

IAEA BULLETIN

INTERNATIONAL ATOMIC ENERGY AGENCY

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60
years
60
pictures

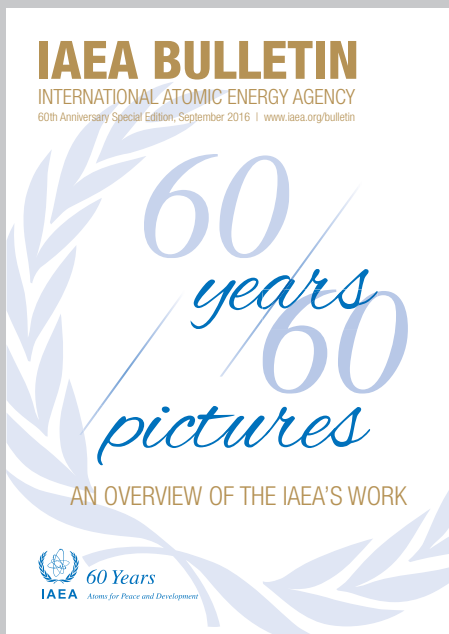
AN OVERVIEW OF THE IAEA'S WORK



IAEA

60 Years

Atoms for Peace and Development



IAEA BULLETIN

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Cover:
Anna Schlosman



IAEA

60 Years

Atoms for Peace and Development

The International Atomic Energy Agency's mission is to prevent the spread of nuclear weapons and to help all countries — especially in the developing world — benefit from the peaceful, safe and secure use of nuclear science and technology.

Established as an autonomous organization under the United Nations in 1957, the IAEA is the only organization within the UN system with expertise in nuclear technologies. The IAEA's unique specialist laboratories help transfer knowledge and expertise to IAEA Member States in areas such as human health, food, water, industry and the environment.

The IAEA also serves as the global platform for strengthening nuclear security. The IAEA has established the Nuclear Security Series of international consensus guidance publications on nuclear security. The IAEA's work also focuses on helping to minimize the risk of nuclear and other radioactive material falling into the hands of terrorists and criminals, or of nuclear facilities being subjected to malicious acts.

The IAEA safety standards provide a system of fundamental safety principles and reflect an international consensus on what constitutes a high level of safety for protecting people and the environment from the harmful effects of ionizing radiation. The IAEA safety standards have been developed for all types of nuclear facilities and activities that serve peaceful purposes, including decommissioning.

The IAEA also verifies through its inspection system that Member States comply with their commitments under the Nuclear Non-Proliferation Treaty and other non-proliferation agreements to use nuclear material and facilities only for peaceful purposes.

The IAEA's work is multi-faceted and engages a wide variety of partners at the national, regional and international levels. IAEA programmes and budgets are set through decisions of its policymaking bodies — the 35-member Board of Governors and the General Conference of all Member States.

The IAEA is headquartered at the Vienna International Centre. Field and liaison offices are located in Geneva, New York, Tokyo and Toronto. The IAEA operates scientific laboratories in Monaco, Seibersdorf and Vienna. In addition, the IAEA supports and provides funding to the Abdus Salam International Centre for Theoretical Physics, in Trieste, Italy.

The IAEA at 60

Atoms for Peace and Development, for the Benefit of Humankind

By Yukiya Amano

The IAEA is proud to mark 60 years of serving the world by making the benefits of peaceful nuclear science and technology available to improve human well-being, health and prosperity.

The world has changed significantly in the last six decades. The IAEA has kept pace both with the changing needs of Member States and with technological developments.

From the 26 countries which ratified the IAEA Statute in 1957, we have grown to an organization with 168 Member States that spans the globe. And our membership continues to grow. Most of the countries that join the IAEA today are developing nations, keen to make use of the benefits of nuclear science and technology in human health, food and agriculture, industry, electricity generation — and countless other areas.

The IAEA works closely with Member States to help them achieve the Sustainable Development Goals that were adopted by world leaders last year. We are active in many of the 17 Goals, including those concerning poverty and hunger, human health, clean water, affordable and clean energy, and climate change.

These are all fields in which nuclear science and technology have a great deal to contribute.

That is why I now describe our mission as *Atoms for Peace and Development*. The past 60 years have demonstrated that nuclear science and technology can play a major role in supporting sustainable development.

Committed to ensuring peaceful uses

A key area of IAEA activity is to prevent the spread of nuclear weapons. We do this by implementing safeguards in around 180 countries. Several hundred IAEA inspectors are constantly on the road, visiting nuclear facilities and keeping track of nuclear material to ensure that it is not being diverted from peaceful purposes. We played an important role in helping to bring about the 2015 agreement between Iran and the group of countries known as the E3/EU+3 — the *Joint Comprehensive Plan of Action* — and are now verifying and monitoring Iran's implementation of its nuclear-related commitments under that agreement.

We coordinated the international response to serious accidents at nuclear power plants, including Chernobyl in 1986 and Fukushima Daiichi in 2011, and helped to bring about a significant improvement in nuclear safety everywhere. Safety is a national responsibility, but the IAEA brings countries



Yukiya Amano
Director General, IAEA

together to agree on safety standards and share practical experience.

We serve as the central global platform for international cooperation to strengthen nuclear security and prevent nuclear and other radioactive material from falling into the hands of terrorists. We provide radiation detection equipment, train border guards and customs officers, maintain a global database on trafficking incidents and establish nuclear security guidance.

Many countries believe nuclear power can help them to address the twin challenges of ensuring reliable energy supplies, while curbing greenhouse gas emissions. Nuclear power is one of the lowest-carbon technologies available to generate electricity.

The IAEA provides assistance and information to countries that wish to use nuclear power to help them do so safely, securely and sustainably.

One of the most rewarding aspects of my work as IAEA Director General is meeting people whose lives have improved because of the work and support provided by the IAEA. They include farmers, who can grow more abundant crops thanks to nuclear techniques, fishermen, who fish in cleaner waters thanks to our environmental work, and cancer patients, who have better access to radiotherapy and nuclear medicine because of the IAEA.

This special edition of the IAEA Bulletin provides a richly illustrated overview of the work of the IAEA. I hope you will find it interesting and informative.

I pay tribute to my predecessors as IAEA Director General, all of whom made major contributions to shaping the organization that is so highly valued by our Member States today.

And I thank all of our very talented staff, past and present, for their dedication.

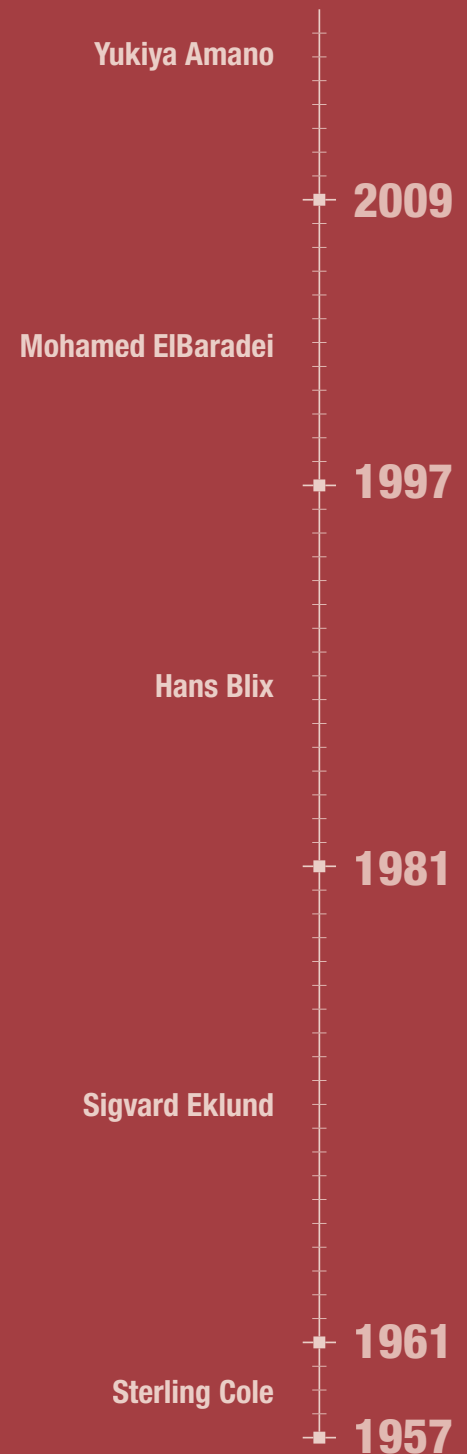
As we begin our seventh decade, we face challenges in all areas of our work. But I am confident that, with the active support and engagement of our Member States, we will overcome them. The IAEA will remain an organization that delivers concrete results, making peaceful nuclear technology available to improve the lives of our fellow human beings throughout the world.

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IAEA DIRECTORS GENERAL

Under the leadership of five Directors General, the IAEA's contribution to maximizing the benefit of nuclear science and technology has over the years progressed to meet the evolving needs and development goals of its Members States while promoting high standards of nuclear safety and security and ensuring that nuclear technologies are used exclusively for peaceful purposes.





IAEA DIRECTOR GENERAL

Yukiya Amano of Japan is the fifth and current Director General of the IAEA since 2009.

Photo: IAEA



Mohamed ElBaradei of Egypt was the fourth Director General of the IAEA, serving from 1997 to 2009.

Photo: IAEA

DIRECTORS GENERAL

Hans Blix of Sweden served as the third Director General of the IAEA from 1981 to 1997.

Photo: IAEA



Sigvard Eklund, a distinguished Swedish scientist, served as the second Director General of the IAEA from 1961 to 1981.

Photo: IAEA

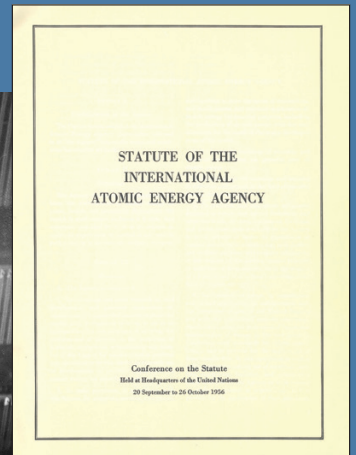
Sterling Cole of the USA was the first Director General of the IAEA. He headed the IAEA during its formative years, from 1957 until 1961.

Photo: IAEA



MILESTONES IN THE HISTORY OF THE IAEA

Following President Eisenhower's Atoms for Peace speech, the Statute of the IAEA was approved unanimously by 81 nations on 23 October 1956 and entered into force on 29 July 1957, establishing the IAEA as an autonomous organization within the United Nations system.



President Eisenhower made his 'Atoms for Peace' proposal to the United Nations General Assembly at the United Nations Headquarters, New York, on 8 December 1953.

Photo: United Nations

The first IAEA General Conference held at the Konzerthaus in Vienna from 1 to 23 October 1957, with the participation of diplomats and scientists from 57 nations.

Photo: IAEA



Leopold Figl, Austria's Minister for Foreign Affairs (seated right), and Sterling Cole, the first IAEA Director General (seated left), signed the Headquarters Agreement between Austria and the IAEA on 11 December 1957.

Photo: IAEA



The headquarters of the IAEA Secretariat in Vienna from 1958 to 1979. The building on Kärntner Ring is today the Grand Hotel.

Photo: IAEA



The inauguration ceremony of the IAEA laboratories in Seibersdorf, Austria, in 1959. The IAEA laboratories support the Agency's activities in nuclear verification, food and agriculture, human health, industrial applications and the environment.

Photo: IAEA



The construction of the Vienna International Centre started in 1973 and was completed in 1978, with the official opening taking place on 23 August 1979. It houses several United Nations system organizations in Vienna and has been the headquarters of the IAEA ever since.

Photo: IAEA

HISTORY

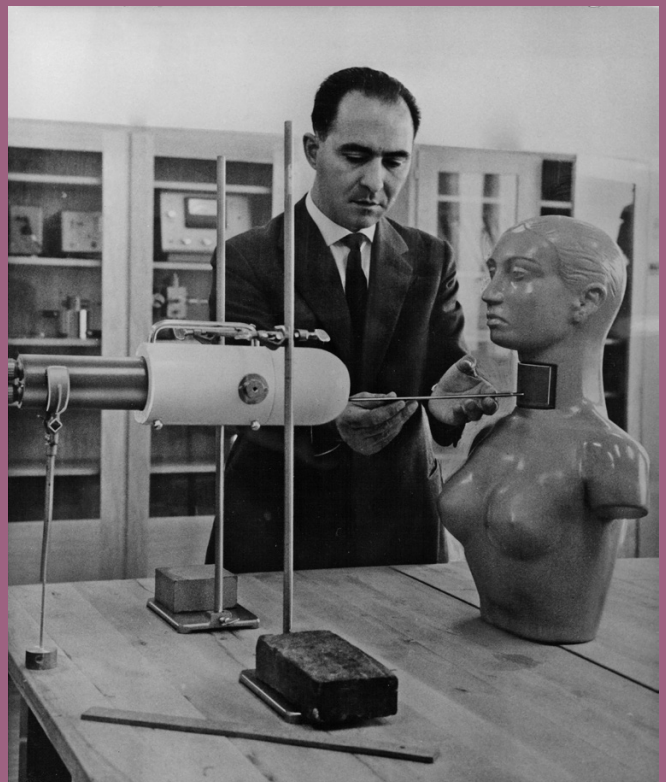


IAEA Director General Mohamed ElBaradei and Ambassador Yukiya Amano, Chairman of the Board of Governors from 2005 to 2006, at the Nobel Peace Prize award ceremony at Oslo City Hall on 10 December 2005.

Photo: IAEA

HUMAN HEALTH

The use of nuclear techniques in medicine and nutrition has become one of the most widespread peaceful applications. Nuclear techniques have a significant role to play in the diagnosis and treatment of health conditions, in particular non-communicable diseases, such as cancer and cardiovascular diseases. The IAEA assists Member States in building capacities for the establishment and implementation of high quality comprehensive national cancer control programmes. Nuclear techniques also help monitor and address all forms of malnutrition, from undernutrition to obesity.



A manikin bust, constructed at the IAEA in 1961, demonstrates the accurate measurement of radioiodine uptake by the thyroid gland, which controls the body's metabolism.

Photo: IAEA



Stable isotope techniques can help determine whether children receive and utilize the right balance of nutrients in their diet. An IAEA research project in Ecuador evaluated the nutritional status of school children in 2012.

Photo: E. Aguilar Lema, Ecuador

HUM



Nuclear medicine specialists from Latin America evaluating whole body images produced by single photon emission computed tomography scanners after administering a radiopharmaceutical to a patient in 2014.

Photo: IAEA



A Sri Lankan expert, trained at the IAEA laboratories in Seibersdorf, Austria, checking the iodine-131 dose to be given to thyroid cancer patients at the Nuclear Medicine Unit in Peradeniya, Sri Lanka, in 2015.

Photo: IAEA

Demonstration of a patient set up for radiotherapy at the Vienna General Hospital in 2016. The IAEA promotes access to radiation therapy and its safe use.

Photo: IAEA



IAN HEALTH

The IAEA Programme of Action for Cancer Therapy supports low and middle income countries in the implementation of comprehensive national cancer control programmes.

Photo: IAEA



FOOD AND AGRICULTURE

Nuclear technologies provide competitive and often unique solutions to help fight hunger and malnutrition, combat plant and animal diseases, improve agricultural productivity and environmental sustainability and ensure that food is safe. The IAEA and the Food and Agriculture Organization of the United Nations (FAO) work in partnership to help Member States use these technologies safely and appropriately.



Male fruit flies sterilized using gamma rays released together with normal flies at a Costa Rican coffee plantation in 1971 to study the use of nuclear technology in the sterilization of insect pests to protect fruit and other crops.

Photo: United Nations



An IAEA fellow trained in food quality testing using nuclear-derived techniques in 2012 at the Joint FAO/IAEA Food and Environmental Protection Laboratory in Seibersdorf, Austria.

Photo: IAEA

FOOD

IAEA fellows attending training on plant mutation breeding technology in 2012 at the Joint FAO/IAEA Plant Breeding and Genetics Laboratory in Seibersdorf, Austria.

Photo: IAEA



Vets from Cameroon's National Veterinary Laboratory in 2012 draw blood from an animal in Gabarey Waka to test for peste des petits ruminants (PPR) using nuclear-related techniques. PPR is a highly contagious disease that kills goats and sheep.

Photo: IAEA





Thanks to drip irrigation optimized through nuclear science, introduced in Sudan in 2015 with IAEA support, Sudanese women run small-scale farms and gardens that thrive in water-scarce areas of Sudan.

Photo: IAEA

AGRICULTURE



A scientist at a 2016 IAEA training course learns how to use a nuclear-derived technique to detect the Zika virus and to control the mosquito vectors by integrating the sterile insect technique (SIT) into comprehensive mosquito control plans.

Photo: IAEA

WATER AND THE ENVIRONMENT

Water security has become a critical issue in human development and environmental and economic sustainability, particularly in the light of global population growth.

The IAEA promotes the application of nuclear techniques to help locate, manage and conserve fresh water, as well as to protect the oceans. It provides Member States with training in isotope hydrology, as well as expert services and analyses to broaden the understanding of natural freshwater systems. Nuclear techniques are used to study environmental processes and the impact of climate change on the marine environment.



Scientists from the IAEA International Laboratory of Marine Radioactivity in Monaco drawing water samples from the Mediterranean in 1971 and using isotopic techniques to study the effects of radioactivity in the sea and on marine life.

Photo: IAEA

Scientists at the IAEA Environment Laboratories in Monaco in 2011 using isotopes to study biological processes in order to understand how marine organisms react to ocean acidification and warming.

Photo: IAEA



A team of scientists lowering core sediment sampling equipment off the coast of Honduras in 2009 to study the impact of water pollution using nuclear techniques.

Photo: IAEA

WATER



In the Gulf of Fonseca off the coast of El Salvador, an IAEA-trained researcher uses radiotracers in 2010 to analyse the origin, content and route of marine pollution.

Photo: IAEA



Thanks to nuclear techniques, a Vietnamese farmer has been able to control soil erosion on his coffee plantation.

Photo: Dalat Nuclear Research Institute, Viet Nam

ENVIRONMENT

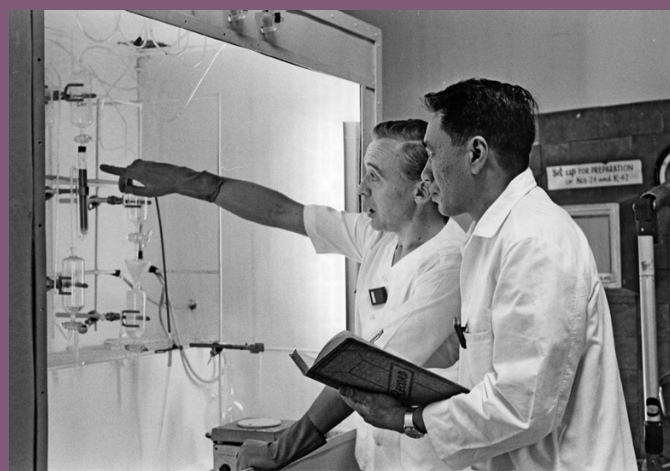
Isotopic techniques are used to conduct comprehensive assessments and management of water resources for domestic, industrial and agricultural uses.

Photo: IAEA



INDUSTRIAL APPLICATIONS

Many safe, tested nuclear techniques are used to identify and assess the properties of materials, measure pollution levels, sterilize and disinfect components, monitor and optimize industrial processes and change chemical, physical and biological properties to produce novel materials. Radiation can be used for the analysis and processing of substances. The IAEA supports Member States in the application of nuclear and isotopic techniques across a wide range of industries.



The radioisotope production unit at the Philippine Atomic Research Centre in Quezon City, in operation since 1965, meets increasing demand for a wide variety of radioisotopes, particularly for use in medicine.

Photo: IAEA

IAEA NUCLEAR APPLICATIONS LABORATORIES

The IAEA has 12 dedicated specialist laboratories located in Vienna, Seibersdorf (Austria) and Monaco, which help Member States tackle fundamental development issues such as food security, water resource management, human health and the monitoring and management of environmental radioactivity and pollution.

A researcher at Myanmar's Department of Atomic Energy is testing equipment to be used for non-destructive testing at the country's oil refinery.

Photo: IAEA



INDUSTRY



At Vienna's Museum of Fine Arts in 2006, conservation scientists, trained at the IAEA, aim precise X-ray beams at the 16th century Italian golden table sculpture known as the Saliera. Nuclear-based techniques are used to study works of art.

Photo: IAEA



Radiation technologies are used to make wires and cables stronger and more resistant to chemicals and fire at the Nuclear and Energy Research Institute (IPEN) in São Paulo, Brazil, in 2015.

Photo: IAEA

State-of-the-art technology used to produce radiopharmaceuticals in Viet Nam developed with IAEA support, in 2014.

Photo: IAEA



Post-injection monitoring of a radiotracer as part of sediment transport investigation conducted at the Kolkata Port, India, in 2016.

Photo: Bhabha Atomic Research Centre

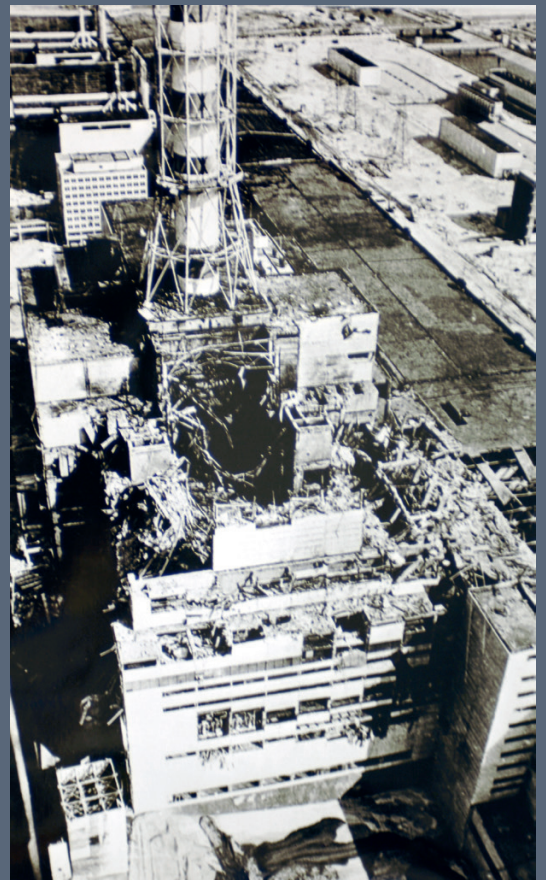


NUCLEAR SAFETY AND SECURITY

The IAEA establishes and adopts safety standards for the protection of people, society and the environment from the harmful effects of ionizing radiation. These safety standards reflect an international consensus on what constitutes a high level of nuclear safety.

The IAEA serves as the global platform for nuclear security, helping to minimize the risk of nuclear and other radioactive material falling into the hands of terrorists, or of nuclear facilities being subjected to malicious acts.

The IAEA further assists Member States to build capacities and works to strengthen the nuclear safety and security framework globally, through peer review services and other dedicated international and national programmes and projects.



The 1986 Chernobyl nuclear accident had a profound impact which led to increased international cooperation on safety and the adoption of several conventions to enhance nuclear safety and emergency response.

Photo: Ukrainian Society for Friendship and Cultural Relations with Foreign Countries

The IAEA fact-finding mission team examines the damaged reactors at the Fukushima Daiichi nuclear power plant on 27 May 2011 to assess tsunami damage and draw initial lessons that could be learned from the accident.

Photo: IAEA



The IAEA Incident and Emergency Centre (IEC) following the 11 March 2011 accident at the Fukushima Daiichi nuclear power plant. The IEC maintains a 24-hour hotline for notification and requests for assistance in case of nuclear or radiological emergencies.

Photo: IAEA

SAFETY

Border security authorities in Padang Besar, Malaysia, conducting a radiation assessment in 2012 using hand-held radiation detectors. The IAEA supports Member States' efforts to strengthen nuclear security, including border checks using specialized equipment.

Photo: IAEA





The IAEA supports Member States in ensuring the safe and secure transport of radioactive material used in many peaceful applications such as in energy, industry, medicine, agriculture, research, manufacturing, and mineral exploration.

Photo: IAEA

SECURITY



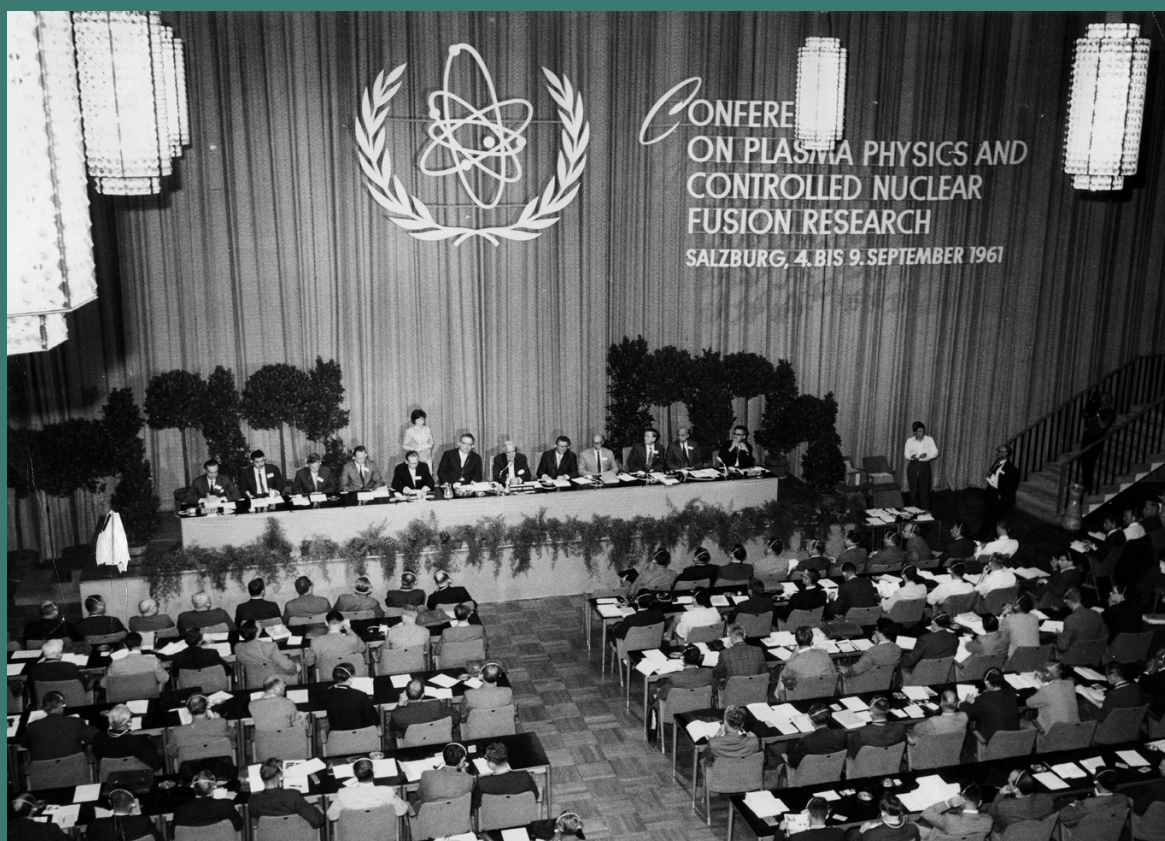
Before and after: environmental remediation of a former uranium mine in France's Limousin region. The IAEA promotes and facilitates collaboration between countries to share knowledge and implementation of environmental remediation projects.

Photo: AREVA/France

NUCLEAR POWER AND FUEL CYCLE

The best known peaceful application of nuclear technology is nuclear power. Many countries see nuclear power as an affordable, reliable and clean source of energy that can help to mitigate the impact of climate change. It is a significant part of the world's energy mix and its use is expected to grow in coming decades.

The IAEA promotes the efficient, safe and secure use of nuclear power by supporting existing and new nuclear programmes around the world. It provides technical support, catalyses innovation and helps to build capacity in energy planning and analysis, and in nuclear information and knowledge management.



More than 500 scientists from 28 nations attended an IAEA conference on plasma physics and controlled nuclear fusion research in Salzburg, Austria, in 1961. The IAEA supports research on nuclear fusion.

Photo: IAEA



The decommissioning of the MERLIN research reactor in Germany in 2008.

Photo: Jülich Research Centre

NUCLEAR POWER

IAEA Director General Yukiya Amano at the ONKALO nuclear waste repository in Olkiluoto, Finland, in 2012. The IAEA promotes the safe and secure disposal of radioactive waste.

Photo: Posiva



IAEA experts explain sustainable practices in phosphate mining and the potential extraction of uranium as a by-product at the Benguerir Mine in Morocco in 2014.

Photo: IAEA

Signing of the Host State Agreement on 27 August 2015 for the IAEA Low Enriched Uranium (LEU) Bank in Ust'-Kamenogorsk, Kazakhstan, scheduled to be built by September 2017. LEU is used to make fuel that powers most nuclear reactors.

Photo: Government of Kazakhstan



The construction site of the Barakah nuclear power plant in the United Arab Emirates in 2016. The IAEA assists countries using or introducing nuclear power to do so safely, securely and sustainably.

Photo: IAEA

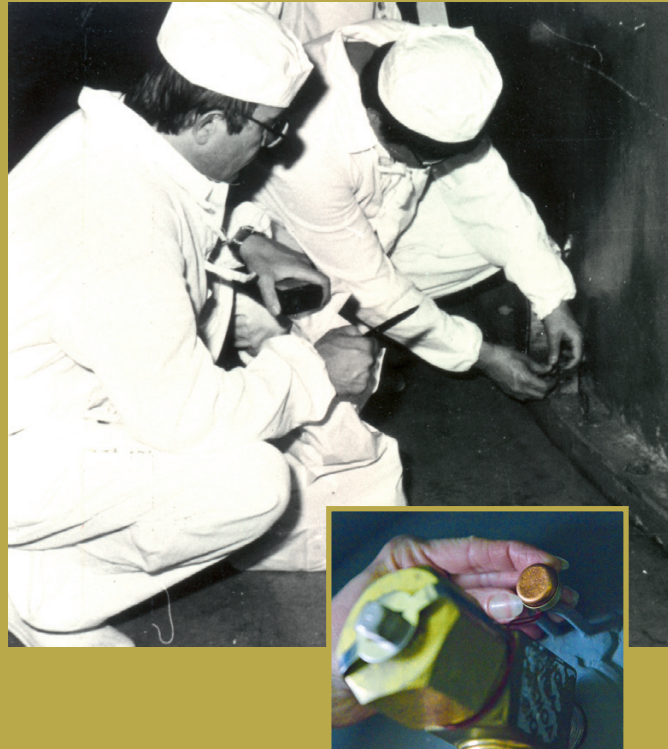
FUEL CYCLE

NUCLEAR VERIFICATION

The IAEA applies technical measures, or ‘safeguards’, to verify that States are honouring their international legal obligations to use nuclear material only for peaceful purposes. Its independent verification work allows the IAEA to play an indispensable role in deterring the proliferation of nuclear weapons.

The implementation of the ‘Road-map for the Clarification of Past and Present Outstanding Issues regarding Iran’s Nuclear Program’ agreed between Iran and the IAEA and of the Joint Comprehensive Plan of Action (JCPOA) — agreed between China, France, Germany, the Russian Federation, the United Kingdom, the United States of America, the High Representative of the European Union and Iran — have opened a new phase in relations between Iran and the IAEA.

The enhanced capabilities of the IAEA’s Safeguards Analytical Laboratories have strengthened the IAEA’s ability to conduct timely and independent analyses of nuclear material samples and ensure quality control to maintain confidence in analytical findings used for safeguards purposes.



IAEA inspectors apply seals to a reactor containment shield at the Kozloduy nuclear power plant in Bulgaria. These specialized seals are attached to protect against any unauthorized or undeclared access to or removal of nuclear material without detection.

Photo: Kozloduy nuclear power plant/Bulgaria

An IAEA safeguards inspection team in Iraq in December 2002. The discovery of Iraq's clandestine nuclear programme in the early 1990s was followed by a substantial strengthening of the effectiveness of IAEA safeguards.

Photo: IAEA



An IAEA safeguards inspector measuring low enriched uranium in a cylinder at the URENCO Almelo enrichment plant in the Netherlands in 2015.

Photo: IAEA

NUCLE VE



Staff at the plutonium laboratory of the newly constructed IAEA Nuclear Material Laboratory in Seibersdorf, Austria. Completed in 2015, this laboratory will significantly enhance the IAEA's capabilities for the analysis of nuclear and environmental samples.

Photo: IAEA



Safeguards inspectors play an important role in the global non-proliferation regime, carrying out verification activities under safeguards agreements at locations all around the world, such as at the Dukovany nuclear power plant in the Czech Republic in 2015.

Photo: IAEA

EAR RIFICATION

IAEA Director General Yukiya Amano and Vice President of the Islamic Republic of Iran Ali Akbar Salehi after the signature of the 'Road-map for the Clarification of Past and Present Outstanding Issues regarding Iran's Nuclear Program' in Vienna on 14 July 2015.

Photo: IAEA



LOOKING INTO THE FUTURE

OUR WORK CONTINUES

Building on the successes of the past six decades, the IAEA's activities in nuclear energy, nuclear safety and security, nuclear applications, technical cooperation and non-proliferation continue to benefit humanity.

The IAEA gives high priority to making nuclear science and technology available to its Member States, especially developing countries, in a safe, secure and peaceful manner, helping them to achieve the United Nations Sustainable Development Goals. The initiatives to modernize the IAEA laboratories, known as the ECAS ('Enhancing Capabilities of the Safeguards Analytical Services') and ReNuAL ('Renovation of the Nuclear Applications Laboratories') projects, will enable the IAEA to meet its growing obligations in nuclear verification as well as the increasing demand for the services provided by its nuclear applications laboratories.

The IAEA remains an organization that delivers concrete results and makes a real difference to the lives of people worldwide.



IAEA training for Member States in radioisotope techniques commenced in the early 1960s and included a bus used as a mobile radioisotope laboratory donated to the IAEA and used for the first time in Mexico.

Photo: IAEA



Radiation oncologists from developing countries receiving hands-on training in 3D radiotherapy tools to provide more accurate cancer diagnosis and treatment at IAEA Headquarters in 2015.

Photo: IAEA



An IAEA-supported training course at a Slovenian research reactor in 2015. Research reactors fulfil diverse needs, including medical and industrial isotope production, elemental analysis, silicon doping, neutron beam based materials research and technology development.

Photo: IAEA

IAEA fellows being trained in nuclear and isotopic techniques at the Joint FAO/IAEA Soil and Water Management and Crop Nutrition Laboratory in Seibersdorf, Austria in 2012.

Photo: IAEA



At the IAEA General Conference on 14 September 2015, the IAEA unveiled the model for the new nuclear applications laboratories in Seibersdorf, under the Renovation of the Nuclear Applications Laboratories (ReNuAL) project.

Photo: IAEA

Over 1000 visitors of all ages attended the Long Night of Research at the Vienna International Centre in 2016. Young people were particularly interested in learning about nuclear science and technology.

Photo: IAEA



FUTURE

60 years 60 pictures

AN OVERVIEW OF THE IAEA'S WORK

“Science is fundamental for development, and technological advances are a must if we are to tackle the many challenges that face humankind today.

Those include generating enough energy, tackling climate change, producing enough food to provide for a growing world population, making the benefits of modern health care available to everyone, and ensuring there is always a high level of nuclear safety and security and that nuclear technologies are used exclusively for peaceful purposes.

The IAEA is active in all of these areas. The impact of our work in the peaceful uses of nuclear science and technology is significant. In a nutshell, our mandate is Atoms for Peace and Development.”

*Yukiya Amano
IAEA Director General*



IAEA

60 Years

Atoms for Peace and Development