities — IAEA Safety Standards Series (in Spanish)
- Development of Knowledge Portals for Nuclear Power Plants — IAEA Nuclear Energy Series (in Russian)
- Knowledge Management and Its Implementation in Nuclear Organizations — IAEA Nuclear Energy Series
- Knowledge Management for Nuclear Research and Development Organizations — IAEA TECDOC (in Russian)
- Leadership and Management for Safety — IAEA Safety Standards Series
- Leadership and Management for Safety — IAEA Safety Standards Series (in Arabic)

- Leadership and Management for Safety — IAEA Safety Standards Series (in Chinese)
- Leadership and Management for Safety — IAEA Safety Standards Series (in French)
- Sustainable Electricity Supply Scenarios for West Africa — IAEA TECDOC

#### **Nuclear Science**

- History, Development and Future of TRIGA Research Reactors — Technical Reports Series
- Nuclear Data Newsletter, Issue No. 61, July 2016
- The Radiation Chemistry of Polysaccharides — Non-serial Publication
- Radiation Technology for Cleaner Products and Processes — IAEA TECDOC
- Trends of Synchrotron Radiation Applications in Cultural Heritage, Forensics and Materials Science — IAEA TECDOC
- Utilization of a Network of Small Magnetic Confinement Fusion Devices for Mainstream Fusion Research — IAEA TECDOC

#### **Environment**

- Advancing Implementation of Decommissioning and Environmental Remediation Programmes — IAEA Nuclear Energy Series
- Certification of Trace Elements and Methyl Mercury Mass Fractions in IAEA-456 Marine Sediment Samples — IAEA Analytical Quality in Nuclear Applications Series
- Certification of Trace Elements and Methyl Mercury Mass Fractions in IAEA-461 Clam (*Gafrarium tumidum*) Sample — IAEA Analytical Quality in Nuclear Applications Series
- Criteria for Radionuclide Activity Concentrations for Food and Drinking Water — IAEA TECDOC
- Environment Laboratories Newsletter, Vol. 2, No. 2, July–December 2015
- Supporting Sampling and Sample Preparation Tools for Isotope and Nuclear Analysis — IAEA TECDOC
- Uso de Nuevas Tecnologías para el Diseño, Modernización y Automatización de Sistemas y Procesos Relacionados con Aplicaciones Nucleares — IAEA TECDOC (in Spanish)
- Worldwide Interlaboratory Comparison on the Determination of Trace Elements in the IAEA-457 Marine Sediment Sample — IAEA Analytical Quality in Nuclear Applications Series

#### **Food and Agriculture**

- Animal Production and Health Newsletter, Nos 63 and 64, January and July 2016
- Development of Radiometric and Allied Analytical Methods and Strategies to Strengthen National Residue Control Programmes for Antibiotic and Anthelmintic Veterinary Drug Residues — IAEA TECDOC
- Food and Environmental Protection Newsletter, Vol. 19, Nos 1 and 2, January and July 2016
- Insect Pest Control Newsletter, Nos 86 and 87, January and July 2016
- Integrated Soil, Water and Nutrient Management for Sustainable Rice–Wheat Cropping Systems in Asia — IAEA TECDOC
- Manual of Standard Operating Procedures for Veterinary Drug Residue Analysis — Training Course Series
- Plant Breeding and Genetics Newsletter, Nos 36 and 37, January and July 2016
- Soils Newsletter, Vol. 38, No. 2, and Vol. 39, No. 1, January and July 2016
- Use of Phosphorus Isotopes for Improving Phosphorus Management in Agricultural Systems — IAEA TECDOC

#### **Human Health**

- Accuracy Requirements and Uncertainties in Radiotherapy — IAEA Human Health Series
- Application of the Risk Matrix Method to Radiotherapy — IAEA TECDOC
- Atlas of Skeletal SPECT/CT Clinical Images — IAEA Human Health Series
- Commissioning of Radiotherapy Treatment Planning Systems: Testing for Typical External Beam Treatment Techniques — IAEA TECDOC (in Russian)
- Nuclear Cardiology: Guidance on the Implementation of SPECT Myocardial Perfusion Imaging — IAEA Human Health Series
- Nutritional & Health Related Environmental Studies Newsletter, Nos 3 and 4, January and July 2016
- SSDL Newsletter, Issue Nos 64 and 65, February and September 2016

### **Water Resources**

- Management and Area-wide Evaluation of Water Conservation Zones in Agricultural Catchments for Biomass Production, Water Quality and Food Security — IAEA TECDOC
- Water and Environment News, Issue 33, September 2016

### **Radioisotope Production and Radiation Technology**

- Cyclotron Produced Radionuclides: Emerging Positron Emitters for Medical Applications: <sup>64</sup>Cu and <sup>124</sup>I — IAEA Radioisotopes and Radiopharmaceuticals Reports

### **Emergency Preparedness and Response**

- Actions to Protect the Public in an Emergency due to Severe Conditions at a Light Water Reactor — Emergency Preparedness and Response (in Spanish)
- Arrangements for Preparedness for a Nuclear or Radiological Emergency — IAEA Safety Standards Series (in Russian)
- Generic Procedures for Response to a Nuclear or Radiological Emergency at Research Reactors — Emergency Preparedness and Response (in Spanish)
- Method for Developing a Communication Strategy and Plan for a Nuclear or Radiological Emergency — Emergency Preparedness and Response (in Spanish)
- Preparedness and Response for a Nuclear or Radiological Emergency — IAEA Safety Standards Series (in Russian)

### **Safety of Nuclear Installations**

- Application of the Safety Classification of Structures, Systems and Components in Nuclear Power Plants — IAEA TECDOC
- Attributes of Full Scope Level 1 Probabilistic Safety Assessment (PSA) for Applications in Nuclear Power Plants — IAEA TECDOC
- Considerations on the Application of the IAEA Safety Requirements for the Design of Nuclear Power Plants — IAEA TECDOC
- Design Safety Considerations for Water Cooled Small Modular Reactors: Incorporating Lessons Learned from the Fukushima Daiichi Accident — IAEA TECDOC
- Diffuse Seismicity in Seismic Hazard Assessment for Site Evaluation of Nuclear Installations — Safety Reports Series
- Governmental, Legal and Regulatory Framework for Safety — IAEA Safety Standards Series
- Governmental, Legal and Regulatory Framework for Safety — IAEA Safety Standards Series (in Arabic)
- Governmental, Legal and Regulatory Framework for Safety — IAEA Safety Standards Series (in Chinese)
- Governmental, Legal and Regulatory Framework for Safety — IAEA Safety Standards Series (in Russian)
- Impact of Open Phase Conditions on Electrical Power Systems of Nuclear Power Plants — Safety Reports Series
- Nuclear Accident Knowledge Taxonomy — IAEA Nuclear Energy Series
- OSART Guidelines — IAEA Services Series
- OSART Independent Safety Culture Assessment (ISCA) Guidelines — IAEA Services Series
- Performing Safety Culture Self-Assessments — Safety Reports Series
- Periodic Safety Review for Nuclear Power Plants — IAEA Safety Standards Series (in Russian)
- Safety Assessment for Facilities and Activities — IAEA Safety Standards Series
- Safety Assessment for Facilities and Activities — IAEA Safety Standards Series (in Arabic)
- Safety Assessment for Facilities and Activities — IAEA Safety Standards Series (in Chinese)
- Safety Assessment for Facilities and Activities — IAEA Safety Standards Series (in Russian)
- Safety of Nuclear Fuel Cycle Facilities — IAEA Safety Standards Series (in French)
- Safety of Nuclear Fuel Cycle Facilities — IAEA Safety Standards Series (in Russian)
- Safety of Nuclear Power Plants: Commissioning and Operation — IAEA Safety Standards Series
- Safety of Nuclear Power Plants: Commissioning and Operation — IAEA Safety Standards Series (in French)



- Safety of Nuclear Power Plants: Commissioning and Operation — IAEA Safety Standards Series (in Chinese)
- Safety of Nuclear Power Plants: Design — IAEA Safety Standards Series
- Safety of Nuclear Power Plants: Design — IAEA Safety Standards Series (in Arabic)
- Safety of Nuclear Power Plants: Design — IAEA Safety Standards Series (in Chinese)
- Safety of Nuclear Power Plants: Design — IAEA Safety Standards Series (in Russian)
- Safety of Nuclear Power Plants: Design — IAEA Safety Standards Series (in Spanish)
- Safety of Research Reactors — IAEA Safety Standards Series
- Safety Reassessment for Nuclear Fuel Cycle Facilities in Light of the Accident at the Fukushima Daiichi Nuclear Power Plant — Safety Reports Series
- Seismic Hazard Assessment in Site Evaluation for Nuclear Installations: Ground Motion Prediction Equations and Site Response — IAEA TECDOC
- Severe Accident Management Programmes for Nuclear Power Plants — IAEA Safety Standards Series (in Spanish)
- Site Evaluation for Nuclear Installations — IAEA Safety Standards Series
- Site Evaluation for Nuclear Installations — IAEA Safety Standards Series (in Arabic)
- Site Evaluation for Nuclear Installations — IAEA Safety Standards Series (in Chinese)
- Site Evaluation for Nuclear Installations — IAEA Safety Standards Series (in French)
- Site Evaluation for Nuclear Installations — IAEA Safety Standards Series (in Russian)
- Volcanic Hazard Assessments for Nuclear Installations: Methods and Examples in Site Evaluation — IAEA TECDOC

#### **Radiation and Transport Safety**

- Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material (2012 Edition) — IAEA Safety Standards Series (in Spanish)
- Education and Training in Radiation, Transport and Waste Safety Newsletter, No. 5, March 2016
- Environmental and Source Monitoring for Purposes of Radiation Protection — IAEA Safety Standards Series (in Russian)
- Operational Radiation Protection and Radioactive Waste Management for Research Reactors — Training Course Series (CD-ROM)
- Preparedness and Response for a Nuclear or Radiological Emergency — IAEA Safety Standards Series (in Arabic)
- Preparedness and Response for a Nuclear or Radiological Emergency — IAEA Safety Standards Series (in Chinese)
- Proceedings of the International Conference on the Safe and Secure Transport of Radioactive Material: The Next Fifty Years — IAEA TECDOC (CD-ROM)
- Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards — IAEA Safety Standards Series (in French)
- Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards — IAEA Safety Standards Series (in Spanish)
- Radiation Safety for Consumer Products — IAEA Safety Standards Series

#### **Management of Radioactive Waste**

- Environmental Change in Post-closure Safety Assessment of Solid Radioactive Waste Repositories — IAEA TECDOC
- Framework and Challenges for Initiating Multinational Cooperation for the Development of a Radioactive Waste Repository — IAEA Nuclear Energy Series
- Predisposal Management of Radioactive Waste from Nuclear Fuel Cycle Facilities — IAEA Safety Standards Series
- Predisposal Management of Radioactive Waste from Nuclear Power Plants and Research Reactors — IAEA Safety Standards Series
- Processing of Irradiated Graphite to Meet Acceptance Criteria for Waste Disposal — IAEA TECDOC

#### **Nuclear Security**

- Conducting Computer Security Assessments at Nuclear Facilities — Non-serial Publication

- Computer Security Incident Response Planning at Nuclear Facilities — Non-serial Publication
- Identification of Vital Areas at Nuclear Facilities — IAEA Nuclear Security Series (in French)
- Management of the Interface between Nuclear Safety and Security for Research Reactors — IAEA TECDOC
- Nuclear Security in the Uranium Extraction Industry — Non-serial Publication
- Nuclear Security Management for Research Reactors and Related Facilities — Non-serial Publication
- Nuclear Security Systems and Measures for Major Public Events — IAEA Nuclear Security Series (in Arabic)
- Security of Nuclear Information — IAEA Nuclear Security Series (in Arabic)

**Nuclear Verification**

- Safeguards Implementation Guide for States with Small Quantities Protocols — IAEA Services Series
- Safeguards Implementation Practices Guide on Provision of Information to the IAEA — IAEA Services Series

**Table A30. Technical cooperation training courses held in 2016****Administration and General Services**

- NTC — Establish Review and Assessment Regulatory Acceptance Criteria for the Design  
Malaysia

**Assessment and Management of Marine and Terrestrial Environments**

- NTC — Environmental Monitoring of Trace Metals, Mercury and Radionuclides  
Benin
- NTC on Determination of TUEs in Environmental and Biological Samples  
Belarus
- NTC on the Application of Isotopes and Nuclear Techniques for the Quantification of Marine Contamination  
Dominican Republic
- RTC on Field Sampling Techniques, Phytoplankton Identification and Culture (Basic)  
Morocco
- RTC on Sampling Strategy PSP and CFP Toxin Extraction Techniques  
Kenya
- RTC on Field Sampling for Monitoring Purposes and on Sample Management  
Morocco
- RTC on Advanced Sediment Dating: Coring and Modelling  
Egypt
- RTC on QA and QC in Analytical and Radio-analytical Laboratories  
Algeria
- RTC on ISO 17025 Requirements and Implementation in Radio-analytical Laboratories  
Namibia
- RTC on Gamma Spectrometry  
Germany
- RTC on Advanced Methods for Air Pollution Source Apportionment  
Greece

**Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development**

- NTC on Energy Statistics and Data for Energy Planning, Application of IAEA's Tools  
Austria
- NTC on Deterministic Safety Assessment and Engineering Aspects Important to Safety  
Algeria
- NTC on Regulatory Control  
Algeria
- Montecarlo n-Particle Software Intermediate Training Course  
Chile
- 2016 WNU Summer Institute  
Canada
- NTC on Energy Demand Analysis (Application of the IAEA's Tool MAED)  
Madagascar
- Regional (AFRA) Training Course on Energy Statistics and Energy Balances for Sustainable Energy  
Planning and Indicators  
United Republic of Tanzania
- Regional (AFRA) Training Course on Energy Demand Assessment Using the IAEA's Model MAED  
Sudan

- Regional (AFRA) Training Course on Sub-regional Power Study for Northern Africa (Use of the IAEA's Tool MESSAGE)  
Algeria
- Regional (AFRA) Training Course on Finalising Sub-regional Power Study for Eastern Africa (Use of the IAEA's Tool MESSAGE)  
Kenya
- Regional (AFRA) Training Course on Assessing the Role of Cost-Effective Energy Technologies Including Nuclear Power as INDCs for Climate Change Mitigation  
United States of America
- Regional (AFRA) Training Course: Joint South Africa–IAEA Nuclear Energy Management School  
South Africa
- RTC on X-ray and Gamma Ray Based DIR for Specialized NDT Requirement in Industry  
Sri Lanka
- 2nd RTC on the Development of e-Learning Courses for Teachers  
Peru
- National Knowledge Management School  
Brazil
- E-Training on IAEA's Tool MAED for Energy Demand Analysis  
Austria
- RTC on Energy Demand Analysis Using IAEA's Tool MAED  
Panama
- E-training on IAEA's Tool MESSAGE  
Austria
- RTC on Analysis of the Sustainable Energy Supply System Development Using IAEA's Tool MESSAGE  
Peru
- NTC on TCP IT Tools and Capacity Building Strategy  
Togo
- NTC on Energy Statistics and Energy Balances (Application of the IAEA Tool EBS)  
Togo
- NTC on Energy Demand Analysis (Application of the IAEA's tool MAED)  
Togo

### **Emergency Preparedness**

- NTC on Considerations in Emergency Preparedness and Response  
Belarus
- Preparation, Conduct, and Evaluation of Emergency Exercises  
Nigeria
- Emergency Consequence Management  
South Africa
- Communication with the Public in a Nuclear or Radiological Emergency  
South Africa
- Emergency Preparedness and Response (EPR) for First Responders  
Ethiopia
- Emergency Preparedness and Response (EPR) for First Responders  
Kenya
- Medical Preparedness and Response to Radiation Emergencies  
Sudan

- Emergency Preparedness and Response (EPR) for First Responders  
Zimbabwe
- School of Radiation Emergency Management  
Japan
- RTC on Radiation Emergency Management  
Austria
- NTC for First Responders to a Radiological Emergency  
Chile
- NTC on Medical Preparedness and Response to Nuclear and Radiological Emergencies for Health  
Emergency Teams  
Chile
- RTC on Medical Preparedness and Response to Radiation Emergencies  
Mexico
- Participation in the Pilot Training Course on the Development and Use of Operational Intervention Levels for  
Severe Emergencies at Light Water Reactors  
Austria
- Emergency Preparedness and Response (EPR)  
South Africa
- NTC on Public Protective Actions for Severe Accidents  
United Arab Emirates
- Workshop on Applying Emergency Preparedness and Response Requirements for NPP Licensing and  
Operation  
Poland
- Regional Workshop to discuss the results of self-assessment and develop an action plan (ARASIA)  
Jordan
- Regional Workshop on Project Coordination and Hazard assessment (ASEAN)  
Thailand
- Regional Workshop on Medical Preparedness and Response to Radiation Emergencies (ARASIA)  
Republic of Korea
- Workshop on Notification, Reporting and Requesting Assistance  
Romania
- National Training Course on Medical Response  
Bosnia and Herzegovina
- Training Course on Emergency Preparedness and Response  
Cyprus
- National Training Course on Emergency Preparedness and Response  
Sri Lanka

#### **Executive Management, Policy Making and Coordination**

- International School of Nuclear Law  
France
- Nuclear Law Institute  
Austria

#### **Food and Agriculture**

- Nitrogen Management in Agro-Ecosystems  
Austria

- Nutrient and Water Management  
Burundi
- Artificial Insemination + Delivery of Reproduction Enhancement Services on Farms  
Benin
- NTC on Pesticide Residues in Foods of Animal Origin  
Costa Rica
- Training Course on Remote Sensing for Assessing Glacier Dynamics  
Brazil
- RTC on QMS, Enhancing Lab Internal Auditing and Quality Control/Assurance  
Indonesia
- Basic Mutation Breeding Techniques for Crop Improvement  
Cote d'Ivoire
- Mutation Breeding of Brachiaria Grass and Dolichos Lablab Species  
Kenya
- Mutation Breeding and Supportive Biotechnologies for Improvement of Vegetables  
Mauritius
- Nutrient and Water Management Practices to Enhance Rice Production  
Mauritania
- Mass Spectrometry and Applications  
Morocco
- NTC on Methodologies and Mechanisms for Screening against Abiotic (Salinity and Drought) and Biotic Stresses  
Oman
- National Monitoring Teams for Diagnosis of Ebola Virus Disease  
Cameroon
- Diagnosis of Ebola Virus Disease  
Uganda
- Proper Sampling and Statistics for a Food Safety Laboratory  
Botswana
- Strengthening Capabilities for Microbial Food Hazard Analysis  
Namibia
- GIS Mapping  
Ghana
- Enhancing Capacity for Diagnosis of Ebola Virus Disease  
Uganda
- National Monitoring Teams for Diagnosis of Ebola Virus Disease  
Cameroon
- Use of Short-lived Fallout Radionuclides  
Austria
- Plant Breeding Approach in Dissemination of Mutant Varieties  
Zimbabwe
- Mutation Breeding Field Experimental Design and Data Analysis  
Benin
- Basic Mutation Breeding Techniques for Crop Improvement  
United Republic of Tanzania
- Veterinary Drug Residues in Foods  
Malawi

- RTC on Taxonomy and Identification of Fruit Fly Pest Species for Southeast Asia  
Thailand
- RTC on Mutation Detection Methods Applied to Floods  
Malaysia
- RTC on Applications of In-vitro Techniques in Mutation Breeding of Bioenergy Crops  
Indonesia
- RTC on Water and Nutrient Management for Marginal Land  
Nepal
- Training Course on Water Management and Use of Crop Simulation Model (AquaCrop)  
United Arab Emirates
- Integrated Good Agricultural Practices/Technology Packages Based on Innovative Soil, Water Nutrient  
Management  
Philippines
- RTC on Handling Mutated Rice Production in Selection through Advanced Marker Added Technique on  
Biotic and Abiotic Traits  
Bangladesh
- Application of Mutation Breeding and Screening for Biotic and Abiotic Stresses in Cereals  
Jordan
- RTC on Mutation Breeding  
Pakistan
- RTC Fruit Fly Detection, Surveillance and Area-Wide Integrated Pest Management  
Croatia
- RTC 1 on the Detection of Pox Virus Infection in Animals  
Austria
- RTC 2 on the Detection of Pox Virus infections in Animals  
Austria
- Advanced Course on Electron Beam Accelerators  
Ecuador
- RTC Determining the Geographical Boundaries of the NSW and the Identification of its Natural Barriers  
Brazil
- RTC on Basic Mutation Breeding  
Cuba
- RTC on Risk Assessment in the Region  
Guatemala
- RTC on Integrated Fruit Fly Management  
Mexico
- RTC on Genetics of Parasite Resistance in Sheep: Sampling, Data Collection, Management and Analyses  
Uruguay
- RTC on Implementation of Biomarkers on Aquatic Organisms  
Brazil
- Phenotyping and Genotyping Mutants for Abiotic Stress  
Sri Lanka

#### **Human Health**

- Strengthening regional capacities for the early and rapid detection of Zika virus infections in South America  
Austria
- NTC on Head, Neck and Lung Cancer  
Bangladesh

- NTC on Cervical Cancer and Genitourinary Malignancies  
Bangladesh
- NTC for RTTs  
Bangladesh
- Patient Dosimetry, Dose Assessment and DRLs in Diagnostic Radiology  
Bosnia and Herzegovina
- NTC on Theoretical and Practical Techniques on Synthesis and Quality Control on New PET Tracers  
Labelled with Fluorine  
Brazil
- NTC to Train 12 Professionals in QUANUM Methodology  
Brazil
- NTC in 4D Breathing Management and Treatment Protocols  
Brazil
- NTC on Radiation Protection  
Colombia
- Radiation Safety Assessment  
Colombia
- NTC on Impact Evaluation of the Micronutrient Supplementation Program  
Dominican Republic
- NTC on Advancing Palliative Care Service Capacity  
Fiji
- Interregional Training Course on Targeted Radionuclide Therapies  
United States of America
- NTC on Radiotherapy in the Management of Head and Neck Cancer with Emphasis on IMRT  
Kazakhstan
- NTC for Outreach in Radiotherapy and Cancer in Port Moresby  
Papua New Guinea
- Regional (AFRA) Training Course on Small Field Dosimetry  
South Africa
- Regional (AFRA) Training Course on Selection, Acceptance, Commissioning and Maintenance of  
Equipment in Radiotherapy  
United States of America
- Regional (AFRA) Training Course on Quality Assurance of Record and Verify Systems  
Algeria
- Regional (AFRA) Training Course on Genitourinary (GU) Cancers  
Nigeria
- Regional (AFRA) Training Course for Radiation Therapists in French  
Morocco
- Regional (AFRA) Training Course on Quality Assurance and Optimization in SPECT/CT and PET/CT  
Applications  
Tunisia
- Regional Training Course (Joint IAEA-ICTP workshop) on Computed Tomography: Quality Control,  
Dosimetry And Optimization  
Italy
- Regional (AFRA) Training Course on Quality Assurance/Quality Control in Mammography  
Algeria



- Joint ICTP-IAEA Regional (AFRA) Training Course on Internal Dosimetry for Medical Physicists Specializing in Nuclear Medicine  
Italy
- NTC on QA/QC in Nuclear Medicine  
Namibia
- NTC on Radiopharmacy Services  
Sudan
- NTC on Safe Practices in Hospital Radiopharmacy  
Kenya
- RTC on Advances in Nuclear Medicine for Diagnosis and Therapy in Oncology  
Egypt
- RTC for Field Workers on the Harmonization of Preparation of Dose, Administration of Dose and Collection of Samples for Assessment of Body Composition  
Zambia
- RTC on Treatment of Lymphoma  
Thailand
- RCA Second RTC on the Basics of Intensity Modulated Radiotherapy  
Indonesia
- RTC on Intensity Modulated Radiation Therapy for Prostate  
Philippines
- RTC on the Role of Molecular Imaging and Therapeutic Nuclear Medicine Techniques in the Management and Treatment of Relevant Non-Communicable Diseases  
Korea, Republic of
- RTC on Cancer Staging for Head and Neck  
Myanmar
- RTC on PET/CT with focus on CT Interpretation and TNM Staging  
United Arab Emirates
- RTC on Radioimmunotherapy, Radioimmunoimaging and Emerging Nuclear Medicine Therapy Approaches  
United Arab Emirates
- RTC on the Role of Hybrid Imaging Technologies in Nuclear C  
Kuwait
- RTC on Data Management and Data Evaluation  
Indonesia
- RTC on Protection Level Calibrations for SSDLs (All MS) (SEIB)  
Austria
- RTC on QMS in SSDLs (all MS)  
Austria
- RTC on Clinical Applications  
Singapore
- RTC on Basic QA/QC for Radiographers Working in Diagnostic Radiology  
Latvia
- RTC on QA/QC in Diagnostic Radiology in a Digital Era  
Slovenia
- IAEA/ESTRO Teaching Course on Basic Clinical Radiobiology  
Hungary
- IAEA/ESTRO Teaching Course on IMRT and Other Conformal Techniques in Practice  
United Kingdom

- IAEA/ESTRO Training Course on Evidence Based Radiation Oncology  
Portugal
- IAEA/ESTRO Training Course on Multidisciplinary Management of Lung Cancer  
Russian Federation
- IAEA/ESTRO Training Course on Best Practice in Radiation Oncology  
Austria
- Regional Hands-on Training Course on VMAT Treatment Planning  
Netherlands
- RTC on Medical Physics for Clinical Radiotherapy  
Russian Federation
- RTC on Brachytherapy Physics  
Russian Federation
- Training Course on the Role of Imaging in Clinical Radiotherapy  
Russian Federation
- Transition from 3D Conformal Radiation Therapy to Intensity Modulated Radiation  
Russian Federation
- IAEA/ESNM Theoretical Learning Course on Imaging in Infection and Inflammation  
Austria
- IAEA/ESNM/ESTRO Course on Molecular Imaging and Radiation Oncology  
Portugal
- IAEA/ESNM Practical Learning Course on Imaging in Infection and Inflammation  
Austria
- IAEA/ESNM Therapy and Basic Dosimetry Course  
Austria
- IAEA/ESNM Advanced Learning Course on PET/CT in Oncology  
Austria
- IAEA/ESNM Training Course on Myocardial Perfusion Imaging / Gated SPECT  
Austria
- RTC on Hybrid Imaging: PET/CT in Oncology  
Latvia
- RTC on Neuroimaging  
Slovenia
- RTC on NM: Update on State of the Art Infection/Inflammation Imaging  
Italy
- RTC pathways: Define the Main Pathways for Exposure by Country and in the Latin American Region  
Mexico
- RTC on the Use of RT-PCR for Rapid Detection and Identification of Zika Virus  
Austria
- RTC on the Use of RT-PCR for Rapid Detection and Identification of Zika Virus  
Austria
- RTC on SIT Package for Mosquito Disease Vectors of Zika  
Brazil
- RTC for Physicians and Medical Physicists in Paediatric Radiotherapy  
Costa Rica
- RTC on Modern Radiotherapy using Linear Accelerators  
United States of America

- RTC on Quality Assurance in Image Guided Radiotherapy  
Argentina
- Refresher Course in Radiobiology for Radiation Oncologists  
Mexico
- RTC on Data Input into REDCap and the Doubly Labelled Water Method of Assessing Total Daily Energy Expenditure  
Chile
- Rtc on In Vitro Preclinical Trials with Therapeutic Radiopharmaceuticals  
Uruguay
- RTC on the Validation of Protocols  
Brazil
- RTC on Internal Dosimetry, Clinical Protocols and Radiation Safety  
Cuba
- RTC on Clinical Applications of Hybrid Radionuclide Imaging Techniques for Paediatric Patients  
Colombia
- RTC on General Quality Assurance Management in the Practice of Radiation Medicine  
Chile
- NTC COS for the Application of the Risk Matrix in the Radiotherapy and Nuclear Medicine Services  
Costa Rica
- NTC COS in Radiation Protection in Intervention for Non-Cardiologists  
Costa Rica
- National training course on the Initial Medical Response in Radiological Emergencies  
Nicaragua
- NTC on First Response to a Radiological Emergency  
Paraguay
- NTC on Acceptance and Commissioning of Radiotherapy Equipment  
Romania
- NTC on Radiotherapy Planning in Head and Neck, Gynaecological and Breast Radiotherapy  
Slovakia
- Strengthening Regional Capacities for the Early and Rapid Detection of Zika Virus Infections in South America  
Austria
- NTC on Analysing Data Collected  
Uganda

#### **Management of Radioactive Waste**

- Interregional Training Course on Pre-Disposal and Disposal Management  
Austria
- Interregional Training Course on Practical Hands-on Training on The Management of Category 3-5 DSRS  
Morocco
- NTC on Fundamentals for the Management of Radioactive Sources  
Namibia
- NTC for Training the Regulatory Authority in Malaysia in the Evaluation of a Safety and Security Case for the Borehole Disposal System  
Malaysia
- Practical Training Course on Planning and Implementation of Nuclear Facility Decommissioning and Remediation of Radioactively Contaminated Sites  
United States of America

- NTC on Environmental Sampling Techniques  
Mauritania
- NTC on The Use of Dose and Risk Models  
Mauritania
- Regional (AFRA) Training Course on Management of Low Level Radioactive Waste Including Conditioning  
Cat. 3-5 DSRS (English)  
Morocco
- Practical Hands-on Training to Create Regional Capabilities in Handling and Conditioning Category 3-5  
Disused Sealed Radioactive Sources (DSRS)  
Thailand
- RTC on Search for Orphan Sources and Post-discovery Activities  
Nepal
- RTC No 1 on the Modalities and Rules of Site Remediation Programme Management  
Russian Federation
- RTC No 2 on the Modalities and Rules of Site Remediation Programme Management  
Russian Federation
- RTC on Disposal of Low and Medium Level Waste – Theory and Physical Examples  
Russian Federation
- NTC for Regulators and Operators on the Implementation of Plans for the Management of Radioactive  
Sources  
Guatemala
- RTC on Practical Aspects for Setting up and Validating National Inventories of Sealed Radioactive Sources  
Bahamas

#### **Management of Technical Cooperation for Development**

- RTC on Severe Accident Prevention and Mitigation  
Croatia
- RTC for Recently Appointed National Liaison Officers and Assistants of English-Speaking Countries in the  
Region of Latin America and the Caribbean  
Austria

#### **Nuclear Fuel Cycle and Materials Technologies**

- NTC on Materials for Nuclear Fuel  
Argentina
- IAEA-UNECE Interregional Training Course on Uranium, Coal, Oil and Gas Classification: Towards a  
Better Understanding of Energetic Basins and Application of UNFC-2009  
Mongolia
- Training Workshop on Uranium Exploration Methods  
Argentina
- RTC on Uranium Exploration and Mining  
Ethiopia
- RTC on Sustainable Management and Efficient Use of Uranium Resources  
Morocco
- RTC on Processing of Unconventional Radioactive Mineral Resources  
Sri Lanka

### **Nuclear Power**

- Interregional Training Course on Supporting Nuclear Power Infrastructure Capacity Building in Member States Introducing and Expanding Nuclear Power  
Korea, Republic of
- Interregional Training Course on Integrated Management Systems and Developing of the Safety Culture  
United States of America
- Interregional Training Course on Licensing Process for New or Expanding Nuclear Power Programmes  
Austria
- NTC on Energy System Modelling for Long Term Planning using MESSAGE  
Morocco
- KOICA-IAEA Joint Training Program on Fundamentals of Radioisotopes and Radiation Technology  
Korea, Republic of
- RTC on Providing Decision Support for Nuclear Power Planning and Development (Mentoring)  
Japan
- IAEA Training Course on Nuclear Power Infrastructure Development  
Japan
- Advanced On-line Monitoring Methodology for Improving Performance of Ageing Critical Structures, Systems and Components  
Germany
- RTC on Assessing the Potential Role of Nuclear Power in the Future Energy Mix using Multi-Criteria Decision Analysis (MCDA) Methodology  
Hungary
- RTC for First Time OSART Reviewers  
Slovakia
- Basic Professional Training Course (BPTC) on Nuclear Safety (Part 1)  
Sudan

### **Nuclear Science**

- Montecarlo n-Particle Software Basic Training Course  
Chile
- Regional (AFRA) Training Course on Programmable System on Chip  
Sudan
- Regional (AFRA) Training Course on Operation and Maintenance of X-ray Fluoroscopy Machines  
Ethiopia
- 1st AFRA Research Reactor School  
South Africa
- RTC on Monitoring and Management Strategies of Air Pollution  
Morocco
- RTC on the Use of IBA Techniques to Analyse Atmospheric Aerosols  
Jordan
- RTC on Applications of Nuclear Techniques for Cultural Heritage Conservation and Preservation  
Brazil

### **Nuclear Security**

- RTC on Developing Nuclear Security Regulations  
Mexico

## **Radiation and Transport Safety**

- NTC on Medical Preparedness and Response to Radiation Emergencies  
Bosnia and Herzegovina
- NTC on First Responders  
Bosnia and Herzegovina
- NTC for the Regulatory Body  
Colombia
- NTC on Diagnostic and Interventional Radiology  
Guatemala
- NTC on Radiation Protection in Dental Radiology  
Guatemala
- NTC on Radiation Protection in Veterinary  
Guatemala
- NTC to Train the Regulatory Authority in Evaluating a Borehole Disposal Safety and Security Case  
Ghana
- Regional (AFRA) Training Course for Radiation Therapists RTTs  
Kenya
- RTC on Second School for Drafting Regulations on Radiation Safety for Africa Member States  
Austria
- RTC for Regulators on Authorization and Inspection of Radiation Sources  
Ethiopia
- RTC on the Integrated Management System for a Regulatory Body  
Mauritius
- RTC on Inspections to Transport of Radioactive Material  
Ethiopia
- RTC on Orphan Source Search Training  
Philippines
- RTC on Organization and Implementation of a National Regulatory Programme for the Control of Radiation Sources  
Korea, Republic of
- RTC on Organization and Implementation of a National Regulatory Programme for the Control of Radiation Sources  
Korea, Republic of
- Advanced Training Course on Assessment of Occupational Exposure Due to Intakes of Radionuclides  
Korea, Republic of
- Regional Train the Trainers Course for Radiation Protection Officers  
Sri Lanka
- Postgraduate Educational Course in Radiation Protection and the Safety of Radiation Sources (PGEC-13)  
Malaysia
- RTC on the Implementation and Maintaining of Quality Management System (QMS) in Radiation Processing Facilities  
Romania
- RTC on Adoption of QA/QC Methods and Procedures for Intercomparison of Radiation Dosimetry in Radiation Facilities for Process Control  
Hungary
- RTC on Radiation Protection in Diagnostic Radiology for Radiographers  
Estonia

- RTC on ORP Programmes and Safety Culture  
Lithuania
- Regional Train the Trainers Course for Radiation Protection Officers  
Kyrgyzstan
- Post-Graduate Educational Training Course on Radiation Protection and the Safety of Radiation Sources (PGEC)  
Belarus
- RTC on Radiological Protection in Computed Tomography with Emphasis in Paediatrics  
Costa Rica
- RTC on Radiological Protection in Computed Tomography with Emphasis in Paediatrics  
Costa Rica
- Postgraduate Specialisation Training Course on Radiation Protection and Safety of Radiation Sources  
Argentina
- Regional Postgraduate Specialisation Course of Studies on Nuclear Safety  
Argentina
- NTC on Radiation Protection for Patients, Personnel and the Public at PET/CT Facilities  
Dominican Republic
- NTC for the Implementation of the Risk Matrix in Radiotherapy, Including External Beam with Accelerators and Brachytherapy  
Honduras
- NTC on Radiation Protection, Including Justification and Optimization, in the Transition from Conventional to Digital Radiology and Mammography  
Honduras
- NTC on Radiation Protection, Including Justification and Optimization in Computed Tomography with Emphasis in Children  
Honduras
- NTC for Radiological Protection in Digital Radiography, Including Mammography  
Peru
- NTC on the Application of Risk Analysis Methods by Means of the Risk Matrix and the Software SEVRRRA in Radiotherapy  
Peru
- NTC for Radiation Protection in Computed Tomography with Emphasis on Paediatrics and Pregnant Women  
Peru
- NTC on Radiation Protection in NORM  
Uruguay
- NTC on Optimization in CT with emphasis in Paediatrics  
Colombia
- NTC for Radiation Protection in Computed Tomography, with Emphasis on Pediatrics CT  
Uruguay
- NTC on the application of Risk Analysis, Risk Matrix and Radiotherapy  
Nicaragua
- NTC on Radiation Protection in Conventional and Digital Radiology  
Paraguay
- NTC Radiation Protection in Accident Prevention in Radiotherapy  
Paraguay
- Regional Train the Trainers Course for Radiation Protection Officers  
Honduras

- RTC on Safety Culture in Organizations, Facilities and Activities with Ionizing Radiation Sources  
Chile
- NTC on Quality Control of Digital X Ray Equipment Used for Radiagnostics  
El Salvador
- NTC on Risk Analysis in Radiotherapy, Application of Risk Matrix and SEVRA Software  
Chile
- NTC on Safety Analysis in Medical Practices  
Colombia
- RTC for Regulators on the Management of Radiation Safety Inspection Plans — Introduction of IT Tool for this Purpose  
Chile
- RTC to Assist in the Consideration of the Gap Analysis to Draft National Regulations  
Uruguay

### **Radioisotope Production and Radiation Technology**

- Training on Management of Small Animal Imaging Laboratory (IPEN)  
Brazil
- RTC on Advanced Characterization Methods of Grafted Polymeric Matrices, Designing and Up-Scaling of Radiation Grafting for Environmental and Industrial Applications  
Malaysia
- RTC on the Development and Clinical Application of Radiosynovectomy Agents  
Philippines
- RTC on Creating Expertise in the Use of Radiation Technology  
Peru
- NTC on Application of Residence Time Distribution (RTD) Studies  
Mexico
- RTC Basic Training Course to Establish Quality Control in Dosimetry and Inter-comparison Protocols for the Industrial Irradiators  
Brazil
- RTC on Metrology Applied to the Preparation and Use of Radiopharmaceuticals  
Argentina

### **Safety of Nuclear Installations**

- NTC on NDE/ISI  
Armenia
- NTC on Understanding the Physics and Technology of PWRs Using Basic Principle Simulators  
Mexico
- International Seismic Safety Centre (ISSC) Site and External Events Design (SEED) Training Course, and RTC on Seismic Safety for Nuclear Installations  
Italy
- RTC on Flood Safety for Nuclear Installations: From Hazard Assessment to Structural Analysis “HASANI”  
Italy
- Regulatory Oversight of Human and Organizational Factors (HOF)  
Lithuania
- RTC No 1 on Infrastructure Development and Safety Assessment of WWER/PWR with Advanced Safety Features  
Russian Federation



- RTC No 2 on Infrastructure Development and Safety Assessment of WWER/PWR with Advanced Safety Features  
Russian Federation
- Joint Safety Culture Workshop for Eletronuclear Senior Management Team and Relevant CNEN Staff  
Brazil

#### **Water Resources**

- NTC in Hydrology in Fractured Media  
Argentina
- Interpretation of Geochemical and Hydrochemical Data in Isotope Hydrology Projects  
Argentina
- NTC on the Use of Hydrochemical Tools in Hydrology — Basic Level  
Bolivia
- NTC on Isotope Hydrology — Basic to Intermediate Level  
Bolivia
- Training Course on the Principles and Applications of Isotope Hydrology Methods  
Austria
- RTC on Handling and Processing Hydro-chemical and Isotopic Data Using GIS Tools  
Austria
- RTC on Groundwater Dating: Practical Aspects on Tritium and Radiocarbon  
Senegal
- IAEA/RCA Regional Training Course on the Assessment of Groundwater by Using Isotope and Related Techniques  
China
- RTC in Artificial Recharge of Aquifers  
Bolivia
- RTC in Aquifer Management Plan Development  
Mexico

**Table A31. Relevant Agency web sites**

Public web site

<http://www.iaea.org/>

**Nuclear Power**

Nuclear energy

<http://www.iaea.org/OurWork/ST/NE/Main/>

Nuclear power

<http://www.iaea.org/NuclearPower/>

Nuclear power technology development

<http://www.iaea.org/NuclearPower/Technology/home.html>

Nuclear power engineering

<http://www.iaea.org/NuclearPower/Engineering/home.html>

Nuclear energy knowledge resources

<http://www.iaea.org/inis/>

INPRO

<http://www.iaea.org/INPRO/>

Planning and economic studies

<https://www.iaea.org/OurWork/ST/NE/Pess/index.html>

International Nuclear Information System and Nuclear Knowledge Management

<http://www.iaea.org/inis/>

Nuclear energy databases

<http://www.iaea.org/OurWork/ST/NE/Main/databases.html>

**Nuclear Fuel Cycle and Materials Technologies**

Nuclear fuel cycle and waste technology

<http://www.iaea.org/OurWork/ST/NE/NEFW/home.html>

Integrated Nuclear Fuel Cycle Information System (iNFCIS)

<https://infcis.iaea.org/>

**Nuclear Science**

Portal for medical related nuclear data

<https://www-nds.iaea.org/medportal/>

Research Reactor Database

<http://nucleus.iaea.org/RRDB/RR/ReactorSearch.aspx?rf=1>

Information on ageing related operating experience from research reactors around the world (available to research reactor operators)

<http://www.iaea.org/OurWork/ST/NE/NEFW/Technical-Areas/RRS/operation-maintenance.html>

**Nuclear Applications**

Joint FAO/IAEA Programme on Nuclear Techniques in Food and Agriculture

<http://www-naweb.iaea.org/nafa/index.html>

**Food and Agriculture**

Agency managed database for officially released mutant varieties

<http://mvd.iaea.org/>

## **Human Health**

Programme of Action for Cancer Therapy (PACT)

<http://cancer.iaea.org/index.asp>

Distance Assisted Training on-line (DATOL)

<http://nucleus.iaea.org/HHW/Technologists/NuclearMedicineTech/Educationalresources/DAT/index.html>

The Human Health Campus

<https://humanhealth.iaea.org/>

Applied Sciences of Oncology distance learning course

<http://elearning.iaea.org/m2/course/index.php?categoryid=45>

DIRAC

<https://dirac.iaea.org/>

Train the Trainers Workshop on Medical Physics Support for Nuclear or Radiological Emergencies

<http://elearning.iaea.org/m2/course/view.php?id=348>

Advanced Medical Physics Learning Environment (AMPLE) consisting of:

AMPLE Radiotherapy Physics

<http://plms-nkm.iaea.org/m2/course/view.php?id=525>

AMPLE Nuclear Medicine Physics

<http://plms-nkm.iaea.org/m2/course/view.php?id=527>

AMPLE Diagnostic Radiology Physics

<http://plms-nkm.iaea.org/m2/course/view.php?id=526>

## **Water Resources**

Isotope measurements from non-Agency projects on rivers and groundwater (available to Member States)

<http://www-naweb.iaea.org/napc/ih/index.html>

## **Environment**

Reference material web site

<http://nucleus.iaea.org/rpst/index.htm>

## **Incident and Emergency Preparedness and Response**

Emergency Preparedness and Response, main page:

<http://www-ns.iaea.org/tech-areas/emergency/>

## **Radiation and Transport Safety**

Radiation Safety Information Management System (RASIMS)

<http://rasims.iaea.org/>

Radiation safety

<http://rpop.iaea.org/RPoP/RPoP/Content/index.htm>

Radiation, transport and waste safety

<http://www-ns.iaea.org/home/rtws.asp>

Nuclear installation safety

<http://www-ns.iaea.org/home/nis.htm>

## **Safeguards**

<http://www.iaea.org/safeguards/index.html>

**Management of Technical Cooperation for Development**

<http://www.iaea.org/technicalcooperation>

**Technical Cooperation Programme Management Online Tools**

Programme Cycle Management Framework

<http://pcmf.iaea.org/>

InTouch

<http://intouch.iaea.org/>

**Standards, Guides and Conventions**

International conventions and agreements

<http://www.iaea.org/Publications/Documents/Conventions/index.html>

**Legal Assistance**

<http://ola.iaea.org/ola/index.html>

**Table A32(a). Number and types of facilities under Agency safeguards by State during 2016**

State <sup>a</sup>	Power reactors	Research reactors and critical assemblies	Conversion plants	Fuel fabrication plants	Reprocessing plants	Enrichment plants	Separate storage facilities	Other facilities	Total
Algeria		2	1	1				1	5
Argentina	4	7	4	3		3	6	7	34
Armenia	2						1		3
Australia		2					1	2	5
Austria		1							1
Bangladesh		1							1
Belarus	2	1					2		5
Belgium	6	3		3			5	5	22
Brazil	3	6	1	1		5	1	5	22
Bulgaria	3	1					2		6
Canada	6	9	2	5			12		34
Chile		2	1	1					4
China	1	1				1			3
Colombia		1							1
Czech Republic	3	3					4	2	12
Democratic Republic of the Congo		1							1
Denmark		1					2	1	4
Egypt		2		2				3	7
Estonia		1							1
Finland	5	1					2	1	9
France				1	1	1			3
Georgia		1						2	3
Germany	24	13		1	1	1	24	6	70
Ghana		1							1
Greece		1							1
Hungary	2	2					2		6
India	7			2			2		11
Indonesia		3		2			1	1	7
Iran, Islamic Republic of	2	5	2	2		3	1	3	18
Iraq							1		1
Israel		1							1
Italy	5	6		1	2		6	3	23
Jamaica		1							1
Japan	63	20	2	8	6	3	8	15	125
Jordan		1						1	2
Kazakhstan	1	4		1			6		12
Korea, Republic of	32	3		1			2	7	45
Latvia		1							1
Libya		1						1	2
Lithuania	1						3		4
Malaysia		1							1

State <sup>a</sup>	Power reactors	Research reactors and critical assemblies	Conversion plants	Fuel fabrication plants	Reprocessing plants	Enrichment plants	Separate storage facilities	Other facilities	Total
Mexico	2	1	1				1		5
Morocco		1							1
Netherlands	2	3				1	2	1	9
Nigeria		1							1
Norway		2						1	3
Pakistan	5	2							7
Peru		2							2
Philippines	1	1							2
Poland		2					1		3
Portugal		1					1		2
Romania	4	2	1	1			1		9
Russian Federation							1		1
Serbia		1							1
Slovakia	5						2		7
Slovenia	1	1							2
South Africa	2	1	2	2			8	3	18
Spain	9			1			6	1	17
Sweden	12	1	1	1			2		17
Switzerland	5	3					3	3	14
Syrian Arab Republic		1							1
Tajikistan		1							1
Thailand		3							3
Turkey		2		1					3
Ukraine	21	2		1			8	5	37
United Kingdom						1	2		3
United States of America							1		1
Uzbekistan		2							2
Venezuela, Bolivarian Republic of		1							1
Viet Nam		1							1

<sup>a</sup> An entry in this column does not imply the expression of any opinion whatsoever on the part of the Agency concerning the legal status of any country or territory or of its authorities, or concerning the delimitation of its frontiers.

- Note:**
1. The numbers indicated here include projected and operational facilities, and facilities at the decommissioning stage.
  2. The Agency was also applying safeguards at 17 facilities in Taiwan, China.

**Table A32(b). Facilities under Agency safeguards or containing safeguarded nuclear material during 2016**

State <sup>a</sup>	Name of facility	Location
<b>Power reactors</b>		
Argentina	Atucha-I Nuclear Power Plant	Lima
	Atucha-II Nuclear Power Plant	Lima
	Carem	Lima
	Embalse Nuclear Power Plant	Embalse
Armenia	Armenian NPP	Metsamor
	Armenian NPP 3	Metsamor
Belarus	Belarus-1	Ostrovets
	Belarus-2	Ostrovets
Belgium	Doel-1 & 2 NPP	Doel
	Doel-3 NPP	Doel
	Doel-4 NPP	Doel
	Tihange-1 NPP	Tihange
	Tihange-2 NPP	Tihange
	Tihange-3 NPP	Tihange
Brazil	Angra-1	Angra Dos Reis
	Angra-2	Angra Dos Reis
	Angra-3	Angra Dos Reis
Bulgaria	NPP Kozloduy-1 & 2	Kozloduy
	NPP Kozloduy-3 & 4	Kozloduy
	NPP Kozloduy-5 & 6	Kozloduy
Canada	Bruce 'A'.N.G.S.	Tiverton, Ontario
	Bruce 'B'.G.S.	Tiverton, Ontario
	Darlington NGD	Bowmanville, Ontario
	Gentilly II	Gentilly, Quebec
	Pickering N.G.S.	Pickering, Ontario
	Point Lepreau	Pt. Lepreau, New Brunswick
China	QSNPP	Hai Yan, Zhe Jiang
Czech Republic	NPP Dukovany (Edu-1)	Dukovany
	NPP Dukovany (Edu-2)	Dukovany
	NPP Temelin	Temelin
Finland	Hanhikivi-I	Pyhaejoki

State <sup>a</sup>	Name of facility	Location
	Loviisa NPP	Loviisa
	TVO-I	Olkiluoto
	TVO-II	Olkiluoto
	TVO-III	Olkiluoto
Germany	AVR	Juelich
	HKG-THTR 300	Hamm
	KKW Brokdorf	Brokdorf
	KKW Brunsbuettel	Brunsbuettel
	KKW Emsland	Lingen (Ems)
	KKW GR3. 5	Lubmin
	KKW Grafenrheinfeld	Grafenrheinfeld
	KKW Greifswald-1 & 2	Lubmin
	KKW Grohnde	Emmerthal
	KKW Gundremmingen, Block B	Gundremmingen
	KKW Gundremmingen, Block C	Gundremmingen
	KKW Isar-1	Essenbach
	KKW Isar-2	Essenbach
	KKW Kruemmel	Geesthacht
	KKW Neckarwestheim-1	Neckarwestheim
	KKW Neckarwestheim-2	Neckarwestheim
	KKW Obrigheim	Obrigheim
	KKW Philippsburg-1	Philippsburg
	KKW Philippsburg-2	Philippsburg
	KKW Unterweser	Unterweser
	KW Biblis A	Biblis
	KW Biblis B	Biblis
	KWL-Lingen	Lingen
	KWW Muelheim-Kaerlich	Muelheim-Kaerlich
Hungary	MVM Paks NPP Ltd. I	Paks
	MVM Paks NPP Ltd. II	Paks
India	KAPS-1 & 2	Surat, Gujrat
	KKNPP	Kudankulam, Tamil Nadu
	NAPS-1 & 2	Bulandshahar, Uttar Pradesh



State <sup>a</sup>	Name of facility	Location
	RAPS-1 & 2	Rawatbhata, Rajasthan
	RAPS-3 & 4	Rawatbhata, Rajasthan
	RAPS-5 & 6	Rawatbhata, Rajasthan
	TAPS	Tarapur, Maharashtra
Iran, Islamic Republic of	Bushehr NPP	Bushehr Halilem
	IR360 NPP	Darkhovein
Italy	Area Disattivazione Caorso	Caorso
	Centrale Latina	Borgo Sabotino
	Centrale Nucleare Di Trino	Trino Vercellese
	Cirene (On Load)	Borgo Sabotino
	So.G.I.N. CN Del Garigliano	Sessa Aurunca (CE)
Japan	Fuku-I-1	Futaba-Gun, Fukushima-Ken
	Fuku-I-2	Futaba-Gun, Fukushima-Ken
	Fuku-I-3	Futaba-Gun, Fukushima-Ken
	Fuku-I-4	Futaba-Gun, Fukushima-Ken
	Fuku-I-5	Futaba-gun, Fukushima-Ken
	Fuku-I-6	Futaba-gun, Fukushima-Ken
	Fuku-N-1	Futaba-gun, Fukushima-Ken
	Fuku-N-2	Futaba-gun, Fukushima-Ken
	Fuku-N-3	Futaba-gun, Fukushima-Ken
	Fuku-N-4	Futaba-gun, Fukushima-Ken
	Genkai-1	Higashimatsuura-Gun, Saga-Ken
	Genkai-2	Higashimatsuura-Gun, Saga-Ken
	Genkai-3	Higashimatsuura-Gun, Saga-Ken
	Genkai-4	Higashimatsuura-Gun, Saga-Ken
	Hamaoka-1	Ogasa-Gun, Shizuoka-Ken
	Hamaoka-2	Ogasa-Gun, Shizuoka-Ken
	Hamaoka-3	Ogasa-Gun, Shizuoka-Ken
	Hamaoka-4	Ogasa-Gun, Shizuoka-Ken
	Hamaoka-5	Ogasa-Gun, Shizuoka-Ken
	Higashidoori-1	Shimokita-gun, Aomori-ken
	Higashidoori-1	Shimokita-gun, Aomori-ken
	Ikata-1	Nishiuwa-gun, Ehime-ken

<b>State<sup>a</sup></b>	<b>Name of facility</b>	<b>Location</b>
	Ikata-2	Nishiuwa-gun, Ehime-ken
	Ikata-3	Nishiuwa-gun, Ehime-ken
	Joyo	Higashi, Ibaraki-ken
	Kaminoseki-1	Kumage-gun, Yamaguchi-Ken
	Kashiwazaki-1	Kashiwazaki-Shi, Niigata-Ken
	Kashiwazaki-2	Kashiwazaki-Shi, Niigata-Ken
	Kashiwazaki-3	Kashiwazaki-Shi, Niigata-Ken
	Kashiwazaki-4	Kashiwazaki-Shi, Niigata-Ken
	Kashiwazaki-5	Kashiwazaki-Shi, Niigata-Ken
	Kashiwazaki-6	Kashiwazaki-Shi, Niigata-Ken
	Kashiwazaki-7	Kashiwazaki-Shi, Niigata-Ken
	Mihama-1	Mikata-Gun, Fukui-Ken
	Mihama-2	Mikata-Gun, Fukui-Ken
	Mihama-3	Mikata-Gun, Fukui-Ken
	Monju	Tsuruga-shi, Fukui-Ken
	Ohi-1& 2	Ohi-gun, Fukui-Ken
	Ohi-3	Ohi-gun, Fukui-Ken
	Ohi-4	Ohi-gun, Fukui-Ken
	Ohma	Shimokita-Gun, Aomori-Ken
	Onagawa-1	Oshika-Gun, Miyagi-Ken
	Onagawa-2	Oshika-Gun, Miyagi-Ken
	Onagawa-3	Oshika-Gun, Miyagi-Ken
	Sendai-1	Sendai-Shi, Kagoshima-Ken
	Sendai-2	Sendai-Shi, Kagoshima-Ken
	Sendai-3	Satsumasendai-Shi
	Shika-1	Hakui-Gun, Ishikawa-Ken
	Shika-2	Hakui-Gun, Ishikawa-Ken
	Shimane-1	Yatsuka-Gun, Shimane-Ken
	Shimane-2	Yatsuka-Gun, Shimane-Ken
	Shimane-3	Yatsuka-Gun, Shimane-Ken
	Takahama-1	Ohi-gun, Fukui-Ken
	Takahama-2	Ohi-gun, Fukui-Ken
	Takahama-3	Ohi-gun, Fukui-Ken

State <sup>a</sup>	Name of facility	Location
	Takahama-4	Ohi-gun, Fukui-Ken
	Tokai	Tokai-Mura, Ibaraki-Ken
	Tokai-2	Tokai-Mura, Ibaraki-Ken
	Tomari-1	Furuu-Gun, Hokkaido
	Tomari-2	Furuu-Gun, Hokkaido
	Tomari-3	Furuu-Gun, Hokkaido
	Tsuruga-1	Tsuruga-Shi, Fukui-Ken
	Tsuruga-2	Tsuruga-Shi, Fukui-Ken
Kazakhstan	BN-350	Aktau
Korea, Republic of	Hanbit-1	Yeonggwang
	Hanbit-2	Yeonggwang
	Hanbit-3	Yeonggwang
	Hanbit-4	Yeonggwang
	Hanbit-5	Yeonggwang
	Hanbit-6	Yeonggwang
	Hanul-1	Ulchin
	Hanul-2	Ulchin
	Hanul-3	Ulchin
	Hanul-4	Ulchin
	Hanul-5	Ulchin
	Hanul-6	Ulchin
	Kori-1	Pusan
	Kori-2	Pusan
	Kori-3	Pusan
	Kori-4	Pusan
	Shin Hanul-1	Ulchin
	Shin Hanul-2	Ulchin
	Shin Hanul-3	Ulchin
	Shin Hanul-4	Ulchin
	Shin Kori-1	Pusan
	Shin Kori-2	Pusan
	Shin Kori-3	Pusan
	Shin Kori-4	Pusan

State <sup>a</sup>	Name of facility	Location
	Shin Kori-5	Pusan
	Shin Kori-6	Pusan
	Shin Wolsong-1	Kyongju
	Shin Wolsong-2	Kyongju
	Wolsong-1	Kyongju
	Wolsong-2	Kyongju
	Wolsong-3	Kyongju
	Wolsong-4	Kyongju
Lithuania	Ignalina NPP	Visaginas
Mexico	Central Laguna Verde Unit I	Muni. Al. Luc. Veracruz
	Central Laguna Verde Unit II	Muni. Al. Luc. Veracruz
Netherlands	Epz. Borssele	Borssele
	N. V. GKN-Dodewaard	Dodewaard
Pakistan	Chasnupp-1	Kundian, District Mianwali
	Chasnupp-2	Kundian, District Mianwali
	Chasnupp-3	Kundian, District Mianwali
	Chasnupp-4	Kundian, District Mianwali
	Kanupp	Karachi
Philippines	BNPP	Morong, Bataan
Romania	Cernavoda-3	Cernavoda
	Cernavoda-4	Cernavoda
	CNE Cernavoda 1	Cernavoda
	CNE Cernavoda 2	Cernavoda
Slovakia	JAVYS NPP A-1	Jaslovske Bohunice
	JAVYS NPP V-1	Jaslovske Bohunice
	NPP Mochovce Units 1 & 2	Mochovce
	NPP Mochovce Units 3 & 4	Mochovce
	V-2 NPP	Jaslovske Bohunice
Slovenia	Krsko (NEK)	Krsko
South Africa	Koeberg Unit I	Cape Town
	Koeberg Unit II	Cape Town
Spain	Asco-1	Asco
	Asco-2	Asco

State <sup>a</sup>	Name of facility	Location
	C.N. Almaraz-1	Almaraz
	C.N. Almaraz-2	Almaraz
	C.N. Cofrentes	Cofrentes
	C.N. de Sta. Maria de Garona	Santa Maria de Garona
	C.N. Jose Cabrera	Almonacid De Zorita
	CN Trillo-1	Trillo
	CN Vandellos-2	Vandellos
Sweden	Barsebaeck Unit 1	Loeddekoepinge
	Barsebaeck Unit 2	Loeddekoepinge
	Forsmark Unit 1	Oesthammar
	Forsmark Unit 2	Oesthammar
	Forsmark Unit 3	Oesthammar
	Oskarshamn Unit 1	Oskarshamn
	Oskarshamn Unit 2	Oskarshamn
	Oskershamn Unit 3	Oskarshamn
	Ringhals-1	Ringhals
	Ringhals-2	Ringhals
	Ringhals-3	Ringhals
	Ringhals-4	Ringhals
Switzerland	KKB Beznau-I	Beznau Doettingen
	KKB Beznau-II	Beznau Doettingen
	KKG Goesgen	Goesgen Daeniken
	KKL Leibstadt	Leibstadt
	KKM Muehleberg	Muehleberg
Ukraine	Chernobyl NPP, Unit 1	Chernobyl
	Chernobyl NPP, Unit 2	Chernobyl
	Chernobyl NPP, Unit 3	Chernobyl
	Chernobyl NPP, Unit 5	Chernobyl
	Chernobyl NPP, Unit 6	Chernobyl
	Khmelnitski-1	Neteshin
	Khmelnitski-2	Neteshin
	Khmelnitski-3	Neteshin
	Khmelnitski-4	Neteshin

State <sup>a</sup>	Name of facility	Location
	Rovno-1 & 2	Kuznetsovsk
	Rovno-3	Kuznetsovsk
	Rovno-4	Kuznetsovsk
	South Ukraine-1	Yuzhnoukrainsk
	South Ukraine-2	Yuzhnoukrainsk
	South Ukraine-3	Yuzhnoukrainsk
	Zaporozhe-1	Energodar
	Zaporozhe-2	Energodar
	Zaporozhe-3	Energodar
	Zaporozhe-4	Energodar
	Zaporozhe-5	Energodar
	Zaporozhe-6	Energodar
<b>Research reactors and critical assemblies</b>		
Algeria	Es Salam Reactor	Ain Oussera
	Nur Reactor	Draria-Bp29 Wilaya de Tipaza
Argentina	Argentine Reactor 0 (RA-0)	Cordoba
	Argentine Reactor 1 (RA-1)	Buenos Aires
	Argentine Reactor 3 (RA-3)	Centro Atomico Ezeiza
	Argentine Reactor 4 (RA-4)	Rosario
	Argentine Reactor 6 (RA-6)	Centro Atomico Bariloche
	Argentine Reactor 8 (RA-8)	Pilcaniyeu
	Argentine Reactor 10 (RA-10)	Centro Atomico Ezeiza
Australia	HIFAR	Lucas Heights, New South Wales
	OPAL	Lucas Heights, New South Wales
Austria	TRIGA Mark II Reactor	Vienna
Bangladesh	Atomic Energ. Res. Estab.	Dhaka
Belarus	Sosny	Minsk
Belgium	BR1-CEN	Mol
	BR2-CEN	Mol
	Venus-CEN	Mol
Brazil	Brazilian Multipurpose Reactor	Ipero, Sao Paulo
	CDTN/IRP-R1 Reactor	Belo Horizonte
	IEN/Argonauta Reactor	Rio de Janeiro

State <sup>a</sup>	Name of facility	Location
	IPEN/IEA-R1	Sao Paulo
	IPEN/MB01 Critical Assembly	Sao Paulo
	LABGENE	Ipero
Bulgaria	IRT-2000	Sofia
Canada	Biology, Chemistry, Physics	Chalk River, Ontario
	DIF	Chalk River, Ontario
	Ecole Polytechnique	Montreal, Quebec
	McMaster Nuc. Reactor	Hamilton, Ontario
	NRU Reactor	Chalk River, Ontario
	NRX Reactor	Chalk River, Ontario
	Slowpoke Alberta	Uni. of Alberta, Edmonton
	Slowpoke Kingston	Kingston, Ontario
	Slowpoke Saskatchewan	Saskatoon, Saskatchewan
Chile	RECH-1	Santiago
	RECH-2	Santiago
China	HTR-10	Nankou, Beijing
Colombia	Ian-R1 R. Reactor	Bogotá
Czech Republic	LR-0	Řež
	LVR-15	Řež
	VR-1	Prague
Democratic Republic of the Congo	TRIGA II Reactor	Kinshasa
Denmark	Danish Decommissioning-DR3	Roskilde
Egypt	ET RR-1	Inshas
	ET RR-2	Inshas
Estonia	A.L.A.R.A.	Paldiski
Finland	FiR 1	Espoo
Georgia	Decom. IRT-M	Tbilisi
Germany	AKR-2	Dresden
	BER-II	Berlin
	FH-Furtwangen	Furtwangen
	FRM	Garching
	FRM II	Garching
	Helmholtz-Zentrum Geesthacht	Geesthacht

State <sup>a</sup>	Name of facility	Location
	KFA-FRJ2	Juelich
	Labor-ST	Zittau
	SUR-100 FHU	Ulm
	SUR-100 Hannover	Hannover
	SUR-100 Stuttgart	Stuttgart
	SUR-100-RWTH	Aachen
	TRIGA Mainz	Mainz
Ghana	GHARR-1 Ghana Research Reactor 1	Legon-Accra
Greece	GRR-1	Attikis
Hungary	Budapest Research Reactor	Budapest
	Training Reactor	Budapest
Indonesia	ChTkn	Bandung
	PPNY	Yogyakarta
	RSG-GAS	Serpong
Iran, Islamic Republic of	Esfahan MNSR	Esfahan
	FARS Research Reactor FRR	Shiraz
	HWZPR	Esfahan
	IR-40	Arak
	Tehran Research Reactor (TRR)	Tehran
Israel	Israel Res. Reactor (IRR1)	Soreq
Italy	AGN-201	Palermo
	CEC-Complexe-Essor	Ispra
	CISAM-RTS-1	San Piero a Grado
	Lena	Pavia
	TAPIRO- Casaccia	Santa Maria di Galeria
	TRIGA RC1 Mark II	Santa Maria di Galeria
Jamaica	CNS	Kingston
Japan	DCA	Oarai-Machi, Ibaraki-Ken
	FCA	Tokai-Mura, Ibaraki-Ken
	HTR	Kawasaki-Shi, Kanagawa-Ken
	HTTR	Higashi, Ibaraki-Ken
	JMTR	Higashi, Ibaraki-Ken
	JMTRC	Higashi-Gun, Ibaraki-Ken



State <sup>a</sup>	Name of facility	Location
	JRR-2	Tokai-Mura, Ibaraki-Ken
	JRR-3	Tokai-Mura, Ibaraki-Ken
	JRR-4	Tokai-Mura, Ibaraki-Ken
	KINKI	Higashiosaka-Shi, Osaka-Fu
	KUCA	Osaka
	KUR	Sennan-Gun, Osaka
	Musashi Reactor	Kawasaki-Shi, Kanagawa-Ken
	NCA	Kawasaki-Shi, Kanagawa-Ken
	NSRR	Tokai-Mura, Ibaraki-Ken
	Rikkyo	Nagasaka, Kanagawa-Ken
	TCA	Tokai-Mura, Ibaraki-Ken
	TODAI	Tokai-Mura, Ibaraki-Ken
	TTR	Kawasaki-Shi, Kanagawa-Ken
	VHTRC	Tokai-Mura, Ibaraki-Ken
Jordan	JRTR	Jordan Univ. Science & Tech.
Kazakhstan	IGR Reactor	Kurchatov
	IVG.1M Reactor	Kurchatov
	RA Reactor	Kurchatov
	WWR-K	Almaty
Korea, Republic of	Gijang Research Reactor	Gijang, Busan Metr. City
	Hanaro	Taejeon
	Kyung Hee	Suwoon
Latvia	IRT	Salaspils
Libya	IRT-Tajura	Tajura
Malaysia	Puspati	Bangi, Selangor
Mexico	TRIGA Mark III	Ocoyoacac
Morocco	MA-R1	Rabat, Agdal
Netherlands	HFR-Petten	Petten
	IRI. Hor	Delft
	LFR-Petten	Petten
Nigeria	NIRR-1	Ahmadu Bello University, Zaria
Norway	HBWR	Halden
	JEEP-II	Kjeller

State <sup>a</sup>	Name of facility	Location
Pakistan	PARR-1	Rawalpindi
	PARR-2	Rawalpindi
Peru	CNIP RP-10 R. Reactor	Lima
	RP-0 R. Reactor	Lima
Philippines	PRR-1	Quezon City, Diliman
Poland	Anna & Agata	Otwock-Swierk
	Maria	Otwock-Swierk
Portugal	IST (CTN) RPI	Sacavem
Romania	IFIN-HH	Magurele
	TRIGA Research & MTR	Pitesti-Mioveni
Serbia	RA-RB	Vinca
Slovenia	TRIGA II	Ljubljana
South Africa	Safari-I Research Reactor	Pelindaba
Sweden	Studsvik AB and AB Svafo	Studsvik
Switzerland	AGN 211-P	Basel
	Crocus	Lausanne
	Proteus	Villigen
Syrian Arab Republic	MNSR	Damascus
Tajikistan	Argus Research Reactor	Dushande
Thailand	MNSR	Nakhon Ratchasima Province
	ONRC	Ongkharak
	TRR-1	Bangkok
Turkey	Cekmece Nuc. Res. & Tr. Centre	Istanbul
	ITU-TRR-TRIGA Mark II	Istanbul
Ukraine	IR-100 Research Reactor	Sevastopol
	WWR-M Research Reactor	Kiev
Uzbekistan	IIN-3M Reactor	Tashkent
	WWR-SM Reactor	Ulugbek
Venezuela, Bolivarian Republic of	RV-1 Ivic R. Reactor	Altos de Pipe
Viet Nam	Da Lat Research Reactor	Da Lat, Lam Dong
<b>Conversion plants</b>		
Algeria	Pilot Uranium Conversion Plant	Draria Nuclear Research Center
Argentina	Experimental Dry Conversion	Pilcaniyeu

State <sup>a</sup>	Name of facility	Location
	UF <sub>6</sub> Conversion Plant	Pilcaniyeu
	UO <sub>2</sub> Conversion Plant	Cordoba
	Uranium Powder Production Fac.	Argentina
Brazil	USEXA	Ipero, Sao Paulo
Canada	Blind River	Blind River, Ontario
	Port Hope	Port Hope, Ontario
Chile	Lab. Experiment. de Conversion	Santiago
Iran, Islamic Republic of	EUPP	Esfahan
	UCF	Esfahan
Japan	JCO	Tokai-Mura, Ibaraki-Ken
	PCDF	Tokai-Mura, Ibaraki-Ken
Mexico	Fuel Fabrication Pilot Plant	Salazar
Romania	National Uranium Company	Feldioara
South Africa	Conversion Plant (U Plant)	Pelindaba
	HEU/LEU Conversion Plant	Pelindaba
Sweden	RMA	Stenstorp
<b>Fuel fabrication plants</b>		
Algeria	UDEC	Draria Nuclear Research Center
Argentina	ECRI	Buenos Aires
	FECN	Ezeiza
	R. Reactor Fuel Fab. Plant	Ezeiza
Belgium	FBFC DNU Fab.	Dessel
	FBFC PU Fab.	Dessel
	N.V. BN	Dessel
Brazil	Fuel Fabrication Plant-FEC	Resende
Canada	Cameco, Port Hope	Port Hope, Ontario
	Fuel Eng. Met. Che. Op.	Chalk River, Ontario
	Fuel Fabrication Facility	Chalk River, Ontario
	GE, Hitachi Inc., Peterborough	Peterborough, Ontario
	GE, Hitachi Inc., Toronto	Toronto, Ontario
Chile	United De Metalur, Fisica (UMF)	Santiago
Egypt	FMPP (Fuel Manuf. Pilot Plant)	Inshas
	R&D - NFL	Inshas

State <sup>a</sup>	Name of facility	Location
France	Melox de Marcoule	Chusclan
Germany	Advanced Nuclear Fuels	Lingen
India	NFC	Hyderabad
	NFC - NU	Hyderabad
Indonesia	IEBE	Serpong
	IPEBRR	Serpong
Iran, Islamic Republic of	FMP	Esfahan
	FPPF	Esfahan
Italy	FN Bosco Marengo	Bosco Marengo
Japan	GNF-J	Yokosuka-Shi, Kanagawa-Ken
	J-MOX	Oaza Obuchi, Rokkasho-Mura
	MNF	Tokai-Mura, Ibaraki-Ken
	NFI Kumatori-1	Sennan-Gun, Osaka
	NFI Tokai-1	Tokai-Mura, Ibaraki-Ken
	NFI Tokai-2	Tokai-Mura, Ibaraki-Ken
	PFPF	Tokai-Mura, Ibaraki-Ken
	PPFF	Tokai-Mura, Ibaraki-Ken
Kazakhstan	UMP	Ust-Kamenogorsk
Korea, Republic of	KNFFP	Taejeon
Romania	SN NFP Subsidiary	Mioveni
South Africa	MTR Fuel Fabrication Plant	Pelindaba
	LEU Fuel Fabrication Plant	Pelindaba
Spain	ENUSA Fab. Juzbado	Juzbado
Sweden	Westinghouse Electric	Vaesteras/Finnslaetten
Turkey	Nuclear Fuel Pilot Plant	Istanbul
Ukraine	NFFP	Smolino Village, Kirovograd
<b>Reprocessing plants</b>		
France	AREVA NC - UP2 & UP3	La Hague
Germany	WAK / VEK	Eggenstein-Leopoldshafen
Italy	So. G.I.N. SpA - Impianto EUREX	Saluggia
	So. G.I.N. SpA - Trisaia	Rotondella
Japan	CPF	Tokai-Mura, Ibaraki-Ken
	RETF	Tokai-Mura, Ibaraki-Ken

State <sup>a</sup>	Name of facility	Location
	RRF	Ibaraki-Ken
	RRP	Kamikita-Gun, Aomori-Ken
	SCF	Tokai-Mura, Ibaraki-Ken
	TRP	Tokai-Mura, Ibaraki-Ken
<b>Enrichment plants</b>		
Argentina	Lasie	Bariloche
	Pilcaniyeu Mock-up Laboratory	Pilcaniyeu
	Uranium Enrichment Pilot Plant	Pilcaniyeu
Brazil	CTMSP/Ladesi-Copesp	Sao Paulo
	CTMSP/LEI	Ipero
	CTMSP/USIDE	Ipero
	FCN-Enrichment Plant	Resende
	IAEV/AR/LAS	Sao Jose dos Campos
China	Shaanxi	Han Zhang, Shaanxi Province
France	Georges Besse II	Bollene
Germany	UTA 1 and UTA 2	Gronau
Iran, Islamic Republic of	FEP	Natanz
	FFEP	Qom
	PFEP	Natanz
Japan	CTF	Kitakami-Gun, Aomori-Ken
	NEP	Tomata-Gun, Okayama-Ken
	REP	Kamikita-Gun, Aomori-Ken
Netherlands	Urenco Nederland	Almelo
United Kingdom	Urenco Capenhurst E22, E23, A3	Capenhurst
<b>Separate storage facilities</b>		
Argentina	Cent. St. Irr. Sp. Fiss. M. (DCMFEI)	Centro Atomico Ezeiza
	Centr. Store Sp. Fiss. Mat. (DCMFE)	Buenos Aires
	DUE	Centro Atomico Ezeiza
	FACIRI	Ezeiza
	Nuclear Material Storage	Buenos Aires
	Storage Bunker	Centro Atomico Ezeiza
Armenia	SSFS	Metsamor
Australia	Bulk Storage Facility	Lucas Heights, Sutherland

State <sup>a</sup>	Name of facility	Location
Belarus	Belarus NPP FF storage	Ostrovets
	Sosny 2	Minsk
Belgium	Belgoprocess	Dessel
	Belgoprocess Dry Storage	Dessel
	Belgoprocess UF <sub>6</sub>	Dessel
	Elbel Doel Dry Storage	Beveren
	Tihange Wet Store	Tihange
Brazil	Planned Fuel Storage Facility	Ilha Da Madeira, Itaguaí
Bulgaria	DSFSF KNPP 2	Kozloduy
	SFSF Kozloduy 1	Kozloduy
Canada	ACEL Research	Pinawa, Manitoba
	CRL Waste Storage Facility	Chalk River, Ontario
	DP Dry Storage	Tiverton, Ontario
	DWMF	Darlington, Ontario
	FPSF	Chalk River, Ontario
	Gentilly I	Gentilly, Quebec
	LTWMF	Port Hope, Ontario
	NMSF	Chalk River, Ontario
	PUFDSF	Pickering, Ontario
	Spent Fuel Canister Storage	Chalk River, Ontario
	Waste Storage Facility	Chalk River, Ontario
Czech Republic	WUFDSF	Tiverton, Ontario
	ISFS Dukovany	Dukovany
	ISFS Temelin	Temelin
	Radioactive Waste Rep. Richard	Litomerice
Denmark	Vao, HLWS	Řež
	DD Storage	Roskilde
Finland	DD Waste	Roskilde
	Geological Repository	Olkiluoto
Germany	TVO-KPA-Store	Olkiluoto
	AVR-BL	Juelich
	BZA Ahaus	Ahaus
	Daher Nuclear Technologies GmbH	Hanau

State <sup>a</sup>	Name of facility	Location
	EWN Zwischenlager Nord GmbH	Lubmin
	HDB	Eggenstein - Leopoldshafen
	Kernmateriallager 87	Rosendorf
	KFA-AVR	Juelich
	KFK-FR-2	Eggenstein - Leopoldshafen
	PTB-Spaltstofflager	Hanau
	SZK Kruemmel	Geesthacht
	SZL Biblis	Biblis
	SZL Brokdorf	Brokdorf
	SZL Brunsbuettel	Brunsbuettel
	SZL Emsland	Lingen (Ems)
	SZL Grafenrheinfeld	Grafenrheinfeld
	SZL Grohnde	Emmerthal
	SZL Gundremmingen	Gundremmingen
	SZL Isar	Essenbach
	SZL Neckarwestheim	Neckarwestheim
	SZL Philippsburg	Philippsburg
	SZL Unterweser	Stadland
	TBH (B) 87.2	Rosendorf
	TBL-G	Gorleben
	Uranoxid-Lager UAG	Gronau
Hungary	Central Isotope Storage	Budapest
	MVDS	Paks
India	PREFRE	Tarapur
	TAPS AFR	Tarapur
Indonesia	Ria-Nd ISFSF	Serpong
Iran, Islamic Republic of	KWS	Karaj
Iraq	Former Location C	Tuwaitha
Italy	CCRM Ispra Central Store	Ispra
	Centro Di Comune di Ricerca	Ispra
	Dep. Avogadro Elementi Irragg	Torino
	Essor Storage	Ispra
	Lab. Misure Nucleari Perla	Ispra

<b>State<sup>a</sup></b>	<b>Name of facility</b>	<b>Location</b>
	Nucleco S.p.A.	Roma
Japan	Fugen	Tsuruga-Shi, Fukui-Ken
	Fuku-I-CSFS	Futaba-Gun, Fukushima-Ken
	Hamaoka (Storage-UC)	Omaezaki-Shi, Shizuoka-Ken
	JAERI Mutsu	Mutsu-Shi, Aomori-Ken
	KUFFS	Sennan-Gun, Osaka
	NFI Kumatori-2	Sennan-Gun, Osaka
	Ningyo R&D	Tomata-Gun, Okayama-Ken
	RFSC	Mutsu-Shi, Aomori-Ken
Kazakhstan	Baikal-1 DSFS	Kurchatov
	BN-350 Temporary Storage	Aktau
	DU & Used Sources Storage	Kurchatov
	IAEA LEU Storage Facility	Ust-Kamenogorsk
	Thorium Storage Facility	Kurchatov
	Ulba Thorium Storage	Ust-Kamenogorsk
Korea, Republic of	NMSF	Kaeri Site in Taejeon
	Uranium Residue Storage Fac.	Kaeri-Taejeon
Lithuania	Radioactive Waste Management	Vilnius
	SNFS-1	Visaginas
	SNFS-2	Visaginas
Mexico	IFSI	Estado de Veracruz
Netherlands	COVRA	Vlissingen-Oost
	HABOG	Vlissingen
Poland	ZUOP	Otwock-Swierk
Portugal	IST (CTN) Instalacao Piloto	Sacavem
Romania	CNE Cernavoda IDSFS	Cernavoda
Russian Federation	IUEC Storage Facility	Angarsk
Slovakia	JAVYS Nuclear Store	Jaslovske Bohunice
	JAVYS ISFS	Jaslovske Bohunice
South Africa	E-Building Storage Facility	Pelindaba
	HEU Storage Vault	Pelindaba
	Koeberg Castor Storage Fac.	Cape Town
	Thabana Pipe Store	Pelindaba



State <sup>a</sup>	Name of facility	Location
	Vaalputs	Springbok
	Waste Storage Facility	Pelindaba
	Y-Plant Storage Facility	Pelindaba
	Z-Plant Storage Facility	Pelindaba
Spain	Almaraz Dry Storage	Almaraz
	Asco Dry Storage	Asco
	ATC Centralized Storage	Madrid
	Nuclenor, S.A. Storage	Santa Maria de Garona
	Trillo Dry Storage	Trillo
	Zorita Dry Storage	Almonacid de Zorita
Sweden	SFK	Oesthammar
	SKB Clab Store	Oskarshamn
Switzerland	Saphir	Villigen
	Zwibez Kernkraftwerk Beznau	Doettingen
	Zwilag	Wuerenlingen Aargau
Ukraine	Chernobyl NPP-SFS	Chernobyl
	Chernobyl SNFSF-2	Chernobyl
	Khmelnitski FF Storage	Neteshin
	Rovno FF Storage	Kuznetsovsk
	South Ukraine FF Storage	Yuzhnoukrainsk
	Ukraine Centralized Dry Store	Chernobyl
	Zaporozhe FF Storage	Energodar
	Zaporozhe SFS	Energodar
United Kingdom	SNM Store 9	Sellafield
	Thorp Product Store	Sellafield
United States of America	KAMS Storage	Savannah River Site
<b>Other facilities</b>		
Algeria	AURES I	Birine Nucl. Site (Ain Oussera)
Argentina	Alpha Laboratory	Buenos Aires
	PPRF	Centro Atomico Ezeiza
	Lapep	Centro Atomico Ezeiza
	Triple Altura Laboratory (LTA)	Centro Atomico Ezeiza
	Enriched Uranium Recovery Lab (LUE)	Centro Atomico Ezeiza

State <sup>a</sup>	Name of facility	Location
	Uranium Power Fab. Plant (PFPU)	Buenos Aires
	PPCA	Buenos Aires
Australia	R&D Labs	Lucas Heights, Sutherland
	SYNROC	Lucas Heights, Sutherland
Belgium	Belgoprocess Waste Treatment	Mol
	I.R.E.	Fleurus
	IRMM. Geel	Geel
	SCK-CEN Lab.	Mol
	SCK-CEN Pu Laboratories	Mol
Brazil	Aramar Store	Ipero
	CTMSP/Lambat	Ipero
	IPEN-Fuel Dev. and Tech. Fac.	Sao Paulo
	IPEN-Reprocessing Project	Sao Paulo
	LADICON	Sao Paulo
Czech Republic	Lab. & Stores, Centr. Anal. Lab	Řež
	UJP	Prague
Denmark	Danish Decommiss. - Hotcell	Roskilde
Egypt	Hydrometallurgy unit	Inshas
	Molybdenum Production Unit	Inshas, Cairo
	NCB	Inshas
Finland	Encapsulation Plant	Olkiluoto
Georgia	Razmnozhitel-1	Tbilisi
	Sukhumi Institute	Sukhumi
Germany	Inst. Kernchemie	Mainz
	JRC-ITU	Eggenstein-Leopoldshafen
	Betriebsstätten der JEN	Juelich
	Lab. Juelich	Juelich
	PKA Gorleben	Gorleben
	WAK-Heisse Zellen der HVT	Eggenstein-Leopoldshafen
Indonesia	RMI	Serpong
Iran, Islamic Republic of	JHL	Tehran
	LWSCR	Esfahan
	MIX Separation Facility	Tehran

State <sup>a</sup>	Name of facility	Location
Italy	CNEN-ISTEC	Santa Maria di Galeria
	Impianto Plutonio	Santa Maria di Galeria
	OPEC 2-CAS	Santa Maria di Galeria
Japan	JNC Tokai R&D	Tokai-Mura, Ibaraki-Ken
	FMF	Higashi, Ibaraki-Ken
	IRAF	Higashi-Gun, Ibaraki-Ken
	JAERI Oarai R&D	Higashi, Ibaraki-Ken
	JAERI Tokai	Tokai-Mura, Ibaraki-Ken
	JNC Oarai R&D	Higashi, Ibaraki-Ken
	Kumatori	Sennan-Gun, Osaka
	Mitsui Iwakuni-Ohtake	Kuga-Gun, Yamaguchi-Ken
	Mitsui Osaka	Takai-Shi, Osaka-Fu
	NDC Fuel Hot Lab	Tokai-Mura, Ibaraki-Ken
	NERL	Tokai-Mura, Ibaraki-Ken
	NFD	Higashi, Ibaraki-Ken
	Showa	Kawasaki-Shi, Kanagawa-Ken
	Sumitomo-Chiba	Sodegaura-Shi, Chiba-Ken
	UML	Higashi, Ibaraki-Ken
Jordan	Jordan Sub-critical Assembly	Jordan Univ. Science & Tech.
Korea, Republic of	ACPF	Taejeon
	DFDF	Taejeon
	HFFL	Taejeon
	IMEF	Taejeon
	KAERI R&D Facility	Taejeon
	PIEF	Taejeon
	PRIDE	Kaeri Site, Taejeon
Libya	Tajura Uranium R&D Facility	Tajura
Netherlands	GCO/ECN Lab.	Petten
Norway	Research Laboratories	Kjeller
South Africa	Decontam. and Waste Recovery Pl.	Pelindaba
	Hot Cell Complex	Pelindaba
	Nu and Du Metals Plant	Pelindaba
Spain	C.A. El Cabril	El Cabril

State <sup>a</sup>	Name of facility	Location
Switzerland	AERA	Villigen
	CERN	Meyrin-Geneva
	Hot Labor	Villigen
Ukraine	Chernobyl Conditioning	Chernobyl
	Chernobyl Unit 4 Shelter	Chernobyl
	KHFTI	Kharkov
	KHFTI	Kharkov
	Sevastopol Subcritical Assembly	Sevastopol

<sup>a</sup> An entry in this column does not imply the expression of any opinion whatsoever on the part of the Agency concerning the legal status of any country or territory or of its authorities, or concerning the delimitation of its frontiers.

- Note:**
1. The Agency was also applying safeguards at 17 facilities in Taiwan, China.
  2. Additionally under Agency safeguards there were 581 material balance areas outside facilities in 129 States and in Taiwan, China. These include 56 material balance areas established for States with a small quantities protocol based on revised standard text.
  3. The list includes projected and operational facilities and facilities at the decommissioning stage.