

THE ANNUAL REPORT FOR 2008

Additional Annex Information

Table A19. Coordinated research projects initiated in 2008

Nuclear Power

- Advanced Surveillance, Diagnostics, and Prognostics Techniques Used for Health Monitoring of Systems, Structures, and Components in Nuclear Power Plants
- Benchmark Analyses of Sodium Natural Convection in the Upper Plenum of the MONJU Reactor Vessel
- Benchmarking Severe Accident Computer Codes for Heavy Water Reactor Applications
- Control Rod Withdrawal and Sodium Natural Circulation Tests Performed during the PHENIX End-of-Life Experiments
- Development of Methodologies for the Assessment of Passive Safety System Performance in Advanced Reactors

Nuclear Fuel Cycle and Materials Technologies

- Accelerator Simulation and Theoretical Modelling of Radiation Effects (SMoRE)
- Improvement of Computer Codes Used for Fuel Behaviour Simulation FUMEX-III
- Planning, Management and Organizational Aspects of Decommissioning of Nuclear Facilities

Food and Agriculture

- Applying GIS and Population Genetics for Managing Livestock Insect Pests
- Increasing the Efficiency of Lepidoptera SIT by Enhanced Quality Control
- Integrated Isotopic Approaches for an Area-wide Precision Conservation to Control the Impacts of Agricultural Practices on Land Degradation and Soil Erosion
- Strategic Placement and Area-wide Evaluation of Water Conservation Zones in Agricultural Catchments for Biomass Production, Water Quality and Food Security

Human Health

- Altered Fractionation and Radiosensitization in Head and Neck Cancer Radiotherapy
- Cost Effective Differential Diagnosis in Lung Cancer Using Gallium PET Generator Based Radiopharmaceuticals
- Doctoral CRP on Quality Assurance of the Physical Aspects of Advanced Technology in Radiotherapy
- Food Fortification and Biofortification to Improve Micronutrients Status during Early Life
- Improving Outcomes in Radiotherapy Using Novel Biotechnologies: Modification of Tissue Reactions and the Use of Stem Cell Therapeutics
- Longitudinal Monitoring of Complicated Osteomyelitis by SPECT/CT
- Management of Severe Acute Malnutrition during Early Life: Addressing Nutritional Requirements by Stable Isotope Techniques
- Optimization of Radiotherapy in Low Resource Settings: Paediatric Cancer Patients

Environment

- Benchmarking Calibration for Low Level Gamma Spectrometric Measurements of Environmental Samples

Radioisotope Production and Radiation Technology

- Application of Large Sample Neutron Activation Analysis Techniques for Inhomogeneous Bulk Archaeological Samples and Large Objects
- Characterization of Size, Composition and Origins of Dust in Fusion Devices
- Development of Radiopharmaceuticals Based on ^{188}Re and ^{90}Y for Radionuclide Therapy

- Nuclear Data Libraries for Advanced Systems: Fusion Devices (FENDL-3)
- Techno-economic Comparison of Ultimate Disposal Facilities for CO₂ and Nuclear Waste

Safety of Nuclear Installations

- Innovative Methods in Research Reactor Analysis: Benchmark against Experimental Data on Neutronics and Thermal Hydraulic Computational Methods and Tools for Operation and Safety Analysis of Research Reactors

Nuclear Security

- Application of Nuclear Forensics in Illicit Trafficking of Nuclear and Other Radioactive Materials

Safeguards

- Development and Implementation of Instruments and Methods for Detection of Unauthorized Acts Involving Nuclear and Other Radioactive Material

Table A20. Coordinated research projects completed in 2008

Nuclear Power

- Master Curve Approach to Monitor the Fracture Toughness of Reactor Pressure Vessel in Nuclear Power Plants
- Studies of Innovative Reactor Technology Options for Effective Incineration of Radioactive Waste

Nuclear Fuel Cycle and Materials Technologies

- Spent Fuel Performance Assessment and Research (SPAR II)
- Study of Process Losses in Separation Processes in Partitioning and Transmutation Systems to Minimize the Long Term Environmental Impact

Nuclear Science

- Development of Nuclear Microprobe Techniques for the Quantitative Analysis of Individual Microparticles
- Ion Beam Modification of Insulators
- Joint Research Using Small Tokamaks
- Parameters for Calculation of Nuclear Reactions of Relevance to Non-Energy Nuclear Applications

Food and Agriculture

- Assess the Effectiveness of Soil Conservation Techniques for Sustainable Watershed Management Using Fallout Radionuclides
- Improvement of Codling Moth SIT to Facilitate Expansion of Field Application
- Molecular Technologies to Improve the Effectiveness of SIT
- Physical Mapping Technologies for the Identification and Characterization of Mutated Genes Contributing to Crop Quality
- Selection for Greater Agronomic Water Use Efficiency in Wheat and Rice Using Carbon Isotope Discrimination
- Testing the Efficiency and Uncertainty of Sample Processing for Analysis of Food Contaminants

Human Health

- Assessment of Total Energy Expenditure and Body Composition for Older Adult Subjects with Different Lifestyles
- Development of Procedures for In Vivo Dosimetry in Radiotherapy
- Evaluation of a Single Utilization of Pulmonary Perfusion Scintigraphy in Patients with Suspected Pulmonary Embolism

Environment

- Radiochemical, Chemical and Physical Characterisation of Radioactive Particles in the Environment

Radioisotope Production and Radiation Technology

- Development of Generator Technologies for Therapeutic Radionuclides

Table A21. Training courses, seminars and workshops in 2008

Nuclear Power

- Foundations of Information Security for Nuclear Organization Managers Indonesia
- Management of Human Resources for the Nuclear Power Industries Germany
- Planning for Development of Sustainable Energy Infrastructure Ethiopia
- Power Conditioning, Earthing and Lighting Protection of Nuclear Equipment Zambia

Nuclear Fuel Cycle and Materials Technologies

- Application of IAEA Analytical Tools for the Evaluation of Sustainable Energy Strategies for Addressing CCI Republic of Korea
- Applied Quality Management Aspects of Low Level Radioactive Waste Management Brazil
- Environmental Management Systems in the Uranium Production Cycle Peru
- Geological Disposal of Radioactive Waste Switzerland
- Inspection, Testing and QC and QA of HTR Type Fuel Elements South Africa
- Planning and Implementation of Remediation in the Uranium Production Cycle Argentina
- Repository Development Canada
- Strategy and Methodologies for the Development of Low and Intermediate Level Waste Disposal Facilities Argentina
- Strategy and Methodologies for the Development of Low and Intermediate Level Waste Disposal Facilities Philippines
- Waste Disposal USA
- Waste Management Operators on Radioactive Waste Management: Pre-disposal Russian Federation

Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development

- Aligning National Energy Planning South Africa
- Data Preparation for Energy Supply Assessment Headquarters
- Energy and Electricity Demand Analysis and Projections Using the IAEA's Model MAED Panama
- Energy Supply Assessment Using MESSAGE (for Francophone Countries) Headquarters
- IAEA Energy Model MESSAGE Egypt
- Incorporating Environmental Aspects into MESSAGE Analysis United Arab Emirates
- Power System Expansion Planning Using the IAEA's Model WASP Libyan Arab Jamahiriya
- Regional Course on MESSAGE Argentina

Nuclear Science

- Accelerator Technology South Africa
- Advanced LabView Applications/Function Malaysia

- Baseline Data Collection United Republic of Tanzania
- Design and Operation of Neutron Irradiation Facilities Headquarters; Republic of Korea
- Developers of ICT Material (Basic) Zambia
- Field Programmable Gate Array (FPGA) in Nuclear Instruments Headquarters
- Good Management Practices and Institutional Governance Tunisia
- ICT Telecentres on Sustainability, Good Management Practice and Quality Management Tunisia
- Interfacing Sensors through PLCs to Modern Nuclear Instruments Ethiopia
- Maintenance and Repair of the MEDISO Spriti Gamma Camera Agency's Laboratories, Seibersdorf
- Maintenance and Repair of the Siemens Ecam Gamma Camera South Africa
- Microcontrollers and Virtual Instrumentation Democratic Republic of the Congo
- Numerical Simulation United Kingdom
- Performing an Acceptance Test of a Dual Head Gamma Camera Agency's Laboratories, Seibersdorf
- Radiography Testing Level 2 (Training and Examination) United Republic of Tanzania
- Use of ICT Materials in Nuclear Analytical Techniques Ghana

Food and Agriculture

- Diagnosis of Brucellosis Sudan
- Diagnosis of Brucellosis: Field, Laboratory and Epidemiological Analysis Tajikistan
- Entomological Baseline Data Collection Uganda
- Integrated Area-wide Tsetse and Trypanosomosis Intervention Projects Senegal
- Molecular Diagnosis and Control of Animal Fascioliasis in the Latin American Region Mexico
- Molecular Diagnosis, Epidemiology and Control of Animal Fascioliasis Cuba
- Molecular Techniques and Applications in Artificial Insemination Botswana
- Mutation Breeding Approach to Improving Salinity, Drought and Heat Stress Tolerance China
- Pest Risk Analysis in Support of Fruit Fly Management and SIT Application Jordan
- Screening for Drought Tolerance for Eastern European Countries Syrian Arab Republic
- Survey, Collection and Storage of Exogenous Germplasm of Potential Interest Mexico
- Tissue Culture Techniques and Their Applications Sierra Leone
- Use of Radiation Processing Facilities and Marketing of Irradiation Services Nigeria

Human Health

- Advances in Hospital Radiopharmacy Practices Macedonia
- Assessment of Body Composition and Human Milk Intake Using the Deuterium Dilution Technique Mexico

- Basic Clinical Radiobiology Russian Federation
- Basic Molecular Markers and Data Analysis Senegal
- Basic Principles of Radiation Oncology Kazakhstan
- Breast Cancer Ghana
- Current Concepts in Radiation Oncology for Radiation Therapy Technologists Ecuador
- Current Concepts in Radiation Oncology Belarus
- Dosimetry Austria
- ESTRO Teaching Course on Basic Clinical Radiobiology Russian Federation
- ESTRO Teaching Course on Radiotherapy Treatment Planning: Principles and Practice Ireland
- Evidence Based Radiation Oncology Romania
- Evidence Based Treatment of Cervical Cancer Brazil
- External Beam Therapy Ireland
- Fundamental Clinical Applications of PET Singapore
- IAEA/RCA Course on Medical Physics in Diagnostic Radiology Philippines
- IAEA/RCA Course on 3D Conformal Radiotherapy and QA for Medical Physicists Singapore
- Identification of Suitable and Comparable Biomonitoring Argentina
- Improvements in Brachytherapy for the Most Common Cancers India
- In Vivo Dosimetry Techniques in Radiotherapy Libyan Arab Jamahiriya
- Lung Cancer Senegal
- Methodology of Clinical Research in Radiation Oncology Peru
- Modern Radiotherapy Aspects — Part I Lithuania
- Networking in Radiation Oncology Morocco; Agency's Laboratories, Seibersdorf
- Nuclear Cardiology for the Medical Physicist Nigeria
- Nuclear Cardiology Egypt
- Nuclear Cardiology, Pulmonology and Receptor Imaging Bosnia and Herzegovina
- PCR Based Molecular Marker Systems Poland
- PET and PET/CT in Oncology Austria
- Portable Digital Industrial Radiography (DIR) and Tomography Systems Mali
- Quality Management System for Maintenance and Calibration of Instruments Applied to Radiology Sudan
- Quality Assurance in Diagnostic Radiology Bosnia and Herzegovina
- Quality Assurance in the Physical and Technical Aspects of Radiotherapy USA
- Quality Audits in Radiation Oncology Indonesia
- Quality Management Programmes to Ensure Effectiveness of Dosimetry Services Lithuania
- Radiation Oncology Austria
- Radiation Protection for Doctors Using Fluoroscopy Bulgaria

- Radiation Protection in Cardiology Armenia
- Radiation Protection in Diagnostic Radiology Serbia
- Radiation Protection in Radiology Zimbabwe
- 3D Conformal Radiotherapy and QA — Part I (for Radiation Oncologists) Thailand
- 3D Conformal Radiotherapy QA for Imaging and Treatment Planning India
- Skeletal Diseases Senegal
- Stable Isotope Techniques in Nutrition Botswana
- Standard Operating Procedures for Community based Micronutrient Supplementation Burkina Faso
- Therapeutic Nuclear Medicine Dosimetry for the Medical Physicist South Africa
- Use of Stable Isotope Techniques in Nutrition Sudan; Vietnam

Water Resources

- Application of Isotope and Geochemical Techniques to Surface Water–Groundwater Interaction and Cont. Trans. Republic of Korea
- Intermediate Isotope Hydrology Egypt

Environment

- Establishment of Transfer Factors and Dose Assessment for Marine Organism Republic of Korea
- Monitoring Radionuclides in Air Serbia
- Quantification of Organic Contaminants in Marine Sediments Costa Rica
- Source Apportionment Methods Applied in Air Pollution Monitoring Egypt
- Receptor Binding Assay Method for Algal and Shellfish Toxin Quantification USA

Radioisotope Production and Radiation Technology

- Application of Agreed Nuclear Techniques to Measurement of Nuclear Contaminants India
- Dating Techniques in Archeometry Croatia
- Electron Beam Flue Gas Treatment Austria
- IAEA Validation and Process Control for Gamma Radiation Processing Hungary
- Interconnection of Oil Wells and Dispersion of Contaminants Using Tracer Techniques Brazil
- Methodology and Applications of Radiotracers in Waste Water Treatment Plants Morocco
- Off-belt Analysis of Metalliferous Ores and Cement Quality by NAS China
- Quality Control of Gamma and X Ray Processing Ukraine
- Radiotracer Applications in Mining, Mineral Processing and Related Environmental Chile
- Radiotracer Applications in the Petrochemical Industry Algeria
- Validation of CFD Models of Multiphase Systems Using Radiotracers India

Incident and Emergency Preparedness and Response

- Application of Safety Requirement GS-R-2 Tajikistan

- Deepening Knowledge about Operation of an Early Warning Network Based on NMC-RAD Qatar
- Developing a National Capability for Response to Radiation Emergencies Tajikistan
- Effective Method and Procedures through Participation in Exercises in Other Countries Japan
- First Responders to a Radiological Emergency Uruguay
- Improvement in the System of Notification and Response to Radiological Emergencies Belarus
- Medical Response to Nuclear Accidents in Asia Japan
- Medical Response to Radiation Emergencies Chile
- National Radiological Emergency Preparedness Saudi Arabia
- Notification Procedures Headquarters
- Practical Medical Preparedness and Response to a Radiation Emergency Ghana
- Practical Response to Radiological Emergencies — Part 1: First Responders Jordan; Madagascar; Morocco; Uruguay
- Practical Response to Radiological Emergencies Jordan
- Preparedness and Response to a Radiological Emergency — First Responders Madagascar
- Public Health Preparedness and Response to Radiation Incidents Kyrgyzstan
- Regional Intercomparison Exercise and Workshop to Evaluate the Results of the Exercise Argentina
- Requirements for EPR and on First Response to Radiological Emergencies Headquarters
- Requirements for EPR Kazakhstan; Kyrgyzstan; Thailand

Safety of Nuclear Installations

- Application of Best Estimates Plus Uncertainty Analysis Hungary
- Application of PSA for Improving the Operational Safety of Nuclear Power Plants Czech Republic
- Application of Safety Requirements GS-R-3 China
- Basic Professional Training Course Argentina; Republic of Korea; Lithuania
- Design Management China
- Experiments and CFD Code Applications to Nuclear Reactor Safety France
- Fuel Issues USA
- Human Factors Management and Safety Culture Enhancement China
- Joint IAEA/EC-JRC Workshop on Operational Events, Transients and Precursor Analyses Netherlands
- Lessons Learned from Strong Earthquakes Japan
- Licensing Process throughout the Whole Life Cycle of Nuclear Installations Bulgaria
- Long Term Operation Romania
- Methodology to Evaluate the Results of the Modernization Programme for the Kozloduy Nuclear Power Plant Bulgaria

- Periodic Safety Review of Research Reactors: Evaluation of the Operating Experience and Review of Safety Documents Function Vietnam
- Promotion of Safety Culture in Research Reactor Operating Organizations for Eastern European Countries Headquarters
- PSR Reports on Safety Factors: Ageing Management, Current Technical Condition and Qualification of Equipment Ukraine
- Quantification of Safety Margins Slovenia
- Regulatory Approaches to Ageing Management and Lifetime Extension of Nuclear Power Plants Romania
- Regulatory Oversight on Safety Management and Human Factors in Nuclear Power Plants Russian Federation
- Review and Assessment of Research Reactor Safety Documents for European Countries Hungary
- Review and Assessment of Research Reactor Safety Documents for African Countries Ghana
- Safety Analyses for Symptom Based Emergency Operating Procedures China
- Safety Analyses in Support of Power Upgrades Romania
- Safety Assessment and Verification for Nuclear Reactors Republic of Korea
- Safety Assessment of Nuclear Power Plants to Assist Decision Making Slovenia
- Safety Committee Senior Members on the Safety Review for Research Reactors Brazil
- Safety Culture Self-assessment and Enhancement Russian Federation
- Safety Margins Republic of Korea
- Safety Requirements for New Nuclear Power Plant Technology Assessment and Bidding Process Lithuania
- Self-assessment Workshop in Support of Preparation for the Integrated Regulatory Review Service Vietnam
- Seminar on Training Needs Assessment Egypt
- Strengthening Safety Culture through Improvement of the Management System and Key Performance Indicators Indonesia
- Stress Analysis Headquarters
- Train the Trainers Course for Regulators Vietnam
- Training Course on Fuel Cycle Facility Safety USA
- Tsunami Hazard Assessment and Code Application Republic of Korea
- Workshop for Safety Committee Members on the Application of Safety Fundamentals and Safety Standards for Research Reactors USA
- Workshop on Lessons Learned from the Integrated Regulatory Review Service Spain

Radiation and Transport Safety

- Course for Iraqi Regulators Morocco
- Course for Regulators Ghana; Lithuania; Morocco; United Republic of Tanzania
- Denials of Shipment of Radioactive Material China; Italy; Madagascar; United Republic of Tanzania
- Legal Infrastructure Malawi
- Methods for Assessing Occupational Exposure Due to External Sources of Radiation Malaysia

- Occupational Radiation Protection Mexico
- Policy Level Experience Exchange Seminar for Senior Decision Makers and Regulators Egypt; Tunisia
- Post-Graduate Educational Course on Radiation Protection and the Safety of Radiation Sources Argentina; Belarus; Greece; Malaysia; Morocco; Syrian Arab Republic
- Radiation Exposure Monitoring Service Organizations to Implement a Quality Management System Botswana; Bulgaria; Islamic Republic of Iran; Lithuania
- Radiation Protection for Doctors (Non-radiologists and Non-cardiologists) Using Fluoroscopy Bulgaria; Uruguay
- Radiation Protection in Cardiology Armenia
- Radiation Protection in Diagnostic Radiology for Radiographers and Radiology Technologists Serbia
- Radiation Protection in Medicine United Arab Emirates
- Radiation Protection of Patients Colombia; Costa Rica; Mexico
- Regulatory Authority Information System (RAIS) Users in Europe, Including Advanced Customization Headquarters
- Regulatory Authority Information System (RAIS) for North African Countries Headquarters
- Safe Transport of Radioactive Material Argentina
- Self-assessment of Regulatory Infrastructure Mali; Peru; Ukraine; Vietnam
- Seminar to Revise the Radiation Protection Act and Regulations Mauritius
- Sharing Knowledge and Regulatory Experience in Latin America Argentina
- Workplace Monitoring Argentina; Ghana

Management of Radioactive Waste

- Authorization (Siting, Design, Operation, Shutdown and Decommissioning) of Centralized Storage Facilities for Radioactive Waste Croatia
- Control of Public Exposure and Waste Management Argentina
- Control of Public Exposure Czech Republic
- Decision Making and Stakeholder Involvement in Repository Development Canada
- Decommissioning of Nuclear Power Plants Headquarters
- Depleted Uranium Research: An Update Italy
- Developing and Implementing Strategies for Radioactive Waste Management Peru
- Graphite Management at Ignalina Nuclear Power Plant Lithuania
- Institutional Radwaste Management Uzbekistan
- Intermediate Depth Disposal of Radioactive Waste Republic of Korea
- Licensing and Regulatory Control of Radioactive Waste Disposal Facilities and Activities Australia
- Licensing Centralized Storage Facilities Mexico
- Long Term Storage as a Waste Management Strategy, Standard Methodologies for Waste Management Assessments, Economics of Waste Management and Quality Assurance Principles for Pre-disposal Activities Turkey

- National Policy and Strategy on Radioactive Waste Management Cuba
 - Organization and Management in Decommissioning of Nuclear Power Plants and Other Large Nuclear Facilities Germany
 - Processing and Storage of Radwaste from WWER Reactors Islamic Republic of Iran
 - Safety in the Management of Radioactive Waste for New Member States Botswana
 - Strengthening the National Infrastructure and Regulatory Framework for Safe Management of Radioactive Waste in Latin American Member States Argentina
 - Update Waste Management Information in the Net Enabled Waste Management Database (NEWMDB) Headquarters
 - Uses of Cement and Cementitious Materials in the Geological Disposal of Radioactive Waste Switzerland
- Nuclear Security**
- Advanced Detection Equipment Azerbaijan; Chile; Ghana
 - Capacity Building in Radiation Detection Equipment for Major Public Events China; Peru
 - Combating Illicit Trafficking in Nuclear and Other Radioactive Material Cameroon; Namibia; Ukraine; United Arab Emirates
 - Data Network and Sustainability of Border Detection Equipment Greece
 - Design Basis Threat Ghana; Hungary; Republic of Korea; South Africa; Ukraine
 - Foundations of Information Security for Nuclear Organizations Managers Indonesia
 - Foundations of Physical Protection of Nuclear Material and Facilities Chile; Morocco
 - Guard Force Management United Kingdom
 - Illicit Trafficking Information Management and Coordination Kenya; Qatar; Sri Lanka
 - Information and Computer Security for Nuclear Security Practitioners Romania
 - Nuclear Security Culture Hungary; Russian Federation; South Africa; Uruguay
 - Nuclear Security, Safety and Safeguards Vietnam
 - Physical Protection against Insiders Slovakia
 - Physical Protection Inspections at Nuclear Facilities Russian Federation
 - Physical Protection of Nuclear Material and Facilities Republic of Korea; Pakistan
 - Physical Protection of Radioactive Sources China; Saudi Arabia; Turkmenistan; Ukraine
 - Physical Protection of Research Reactors Argentina; Romania
 - Practical Operation of Physical Protection Systems Russian Federation
 - Radiation Detection Equipment for Front Line Officers Bosnia; Colombia; Croatia; Indonesia; Kuwait; Philippines; Ukraine; Uzbekistan; Venezuela; Vietnam; Zambia
 - Response to Detection Alarms Peru
 - Response to Unauthorized Acts Involving Nuclear and Other Radioactive Material Colombia; Republic of Korea
 - Security in Transport of Radioactive Material South Africa; Ukraine
 - Seminar on Nuclear Security USA

Safeguards

- Course for SSAC Personnel Republic of Korea
- International SSAC Advisory Service Georgia; Niger; Romania
- National Course Armenia; Switzerland
- National SSAC Course for Tajikistan Headquarters
- National SSAC Course for Turkmenistan Headquarters
- Nuclear Material Accounting and Control Conference Ukraine
- Peaceful Use of Nuclear Energy and Non-proliferation (Expert Meeting) Headquarters
- Regional SSAC Course (Uranium Mining) Namibia
- Regional SSAC Course Australia
- Regional SSAC Course Mexico
- Regional SSAC Facility Level Workshop Indonesia
- Regional Technical Meeting Kazakhstan
- Safeguards/Security/Safety Seminar for Senior Officials Vietnam
- SQP Seminar Headquarters
- SSAC Course for Countries with Small Quantities Protocols USA
- Training Course Russian Federation

Management of Technical Cooperation for Development

- Application of Isotope Techniques Hungary
- Data Collection, Organization, Analysis and Associated Software Botswana
- Establishment of Quality Management Programmes Russian Federation
- Group 1 Assessors Morocco
- ISO17025 Ghana
- PGEC Lecturers Belarus; Romania
- Quality Management and Record Keeping Tunisia
- Quality Management for Customer Oriented Services (Second Group) Ghana
- Quality System Documentation and Internal Auditing Zambia
- Radiation Safety for Lawyers Algeria; Botswana
- Quality Management Systems and Strategic Planning Indonesia
- Remedial Preparation Technologies Hungary
- Refinement of Analytical Methodology, LIMS, Bioassays and QA/QC Measures Costa Rica
- Source Components and Visibility and Introduction to Back Trajectories Malaysia; Saudi Arabia
- Technology Transfer and Successful Technology Licensing Austria
- (Virtual Course) on Chemometry (Qualitative and Quantitative Analysis) Argentina

Nuclear Law and Legislative Assistance

- Liability for Nuclear Damage (INLEX) South Africa
- National Workshop on Nuclear Law Mauritius; Nigeria; Sudan
- Return of Spent Fuel from Research Reactors to the Russian Federation Headquarters
- Workshop for Diplomats on Nuclear Law Headquarters
- Workshop for Senior Governmental Officials on Implementing Legislation in Nuclear Security for Selected African Countries (EU funded) Headquarters

Table A22. Publications issued in 2008

Nuclear Power

- Advanced Applications of Water Cooled Nuclear Power Plants — IAEA-TECDOC-1584
- Application of Reliability Centred Maintenance to Optimize Operation and Maintenance in Nuclear Power Plants — IAEA-TECDOC-1590
- Commissioning of Nuclear Power Plants: Training and Human Resource Considerations — IAEA Nuclear Energy Series No. NG-T-2.2
- Country Nuclear Power Profiles: 2007 Edition — IAEA-CNPP/2007/CD
- Decommissioning of Nuclear Facilities: Training and Human Resource Considerations — IAEA Nuclear Energy Series No. NG-T-2.3
- Evaluation of the Status of National Nuclear Infrastructure Development — IAEA Nuclear Energy Series No. NG-T-3.2
- Guidance for the Application of an Assessment Methodology for Innovative Nuclear Energy Systems: INPRO Manual: Overview of the Methodology — IAEA-TECDOC-1575 Rev.1
- Heavy Component Replacement in Nuclear Power Plants: Experience and Guidelines — IAEA Nuclear Energy Series No. NP-T-3.2
- INDAG Newsletter — No. 8, September 2008
- Liquid Metal Cooled Reactors: Experience in Design and Operation — IAEA-TECDOC-CD-1569
- Nuclear Energy Basic Principles — IAEA Nuclear Energy Series No. NE-BP
- Nuclear Power Newsletter — Vol. 5, Nos 1–4, March, June, September and December 2008
- Nuclear Power Plant Life Management — Proceedings Series
- Nuclear Power Reactors in the World: 2008 Edition — IAEA-RDS-2/28
- On-line Monitoring for Improving Performance of Nuclear Power Plants — Part 1: Instrument Channel Monitoring — IAEA Nuclear Energy Series No. NP-T-1.1
- On-line Monitoring for Improving Performance of Nuclear Power Plants — Part 2: Process and Component Condition Monitoring and Diagnostics — IAEA Nuclear Energy Series No. NP-T-1.2
- Operating Experience with Nuclear Power Stations in Member States in 2007
- Restarting Delayed Nuclear Power Plant Projects — IAEA Nuclear Energy Series No. NP-T-3.4
- The Role of Instrumentation and Control Systems in Power Upgrading Projects for Nuclear Power Plants — IAEA Nuclear Energy Series No. NP-T-1.3
- Thermophysical Properties of Materials for Nuclear Engineering: A Tutorial and Collection of Data — IAEA-THPH

Nuclear Fuel Cycle and Materials Technologies

- Decommissioning of Research Reactors and Other Small Facilities by Making Optimal Use of Available Resources — Technical Reports Series No. 463
- Fuel Cycle and Waste Newsletter — Vol. 3, No. 3, January 2008, and Vol. 4, Nos 1–3, April, September and December 2008
- Innovative and Adaptive Technologies in Decommissioning of Nuclear Facilities — IAEA-TECDOC-1602
- Long Term Preservation of Information for Decommissioning Projects — Technical Reports Series No. 467
- Managing Low Radioactivity Material from the Decommissioning of Nuclear Facilities — Technical Reports Series No. 462
- Managing the Socioeconomic Impact of the Decommissioning of Nuclear Facilities — Technical Reports Series No. 465

- Optimization of Research Reactor Availability and Reliability: Recommended Practices — IAEA Nuclear Energy Series No. NP-T-5.4
- Radioactive Waste Management Profiles — Number 8 : A Compilation of Data from the Net Enabled Waste Management Database — IAEA/WMDB/08
- Radioactive Waste Management Profiles — Number 9: A Compilation of Data from the Net Enabled Waste Management Database — IAEA/WMDB/09
- Return of Research Reactor Spent Fuel to the Country of Origin: Requirements for Technical and Administrative Preparations and National Experiences — Proceedings Series
- Spent Fuel Reprocessing Options — IAEA-TECDOC-1587

Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development

- Cuba: A Country Profile on Sustainable Energy Development
- Energy, Electricity and Nuclear Power Estimates for the Period up to 2030: 2008 Edition — IAEA-RDS-1/28
- Fast Reactor Knowledge Preservation System: Taxonomy and Basic Requirements — IAEA Nuclear Energy Series No. NG-T-6.3
- Financing of New Nuclear Power Plants — IAEA Nuclear Energy Series No. NG-T-4.2
- INIS: Authority List for Journal Titles — IAEA-INIS-11 (Rev. 34)/CD
- Nuclear Information and Knowledge — Nos 5 and 6, March and December 2008
- Planning and Execution of Knowledge Management Assist Missions for Nuclear Organizations — IAEA-TECDOC-1586

Nuclear Science

- A Training Module for Quality Management in Calibration, Maintenance and Repair of Nuclear Instrumentation — IAEA-TCS-33/CD
- Atomic and Plasma-Material Interaction Data for Fusion — Vol. 14
- First Generation of Fusion Power Plants: Design and Technology — Proceedings Series (CD-ROM)
- Fission Product Yield Data for the Transmutation of Minor Actinide Nuclear
- Frontiers of Plasma Physics and Technology — Proceedings Series (CD-ROM)
- Ion Beam Applications in Surface and Bulk Modification of Insulators — IAEA-TECDOC-1607
- Neutron Imaging: A Non-Destructive Tool for Materials Testing — IAEA-TECDOC-1604
- Nuclear Data Newsletter — Nos 45 and 46, May and September 2008
- Quality Control Procedures Applied to Nuclear Instruments — Proceedings Series
- Radiotracer Residence Time Distribution Method for Industrial and Environmental Applications — IAEA-TCS-31
- X Ray Fluorescence in the IAEA and its Member States Newsletter — Nos 15 and 16, July and December 2008

Food and Agriculture

- Animal Production and Health Newsletter — No. 48, July 2008
- Field Estimation of Soil Water Content: A Practical Guide to Methods, Instrumentation and Sensor Technology — IAEA-TCS-30, IAEA-TCS-30/CD
- Food and Environmental Protection Newsletter — Vol. 11, Nos 1 and 2, January and July 2008
- Guidelines for Sustainable Manure Management in Asian Livestock Production Systems — IAEA-TECDOC-1582
- Guidelines on Nitrogen Management in Agricultural Systems — IAEA-TCS-29/CD

- Insect Pest Control Newsletter — Nos 70 and 71, January and July 2008
- Management of Agroforestry Systems for Enhancing Resource Use Efficiency and Crop Productivity — IAEA-TECDOC-1606
- Model Business Plan for a Sterile Insect Production Facility — IAEA-MBP
- Plant Breeding and Genetics Newsletter — Nos 20 and 21, January and July 2008
- Plant Mutation Reports — Vol. 2, No. 1, December 2008
- Soils Newsletter — Vol. 30, No. 2, January 2008, and Vol. 31, No. 1, July 2008

Human Health

- A Guide to Clinical PET in Oncology: Improving Clinical Management of Cancer Patients — IAEA-TECDOC-1605
- A Syllabus for the Education and Training of Radiation Oncology Nurses — IAEA-TCS-28, IAEA-TCS-28/CD
- A Syllabus for the Education and Training of RTTs (Radiation Therapists/Therapy Radiographers) — IAEA-TCS-25/CD
- Advanced Radiotherapy Techniques with Emphasis on Imaging and Treatment Planning
- Analysis of Stable Isotope Data to Estimate Vitamin A Body Stores — IAEA-VITA
- Assessment of Levels and ‘Health-Effects’ of Airborne Particulate Matter in Mining, Metal Refining and Metal Working Industries Using Nuclear and Related Analytical Techniques — IAEA-TECDOC-1576
- Clinical Applications of SPECT/CT: New Hybrid Nuclear Medicine Imaging System — IAEA-TECDOC-1597
- Commissioning of Radiotherapy Treatment Planning Systems: Testing for Typical External Beam Treatment Techniques — IAEA-TECDOC-1583
- Measurement Uncertainty — A Practical Guide for Secondary Standards Dosimetry Laboratories — IAEA-TECDOC-1585
- Nuclear Medicine in Thyroid Cancer Management: A Practical Approach — IAEA-TECDOC-1608
- Operational Guidance on Hospital Radiopharmacy: A Safe and Effective Approach
- Quality Assurance of Physical and Technical Aspects in Radiotherapy
- Quality Management Audits in Nuclear Medicine Practices
- Reference Asian Man: Ingestion and Organ Content of Trace Elements of Importance in Radiological Protection — IAEA-TECDOC-1592
- Relative Biological Effectiveness in Ion Beam Therapy — Technical Reports Series No. 461
- Setting Up a Radiotherapy Programme: Clinical, Medical Physics, Radiation Protection and Safety Aspects
- SSDL Newsletter — Nos 55 and 56, April and December 2008
- The Role of PET/CT in Radiation Treatment Planning for Cancer Patient Treatment — IAEA-TECDOC-1603
- Transition from 2-D Radiotherapy to 3-D Conformal and Intensity Modulated Radiotherapy — IAEA-TECDOC-1588

Water Resources

- Atlas of Isotope Hydrology: Asia and the Pacific
- International Bulletin on Atomic and Molecular Data for Fusion — No. 67, December 2008
- Nuclear and Isotopic Techniques for the Characterization of Submarine Groundwater Discharge in Coastal Zones — IAEA-TECDOC-1595
- Water and Environment News, No. 24, December 2008 — IAEA/WE/NL/24

Radioisotope Production and Radiation Technology

- Cyclotron Produced Radionuclides: Principles and Practice — Technical Reports Series No. 465
- Homogeneous Aqueous Solution Nuclear Reactors for the Production of Mo-99 and Other Short Lived Radioisotopes — IAEA-TECDOC-1601
- Industrial Process Gamma Tomography — IAEA-TECDOC-1589
- Ion Beam Applications in Surface and Bulk Modification of Insulators — IAEA-TECDOC-1607
- Radiation Treatment of Polluted Water and Wastewater — IAEA-TECDOC-1598
- Technetium-99m Radiopharmaceuticals: Manufacture of Kits — Technical Reports Series No. 466
- Training Guidelines in Non-destructive Testing Techniques: 2008 Edition — IAEA-TECDOC-628/Rev.2
- Trends in Radiation Sterilization of Health Care Products
- Trends in Radiopharmaceuticals (ISTR-2005) — Proceedings Series (Vols 1 and 2)

Safety of Nuclear Installations

- Accident Analysis for Nuclear Power Plants with Modular High Temperature Gas Cooled Reactors — Safety Reports Series No. 54
- Analysis of Severe Accidents in Pressurized Heavy Water Reactors — IAEA-TECDOC-1594
- Approaches and Tools for Severe Accident Analysis for Nuclear Power Plants — Safety Reports Series No. 56
- Best Estimate Safety Analysis for Nuclear Power Plants: Uncertainty Evaluation — Safety Reports Series No. 52
- Best Practices in Identifying, Reporting and Screening Operating Experience at Nuclear Power Plants — IAEA-TECDOC-1581
- Best Practices in the Organization, Management and Conduct of an Effective Investigation of Events at Nuclear Power Plants — IAEA-TECDOC-1600
- Best Practices in the Utilization and Dissemination of Operating Experience at Nuclear Power Plants — IAEA-TECDOC-1580
- Conduct of Operations at Nuclear Power Plants — IAEA Safety Standards Series No. NS-G-2.14
- Core Management and Fuel Handling for Research Reactors — IAEA Safety Standards Series No. NS-G-4.3
- Derivation of the Source Term and Analysis of the Radiological Consequences of Research Reactor Accidents — Safety Reports Series No. 53
- IAEA Safety Glossary: Terminology Used in Nuclear Safety and Radiation Protection: Multilingual 2007 Edition – Including the IAEA Safety Fundamentals, Arabic–Chinese–English–French–Russian–Spanish (CD-ROM)
- Improving the International System for Operating Experience Feedback — INSAG 23
- NS Update — Nos 6–9, March, July, September and December 2008
- Nuclear Safety Infrastructure for a National Nuclear Power Programme Supported by the IAEA Fundamental Safety Principles — INSAG 22
- Nuclear Security Culture — IAEA Nuclear Security Series No. 7
- Operational Limits and Conditions and Operating Procedures for Research Reactors — IAEA Safety Standards Series No. NS-G-4.4
- Research Reactors: Safe Management and Effective Utilization — Proceedings Series
- Safety Analysis for Research Reactors — Safety Reports Series No. 55
- Safe Long Term Operation of Nuclear Power Plants — Safety Reports Series No. 57
- SCART Guidelines — IAEA-SVS-16

- SALTO Guidelines: Guidelines for Peer Review of Long Term Operation and Ageing Management of Nuclear Power Plants — IAEA-SVS-17
- Safety Analysis of WWER-440 Nuclear Power Plants: Potential Consequences of a Large Primary to Secondary System Leakage Accident — IAEA-TECDOC-1610
- Safety of Nuclear Fuel Cycle Facilities — IAEA Safety Standards Series No. NS-R-5
- The Operating Organization and the Recruitment, Training and Qualification of Personnel for Research Reactors — IAEA Safety Standards Series No. NS-G-4.5

Radiation and Transport Safety

- Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material — IAEA Safety Standards Series No. TS-G-1.1 (Rev. 1)
- Chernobyl: Looking Back to Go Forward — Proceedings Series
- Estimation of Global Inventories of Radioactive Waste and Other Radioactive Materials — IAEA-TECDOC-1591
- Naturally Occurring Radioactive Material (NORM V) — Proceedings Series
- The Management System for Technical Services in Radiation Safety — IAEA Safety Standards Series No. GS-G-3.2
- The Management System for the Disposal of Radioactive Waste — IAEA Safety Standards Series No. GS-G-3.4
- The Management System for the Processing, Handling and Storage of Radioactive Waste — IAEA Safety Standards Series No. GS-G-3.3
- The Management System for the Safe Transport of Radioactive Material — IAEA Safety Standards Series No. TS-G-1.4
- Radiation Protection in Newer Medical Imaging Techniques: PET/CT — Safety Reports Series No. 58
- Storage of Radioactive Waste — IAEA Safety Standards Series No. WS-G-6.1

Nuclear Security

- Illicit Nuclear Trafficking: Collective Experience and the Way Forward — Proceedings Series
- Preventive and Protective Measures Against Insider Threats — IAEA Nuclear Security Series No. 8
- Security in the Transport of Radioactive Material — IAEA Nuclear Security Series No. 9

Safeguards

- Improvement of Technical Measures to Detect and Respond to Illicit Trafficking of Nuclear and Radioactive Materials — IAEA-TECDOC-CD-1596
- Nuclear Material Accounting Handbook — IAEA-SVS-15

Technical Cooperation

- Application of High-Precision 3D Radiotherapy for Predominant Cancers in the RCA Region

Table A23. Facilities under Agency safeguards or containing safeguarded material on 31 December 2008

State ^a	Name of facility	Location ^a
Power reactors		
Argentina	Atucha-I	Lima
	Atucha-II	Lima
	Embalse	Embalse
Armenia	Armenia	Metsamor
Belgium	BR3-Mol	Mol
	Elbel. Doel-1	Doel
	Elbel. Doel-3	Doel
	Elbel. Doel-4	Doel
	Elbel. Tihange-1	Tihange
	Elbel. Tihange-2	Tihange
	Elbel. Tihange-3	Tihange
Brazil	Angra-2	Angra dos Reis
	Angra-1	Angra dos Reis
	Pressurized Water Nuclear Installation	Resende
Bulgaria	Kozloduy-I	Kozloduy
	Kozloduy-II	Kozloduy
	Kozloduy-III	Kozloduy
Canada	Bruce A NGS	Tiverton, Ontario
	Bruce B GS	Tiverton, Ontario
	Darlington NGS	Bowmanville, Ontario
	Gentilly-II	Gentilly, Quebec
	Pickering NGS	Pickering, Ontario
	Point Lepreau	Point Lepreau, New Brunswick
China	QSNPP	Hai Yan
Czech Republic	EDU-1	Dukovany
	EDU-2	Dukovany
	Temelin	Temelin
Finland	Loviisa	Loviisa
	TVO-I	Olkiluoto
	TVO-II	Olkiluoto
	TVO-III	Olkiluoto
Germany	AVR	Jülich
	Gem. Kraftwerk Grohnde	Grohnde
	GKN-2	Neckarwestheim
	GKN-Neckarwestheim	Neckarwestheim
	HKG-THTR 300	Hamm
	KBR-Brokdorf	Brokdorf
	KKB-Brunsbüttel	Brunsbüttel
	KKE	Lingen (Ems)
	KKG-Grafenrheinfeld	Grafenrheinfeld
	KKI-2-Isar	Essenbach
	KKI-Isar-Ohu	Ohu bei Landshut
	KKK-Krümmel	Geesthacht
KKP-Philippsburg-1	Philippsburg	

State ^a	Name of facility	Location ^a
	KKP-Philippsburg-2	Philippsburg
	KKS-Stade	Stade
	KKU-Unterweser	Unterweser
	KKW-Gr1. 1 and 2	Lubmin
	KKW-Gr2. 3 and 4	Lubmin
	KKW-Gr3. 5	Lubmin
	KKW-Rheinsberg	Rheinsberg
	KRB II-Gundremmingen B	Gundremmingen
	KRB II-Gundremmingen C	Gundremmingen
	KWL-Lingen	Lingen
	KWO-Obrigheim	Obrigheim
	RWE-Biblis-A	Biblis
	RWE-Biblis-B	Biblis
	RWE-Mülheim-Kärlich	Mülheim-Kärlich
Hungary	Paks-I	Paks
	Paks-II	Paks
India	KKNPP	Kudankulam
	RAPS	Anushakh-Kota, Rajasthan
	TAPS	Tarapur
Iran, Islamic Republic of	Bushehr	Halilem
Italy	CIRENE (on-load)	Latina
	ENEL-6	Montalto
	ENEL-8	Montalto
	ENEL-Caorso	Caorso
	ENEL-Garigliano	Sessa Aurunca (Caserta)
	ENEL-Latina	Borgo-Sabotino
	ENEL-Trino-Vercellese	Trino-Vercellese
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
	Higashidori-1	Shimokita-gun, Aomori-ken
	Ikata-1	Nishiuwa-gun, Ehime-ken
	Ikata-2	Nishiuwa-gun, Ehime-ken
	Ikata-3	Nishiuwa-gun, Ehime-ken
	Joyo	Higashi-gun, Ibaraki-ken
	Kashiwazaki-1	Kashiwazaki-shi, Niigata-ken

State ^a	Name of facility	Location ^a
	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 and 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
	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
	Takahama-4	Ohi-gun, Fukui-ken
	Tokai	Tokai-mura, Ibaraki-ken
	Tokai-2	Tokai-mura, Ibaraki-ken
	Tomari-1	Furui-gun, Hokkaido
	Tomari-2	Furui-gun, Hokkaido
	Tomari-3	Furui-gun, Hokkaido
	Tsuruga-1	Tsuruga-shi, Fukui-ken
	Tsuruga-2	Tsuruga-shi, Fukui-ken
Kazakhstan	BN-350	Aktau
Korea, Republic of	Kori-1	Pusan
	Kori-2	Pusan
	Kori-3	Pusan
	Kori-4	Pusan
	Shin Kori-4	Pusan
	Shin Kori-1	Pusan
	Shin Kori-2	Pusan
	Shin Kori-3	Pusan
	Shin Wolsong-1	Kyongju
	Shin Wolsong-2	Kyongju
	Ulchin-1	Ulchin
	Ulchin-2	Ulchin
	Ulchin-3	Ulchin
	Ulchin-4	Ulchin
	Ulchin-5	Ulchin
	Ulchin-6	Ulchin
	Wolsong-1	Kyongju
	Wolsong-2	Kyongju
	Wolsong-3	Kyongju

State ^a	Name of facility	Location ^a
	Wolsong-4	Kyongju
	Younggwang-1	Younggwang
	Younggwang-2	Younggwang
	Younggwang-3	Younggwang
	Younggwang-4	Younggwang
	Younggwang-5	Younggwang
	Younggwang-6	Younggwang
Lithuania	Ignalina	Visaginas
Mexico	Central Laguna Verde Unit I	Alto Lucero
	Central Laguna Verde Unit II	Alto Lucero
Netherlands	EPZ. Borssele	Borssele
	NV GKN-Dodewaard	Dodewaard
Pakistan	Chasnupp-1	Kundian
	KANUPP	Karachi
Philippines	BNPP	Morong
Romania	Cernavoda-1	Cernavoda
	Cernavoda-2	Cernavoda
	Cernavoda-3	Cernavoda
	Cernavoda-4	Cernavoda
	Cernavoda-5	Cernavoda
	Cernavoda-U2	Cernavoda
Slovakia	A-1	Bohunice
	Mochovce 3, 4	Mochovce
	Mochovce	Mochovce
	V-1	Bohunice
	V-2	Bohunice
Slovenia	Krško (NEK)	Krško
South Africa	Koeberg-1	Cape Town
	Koeberg-2	Cape Town
Spain	Cn. Almaraz-1	Almaraz
	Cn. Almaraz-2	Almaraz
	Fec. Asco-1	Asco
	Fec. Asco-2	Asco
	He. Cofrentes	Cofrentes
	Hifr. Vand. I	Vandellòs
	Santa María de Garona	Santa María de Garona
	Ue. J. Cabrera	Almonacid de Zorita
	Ue. Trillo-1	Trillo
	Valdecaballeros	Badajoz
	VandellòsII	Vandellòs
Sweden	Barsebaeck-1	Loeddekoepinge
	Barsebaeck-2	Loeddekoepinge
	Forsmark-1	Östhammar
	Forsmark-2	Östhammar
	Forsmark-3	Östhammar
	Oskarshamn-1	Oskarshamn

State ^a	Name of facility	Location ^a
	Oskarshamn-2	Oskarshamn
	Oskarshamn-3	Oskarshamn
	Ringhals-1	Ringhals
	Ringhals-2	Ringhals
	Ringhals-3	Ringhals
	Ringhals-4	Ringhals
Switzerland	KKB Beznau-II	Beznau Doettingen
	KKB Beznau-I	Beznau Doettingen
	KKG-Gösgen	Gösgen-Däniken
	KKL-Leibstadt	Leibstadt
	KKM Mühleberg	Mühleberg
Ukraine	Chernobyl	Chernobyl
	Khmelnitski-1	Neteshin
	Khmelnitski-2	Neteshin
	Rovno-1 and 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
Uzbekistan	Combine	Tchkavovsk
Research reactors and critical assemblies		
Algeria	Es Salam research reactor	Ain Oussera
	NUR research reactor	Draria Wilaya de Tipaza
Argentina	Argentine reactor-0	Córdoba
	Argentine reactor-1	Centro Atomico Constituyentes
	Argentine reactor-3	Centro Atomico Ezeiza
	Argentine reactor-4	Rosario
	Argentine reactor-6	Centro Atomico Bariloche
	Argentine reactor-8	Pilcaniyeu
Australia	HIFAR	Lucas Heights, New South Wales
	MOATA	Lucas Heights, New South Wales
	OPAL	Lucas Heights, New South Wales
Austria	Atominstytut der Österreichischen Universitäten	Vienna
Bangladesh	Atomic Energy Research Establishment	Dhaka
Belarus	Sosny	Minsk
Belgium	BR1-CEN	Mol
	CEN-BR2/BR02	Mol
	CEN-Venus	Mol

State ^a	Name of facility	Location ^a
	Thetis-Rijkuniv.-Gent	Gent
Brazil	Argonaut reactor-IEN IPEN/MB-01 Critical Assembly IPR-R1 reactor-CDTN Research reactor IEA-R1	Rio de Janeiro São Paulo Belo Horizonte São Paulo
Bulgaria	IRT-2000	Sofia
Canada	Biology, Chemistry, Physics DIF École Polytechnique McMaster reactor NRU reactor NRX reactor University of Alberta Slowpoke Slowpoke Dalhousie Slowpoke Kingston Slowpoke Saskatchewan	Chalk River, Ontario Chalk River, Ontario Montreal, Quebec Hamilton, Ontario Chalk River, Ontario Chalk River, Ontario Edmonton, Alberta Halifax, Nova Scotia Kingston, Ontario Saskatoon, Saskatchewan
Chile	La Reina reactor Lo Aguirre experimental reactor	Santiago Santiago
China	HTR-10	Nankou, Beijing
Colombia	IAN-R1 research reactor	Bogotá
Czech Republic	LR-O University training reactor VR-1 VVR-S	Řež Prague Řež
Democratic Republic of the Congo	Triga-II reactor	Kinshasa
Denmark	Danish Decommissioning – DR3	Roskilde
Egypt	ET RR-1 Multi-purpose reactor	Inshas Inshas
Estonia	ALARA	Paldiski
Finland	FIR-1	Espoo
Georgia	Decom. IRT-M	Tbilisi
Germany	BER-II FH-Furtwangen FRM FRM-II GKSS FRG-1, FRG-2 KFA-FRJ-2 Labor-St SUR-100 SUR-100 FHK SUR-100 FHU SUR-100-RWTH SUR-100-TUB	Berlin Furtwangen Garching Garching Geesthacht Jülich Zittau Hannover Kiel Ulm Aachen Berlin

State ^a	Name of facility	Location ^a
	SUR-100-University of Stuttgart	Stuttgart
	Triga Mainz	Mainz
	Triga-3	Neuherberg
	AKR	Dresden
	VKT research reactor	Rosendorf
Ghana	GHARR-1	Legon-Accra
Greece	GRR-1	Attiki
Hungary	Budapest research reactor	Budapest
	Training reactor	Budapest
Indonesia	P3TkN	Bandung
	PPNY	Yogyakarta
	RSG-Gas	Serpong
Iran, Islamic Republic of	HWZPR	Esfahan
	IR-40	Araq
	LWSCR	Esfahan
	MNSR	Esfahan
	Tehran research reactor	Tehran
Israel	Israel RR-1	Soreq
Italy	AGN-201	Palermo
	Camen-RTS-1	San Piero a Grado
	CEC-Essor-Ispra	Ispra
	CNEN-RB-3	Montecucolino
	RB-1	Montecucolino
	Tapiro-Cas.	Santa Maria di Galeria
	Triga-RC1-Cas.	Santa Maria di Galeria
	University of Pavia	Pavia
Jamaica	CNS	Kingston
Japan	DCA	Oarai-machi, Ibaraki-ken
	FCA	Tokai-mura, Ibaraki-ken
	HTR	Kawasaki-shi, Kanagawa-ken
	HTTR	Higashi-gun, Ibaraki-ken
	JMTR	Higashi-gun, Ibaraki-ken
	JMTRC	Higashi-gun, Ibaraki-ken
	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
	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

State ^a	Name of facility	Location ^a
Kazakhstan	Kurchatov test reactor WWR-K	Kurchatov Almaty
Korea, Republic of	HANARO Kyung Hee Triga-II and III	Taejon Suwoon Seoul
Latvia	IRT	Salaspils
Libyan Arab Jamahiriya	IRT-Tajura	Tajura
Malaysia	Puspati	Bangi
Mexico	Triga- Mark III	Ocoyoacac
Morocco	MA-R1	Rabat
Netherlands	BARN HFR-Petten IRI. HOR LFR-Petten	Wageningen Petten Delft Petten
Nigeria	NIRR 1	Zaria
Norway	HBWR JEEP-II	Halden Kjeller
Pakistan	PARR-1 PARR-2	Rawalpindi Rawalpindi
Peru	CNIP RP-10 research reactor RP-0 research reactor	Lima Lima
Philippines	PRR-1	Quezon City, Diliman
Poland	Anna and Agata Maria	Otwock-Swierk Otwock-Swierk
Portugal	RPI	Sacavem
Romania	Material testing facility National Institute R&D	Pitești Colibasi Magurele
Serbia	RA-RB	Vinča
Slovenia	Triga-II	Ljubljana
South Africa	SAFARI-I research reactor	Pelindaba
Sweden	Studsvik-RR	Studsvik
Switzerland	AGN 211P Crocus Proteus	Basel Lausanne Würenlingen
Syrian Arab Republic	MNSR	Damascus

State ^a	Name of facility	Location ^a
Tajikistan	Research reactor	Duschanbe
Thailand	ONRC TRR-1	Ongkharak, Nakon Nayon Bangkok
Turkey	Çekmece Nuclear Research and Training Centre ITU-TRR Triga- Mark II	Istanbul Istanbul
Ukraine	IR-100 research reactor WWR-M research reactor	Sevastopol Kiev
Uzbekistan	IIN-3M WWR-SM	Tashkent Ulugbek
Venezuela	RV-1 IVIC research reactor	Altos de Pipe
Vietnam	Da Lat	Da Lat, Lam Dong
Conversion plants		
Algeria	Pilot uranium conversion plant	Draria Nuclear Research Centre
Argentina	UF ₆ conversion facility UF ₆ production plant UO ₂ conversion plant	Pilcaniyeu Pilcaniyeu Córdoba
Brazil	UOC to UF ₆ conversion Uran. Hexafluor. Prod. Unit (USEXA)	Iperó Iperó
Canada	Blind River Port Hope	Blind River, Ontario Port Hope, Ontario
Chile	Lab. Experiment. de Conversion	Santiago
Iran, Islamic Republic of	UCF Uranium chemistry laboratory	Esfahan Esfahan
Japan	JCO Ningyo R&D PCDF	Tokai-mura, Ibaraki-ken Tomata-gun, Okayama-ken Tokai-mura, Ibaraki-ken
Korea, Republic of	DUF4 conversion plant	Taejon
Mexico	Fuel fabrication pilot plant	Salazar
Romania	UO ₂ powder processing plant	Feldiora
South Africa	Conversion plant (U plant) HEU and LEU conversion plant	Pelindaba Pelindaba
Sweden	Ranstad Mineral	Stenstorp
Fuel fabrication plants		
Algeria	UDEC	Draria nuclear site

State ^a	Name of facility	Location ^a
Argentina	Exp. Pl. Fuel Mat. and Powder Met.	Constituyentes
	Fuel. Fab. Plant — Fecn	Ezeiza
	Research reactor fuel element fabrication plant	Constituyentes
	Research reactor fuel fabrication plant	Ezeiza
Belgium	BN-MOX-FFP	Dessel
	FBFC Dessel	Dessel
	FBFC Pu. MOX	Dessel
Brazil	Fuel fabrication plant	Resende
Canada	Fuel Eng. Met. Che. Op.	Chalk River, Ontario
	Fuel fabrication facility	Chalk River, Ontario
	GEC Inc., Toronto	Toronto, Ontario
	GEC Inc., Peterborough Zircatec, Port Hope	Peterborough, Ontario Port Hope, Ontario
Chile	Unidad de Metalur. Fisica (UMF)	Santiago
Egypt	FMPP	Inshas
	R&D-NFL	Inshas
France	Melox. Marcoule	Chusclan
Germany	Advanced Nuclear Fuels-FFP	Lingen
	Siemens MOX II	Hanau
India	AFFF	Tarapur-Mumbai
	CFFAA	Hyderabad
	NFC	Hyderabad
Indonesia	IEBE	Serpong
	IPEBRR	Serpong
Iran, Islamic Republic of	FMP	Esfahan
	Fuel fabrication laboratory	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 PFPF	Tokai-mura, Ibaraki-ken Tokai-mura, Ibaraki-ken
Kazakhstan	Ulbinski metallurgical plant	Ust-Kamenogorsk
Korea, Republic of	KNFFP	Taejon
Romania	NFP	Pitești Colibasi
South Africa	LEU fuel fabrication plant	Pelindaba
	MTR fuel fabrication plant	Pelindaba

State ^a	Name of facility	Location ^a
Spain	ENUSA Fab. Juz.	Juzbado
Sweden	Vaesteras ABB	Vaesteras
Turkey	Nuclear fuel pilot plant	Istanbul
Reprocessing plants		
Belgium	Eurochemie	Mol
Egypt	Hydrometallurgy unit	Inshas
France	Cogema-UP2 and UP3	La Hague
Germany	WAK	Eggenstein-Leopoldshafen
India	PREFRE	Tarapur-Mumbai
Iran, Islamic Republic of	Mix Facility	Tehran
Italy	CNEN-Eurex ITREC	Saluggia Rotondella
Japan	CPF RETF RRP SCF TRP	Tokai-mura, Ibaraki-ken Tokai-mura, Ibaraki-ken Kamikita-gun, Aomori-ken Tokai-mura, Ibaraki-ken Tokai-mura, Ibaraki-ken
Enrichment plants		
Argentina	Uranium enrichment plant	Pilcaniyeu
Australia	Silex	Lucas Heights
Brazil	Isotopic enrichment laboratory (LEI) Laser spectroscopy laboratory (AR/LAS) U-235 centrifuge enrichment plant Uranium enrichment pilot plant (USIDE)	Iperó São José dos Campos Resende Iperó
China	Shaanxi	Han Zhang
France	Georges Besse II	Pierrelatte
Germany	UTA-1 and UTA-2	Gronau
Iran, Islamic Republic of	FEP PFEP	Natanz Natanz
Japan	CTF NEP REP	Kitakami-gun, Aomori-ken Tomata-gun, Okayama-ken Kamikita-gun, Aomori-ken
Netherlands	URENCO Nederland	Almelo

State ^a	Name of facility	Location ^a
United Kingdom	URENCO E22 and E23	Capenhurst
Separate storage facilities		
Argentina	Cent. St .Irr. Sp. Fiss. Mat. (DCMFEI) Cent. St. Sp. Fiss. Mat. (DCMFE) DUE Nuclear material storage Storage bunker	Ezeiza Constituyentes Ezeiza Constituyentes Ezeiza
Armenia	SSFS	Metsamor
Australia	Vault storage	Lucas Heights
Belgium	Belgoprocess Elbel. DL. DS Fbfc Internat. SA Wet store	Dessel Beveren Dessel Tihange
Brazil	Aramar store UF ₆ production-Ipen	Iperó São Paulo
Bulgaria	AFRS Dry SFSF	Kozloduy Kozloduy
Canada	AECL Research DP dry storage DWMF Gentilly-I NMSF Port Hope Llrw Storage PUFDSF Spent fuel canister storage Spent fuel storage Waste Storage System WUFDSF	Pinawa, Manitoba Tiverton, Ontario Darlington, Ontario Gentilly, Quebec Chalk River, Ontario Port Hope, Ontario Pickering, Ontario Chalk River, Ontario Chalk River, Ontario Chalk River, Ontario Tiverton, Ontario
Czech Republic	High level radioactive waste storage Dukovany (ISFS)	Řež Dukovany
Denmark	Danish decommissioning- Risø store Danish decommissioning waste	Roskilde Roskilde
Finland	TVO-KPA store	Olkiluoto
Germany	Adv. Nucl. Fuels-UF-6 Lager BE-ZL-Gundremmingen BZA-Ahaus BZL Biblis Energiewerke Nord GmBH EWN ZLN GKN-ZL Kernmateriallager 87 KFA-AVR. BL KFA-AVR KFK-FR-2 KKG-Bella	Lingen Gundremmingen Ahaus Biblis Lubmin Lubmin Neckarwestheim Rossendorf Jülich Jülich Eggenstein-Leopoldshafen Grafenrheinfeld

State ^a	Name of facility	Location ^a
	KKI-Bella	Essenbach
	LSG Offset-Lager	Hanau
	NCS-Lagerhalle	Hanau
	PTB-Spaltstofflager	Hanau
	SBZ	Brunsbüttel
	SZL	Lingen
	Tansportbehaelterlager (TBL-G)	Gorleben
	TBH (B) 87.2	Rossendorf
	ZL-Grohnde	Emmerthal
	ZL-KBR	Brokdorf
	ZL-KKU	Stadland
	ZL-Krümmel	Geesthacht
	ZL-Philippsburg	Philippsburg
Hungary	Central isotope storage	Budapest
	MVDS	Paks
India	AFR	Tarapur
Indonesia	TC and ISFSF	Serpong
Iran, Islamic Republic of	KWS	Karaj
Iraq	Tuwaittha, location C	Tuwaittha
Italy	Dep. Avogadro	Torino
	Essor nuclear plant	Ispra
	JRC-Essor storage	Ispra
	Nucleco SPA	Rome
	Research Centre Ispra	Ispra
Japan	Fugen	Tsuruga-shi, Fukui-ken
	Fuku-I-CSFS	Futaba-gun, Fukushima-ken
	JAERI Mutsu	Mutsu-shi, Aomori-ken
	KUFFS	Sennan-gun, Osaka
	NFI Kumatori-2	Sennan-gun, Osaka
Kazakhstan	Baikal-1 DSFS	Kurchatov
	BN-350 temporary storage	Aktau
	Ulbinski thorium storage	Ust-Kamenogorsk
Korea, Republic of	NMSF	Kaeri
	SFS	Kaeri
	Uranium residue storage facility	Kaeri-Daejeon
Lithuania	SNFS-1	Visaginas
	SNFS-2	Visaginas
Netherlands	Covra store	Vlissingen
	Habog	Vlissingen
Pakistan	Hawks Bay depot	Karachi
Poland	Zuop	Swierk
Portugal	Inst. de Armazenagem	Sacavem

State ^a	Name of facility	Location ^a
Romania	ISFS Cernavoda	Cernavoda
Slovakia	Bohunice store	Bohunice
Slovenia	ARAO	Brinje
South Africa	Bulk storage facility	Pelindaba
	E-Building	Valindaba
	HEU storage vault	Pelindaba
	Koeberg Castor storage facility	Cape Town
	Thabana pipe store	Pelindaba
	Waste storage facility	Pelindaba
	Y-plant storage facility	Pelindaba
	Z-plant	Pelindaba
Spain	ATI	Almonacida de Zorita
	Trillo	Trillo
Sweden	Clab store	Oskarshamn
Switzerland	SAPHIR	Paul Scherrer Institut, Würenlingen
	Zwibez Kernkraftwerk Beznau	Beznau
	ZWILAG	Würenlingen Aargau
USA	KAMS storage	Savannah River Site
	Plu. Sto.(Room 3, Bld.2376-Z)	Hanford, Washington
	Y-12 plant	Oak Ridge, Tennessee
Ukraine	Chernobyl NPP-SFS	Chernobyl
	Chernobyl SNFSF-2	Chernobyl
	Khmelnitski FF storage	Neteshin
	Rovno FF storage	Kuznetsovsk
	South Ukraine FF storage	Yuzhnoukrainsk
	Zaporozhe FF storage	Energodar
	Zaporozhe Sfs	Energodar
United Kingdom	BNF SNM St. 9	Sellafield
	SMP Export	Sellafield
	Thorp Pu. M.S.	Sellafield
Other facilities		
Algeria	AURES I	Birine Nucl.Site (Ain Oussara)
Argentina	Alpha Laboratory	Centro Atomico Constituyentes
	Enriched uranium recovery laboratory	Centro Atomico Ezeiza
	Experimental dry conversion	Bariloche
	Fission products division	Centro Atomico Ezeiza
	LAPEP	Centro Atomico Ezeiza
	LFR	Centro Atomico Ezeiza
	Triple Altura Laboratory (LTA)	Centro Atomico Ezeiza
	Uranium powder fabrication plant	Centro Atomico Constituyentes
Australia	R&D labs	Lucas Heights

State ^a	Name of facility	Location ^a
Belgium	CEN-Lab-Pu	Mol
	CEN-Waste	Dessel
	IRE	Fleurus
	IRMM-GEEL	Geel
	SCK-CEN Lab.	Mol
Brazil	(Ladesi)-Copesp	São Paulo
	Fuel development and tech. facility	São Paulo
	Labgene	Iperó
	Nucl. Fuel and Instr. Devel. Lab.	São Paulo
	Nuclear Mat. Lab.-Labmat	Iperó
	Pilot Hot Cells Unit (UCQP)	Iperó, Sao Paulo
Reprocess. Proj.(IPEN-CNEN/SP)	São Paulo	
Czech Republic	Nuclear Fuel Institute, UJP	Prague
	Research Laboratories	Řež
	Richard Repository	Litomerice
Denmark	Danish Decommissioning – Hot cell	Roskilde
Egypt	Molybdenum production unit	Inshas
	NCB	Inshas
Georgia	Razmnozhitel-1	Tbilisi
	Sukhumi Inst.	Sukhumi
Germany	DESY-Hamburg	Hamburg
	Inst. Kernchemie	Mainz
	KFA-HZ	Jülich
	KFA-Lab. Jülich	Jülich
	KFK-Heisse Zellen	Eggenstein-Leopoldshafen
	PKA Gorleben	Gorleben
	Transuran	Leopoldshafen
	VEK	Eggenstein-Leopoldshafen
VKT Tec. Ztr	Rosendorf	
Indonesia	RMI	Serpong
Iran, Islamic Republic of	JHL	Tehran
Italy	CNEN-Istec	Santa Maria di Galeria
	CNEN-Lab. Pu.-Cas	Santa Maria di Galeria
	OPEC 2-Cas	Santa Maria di Galeria
Japan	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
	JNC Tokai R&D	Tokai-mura, 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
	NRF	Tsukuba-shi, Ibaraki-ken

State ^a	Name of facility	Location ^a
	Showa Sumitomo-Chiba UML	Kawasaki-shi, Kanagawa-ken Sodegaura-shi, Chiba-ken Higashi, Ibaraki-ken
Korea, Republic of	ACPF Acrylonitrile plant DFDF HFFL IMEF KAERI R&D facility PIEF	Daejeon Ulsan Taejon Taejon Taejon Taejon Taejon
Libyan Arab Jamahiriya	Tajura uranium R&D facility	Tajura
Netherlands	DSM ECN and JRC	Heerlen Petten
Norway	Research laboratories	Kjeller
South Africa	Decontamination and waste recovery plant Hot cell complex NU and DU metals plant	Pelindaba Pelindaba Pelindaba
Spain	Ciem. Reproc. ENRESA	Madrid El Cabril
Switzerland	CERN EIR	Geneva Würenlingen
Ukraine	Chernobyl conditioning Chernobyl unit 4 shelter KHFTI Sevastopol subcritical assembly	Chernobyl Chernobyl Kharkov Sevastopol
Uzbekistan	Combine	Navoi

^a 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: The Agency was also applying safeguards in Taiwan, China, at eight power reactors, four research reactors and critical assemblies, two fuel fabrication plants, two storage facilities and one R&D facility.

Note: Additionally under Agency safeguards, there were more than 445 locations outside facilities in 55 States and in Taiwan, China.