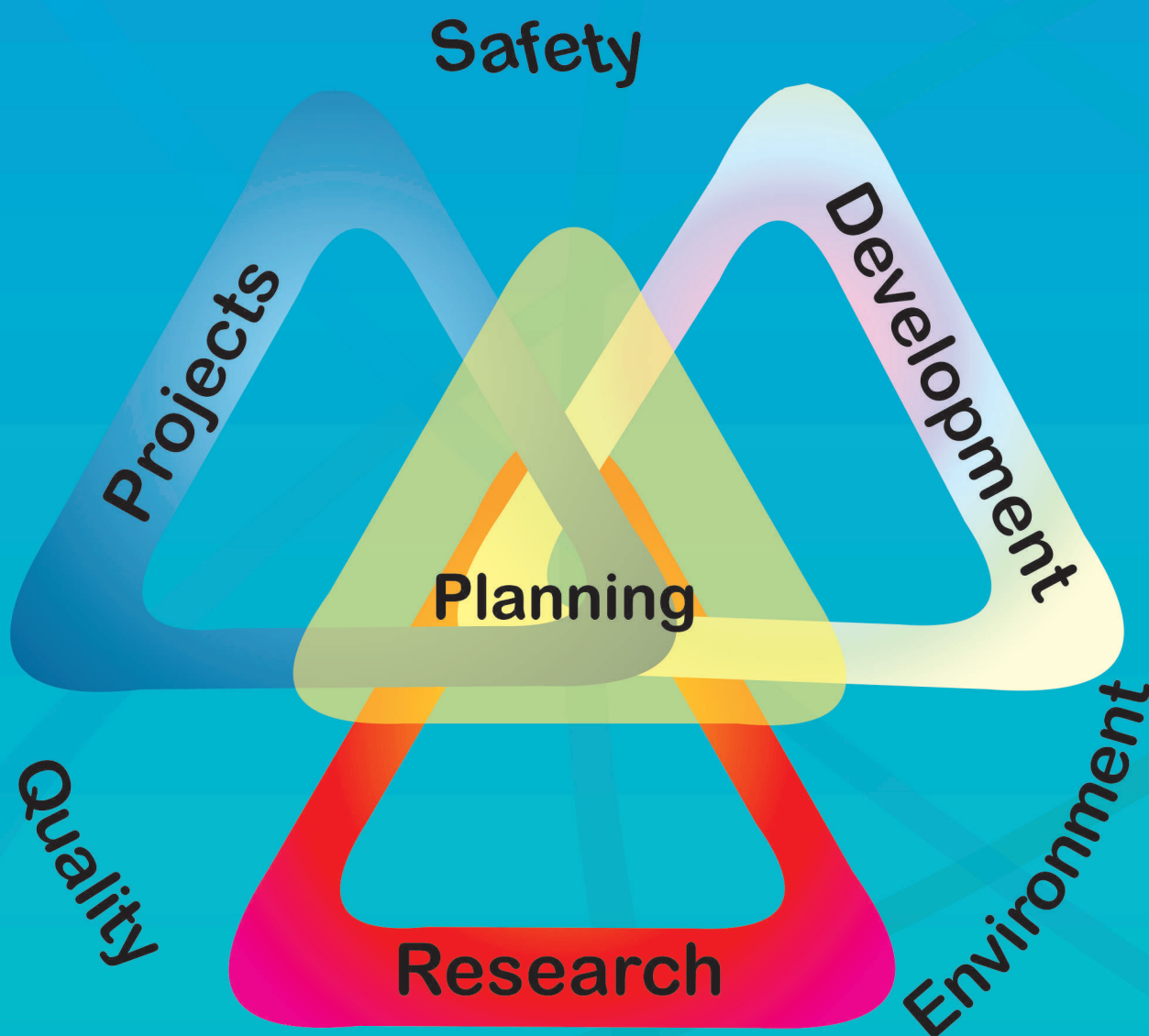


Argentine Atomic Energy Commission



Strategic Plan
2015-2025



Argentina is a nuclear country

ARGENTINE ATOMIC ENERGY COMMISSION

STRATEGIC PLAN



2015-2025

Update of the Strategic Plan 2010-2019

AUTHORITIES



LETTER BY THE PRESIDENCY

Since its creation 65 years ago, the Argentine Atomic Energy Commission (*Comisión Nacional de Energía Atómica, CNEA*) has been the lead agency in the Argentine nuclear development and a highlighted stakeholder in science and technology in Argentina.

The decision made by the national government to launch the Argentine Nuclear Plan in 2006, boosted by the former President Néstor Kirchner and ratified by the President Cristina Fernández de Kirchner, allowed the nuclear sector to recover its full capacity development after a period of standstill which led to a significative reduction of the nuclear energy Research and Development during the nineties.

Thanks to the permanent support provided by the Minister of Federal Planning, Public Investment and Services, Architect Julio Miguel De Vido, these areas were given the possibility of unprecedented development in Argentina. Therefore, in order to sustain and consolidate this process, it is essential that a long term plan exists, both to maintain objectives of technological development from the area and to keep achieving that advancements which are translated into improvements for the life quality of society.

The Argentine Nuclear Plan is the framework that has enabled projects from the nuclear energy R&D to be developed in such a way that is not through isolated actions by a scientific and technical group but as part of a State policy that lays the strategic importance that nuclear energy has on the social and economic development of Argentina.

Therefore, in line with what was aforesated, in 2008, CNEA started planning all of its activities in the long term and established a Strategic Plan to make projections for 10 years. In order to achieve this, it boosted an intense activity of coordination, integration and planning which included -directly and indirectly- all of the directors, professionals, technicians and employees of the Institution.

As a corollary of this activity, a flexible and open methodological tool was designed to orient activities and projects daily undertaken at the time that a periodical revision and update of institutional objectives and actions are possible within the Argentine Nuclear Plan.

In this sense, our motivation to elaborate the Strategic Plan keeps giving a reference framework to undertake programmed activities and to apply the assigned economic resources and the available human resources.

By taking into account guidelines set forth by the National Government in the long term of the nuclear energy R&D, CNEA has focused on planning of projects in the following areas:

- Uranium Exploration and Production. - Nuclear Fuels. - Research and Small reactors. - Radioactive Waste Management. - Nuclear Medicine and Radioisotopes. - Basic Science Research and Innovation and Technology Transfer. - Quality and Safety. - Academic and Professional Training. - Environmental Protection. - Relations with the Community. - International Cooperation.

These areas structure a substantial part of the daily tasks that CNEA undertakes in each branch, atomic centre, regional centres, reactors, labs and projects. Throughout these years, we have incorporated new top-level equipment and built 51 000 square metres of new facilities. It is worth highlighting that it would be impossible to conduct remarkable daily work as the lead agency in nuclear energy in Argentina if it was not for the dedication, experience, creativity and enthusiasm of our personnel.

In conclusion, the Strategic Plan 2015-2025 herein presented boosts the continuity of the projects and research undertaken in different scientific and technological fields in the long term. Moreover, this Plan is the document that summarizes contribution of CNEA to consolidating our country as regional leader and relevant international stakeholder in the development of this technology in favour of all the Argentineans.



Eng. Mauricio **Bisauta**
Vicepresident



Lic. Norma Luisa **Boero**
President

HEADQUARTERS





E ENERGIA ATOMICA



CNEA IN ARGENTINA



CONSTITUYENTES ATOMIC CENTRE



EZEIZA ATOMIC CENTRE



BARILOCHE ATOMIC CENTRE

ATOMIC CENTRES

CNEA IN ARGENTINA - REGIONAL OFFICES



NORTH WESTERN REGIONAL OFFICE, PROVINCE OF SALTA



CENTRAL REGIONAL OFFICE, PROVINCE OF CÓRDOBA



PATAGONIA REGIONAL OFFICE, PROVINCE OF CHUBUT



CUYO REGIONAL OFFICE, PROVINCE OF MENDOZA

CNEA IN ARGENTINA



PILCANIYEU TECHNOLOGICAL COMPLEX, PROVINCE OF RÍO NEGRO



SAN RAFAEL INDUSTRIAL MINING COMPLEX, PROVINCE OF MENDOZA

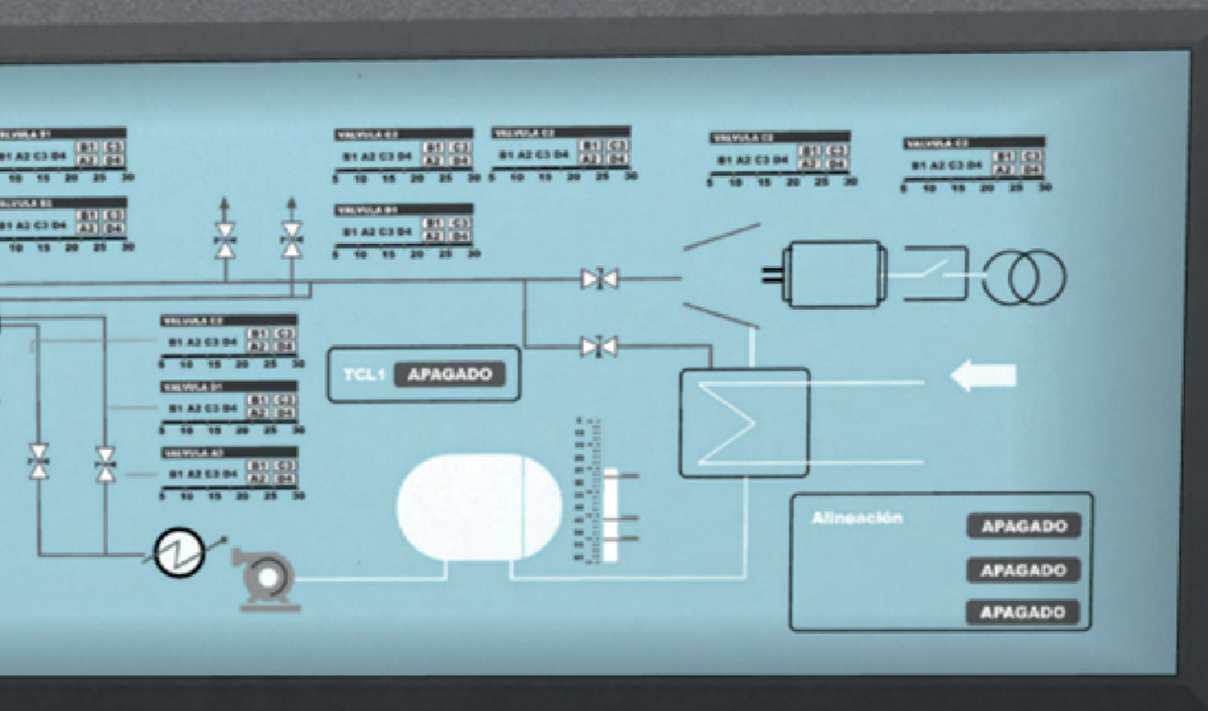


"LOS ADOBES" CAMP CERRO SOLO, PROVINCE OF CHUBUT

TECHNOLOGICAL AND INDUSTRIAL COMPLEXES

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CNEA MISSION AND VISION



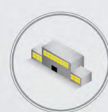
MISSION

"Advise the Executive on defining the nuclear policy; undertake technological research and developments, engineering and services in the industry, within the framework of the peaceful uses of nuclear energy"

VISION

"Strengthen the position of CNEA as a lead agency in the Argentine nuclear development, being the institution to back all of the nuclear energy R&D in the country and strengthen the position of Argentina around the world as a leader in the peaceful uses of nuclear energy"

INTRODUCTION



3 ATOMIC CENTRES



6 RESEARCH REACTORS



3 NUCLEAR POWER PLANTS IN OPERATION



1 NUCLEAR POWER PLANTS UNDER CONSTRUCTION



813 NUCLEAR MEDICINE FACILITIES



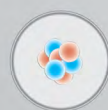
5 NUCLEAR MEDICINE CENTRES IN OPERATION



1 TECHNOLOGICAL POLO



9 AREAS WITH MINING ACTIVITY



5 PARTICLE ACCELERATOR FOR RADIOISOTOPE PRODUCTION



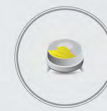
339 FACILITIES FOR INDUSTRIAL APPLICATIONS



4 IRRADIATION PLANTS FOR INDUSTRIAL USES



1 URANIUM ENRICHMENT FACILITY



1 URANIUM PURIFICATION FACILITY



1 URANIUM PURIFICATION FACILITY UNDER CONSTRUCTION



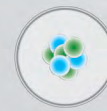
1 INDUSTRIAL MINING COMPLEX



1 HEAVY WATER PRODUCTION FACILITY



13 NUCLEAR MEDICINE FACILITIES UNDER CONSTRUCTION



5 PARTICLE ACCELERATOR FOR RESEARCH APPLICATIONS



4 REGIONAL: CENTRE, NORTHWEST, CUYO, PATAGONIA



1 NUCLEAR FUELS PRODUCTION FACILITY



3 ACADEMIC TRAINING INSTITUTES

In the second semester of 2012, by following guidelines established during the elaboration of CNEA Institutional Strategic Plan 2010-2019 (*Plan Estratégico Institucional*, PEI-2010), the tasks were set out in order to update the Plan in furtherance of continuous improvement.

The objective of this process was to conduct an analysis of the period 2010-2014 and to make new projections by the year 2025 to strengthen and boost the nuclear reactivation project which started in 2006.

This revision makes it possible to conduct an evaluation about the advancement of CNEA nuclear projects and actions by integrating budgetary and intellectual capital needs with strategic objectives which are foreseen to face current and future challenges.

As from April 2013, updating work was undertaken to develop CNEA Strategic Plan 2015-2025 through a virtual platform oriented towards participation in a collaborative way. In the same way that it was conducted in the PEI-2010, work on thematic areas with specialists of each of them continued, by fostering participative dialogues as the centre to gather opinions; a deep transformation of culture and institutional commitment was sought, by involving directly 250 people and through them by involving indirectly the whole personnel of the Institution.

A revision of Strengths, Weaknesses, Opportunities and Threats of each of the thematic areas was conducted, as well as objectives, achievements and difficulties. The Mission, Vision and Objectives of each thematic area of CNEA are included in this publication.

It is well known that the nuclear energy R&D needs long term planning; therefore, a process of planning during 11 years is conducted.

Moreover, dynamism and processes involved in it will make it possible to identify new strategies in time, to acquire better coordination and integration to avoid delays in the construction of Major Nuclear Projects, identification of stakeholders and their real participation, thus improving efficiency and performance of the whole process.

The plan was designed based on the following topics:

▀ Contribute from a technological viewpoint to electricity generation by means of nuclear energy.

▀ Guarantee uranium reserves and supply for the Argentine nuclear power plants.

▀ Build and operate CAREM 25 Nuclear Power Plant, positioning Argentina as one of the designor countries of nuclear power plants.

/// Operate the gaseous diffusion Uranium Enrichment Mock-Up facility and develop other technologies by strengthening the technological domain of every nuclear fuel cycle stage.

/// Reaffirm the development and national supply of fuel assemblies for Argentine reactors.

/// Contribute to public health by means of nuclear energy applications, particularly to the radioisotope production and state-of-the-art nuclear medicine centres.

/// Build and operate the RA-10 Argentine Multipurpose Nuclear Reactor and consolidate Argentina as a supplier of research and radioisotope reactors and its fuels.

/// Continue with fulfilling the obligations derived from the Radioactive Waste Management National Programme and CNEA environmental liabilities.

/// Strengthen commitment of the Institution and its personnel to safety, environment, quality and planning.

/// Strengthen research and development lines that contribute towards sustaining nuclear activities.

/// Preserve and boost intellectual capital of the Institution.

All of the activities will be developed within the framework of the peaceful uses of nuclear energy in a planned way, by following guidelines set out by quality and environmental policies of the Institution in agreement with regulations of safety and radiation protection set forth by the Nuclear Regulatory Body (*Autoridad Regulatoria Nuclear*, ARN) and abiding by all the legislation in effect and by international commitments assumed by the country.

In 2015, after two years of work, this publication was conducted in line with the CNEA 65th anniversary. It is expected that this will make it possible to establish and to define CNEA nuclear activities and projects for the next decade and, moreover, this Plan contributes towards the State Policy of the nuclear sector.

HISTORICAL DEVELOPMENT

CNEA has been able to transcend time due to the acquisition of scientific and technological knowledge about its field; due to its achievements and to overcoming the obstacles encountered in each historical moment the Institution has gone through; all of these are the most important characteristics for CNEA.

Therefore, CNEA developed capacities to provide high technological content for society and for companies that provide goods and services specifically in the nuclear industry, as well as in other related fields.

By analysing CNEA history, it can be stated that, few years after 1943, when Enrico Fermi produced the controlled chain nuclear reaction introducing the nuclear topic into the scientific community worldwide, the first steps to establish the Argentine Atomic Energy Commission were taken. CNEA became responsible for all of the nuclear activities with peaceful uses undertaken at a national level.

The establishment of CNEA in 1950 was framed within an industrialization process boosted by the State with the firm intention of not only being owner but also designer of nuclear technology.

During its first decade (1950-1959), the nuclear energy R&D was oriented towards:

- Organizing the first research and development piece of equipment.
- Training its personnel abroad in the most advanced countries of the nuclear industry.
- Setting up the Bariloche Atomic Centre (*Centro Atómico Bariloche*, CAB) in 1955, which is located in the province of Río Negro.
- Training professionals specialized in physical sciences, and for such purpose an Institute of Physics was created, currently known as Institute Balseiro.
- Starting uranium prospecting and exploration.
- Designing and constructing the first experimental reactor RA-1, 40 kW_e, Argonaut type and its fuel assemblies, which started in 1957.
- Establishing the Constituyentes Atomic Centre (*Centro Atómico Constituyentes*, CAC) in 1958, located in the northern part of Gran Buenos Aires.
- Selling know-how to manufacture fuel assemblies for “ARGONAUT” type reactors to the German company Degussa-Leybold AG in November 1958.

■ In 1959, in the Clinical Hospital of the University of Buenos Aires, the Radioisotope Lab for Haematological Studies was inaugurated, which anticipated the “José de San Martín Nuclear Medicine Centre of the Clinical Hospital” which started up in 1969.

During the second decade (1960-1969), the following activities were undertaken:

■ The design and construction of experimental reactors RA-0 1 W_t, RA-2 0,1 W_t and RA-3 3 MW in 1965, 1966 and 1967 accordingly.

■ Research in metallurgy and fabrication of fuel assemblies for experimental reactors.

■ Operation of a leaching facility in Don Otto (province of Salta).

■ In the beginning of 1964, a new stage in the history of nuclear energy in Argentina began thanks to the possibility of building CNA-I (*Central Nuclear Atucha I*, CNA-I) nuclear power plant. During a 14-month period, a feasibility study was completed in CNEA with the recommendation of building a 300 to 500 MWe plant in the neighbourhood of Lima, province of Buenos Aires. This study concluded that the project was technically feasible, economically convenient and financially sound. Moreover, thanks to a 40% to 50% of contribution of the national industry to construction and operation of the facility, the development of technological and scientific activities could be taken into account. Additionally, it was necessary to define whether to buy a light water reactor or a heavy water reactor.

■ Construction of the first uranium concentration plant in Malargüe (province of Mendoza) and beginning of operation in 1965 and its technology developed in CNEA.

■ The establishment of the Ezeiza Atomic Centre (*Centro Atómico Ezeiza*, CAE), in 1967, located in the western part of Gran Buenos Aires.

During the third period (1970-1979), radioisotopes production techniques and applications of radiations in medicine, biology, industry and agriculture were developed.

■ To such purpose, in CAE, the following facilities were built:

- A semi-industrial multipurpose irradiation facility (1970) with a capacity of 1 000 000 Ci (Curies).

- A radioisotope production facility in RA-3 reactor which has met national demand and has produced exports to Brazil since its creation in 1972.

- A Cobalt-60 sealed radioactive source production facility for medical and industrial uses (1978).

/// In 1974, the construction of CNA-I was concluded and its commercial operation began.

/// In 1976, INVAP was established jointly with the province of Río Negro.

/// During that year, the fuel manufacturing pilot plant for CNA-I NPP was built in CAC.

/// In 1978, a heavy water experimental plant started which had a production capacity of 3 t/year in Lima, province of Buenos Aires.

/// In 1979, the construction of a reprocessing pilot plant began in CAE.

/// In August 1979, the assignment of the exploitation of uranium ore deposits “Los Gigantes” started in the province of Córdoba.

/// Also, in 1979, the uranium concentration plant was inaugurated in San Rafael, province of Mendoza.

/// In late 1979, the construction of heavy ions accelerator facility “Lab Tándem Argentino” (TANDAR) started in CAC.

The development of nuclear energy during the next decade (1980-1989) was characterized by:

/// Completion of nuclear fuel cycle stages, prior to the introduction of fuel assemblies into the reactor (front end). For such purposes, the following started:

- New Uranium ore deposits exploitation at the San Rafael Industrial Mining Complex (Complejo Minero Fabril San Rafael, CMFSR), Sierra Pintada (Mendoza), Los Gigantes (Córdoba), La Estela (San Luis) and Los Adobes (Chubut).

- Operation of a uranium concentrate purification facility and uranium dioxide production facility with a capacity of 150 t/year in Córdoba Industrial Nuclear Complex.

- In 1982, the start up of a fuel fabrication facility to supply nuclear power plants in operation located in CAE (CONUAR S.A.). One year later, the first fuel assemblies were delivered for CNA-I.

- In 1983, the domain of uranium enrichment technology through gaseous diffusion was developed by CNEA in collaboration with INVAP in Pilcaniyeu, province of Río Negro.

- In 1984, a special alloys plant started up in CAE which is mainly devoted to produce rods and zircaloy components for fuel assemblies. In 1986, the corporation FAE S.A. was established.

- Regarding the stages of the nuclear fuel cycle, after the passage of the fuel element through the reactor ("back end"), a spent fuel assembly reprocessing pilot plant was built, which was later shut down.

/// The RA-6 experimental reactor was built in 1982 in CAB, province of Río Negro.

/// The second nuclear power plant Embalse (*Central Nuclear Embalse*, CNE) was finalized by a consortium formed by Atomic Energy of Canada Limited (AECL) and by the Italian Construction Company (Italimpianti). The nuclear power plant was located in the dam Río Tercero, province of Córdoba. The CNE NPP started up in January 1984 with a net capacity of 600 MW_e. The main attraction of the Canadian offer was the agreement to transfer technology, which would be used to acquire the necessary knowledge in order to guarantee an independent future production of nuclear power.

/// The next nuclear power plant to be built was Atucha II NPP (*Central Nuclear Atucha II*, CNA-II). This project began in the middle of the eighties through an agreement signed between CNEA and Siemens AG. The German company was chosen as a supplier under the condition that it would supply both the nuclear power plant and a heavy water production plant (HWPP) which was inaugurated in 1993. The agreement included the transfer to CNEA of the know how of design, fabrication and assembly during its construction and of other three nuclear power plants which were part of an electricity generation expansion plan in a 20-year period. To implement that project, the corporation Empresa Nuclear Argentina de Centrales Eléctricas Sociedad Anónima (ENACE S.A.) was established jointly by Siemens Kraftwerk Union (KWU), which owned 25%, and CNEA, which owned 75%. As from 1982, there were difficulties in granting funds for national supplies, a situation which was aggravated by the permanent modification of the exchange rate and which caused partial delays and standstills, along with growing difficulties of the Argentine economy. This situation lasted for several years, and led to the dissolution of ENACE S.A. and that work on the project had practically come to a stop since 1994.

/// In 1985, the fabrication of mixed oxide fuel (MOX) took place in CAC destined for irradiation tests, and for post-irradiation analysis in the Petten reactor in the Netherlands.

/// In that year, the production of molybdenum-99 fission began in the radioisotope production facility in CAE.

/// An Argentine-Brazilian Joint Presidential Statement on nuclear policy was issued in November 1985 in Foz de Iguazú, Brazil.

/// In 1986, the Argentine government signed the Convention on the Physical Protection of Nuclear Material.

/// From 1985 to 1987, U3O8-Al fuels were fabricated to 20% U-235 for the Peruvian critical facility RP-0.

/// In December 1988, the Nuclear Research Centre of Peru and RP-10 reactor built by CNEA were formally inaugurated in Huarangal, Peru.

/// In the period 1988-1989, U₃O₈-Al fuels were fabricated to 20% U-235 for the Algerian NUR Reactor. This reactor was built by INVAP SE and inaugurated in 1989.

/// In late 1989, the state company devoted to engineering services Empresa Neuquina de Servicios de Ingeniería S.E. (ENSI S.E.) was established to operate the Heavy Water Production Plant (HWPP) in Arroyito town.

/// During the period 1989-1992, the fuel assemblies of U₃O₈-Al were fabricated to 20% U-235 for the Teheran Research Reactor from Iran.

In the following decade (1990-1999), the goals appearing below were achieved in spite of the political situation which was unfavourable from an energetic viewpoint:

/// In March 1990, RA-3 research reactor used to produce radioisotopes was relaunched with a core of low enriched uranium fuel (20% concentration of U-235) which was designed and built by CNEA.

/// In the same month, the Hot Cells Lab (*Laboratorio de Celdas Calientes*, CELCA) was inaugurated in CAE.

/// In 1990, the HWPP started up in Arroyito, province of Neuquén, with a design capacity of 220 t nuclear grade heavy water to replace that input to the operating nuclear power plants and supply the initial stock of future nuclear power plants.

/// In November 1990, a Joint Presidential Brazilian Argentine Statement was made about a common nuclear policy. The event took place in Foz de Iguazú, Brazil.

/// In late 1990, the non-profit School of Nuclear Medicine (*Fundación Escuela de Medicina Nuclear*, FUESMEN) with its headquarters in the city of Mendoza was established through an agreement among CNEA, the Government of the province of Mendoza and the University of Cuyo.

/// In 1991, an Agreement was signed jointly by the Argentine Brazilian Accountancy and Nuclear Material Control Agency (ABACC), by the government of Argentina and Brazil and by the IAEA in Vienna. This agency was established in September 1992 in Río de Janeiro, Brazil, as a world regional cooperation model in the pacific uses of nuclear energy.

/// In May 1991, FUESMEN was inaugurated.

/// In November 1993, in CAC, the Institute of Technology, currently known as Instituto Sábató, was established jointly with the University of San Martín.

/// In 1994, a radioisotope production cyclotron was inaugurated in CAE.

/// In August 1994, the National Executive Power Decree No. 1540/94 was issued which restructured CNEA and established the National Nuclear Regulatory Body (*Ente Nacional Regulador Nuclear*, ENREN) as an independent body under the jurisdiction of the Presidency and the corporation Nucleoeléctrica Argentina S.A. (NA-SA), within the scope of the Secretary of Energy.

/// In February 1995, Argentina adheres to the Treaty on Non-Proliferation of Nuclear Weapons.

/// In 1995, there was an industrial scale operation of the ^{99}Mo Production Facilities by fission for medical purposes. This facility became the first worldwide facility to operate with low enriched uranium targets (20% concentrate of U-235). This was the response to the international requirement to reduce the use of U-235 to 90% due to the risks of proliferation derived from its use.

/// As from 1996, CNA-I has started to use low enriched uranium fuel targets (LEU, U-235 0.85%) and, since 2001, it has been the first and only worldwide nuclear power plant to use heavy water that fully operates with LEU, a result of CNEA scientific achievements. This change of natural uranium to LEU brought a decrease of 40% in consumption of fuel with a reduction of around 30% in the fuel cost.

/// In 1997, the critical facility RA-8 10 W_t in Pilcaniyeu Technological Complex was built in the province of Río Negro.

/// In May 1997, the corporation DIOXITEK S.A. was established.

/// Between 1994-1998, the design, start up and training of personnel for the Fuel Manufacturing Pilot Plant (FMPP) to fabricate fuel assemblies for research reactors and fuels fabricates U_3O_8 -Al, 20% U-235 of Multipurpose Reactor ETRR-2 of 20 MW. In February 1998, the research and production reactor in Inshas, Egypt, was built by the State company INVAP S.E.

/// In January 1997, the Law of Nuclear Activity No. 24804 was enacted. This law regulates public and private activities that are developed in the nuclear field in Argentina and establishes tasks exercised by the National Government through CNEA and ARN, which has replaced ENREN. In November 1998, this law was regulated under the Decree No. 1390/98.

/// In 1998, the National Law No. 25018 Radioactive Waste Management Regime was sanctioned which establishes basic instruments for the adequate management of radioactive waste, which guarantee the protection of the environment, public health and rights of future generations.

/// As from 1999, a whole revision has been conducted on the project CAREM 25 NPP engineering.

From 2000-2010, the following goals were achieved:

/// In January 2000, a contract was signed between the state-owned corporation INVAP S.E. and the Australian Nuclear Science and Technology Organization ANSTO to build OPAL research and production 20 MW reactor. Fuels U_3Si_2 -Al, 20% U-235 destined for this reactor were fabricated by CNEA in CAC during the period 2003-2007.

/// RA-3 research and radioisotope production reactor was located in CAE in order to improve its production capacity of radioisotopes for medical purposes to become more efficient and as a source of neutrons for industrial applications and research.

/// In December 2001, the Radiochemistry Laboratory (*Laboratorio Facilidad Radioquímica*, LFR) was inaugurated in CAE.

/// In July 2002, the processes of separation and purification of Strontium-90 from fission products took place for the first time and had important applications in medicine and industry.

/// In August 2002, Argentina became the first country to use low enriched uranium targets (below 20%) for the regular production of Molybdenum-99 from fission products.

/// In March 2003, the supply of the radiopharmaceutical FDG for diagnostic purposes started through Positron Emission Tomographies (PET-CT) produced from Fluoride-18 in the cyclotron at CAE.

/// Also in March, the first Annual Report on Spent Fuel and Radioactive Waste Management was sent to the Argentine Congress within the framework of the Act 25018/98 National Law on Radioactive Waste Management Regime.

Within the framework of the environmental policy of the Institution, the environmental restoration works in Malargüe Mining Industrial Complex (PRAMU Project) started in March 2003.

In October 2003, the first application in Latin America of Boron neutron capture therapy (BNCT) was undertaken in RA-6 research reactor in Bariloche Atomic Centre, CAB.

In 2004, the non-profit Nuclear Diagnostic Centre (*Fundación Centro de Diagnóstico Nuclear*, FCDN) was established with a PET-CT system associated to a baby cyclotron.

In the end of 2005, the Joint Presidential Argentine-Brazilian Statement on Nuclear Policy in Puerto Iguazú was issued. The Additional Protocol to the Cooperation Agreement with Brazil was also signed for the development and application of peaceful uses of nuclear energy in reactors, nuclear fuels, radioisotope and radiopharmaceutical supply and radioactive waste management and in the areas of regulation and implementation of nuclear laws.

In May 2006, CNEA and NA-SA signed the Agreement on Cooperation in Nuclear Energy with the Atomic Energy of Canada Limited (AECL) in Ottawa.

In 2006, production of heavy water started to be used in CNA-II reactor.

On 23 August 2006, the Relaunch of the nuclear energy R&D in Argentina was officially announced by the Argentine Government.

In November 2006, the official inauguration of the Cosmic Rays Observatory Pierre Auger took place in Malargüe, Mendoza Province.

In December 2006, by means of an agreement with the National University of San Martín, the Nuclear Technology Institute Dan Beninson was created in CAE.

In April 2007, OPAL reactor, which was built by INVAP S.E. for ANSTO, was officially inaugurated.

In May 2007, the non-profit Nuclear Diagnostic Centre is officially inaugurated.

In July 2008, the World Bank granted a loan to contribute to financing activities of the PRAMU Project.

/// In 2009, RA-6 research reactor went critical with a new configuration of the core, by applying fuels of low-enriched uranium silicide (below 20%), becoming the first research reactor in Argentina to work with this type of fuel. An achievement was that every research reactor in Argentina used low-enriched uranium fuel assemblies by fulfilling non proliferation international agreements and the commitment of developing peaceful uses of nuclear energy in Argentina.

/// In July 2009, the first national container was manufactured, designed by CNEA to transport radioisotopes.

/// In September 2009, the IAEA appoints Institute Balseiro as a Collaboration Centre for the Development of Human Resources for Nuclear Technologies and their Applications.

/// In November 2009, the Law No. 26566 was enacted by ample majority in both chambers, declaring CNE PLEX (Plant Life Extension) a matter of national interest. This law was sanctioned in December 2009, and authorised the creation of trust-funds to conduct the above mentioned extension and to construct the fourth Argentine nuclear power plant. Likewise, CAREM 25 NPP is also a matter of national interest, and the law appoints CNEA to build it.

/// At the end of 2009, the Institute of Technologies in Detection of Astroparticles was established jointly by CNEA, the National Council of Scientific and Technical Research (*Consejo Nacional de Investigaciones Científicas y Técnicas*, CONICET) and the National University of San Martín (*Universidad Nacional de San Martín*, UNSAM).

At the beginning of the current decade, the following highlights should be mentioned:

/// Since December 2010, CNEA and ARN have become members of the Latin American Network for Education in Nuclear Technology (LANENT), fostered by the IAEA. This educational network has a website operated by CNEA.

/// In January 2011, the development of the prototype of fuel assemblies to be used in CAREM reactor was concluded, by means of a patented innovative contribution: the separator. This was an important achievement because to date in Argentina only fuel assemblies for research reactors have been designed.

/// In 2011, the process of CNA-II NPP startup began.

/// In 2012, in Vienna, CNEA and the IAEA signed the Practical Arrangements to reinforce cooperation agreements between both agencies in terms of education, training, outreach and nuclear knowledge management.

/// In November 2012, President Cristina Fernández de Kirchner inaugurated the new facilities of the Nuclear Medicine Service of the “José de San Martín” Clinical Hospital.

/// In 2013, the licence to build CAREM 25 NPP was obtained through a Preliminary Safety Report approved by ARN.

/// In December 2013, there was an agreement signed to supply the pressure vessel of CAREM 25 NPP.

/// In 2013, NA-SA conducted the first synchronization test of CNA-II with the electric network thus contributing with a 35 MW peak vapour of non nuclear origin during approximately 20 minutes.

/// In 2013, the stage of Basic Engineering concluded and the one of Detailed Engineering of the RA-10 Argentine Multipurpose Nuclear reactor started.

/// In February 2014, civil construction works of CAREM 25 started in the town Lima, Buenos Aires, in the vicinity of CNA-I and CNA-II.

/// In May 2014, ARN granted the licence to start up the nuclear phase of CNA-II. Later in June, NA-SA, together with the collaboration of CNEA, made the reactor go critical and, in July 2014, the electrical grid was supplied with energy.

/// In 2014, the project on gaseous diffusion to produce enriched uranium was reactivated in Pilcaniyeu Technological Complex in the province of Río Negro, starting up the “Mock-Up” facility.

/// Both the radioisotope production facility together with RA-3 reactor currently satisfy national demand and supply 30% of the Brazilian market.

/// In October 2014, ARN granted the Construction Licence of the RA-10 Argentine Multipurpose Nuclear reactor.



COMISION NACIONAL DE ENERGIA ATOMICA



PRESENT



After the statements made by the Ministry of Federal Planning, Public Investment and Services, Architect Julio Miguel De Vido, in 2006, the nuclear sector was devoted to recover its capacities and facilities. It is part of the challenge presented by this reactivation to support the development of activities with a high level of responsibility towards safety and the environment.

Over the past nine years, different tasks to recover the nuclear energy R&D have been conducted by highlighting participation of highly specialized personnel of CNEA in finishing “President Dr Néstor Carlos Kirchner” CNA-II NPP and the development of engineering and design to fabricate, assay, supervise and provide technical support to the manufacturer (CONUAR S.A.) of nuclear fuel assemblies.

Currently, CNEA focuses on consolidating achievements from this period and advances in coordinating new challenges in the nuclear energy R&D. The most important work trends are the following ones:

Among the strategic goals pursued over the last years, the construction of CAREM 25 NPP is highlighted, having Argentine technology and a fully national design under the responsibility of CNEA with the intervention of all their Departments.

The Certificate of Environmental Approval has been obtained, which was issued by the Provincial Agency for Sustainable Development (PASD) in the province of Buenos Aires as well as the authorization for Use of the Site and Construction, issued by ARN.

On 8 February 2014, the first structural concrete casting of the reactor building was conducted. It represents a milestone at an international level in the beginning of the construction of the facility.

Moreover, there are facilities under construction to train personnel associated with the operation of nuclear power plants, as well as to undertake specialized services in them.

In May 2010, a Framework Agreement was signed with the province of Formosa with the aim of boosting the construction of CAREM Nuclear Power Plant. During the first semester 2013, the macrolocalization study concluded, and there were activities for the microlocalization study which is currently in its final stage.

The Construction Licence for the RA-10 Argentine Multipurpose Nuclear reactor was issued by ARN. This is also a highlight in the Argentine nuclear development. As a result of the consistent long-term policy, Argentina has become a worldwide reference to the design and construction of research, and multipurpose reactors and critical assemblies.

Another main activity of CNEA is to participate in tasks related to CNE PLEX. The development of technology of fabrication of cold rolled pressure tubes was concluded in order to replace the original Canadian wire drawing, which were sent to CONUAR-FAE for its final treatment. Moreover, tasks on research, development and fabrication of zirconium structural components are undertaken at present.

CNEA does ongoing activities related to energy planning and forecasting so as to evaluate nuclear competitiveness at domestic, regional and international levels. The analysis of different scenarios is the basis of the Institutional Strategic Planning.

In order to define future nuclear power plants, different technological alternatives to existing commercial reactors are considered; therefore, CNEA advises the National Government on the most convenient technology.

Another line of action is mining exploration and production. The areas of Exploration and Production of Raw Materials of CNEA work jointly in a proposal for production of uranium concentrate with mineral to be extracted from two of the seven sectors of Cerro Solo site (B and C), in the province of Chubut. Moreover, assays and laboratory studies are developed to define the production process for the mineral of the ore.

By counting the areas already assigned and those in the process of being granted, 71 areas are explored, which are geographically located in the provinces of Salta, Catamarca, La Rioja, San Juan, Mendoza, Río Negro, Chubut and Santa Cruz, amounting to 325,189 hectares.

As regards uranium production, all of the steps to reopen the CMFSR are followed to enable us to have domestic uranium in the short term. In order to achieve this, the update of the Environmental Impact Study has been submitted. Currently, there are tasks related to transitory disposal waste management. Also, as regards the rehabilitation of uranium concentrate production, in this centre, mining designs of uranium site extraction from Sierra Pintada at the CMFSR.

By complying with all the environmental standards, the Environmental Restoration of Uranium Mining Project (*Proyecto de Restitución Ambiental de la Minería del Uranio*, PRAMU) keeps developing remediation works in those sites where industrial mining activities are developed.

In May 2014, there concluded works to recover gaseous diffusion uranium enrichment technology capacities in Pilcaniyeu Technological Complex pilot plant (*Pilcaniyeu Complejo Tecnológico*, CTP). Within a context to rearrange the international nuclear policy, it is necessary to have this technology to reposition the country as a relevant actor in the international nuclear system.

At the same time, research into ultracentrifuge and laser technologies continues to be conducted.

▀ Since 2009, low enriched U-Al mini plates have been supplied to ANSTO for the production of irradiation targets to obtain molybdenum-99. In 2014, CNEA obtained the tender for an international bidding to supply fuel assemblies to the Peruvian radioisotope production RP-10 reactor.

▀ There has been work done in developing and rating technology of manufacturing of very high density materials for research reactors and in developing materials and processes to manufacture fuel assemblies of CAREM Project.

▀ CNEA has a strong commitment to produce radioisotopes and radiopharmaceuticals, as well as to its applications in different areas, in particular in health, and produces sustainably molybdenum-99, iodine-131 and other radioisotopes for medical uses, satisfying demand for the local market and partly for the regional market. Moreover, new radioisotopes are being developed in line with technological advances in the medical and industrial fields.

▀ Also, CNEA intervenes in the health sector through its nuclear medicine centres, which received new pieces of equipment with state-of-the-art technology, and where new professionals and technicians were hired. CNEA also actively participates in the National Plan of Nuclear Medicine to provide different regions of Argentina with state-of-the-art technology to provide diagnosis and treatment.

▀ CNEA is contributing to the Programme of Radiation Protection for the Patient in order to control doses produced by ionising radiations, doing calibration of radiation equipment, and diagnostic imaging and its regulations, jointly with the Nuclear Regulatory Body and the Ministry of Health.

The main benefit of the programme is summarised in the contribution towards improving the life quality of population, which portrays CNEA's dedication to society and, therefore, its commitment to continue as an agency specialised in Radiation Protection and Nuclear Safety and as a referential agency.

▀ CNEA fosters research and development in topics related to nuclear energy and its applications covering topics referred to nuclear fuels, physics, chemistry, materials, biology, robotics and alternative energies. Technological innovative activities conducted in the nuclear industry enable CNEA to continually undertake developments and transfer new technologies in areas derived from the nuclear sector.

These activities are possible thanks to the work of the personnel who undertake them in a knowledgeable and efficient manner. Education and training are the milestones that enable these developments, guaranteeing safety and protection of its workers, population and the environment. Therefore, CNEA fosters training of professionals and technicians to the highest academic level through courses given in the Institutes Balseiro, Sabato and Dan Beninson which specialize in nuclear topics.

An active internship programme enables CNEA to contribute towards training new generations in topics which are necessary for the development of nuclear activities, considered a priority by national authorities. The initiative "Learn by Doing" grants internships to train professionals, university students and technicians which are directed by specialists and experts of the Institution. Moreover, scholarships offer the possibility to students and professionals with high academic performance of doing graduate and post graduate courses in CNEA Academic Institutes. Graduates from these institutes can capitalize on the academic training as they are hired as Interns to work in CNEA nuclear main projects.

As part of the institutional strategic planning, as there is awareness of the fact that CNEA intellectual capital is its main asset, the evaluation of the human capital has been updated, the changes produced over the past years have been evaluated and priorities to hire new personnel have been defined to achieve strategic objectives in a due manner.

The outlook currently presented in CNEA for the nuclear energy R&D is highly promising because all of the ongoing works are destined to satisfy the two foundational objectives which are the production of massive electricity generation and the applications of nuclear technology in health and industry for the benefit of the population.

ACCOMPLISHED NUCLEAR ACHIEVEMENTS AND OBJECTIVES

CNEA Strategic Plan 2010-2019 set a number of goals and objectives; a long-term outlook and the creation of capacities and support to all of the nuclear system were the main milestones that led to the preparation of the plan. As well as this, the national government boosted the nuclear energy R&D which raised expectations rarely seen before in the nuclear industry.

Most work conducted is long-term, it passes different administrations and intends to follow what is commonly called “State Policy” in the nuclear energy R&D. The following achievements and objectives initially set in the plan are mentioned herein. Most of them are in different stages of development, looking for its best achievement and in furtherance of creating national capacities.

The formation of teamworks and training of new professionals and technicians who joined the Argentine Nuclear Sector can be considered as one of the biggest achievements of this administration which has set the basis for new projects and creation of capacities. Under this framework, sustainability and growth of the Internship Programme “Learn by Doing” are highlighted; this programme enables training of technicians and professionals in different sectors in CNEA.

Also, new courses were created: engineering in telecommunications in Institute Balseiro as an institutional response to the requirement of the National State, presented by the Ministry of Federal Planning, Public Investment and Services in Institute Beninson, the Technical College course in Nuclear Applications, the Doctorate in Nuclear Technology and, recently, Nuclear Engineering with a Specialization in Nuclear Applications. These achievements are crucial to sustainability of the nuclear energy R&D. It should be highlighted that prior to the nuclear renaissance, there were no new personnel or project on which to work, on a situation that brought the difficulty in knowledge transfer to newer generations.

Uranium exploration is an activity that CNEA undertakes permanently throughout the country; CNEA discovered 20 new manifestations of uranium and had six titles of ownership. In the case of Cerro Solo Project, the most advanced project in terms of exploration of CNEA, there is a proposal under development of production of sectors B and C.

One of the main points of the Strategic Plan 2010-2019 in raw materials is to reactivate the CMFSR. This was achieved owing to a number of court orders and legal restrictions exceeding the scope of influence of CNEA; however, within the court system, CNEA acted by complying with court rulings and by working as required by the competent authority. Reconditioning and stabilization of reconditioning of complex dams were conducted within this context.

In the area of Nuclear Fuels, the design of fuel assemblies for Atucha II nuclear power plant, President Dr Néstor Carlos Kirchner (*Central Nuclear Atucha II*, CNA-II NPP), was finalized and optimized. Moreover, CNEA contributed to its startup.

As part of the facilities developed for research and development of fuel assemblies purposes, civil building works finished and the assembly of circuits for essays of critical heat flux (CFH) started. Also engineering of fuel assemblies and control rod reactivity of CAREM 25 NPP were finalized.

The mock up uranium enrichment by gaseous diffusion plant started up in Pilcaniyeu Technological Complex. Moreover, within the framework of the project, the capacity of the electrochemical plant of fluoride production was recovered.

Likewise, there were advances in developing technologies of ultracentrifuge and laser isotope separation. For this type of technologies, there are test beds of basic engineering for isotope separation of non nuclear gases.

CNEA still provides the main technological support to nuclear power plants. In this field, technology was transferred to CONUAR developed for processes and pressure tube rolling that will be used for CNE PLEX (Plant Life Extension).

At CNA-I, detailed engineering was developed and dry storage for 2750 fuel assemblies was built of the NPP. This will enable an increase in the number of spent fuel assemblies to be stored in the nuclear power plant so that there is no need to enlarge storage pools, which in this way favours the operation of the nuclear power plant.

Regarding experimental reactors and radioisotope production reactors, RA-6 reactor power increased from 1 to 3 MW_t, which improved the capacities of the reactor to undertake experiments in physics, materials and applications to health. At the same time, the RA-6 reactor core was converted to low enriched uranium (LEU) fuel assemblies within the framework of UBERA-6 project.

In 2010, by complying with the agreements with Brazil to supply radioisotopes to moderate the effects of a world crisis of radioisotopes supply, production of RA-3 reactor was doubled by means of the adequacy of the reactor by operating with 10 MW_t power. This prevented Argentina from suffering effects of shortages and also made it possible to have less effects than in Brazil and other Latin American countries.

As part of research and development, there is a new facility to store spent fuel assemblies of experimental reactors in CAE. Moreover, together with Brazilian researchers, a shield was developed to transport its spent fuel assemblies.

In the area of spent fuels and radioactive waste, the Long Term Storage Deposit was inaugurated to abide by requirements to move drums to Ezeiza Management Area until there is a low and intermediate level waste repository at a national level.

In terms of Nuclear Technology Applications to Health, Industry and Agriculture, there are important achievements that should be mentioned, which result from the continuous improvement of nuclear science and technology and permanent works of CNEA. Among these achievements, the following should be highlighted: development of new pharmaceuticals for PET/CT tomography and SPECT-CT, consolidation of 18-FDG radiopharmaceuticals and development of new tracers, such as Choline ^{11}C . Moreover, the radiopharmaceutical Lutetium-177 with a 23.7 Ci/mg specific activity was firstly produced in Latin America. Besides, the cyclotron at CAE was conditioned to produce Gallium-67 to be injected.

There are other achievements, such as the conclusion and start-up of different facilities and equipment for health applications. The following achievements are worth mentioning: the service of nuclear magnetic resonance at the Nuclear Diagnostic Centre, supplied by CNEA; a new tomographer at the Nuclear Medicine Centre; and the installation of a thyroid uptake equipment together with a lung ventilation one. Also, CNEA provided a tomographer to FUESMEN, which has the necessary technological capacity to use tracers, such as Carbon-11. Finally, it is important to highlight the finalization of an intense ion source to generate high neutron fluxes for accelerators used for nuclear applications and medical treatments.

In the area of research and development of non nuclear applications, CNEA has collaborated with different government agencies. In relation to the Argentine Agency for Outer Space Activities (*Comisión Nacional de Actividades Especiales*, CONAE), antennas were developed and fabricated for SAOCOM 1A and 1B satellite missions. Also, solar panels of the Argentine satellite mission Aquarius/SAC-D were integrated. In another field, clean rooms of nanotechnology laboratories were finished, and a prototype of non volatile memories was developed, which was sent to space. Designed to resist hostile environments, these memories were devised to work in adverse environments, such as the satellite, metallurgic and nuclear.

In the area of Planning, a group to undertake a system of management control and follow-up of major projects of CNEA was consolidated. Moreover, there was an approval to create an Institutional Digital Repository to identify, gather, register and preserve all the documentation and audiovisual material produced in CNEA which comply with confidentiality clauses and intellectual property of CNEA.

In order to achieve the objectives of technical thematic areas, it is necessary to work during long periods of time due to the complexity and scale of the projects. During the period 2010-2014, a number of projects started which will be finalized over the next years, among which the following should be highlighted:

- Fuel assemblies Facility for Research Reactors.

- The new Facility for Radiosotope Production by Fission.

- The Project of Uranium Enrichment by Gaseous Diffusion in Pilcaniyeu concluded the update and startup of the Mock Up Pilot Module and started tests to operate and obtain uranium successfully.

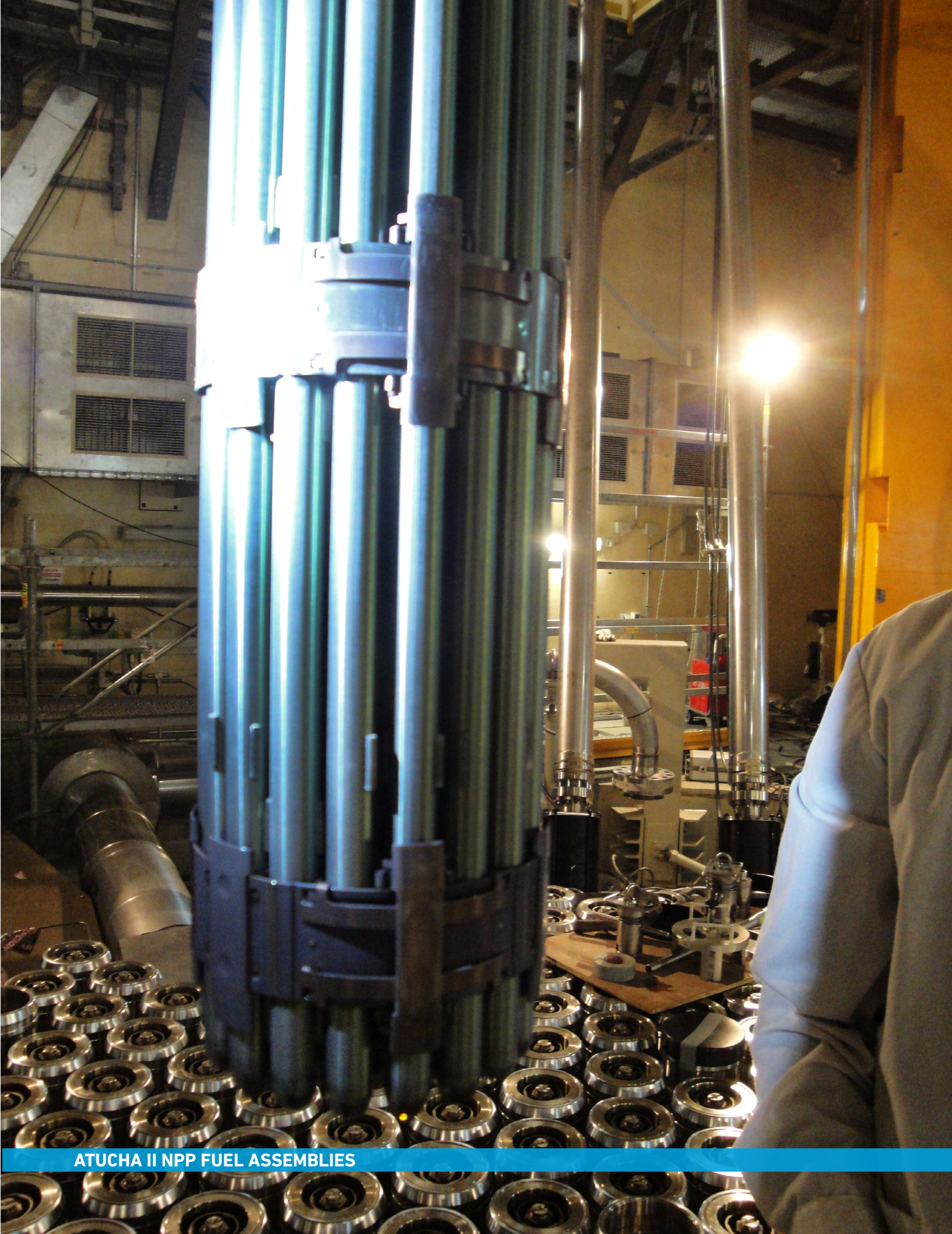
- CAREM Project advanced by starting to build its civil work in Atucha; there was a tender offer to hire the reactor vessel; the fabrication of fuel assemblies was hired and there was a tender to conduct the engineering, construction and assembly of the conventional area (turbine, electrical generator, etc.). The previous items were some of the important steps, among others.

- As regards RA-10 reactor, there were advances to obtain the construction licence and tender of the civil work.

- As regards radioactive waste, the facility that stores irradiated fuels of experimental reactors (*Facilidad de Almacenamiento de Combustibles Irradiados de Reactores de Investigación*, FACIRI) was built in CAE.

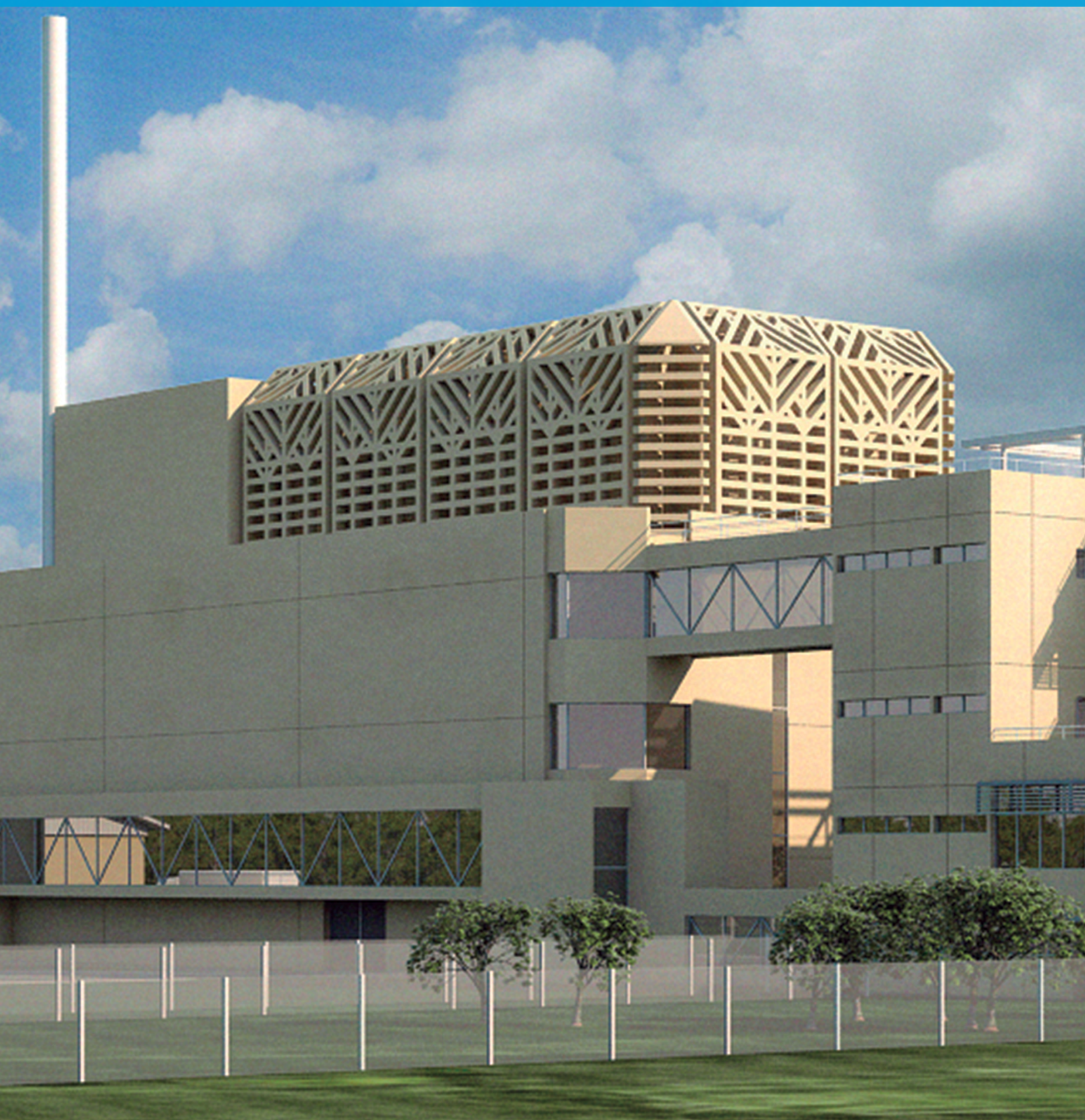
- In terms of the Environmental Remediation of Uranium Mining, remediation of Malargüe started which is expected to conclude in 2016 and, according to what was planned, remediation work started in other areas, such as Los Gigantes and Córdoba Industrial Mining Complex.

- Regarding Cerro Solo Project, there was data of uranium exploration which was transferred to the production sector so that there starts a study of the project on the production facility.



ATUCHA II NPP FUEL ASSEMBLIES

FUTURE



Over the next eleven years, CNEA intends to become the real driving force of the national industry to consolidate Argentina internationally in nuclear development for peaceful purposes. This policy sets several developments and projects in all of the areas of incumbence for CNEA.

/// Within the scope of nuclear power, CNEA will keep contributing to its role to provide technological support to the Argentine nuclear system, relating and coordinating actions from different actors and responding to the needs of the country.

/// Under this framework, there will be continuous search for local solutions for operating nuclear power plants. We should mention a more highlighted project which is the participation in CNE PLEX and repowering, which expects an important inclusion of local industry. Technological support for nuclear power plants in Lima, province of Buenos Aires, will continue to be provided.

/// For future nuclear power plants, CNEA will support their planning, design and construction, as a receiver of design technology transfer, which will enable to acquire new capacities to strengthen the national industrial framework. This multiplying effect will be an advantage for a continuous increase in the local participation in building nuclear power plants.

/// In terms of the development of national technology of nuclear power plants, the construction of CAREM 25 nuclear power plant in 2018 is expected to be concluded with cold testing and load testing.

/// Moreover, engineering of modules of higher power CAREM concept 100/150 MW_e is developed so that these modules are built in the country, and, in particular, its installation in Formosa is under evaluation.

/// Small reactors are expected to be developed and designed to be used as transport propulsion.

/// A programme on the follow-up to new technologies for Generation-IV nuclear reactors and its nuclear fuel cycles to evaluate and generate related research and development will continue to be implemented and executed.

/// The area of exploration of raw materials is intended to continue with geological research in order to define uranium favourability of the country to define new areas of study as a result of the exploration of nuclear raw materials in the national territory which became one of the main milestones on which CNEA activity will focus over the next years with its main objective to increase uranium resources in a framework of social and environmental sustainability.

/// The country has been divided into 61 geological units which are under research to determine its Uranium Favourability potential at a regional scale. The opening of new exploration targets will depend on the obtained result of the research, which will be included in the inventory of areas under study.

/// In order to comply with the binding legislation, the communication programmes implemented by CNEA will be coordinated in order to obtain the social license in mining projects.

/// In Cerro Solo, the feasibility of uranium concentrate production will be defined once exploration tasks have been concluded along with the evaluation of sectors B and C and the tasks of developing extraction processes.

/// There are plans to develop a regulatory framework to grant strategic status to radioactive minerals.

/// The nuclear fuel cycle stages entail, among all of them, the production of uranium dioxide (UO_2); therefore, the project of the new Uranium Facility of Dioxitek, under construction in Formosa, will continue in order to supply the requirements derived from current and future nuclear power plants. Uranium concentrate (U_3O_8) is currently processed and totally imported, after the Argentine local ore deposits stopped being exploited in the nineties.

/// There will be new fuel element lines of work, using enriched uranium; the technology of gaseous diffusion to produce enriched uranium will be consolidated; research and development of laser and ultracentrifuge technologies will continue. Two facilities, an ultracentrifuge and a laser pilot plant, are expected to be constructed. All this will make it possible to have the necessary knowledge and elements to define both uranium enrichment technology to be implemented in Argentina at an industrial scale and the main characteristics necessary for a production facility.

/// Within the area of nuclear fuels, the development of fuel assemblies for CNA-II will continue to provide the nuclear power plant with a type of fuel element that is more economical and significantly simplified in its fabrication. Jointly with the development of new lines of fuels, there is work done to consolidate the reprocessing technology domain of irradiated fuel assemblies by performing experiences at a laboratory scale in licensed facilities of CNEA.

/// Moreover, there are new materials and processes developed to fabricate higher burnt fuel assemblies for Generation III and IV Reactors.

As regards radioactive waste, CNEA aligns its operations with the National Programme of Radioactive Waste Management in order to improve all of the management stages continuously in order to achieve its definite confinement and isolation; for these purposes, studies are intended to be completed for new systems of final disposal siting.

Among the major activities CNEA plans to undertake over the next years, the following can be mentioned: construction and start up of the RA-10 Argentine Multipurpose Nuclear Reactor. Its objective will be to produce radioisotopes at a commercial scale to supply the local market and part of the international market with the appropriate design to test fuels for nuclear power plants and experimental reactors with a wide range of applications in topics related to basic research and advanced technological applications. Particularly, the following can be mentioned: research in the field of nuclear engineering, material sciences, nuclear medicine, reactor physics, physics of condensed matter, chemistry, and biology, among others.

The Nuclear Medicine National Plan (NMNP) aims at giving Argentina the tools the nuclear industry offers to prevent, control and treat noncommunicable diseases. The State intends to invest on this Plan through the construction of new centres in different points of Argentina and to strengthen the already existing centres.

CNEA is the agency in charge of the coordination of all of the actions that must be conducted to achieve the objective of the NMNP. In this sense, it is CNEA responsibility to provide a technical definition about the type of equipment to be acquired, which generation, coordination and control of tools that need to be subscribed for each Centre that expected to be built.

During a first stage, the installation of Nuclear Medicine and Radiotherapy Centres has started in the provinces of Formosa, Entre Ríos, Santa Cruz, Río Negro, Santiago del Estero and La Pampa. Also new state-of-the-art equipment has been acquired for already existing centres where CNEA participates in Mendoza (FUESMEN) and City of Buenos Aires (FCDN).

Developments in boron neutronic capture therapy for different pathologies using main reactors of CNEA will continue, and the construction of a proton accelerator and a single photon emission computed tomography (SPECT-CT) for dosimetry in line with BNCT is expected to be concluded.

Thanks to the Programme on Radiation Protection of Patients that will be developed by CNEA, medical practices with ionizing radiations are intended to be optimized in order to decrease radiation dosis as much as possible due to the treatment and/or radiodiagnosis in patients and in exposed workers, minimizing the occurrence of eventual accidents.

/// In order to achieve this objective the patient has to be examined only with justified radiological studies; they must be done in controlled equipment with the appropriate protocols and the necessary protective measures to avoid accidents. must Therefore, the Programme will undertake training, outreach, working protocols and control exercised by the competent authority.

/// In the area of Research and Development, basic and applied science will be continued to provide support for technological goals for the next years, which are the finalization of the ion accelerator for health purposes, robotization of services for nuclear power plants and in sensing devices for nuclear applications. Basic and applied research in nuclear physics and subnuclear of high energies, in applications to nanotechnology to nuclear materials and health. As part of research and development activities of alternative energies, solar energy and fuel cells will be taken advantage of.

/// Activities which are planned for the future in CNEA imply new efforts in basic research, development and characterization of materials by means of new technologies including those non destructive. The need to continue them and deepen them is determined by requirements of new high density fuels for experimental reactors, higher demands in structural components in power reactors by guaranteeing its behaviour in case of having a PLEX Programme, the need to suggest materials for containment barriers and matrixes for immobilization and transmutation of radioactive waste, materials for new generations of nuclear fission power plants for nuclear fusion reactors and use in alternative energies. Also new non destructive techniques of inspection of components in nuclear facilities are expected. These activities will be able to continue with knowledge transfer and technologies to the industrial technological sector at a national level.

/// There will continue to be long term prospective studies in Argentina, adding advanced reactors with its nuclear fuel cycles, framed with the activities jointly developed with the IAEA.

/// The technical economic feasibility analysis of nuclear facilities and its localization studies will continue as part of the nuclear planning activities.

/// In order to follow the activities developed in CNEA, educational and training activities of its academic institutes will continue to be strengthened and expanded through their courses of study, courses and permanent educational activities and through acquiring new methodologies and educational tools.

/// CNEA will continue with communication actions in a periodic and systematic way through their own channels and massive media considering diverse audiences and diversity of topics related to nuclear technology and its peaceful uses. The advance of the Argentine nuclear development will contribute to the development of nuclear communication in the region in a leading way.

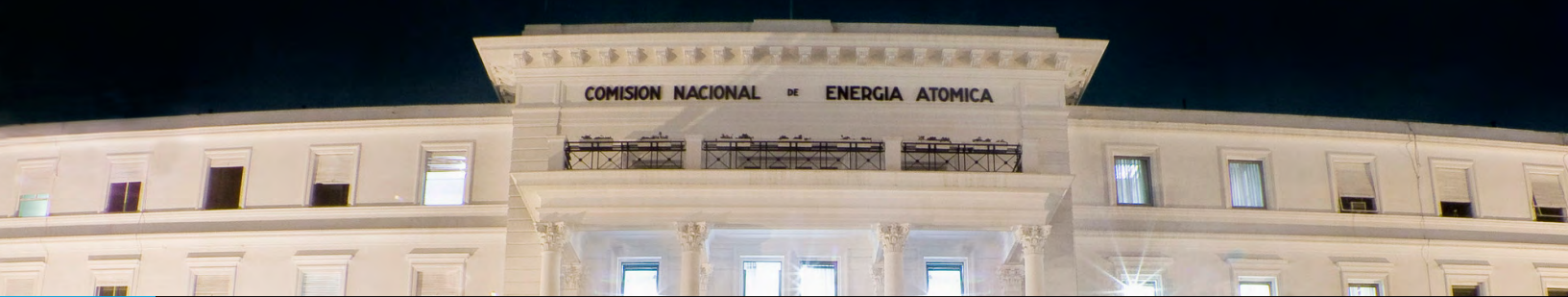
/// CNEA will continue to boost its scholarship programme “Learn by Doing” in order to supply training for those who will form the new generation of specialists in the Argentine nuclear sector. Moreover, scholarships will continue to be granted for students of university courses and post graduate courses given in CNEA academic institutes.

/// CNEA intellectual capital is expected to be strengthened with plans for training and transferring knowledge to the young personnel who are hired and will be hired to work at CNEA by protecting the technology developed and by fostering long term preservation of scientific and technological document production.

/// An institutional network is expected to be formed to organize the Programme on Nuclear Knowledge Management.

/// A network to protect intellectual property of technological developments generated in CNEA.

/// CNEA is committed to guarantee the continuity of the nuclear energy R&D, fostering hiring of personnel and boosting their wellbeing, development and retention of trained and qualified personnel contributing towards improving the work environment and efficiency of the public sector.



1950 CNEA

COMPANIES ASSOCIATED AND RELATED TO CNEA



1976 INVAP S.E.



1981 CONUAR S.A.



1986 FAE S.A.



1989 ENSI S.E.



1991 FUESMEN



1994 NA-SA



1997 DIOXITEK S.A.

DESCRIPTION:

Within the framework of the organizational restructuring approved in November 2006, the Corporate Board formed by CNEA and associated companies CONUAR S.A., FAE S.A., DIOXITEK S.A. and ENSI S.E., with the main objective to provide assistance for the direction and evaluation of relations of the Institution with these companies, fostering the coordination of actors for better profit, efficiency and effectiveness. These four companies were created from CNEA initiatives to which it transferred technologies developed for its use at a commercial scale.

The main activity of **CONUAR S.A.** is the fabrication of fuel assemblies for CNA-I, CNA-II and CNE. Moreover, some years ago, fabrication of fuel assemblies for research reactors started which has enabled CNEA to be supplied with fuels used in research and production RA-3 reactor. Another of its products are reactivity control bars used in CNE for Cobalt-60 production. Currently, CONUAR participates in supplying spare parts for CNE PLEX, aside from offering to conduct BOP (Balance of Plant) engineering of CAREM 25 NPP.



CONUAR S.A.

FAE S.A. fabricates zircaloy cladding of fuel rods produced by CONUAR S.A. Also, it produces welded and seamless stainless steel tubes and titanium alloys. It is one of the most important suppliers in CNE PLEX, where the fabrication of pressure tube for the reactor will be developed by CNEA. FAE is one of the few worldwide companies and the only one in Latin America to fabricate this type of products.



DIOXITEK S.A. main activity is the production of uranium dioxide and fabrication of cobalt-60 sources, used in medical and industrial applications. The industrial plant of uranium dioxide has been operational since 1982 in the city of Córdoba, processing around 120 t uranium annually. The industrial facility that fabricates cobalt-60 sealed sources is located in CAE. The production of this facility places our country as the third worldwide producer. In this period, DIOXITEK also started the export of radioisotopes to Brazil within the framework of collaboration between Argentina and Brazil as a response to the worldwide supply crisis. There is a current project which is the New Uranium Facility (*Nueva Planta de Uranio*, NPU) under construction in Formosa.



DIOXITEK S.A. - NPU

ENSI S.E. operates the Heavy Water Industrial Plant owned by CNEA located in Arroyito, Neuquén. It has an annual production capacity of 200 tons of reactor grade heavy water (99.89% purity) which has supplied CNA-I, CNE and CNA-II and has provided exports for a number of countries. Moreover, it provides engineering services for companies operating in the region. The company will be the heavy water supplier for Atucha II nuclear power plant.



ENSI S.E.

NA-SA was established as a productive unit for construction, start-up, operation, maintenance and decommissioning of nuclear power plants. It started operating CNA-I and CNE. In 2005, NA-SA was given the responsibility for finalizing CNA-II, which started up in July 2014 and fully operates since February 2015. Moreover, there is a project to extend life of CNE and to undertake actions to complete the projects of the fourth, fifth and sixth nuclear power plants.



NA-SA, CNA-I and CNA-II

INVAP S.E. was established jointly by CNEA and Río Negro Province in 1976 arising from Applied Research at CAB located in San Carlos de Bariloche. Between INVAP and CNEA, there is an agreement on which CNEA appoints part of members of its board. It is a company devoted to design and construction of complex engineering systems creating technological packages with added value. Its origins were the nuclear energy R&D and, currently, it also develops activities of other fields. It successfully exported research reactors and radioisotope production facilities to Algeria, Egypt and Australia. INVAP signed an agreement with the American company Coquí Pharma to conduct two radioisotope production reactors in USA and it also participates in relaunching tender offers for a new reactor in the Netherlands, which was accepted in 2012 and due to budgetary problems it was postponed.



INVAP S.E.

STRATEGIC CONNECTIONS:

Common strategic connections are developed to:

CONUAR S.A.: Strengthen and consolidate the strategy adopted by Argentina towards fuel fabrication in Argentina of all its nuclear power plants; in order to achieve that, CNEA will develop technologies which will be necessary in the future and the company will have to adapt its technology and the capacity of fabrication in accordance with national needs.

FAES.A.: In accordance with the strategy of national production of fuel assemblies, the company will adapt its technology and the capacity of cladding fabrication and structural elements to meet the requirements of CONUAR S.A. regarding fuels of current and future nuclear power plants. Regarding CNE PLEX, the company will adapt its facilities to fabricate fuel channels and other components with technology developed by CNEA strengthening the synergy with the development groups of the company.

DIOXITEK S.A.: In order to satisfy the demand for main supplies of current and future nuclear power plants, the company must increase its production capacity. In order to achieve that, it must project and build a new industrial facility. The company will study and consider the possibility to broaden its field of work following the needs of the Institution.

ENSI S.E.: In accordance with the strategy to satisfy the demand with the national production of supplies for the national nuclear power plants, the company will have to produce heavy water which is necessary for current and future Pressurized Heavy Water Reactor (PHWR).

NA-SA: Strengthen and increase the contribution of nuclear energy in the future power matrix of Argentina; safe, trustworthy and competitive energy. In order to achieve that, the technical synergy between CNEA and NA-SA shall be consolidated, the former developing the role of the technological support that goes with the construction and operation of new nuclear power plants under NA-SA responsibility.

INVAP S.E.: Strengthen the synergy and technical association between INVAP and CNEA to help promote the nuclear technological lines of the company and technological developments of CNEA.



NUCLEAR MEDICINE NON-PROFIT ORGANIZATIONS



DESCRIPTION:

CNEA fosters the use of peaceful applications of nuclear energy in the field of health through the access to state-of-the-art technology related to diagnosis and medical treatment by means of nuclear techniques.

In 1986, a Post graduate School in Nuclear Medicine and Radioisotopes started up in the city of Mendoza. CNEA provided the academic and technical infrastructure that guarantees the creation of a scope of excellence in this specialty. This idea was welcome by the University of Cuyo (UNCuyo) and by the provincial government, which became part of the project by transforming it in 1991 in an Interinstitutional Project by ensuring its continuity by granting the legal status of a non-profit organization to the School of Nuclear Medicine (*Fundación Escuela de Medicina Nuclear*, FUESMEN).

This decision gave way to an innovative management model that responds to the needs of people and allows the social role of institutions to be fulfilled, which form this organization (CNEA, Province of Mendoza and University of Cuyo).

FUESMEN main objective is to undertake scientific, academic and assistential activities in the field of nuclear medicine and radiodiagnostic within a framework of technical and human excellence by contributing towards the life quality and preservation of health of population. Since its beginnings, there was a Positron Emmission Tomographer (PET) becoming a pioneer in this field in Latin America.



NUCLEAR MEDICINE SCHOOL NON-PROFIT ORGANIZATION

CNEA made the decision of establishing the non-profit **Nuclear Diagnostic Centre** (*Fundación Centro de Diagnóstico Nuclear*, FCDN) jointly by CNEA and FUESMEN as a result from the experience from FUESMEN and the need to provide PET technology in Buenos Aires, located opposite the Oncology Institute Angel H. Roffo in the City of Buenos Aires. FCDN has the same principles that FUESMEN: research and development, training of human resources, production of radiopharmaceuticals and assistential tasks in a scope of academic excellence with the objective of contributing towards the health national system to be more fair and cooperational.



NUCLEAR DIAGNOSTIC CENTRE NON-PROFIT ORGANIZATION

FUESMEN and FCDN strategies fully agree with objectives that the Nuclear Law sets forth for CNEA.

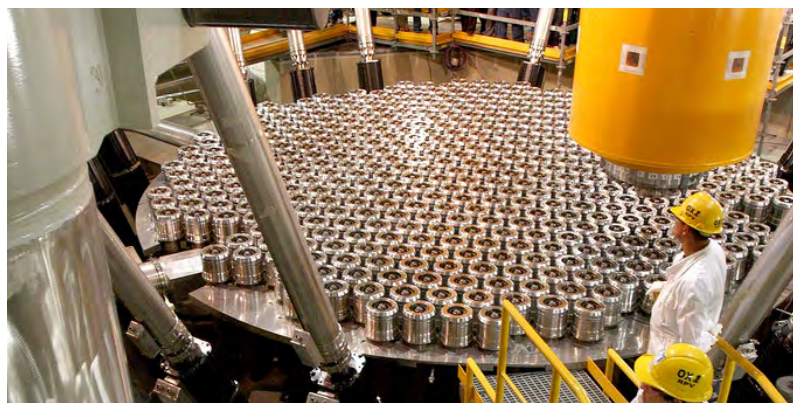
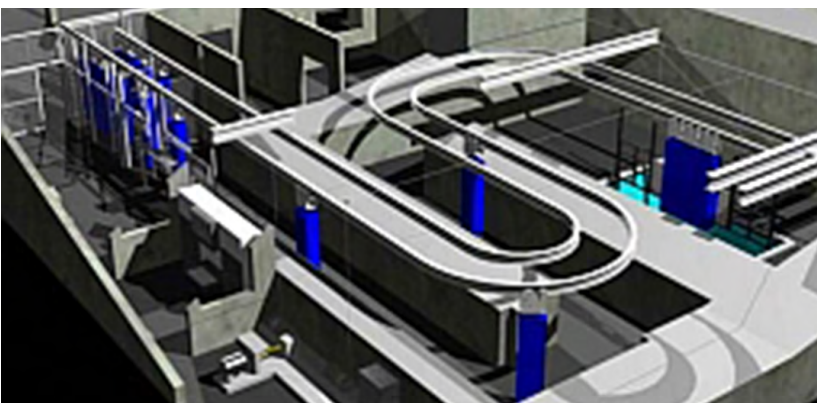
DEVELOPMENT STRATEGY:

The model of non-profit organizations applied to this type of institutions enables future centres to operate duly, mainly if it is taken into account that medical equipment provided for these centres is highly complex and is also strongly regulated and fiscalized.

CNEA fosters the option of “non-profit organizations” in order to guarantee that more regions of the country have access to advanced technology in the field of nuclear medicine and education and training opportunities in different related disciplines. This enables an excellent practice of medicine giving the possibility of acceding to state-of-the-art services in the image diagnosis and treatment through the nuclear medicine and development of research and teaching activities.



INSTITUTIONAL STRATEGIC OBJECTIVES



Over its 65 years, CNEA has grown thanks to the development of multiple activities in the nuclear and technological scope. Taking into account current needs in the country and guidelines provided by the State set by the current government, below appear the topics related to institutional strategic objectives:

■	Uranium Exploration and Production
■	Nuclear Fuels
■	Uranium Enrichment
■	Nuclear Power Plants
■	Radioactive Waste Management and Spent Fuel Management
■	Nuclear Technology Applications to Medicine
■	Research and Radioisotope Production Reactors
■	Nuclear Technology Applications to Industry and Agriculture
■	Research and Development
■	Technological Innovation and Technology Transfer
■	Employees, their Expertise and their Academic Qualifications
■	Relations with the Community
■	Domestic and International Affairs

The importance the topics of Safety and Environment deserves should be highlighted, since they are directly contemplated in the institutional objectives and considered essential in the development of the Strategic Plan.

In the following paragraphs, institutional strategic objectives for each of these topics are presented and then they are detailed by thematic area, the mission and vision of each of them and strategic objectives that will be developed to fulfil institutional objectives.



URANIUM EXPLORATION AND PRODUCTION

DESCRIPTION:

One of the main objectives of CNEA has been uranium exploration in order to guarantee this strategic resource for use within the country. In this way, uranium production at a pilot scale began in 1952 and later at an industrial scale between 1964 and 1997 when the productive activity stopped in the San Rafael Industrial Mining Complex (Complejo Minero Fabril San Rafael, CMFSR) operated by CNEA. During that period, 2500 t uranium (Ut) were produced in eight mining complexes and thirteen localized sites along the country.



CERRO SOLO - DRILLING ACTIVITIES

In CNEA, all the stages of exploration and mining production from the search of the mineral to the start up of production in the ores. There are also some ores under exploration in private hands. This is done within an extremely complex federal framework as the topic of mining is one of the most politized causes which mobilized society the most over the last years. Even so, there were achievements with this.

In the stage of exploration-evaluation, geology of the mineralized area is investigated and analyzed in detail identifying ore-bearing rocks and elaborating geological maps in detail. In this framework, CNEA managed to identify twenty new manifestations of uranium in the country.

The current most important project in the stage of exploration and evaluation is Cerro Solo in Chubut Province. In this period (2010-2015), the tasks of characterization and preliminary evaluation by doing later work and mineral extraction engineering studies in order to achieve a model of feasible production adapted to mineral characteristics of the deposit.



Regarding the Environmental Evaluation of the Project, the Environmental Base Lines were done along with monitorings requiring binding legislation both national and provincial and/or municipal and with regulatory frameworks specific to CNEA.

Due to the complexity of exploitation of this mineral, which also has molybdenum, and is found in a semiarid area where water saving is relevant, it is necessary that a wider range of studies and essays that allows the correct planning of the Project. In order to achieve this objective, two working groups were created: one in charge of mining development which includes extraction methodology, stockpiles and depression of aquifers and another one, in charge of defining the type of process, design and



San Rafael Industrial Mining Complex (CMFSR) - EVAPORATION PONDS

selection of equipment, separation and destination of molybdenum, partial reuse of process water, effluent and mining tailings management, supply of electricity and provision of chemical supplies and everything that is related to the definition of basic engineering. Moreover, collaboration towards other thematic areas of CNEA was required for specific tasks, such as research and development in chemistry.

The CMFSR in the province of Mendoza from 1979 to 1997 produced 1600 Ut with a production plant of uranium concentrate with a capacity of 120 Ut/year processing mineral from the Sierra Pintada ore located in that same hill which makes this mining complex be the most important one operated by CNEA. In the mineral deposit, there is a remaining of 6500 Ut, a main strategic energetic resource to supply uranium required for Argentine nuclear power plants.



As a previous step to rehabilitation of CMFSR as a production centre, there have been activities on waste management in interim disposal and its productivity model was updated. The location of the ore in the province of Mendoza which has a legislation that discourages mining requires a constant effort in terms of legal and social topics to allows reversal of the negative image of that activity and convinces society of the importance of producing uranium concentrates at a national level through a responsible environmental management.

PRAMU Project is working on ores which were exploited in the past and are currently closed. Under this project, remediation of the site was finalized where Malargüe Industrial Complex and environmental characterizations are being conducted from the sites Tonco, Córdoba and Los Gigantes.

OBJECTIVE:

Strategic Objective 1: Increase uranium reserves in the country and guarantee uranium concentrate supply with the national production of minerals to meet the requirements of existing nuclear power reactors and research reactors and the ones to be built.

MAIN PROJECTS:

- *Reactivate uranium mineral extraction at Sierra Pintada uranium ores (San Rafael - Mendoza) and the production of uranium concentrate.*

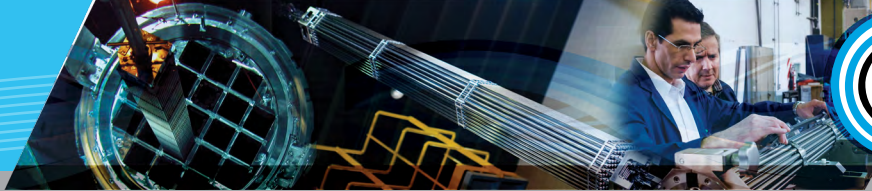
- *Manage transitory disposal waste in CMFSR.*

- *Start the production of Cerro Solo ore.*

- *Undertake exploration activities in four ores and Cerro Solo in Pichiñán Uranium District.*

- *Continue with detailed exploration in uranium prospects of Alipán I, La Rioja and Mina Franca, Catamarca.*

- *Advance in prospecting and exploration of 32 prospecting areas granted to CNEA in Salta, Catamarca, La Rioja, Mendoza, Río Negro, Neuquén, Chubut and Santa Cruz.*

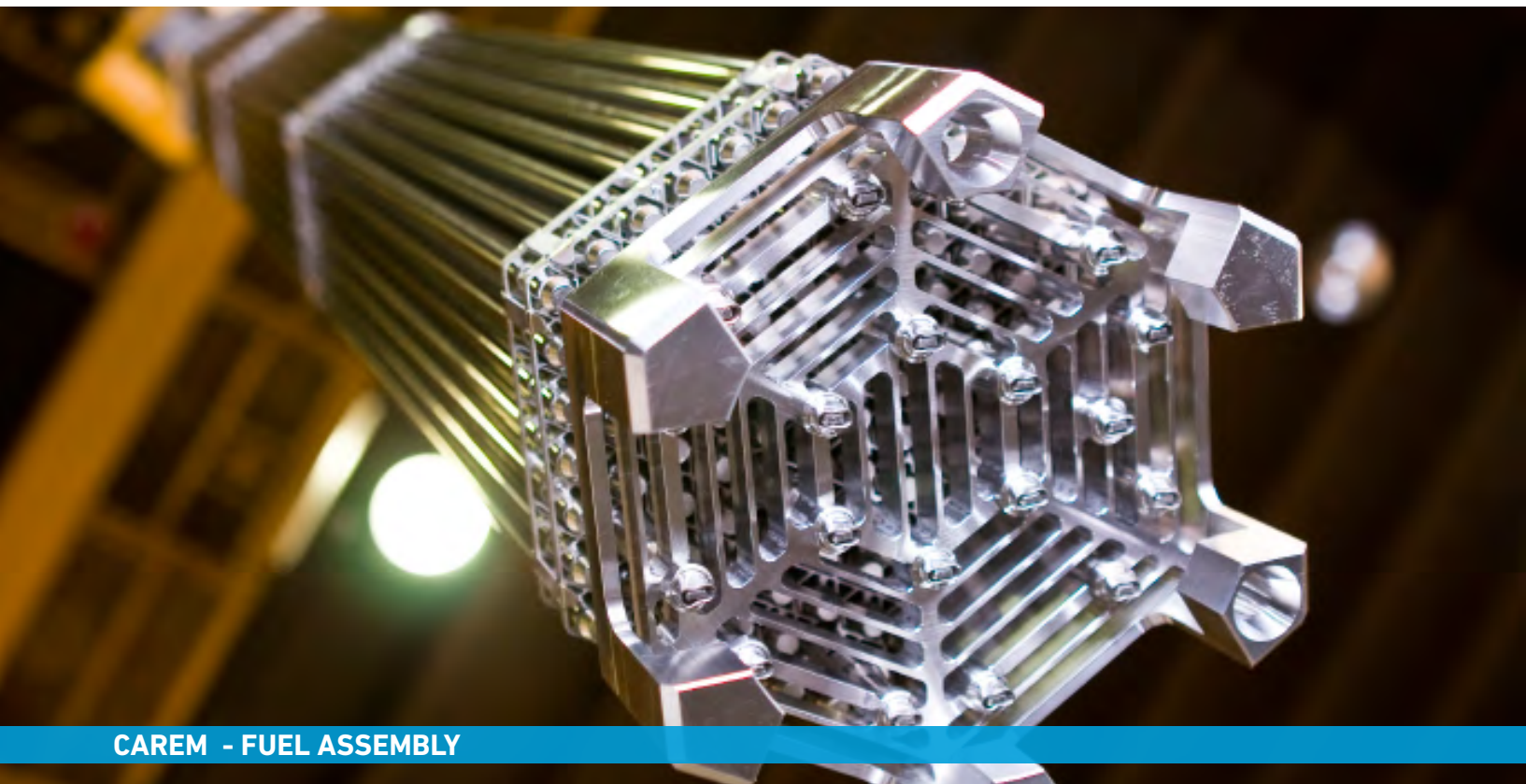


NUCLEAR FUELS

DESCRIPTION:

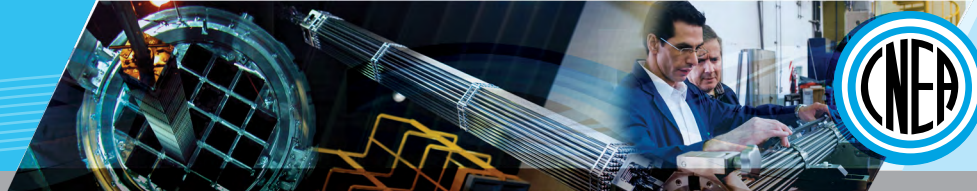
The development of the different groups of activities is distributed into three Atomic Centres of CNEA. The nuclear activities undertaken over 57 years have made it possible to gain wide experience in areas of fuels for experimental reactors as well as radioisotope production reactors and fuels for nuclear power plants.

In the field of experimental reactors, in the past, these activities reached major milestones, such as: conversion of the core of Argentine reactors RA-3 and RA-6 from highly enriched uranium (90%) to low enriched uranium (< 20%); the first international



CAREM - FUEL ASSEMBLY

development of low enrichment irradiation targets for the production of molybdenum-99 and their supply to RA-3, Egypt and Australia; participation in the design and start up of a fuel element manufacturing plant abroad (Egypt and Algeria) and training of employees; supply of fuel assemblies for experimental reactors in different countries (Peru, Algeria, Iran, Egypt and Australia); irradiation of miniplates with high density uranium compounds in the United States and post irradiation assays of plate-type fuel assemblies in Argentine hot cells.



Moreover, in the field of fuel assemblies for NPPs, the following points are worth mentioning: the development of fuel assemblies for CNA-I, CNA-II and CNE and later technology transfer to CONUAR S.A.. In 1995, the original design of fuel for CNA-I changed from natural uranium to low enriched uranium (0.85% U-235).

Likewise, fuel bars produced in the country were irradiated in the Netherlands using uranium and plutonium, fuel rods for the critical facility RA-8 and cobalt pellets for the reactivity control rods were fabricated in CNE and calculation codes were developed for the simulation of fuel bar behaviour inside the reactor.

In this period, the area of fuels managed to finish and transfer engineering of fuel assemblies to CONUAR S.A. for CNA-II. Moreover, the design of fuels for reactor CAREM finished and technology is transferred to CONUAR S.A. to start production of these fuels.

In another area, the project of development, elaboration and characterization of fuel channels for CNE PLEX ended in December 2014.

In order to undertake its activities, in the area there are important facilities such as pilot plants that produce dust, fuel assemblies and special alloys; experimental circuits of low and high pressure, hot cells, labs to work with enriched uranium, plutonium and irradiated material and deposits of nuclear materials.

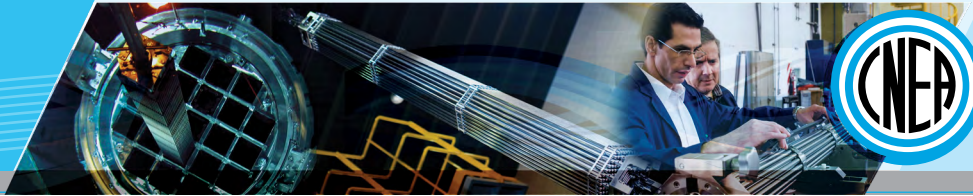
At present, tasks are undertaken of developing new materials to be used in the elaboration of fuel assemblies for research reactors and current and future nuclear power plants; of developing engineering and optimization of design of these fuel assemblies; and of validating codes developed by means of the participation in international intercomparison programmes coordinated by the IAEA.

OBJECTIVES:

Strategic Objective 1: Strengthen and intensify research and development capacity in the field of fuel assemblies for future nuclear power plants and future experimental and radioisotope production reactors.

Strategic Objective 2: Become the technological and engineering support for the fabrication of fuel assemblies of nuclear reactors.

Strategic Objective 3: Guarantee the supply to the country and eventual export of fuel assemblies for experimental reactors and irradiation targets for radioisotope production.



MAIN PROJECTS:

▀ *Develop the Project of an Industrial Plant for Fuel Assemblies of Experimental Reactors.*

▀ *Develop nuclear fuels for Pressurized Water Reactor (PWR).*



URANIUM ENRICHMENT

DESCRIPTION:

The Argentine Republic has reached a high level of development in the peaceful uses of nuclear energy since CNEA was created. At present, the National Government resumed long term strategic policies covering every stage of the nuclear fuel cycle from extracting minerals and treating them up to enrichment and reprocessing in order to exercise the right to a peaceful nuclear development, recognized and sustained by the Non-Proliferation Treaty subscribed by our country on 10 February 1995.



PILCANIYEU TECHNOLOGICAL COMPLEX FACILITY

In line with what was aforementioned, CNEA resumed uranium enrichment activities in the Pilcaniyeu Technological Complex (*Centro Tecnológico Pilcaniyeu*, CTP), starting the production of Mock-Up facilities. These are expected to be used to produce uranium enrichment to be applied in CNA-I and CNA-II. Moreover, research and development activities of advanced technologies of uranium enrichment started, such as the use of centrifuge and laser. This decision was taken based on the most significant fundamentals which are presented below:

Place the country within the group of countries in possession of uranium enrichment technology, which is crucial since nowadays there are several initiatives which try to establish an international structure of supply for the nuclear fuel cycle



to supply the worldwide market. This initiative sets the number of possible countries which are suppliers of enrichment uranium service as from a date to be defined in the short term. Within the framework of the external context, it is crucial to have a sound nuclear programme which makes it possible to sustain the position of a country in possession of this technology which, otherwise, would be free from economical conditionings depending on the market imposed by these new structures, by limitations to the development of local industry and technology.

▀ The restart of gaseous diffusion enrichment technology is related to the need to recover full capacities of Argentina in this area, which includes the handling of



PILCANIYEU TECHNOLOGICAL COMPLEX FACILITY

uranium hexafluoride and a number of knowledge associated to the materials used. Thanks to this, in the mid term, there will be a successful handling of advanced technologies if economic and political conditions advise on doing it.

Have enrichment technology and its development at an industrial scale in the future favour sustainability of this activity throughout time and enables the prevention on the use of fuel assemblies with slightly enriched uranium for power reactors. In the long term, it also makes it possible to foresee the use of fuel assemblies with enriched uranium for nuclear power plants as well as for experimental and radioisotope production reactors, both those which are installed in the country and those which are to be exported.



In this way, local technology and infrastructure are developed, which will favour the possibility of achieving the nuclear fuel cycle and electricity generation.

/// The development of the technological area gives it a sense of depth and strategic sense to the bilateral process with Brazil in the nuclear energy R&D contributing to the technological balance between both countries, strengthening the regional viewpoint in the international context.

It is important to highlight that these activities are developed within the framework of strict adherence to the peaceful use of nuclear energy and fulfilment of non proliferation treaties subscribed by Argentina.

All of the Argentine nuclear programme is set under the IAEA safeguards system in agreement with NPT and the Treaty of Tlatelolco, as well as bilateral agreements with Brazil, mainly the Brazilian Argentine Accountancy and Nuclear Material Control Agency (*Agencia Brasileño Argentina de Contabilidad y Control de Material Nuclear*, ABACC). Likewise, every nuclear export done by our country has a prior requirement that the receiving State has subscribed by the agreements on safeguards related to the IAEA.

OBJECTIVES:

Strategic Objective 1: Consolidate gaseous diffusion technology and continue with the development of other uranium enrichment technologies, strengthening the international position of Argentina and achieving independence towards defining strategies.

Strategic Objective 2: Position CNEA as supplier of uranium enrichment services observing non proliferation commitments assumed by the Argentine Republic.

Strategic Objective 3: Define uranium enrichment technology to be applied and the main characteristics for a production plant at an industrial scale.



MAIN PROJECTS:

- *Keep capacities of the enrichment plant of the Pilcaniyeu Technological Complex.*
- *Development of uranium enrichment technologies by laser and ultracentrifuge.*

NUCLEAR POWER PLANTS

DESCRIPTION:

Since its creation in 1950, CNEA has achieved a constant advance in terms of technological autonomy related to nuclear reactors. In 1964, CNEA began the construction studies of Atucha I NPP. Its construction began in 1968 and started operating commercially in June 1974. Participation at a national level of 36.7% of its total cost was reached which included 13% of electromechanical components. The percentage of participation achieved at a national level was a whole success for the country.



NA-SA - CNA-I AND CNA-II

The construction of Embalse NPP began in 1974, its criticality was reached in February 1983, which was connected to the network in January 1984. The option of this technology was based on technological transfer agreements with the Atomic Energy of Canada Limited (AECL) in line with the domain of the natural uranium fuel cycle. Continuing with the policy of promoting national shareholding, a 51% share was acquired.

In late 1979, the construction of a third nuclear power plant of 700 MWe with natural uranium and heavy water was under consideration with a similar design and location of CNA-I. The contract was granted by the Argentine corporation ENACE S.A..



Its construction began in 1981 and stopped in 1984. Since early 1994, construction activities completely stopped at the time that the civil building works were advanced at an 80%.

The conclusion of the Project Atucha II achieved in 2014 was a major challenge for engineering in Argentina and was the main point of the reactivation of the nuclear energy R&D. CNEA undertook different work under the direction of the project entrusted to NA-SA.



CNA-II started to operate 100% of its capacity on 18 February 2015.

At present, one of the most important projects undertaken is CNE PLEX for which professionals involved in performing the project conduct studies of materials and calculations in the nuclear energy R&D.

The definition of the fourth nuclear power plant (CNA-III) based on the same design as Embalse includes the continuity of assistance to the operator in charge of building nuclear power plants. It is estimated that Argentine shareholding in this project will be around 70% with a highlighted role of CNEA in several aspects.

Another project with a longer projection for the sector's growth is the development of the CAREM Argentine nuclear power plant.

The experience gained has enabled CNEA to be positioned as a highlighted organization of science and technology at an international level, acting as a point of reference of the nuclear system. This entails planning, implementation and management of research activities, technological development, design, engineering, start up, services and training of human resources in the area of nuclear power plants.

The decision about technology of heavy water reactors that use natural uranium was a strategic decision appropriate for that time, contributing to the development of nuclear energy R&D. However, at present, the Argentine nuclear system is prepared for implementing the uranium fuel cycle to which the majority of innovative reactors of the international community responds. In February 2015, agreements were signed with the People's Republic of China to evaluate an enrichment uranium nuclear power plant. The participation of CNEA will be essential so that the local industry can participate in these new developments.

OBJECTIVES:

Strategic Objective 1: Advise the National Executive Power on the expansion of nuclear power generation in Argentina analysing existing technologies and future developments of nuclear power plants and their nuclear fuel cycles, guaranteeing a continuous advance towards national designs and technologies and creating related lines of research and development.

Strategic Objective 2: Consolidate CNEA technological autonomy in the field of nuclear power plants positioning itself as the organization that provides technological support for nuclear power plants in Argentina and contributing to sustainability of their operation during the life cycle of nuclear power plants.

Strategic Objective 3: Place Argentina at the forefront of state-of-the-art design of innovative nuclear power plants, building and starting up the nationally designed prototype of CAREM 25 nuclear power plant.



Strategic Objective 4: Consolidate the design of medium and low power nuclear power plants for the national and international markets developing engineering of new modules based on the CAREM concept.

MAIN PROJECTS:

▀ *Contribute towards CNE PLEX and surveillance programmes of the nuclear power plants in general.*

▀ *Participate as a strategic partner in the construction and start up of CNA-III.*

▀ *Undertake technical evaluations of the alternatives referring to future nuclear power plants.*

▀ *Participate in international forums related to nuclear power plants for the future.*



RADIOACTIVE WASTE AND SPENT FUEL MANAGEMENT

DESCRIPTION:

The activities related to radioisotope production, medical and industrial applications, research and development activities and those corresponding to the nuclear fuel cycle have generated radioactive waste and spent fuels of highly different characteristics including the stages of exploitation of uranium resources up to operation, maintenance, decontamination and dismantling of facilities, equipment and devices used in all of the areas of the nuclear energy R&D.



CAE - DEPOSIT OF LOW LEVEL WASTE AND SEALED SOURCES

Law No. 24804 establishes that CNEA “is responsible for radioactive waste management by fulfilling those tasks entrusted by the specific applicable law” and “state ownership of special fissionable radioactive materials contained in irradiated fuel assemblies.” Likewise, Law No. 25018 creates the National Programme of Radioactive Waste Management (*Programa Nacional de Gestión de Residuos Radiactivos*, PNGRR) within CNEA attributing to it specific responsibilities related to this activity.

Safe management of radioactive waste entails the development of the set of activities necessary to isolate them from the biosphere during the necessary time so that its radioactivity decays at such a level that its eventual reentry does not entail risks either for our society or the environment.



Regarding current spent fuels, their management consists of interim storage under safe conditions which are permanently controlled in nuclear power plants. Initially they are stored in pools to be later transferred to steel silos for dry storage. In CNE, they are already available and in CNA-I they are under construction. Therefore, they will be stored in said dry silos up to their reprocessing, taking into account that they still do not have a high non consumed power level which may be usable if the plutonium and uranium contained in these fuels are separated.

Should the country decide not to reprocess its spent fuel, its final disposal will be managed.



CAE - FACIRI (FACILITY THAT STORES IRRADIATED FUELS OF RESEARCH REACTORS)

Both types of management will be completely performed in accordance with regulations set forth by ARN, national and provincial regulations and the provisions set forth by the authorities of the City of Buenos Aires and international agreements duly executed.

The expected time to fulfil those actions of the National Programme of Radioactive Waste Management requires the development of a technically consolidated organization which may be renewed and continuously improved so as to respond to society with the proper technical solutions needed at each time.



It is worth mentioning that since 1994 radioactive waste generated outside this province have not entered the Ezeiza Management Area (*Área de Gestión Ezeiza*, AGE) due to legal reasons set forth in Article 28 of the new Constitution of Buenos Aires province. In 2001, it was decided to interrupt operations of final disposals in AGE because of limitations in their operational conditions.

As a consequence, low and intermediate level waste, coming from operational and maintenance processes, have been stored transitorily in NPPs.

On the other hand, the selection of the site where the future repositories will be located is an issue that involves technical knowledge and the necessary communication to the public necessary to make stakeholders participate in the decision-making process. This requires technical knowledge, the communication with the public to achieve a proper understanding of this issue and to encourage participation of stakeholders in the decision-making process. This includes the necessary political support to carry out the project.

OBJECTIVE:

Strategic Objective 1: Continue with the fulfilment of obligations assumed regarding safe management of radioactive waste and spent fuels, exclusively derived from the nuclear energy R&D and its applications in Argentina through the National Programme of Safety Management in a sustainable way.

MAIN PROJECTS:

- *Improve existing facilities in AGE.*
- *Keep spent fuels of experimental and radioisotope production reactors stored safely.*
- *Design of future repositories.*



NUCLEAR TECHNOLOGY APPLICATIONS TO HEALTH

DESCRIPTION:

The area of health starts with research and development, along with training of human resources; it continues with the production of the necessary supplies fulfilling the requirements of the Argentine Food, Technology and Drugs Administration (*Administración Nacional de Medicamentos, Alimentos y Tecnología Médica*, ANMAT) until its application to patients. Nuclear medicine entails diagnostic and treatment of different pathologies, along with radiotherapy in different modalities. These specialties apply advanced medical technologies focusing mainly on diagnosis and cancer treatment.



PET-CT SCANNER

Since its beginnings, CNEA has paid special attention to radioisotopes research and applications and radiation in medicine, starting research in Biology and Medicine in 1952 and in Radiobiology in 1957. The Laboratory of Nuclear Medicine at the Clinical Hospital (UBA) was created in 1958 which, in 1962, became the Nuclear Medicine Centre (NMC). In 1966, the first agreement was executed on the operation of this centre between CNEA and the University of Buenos Aires.

Continuing with the efforts to develop nuclear medicine, the Centre for Oncology and Nuclear Medicine was created in the Institute Ángel H. Roffo within the framework of the same agreement between UBA and CNEA. In this Institute, CNEA also conducts



activities in teaching and planning of treatments related to Physics and Dosimetry of Radiotherapy.

While the direction of the Nuclear Medicine Centre at the Clinical Hospital is conducted by personnel of CNEA, the direction of Institute Roffo is undertaken by personnel of the UBA. The pieces of equipment in both centres belong in its majority to CNEA, which is responsible for its maintenance.

In 1991, through an agreement between CNEA, University of Cuyo and the Government of the Province of Mendoza, FUESMEN was established, which is a highly specialized and complex medical centre. CNEA and FUESMEN agreed on creating the Non-Profit Nuclear Diagnostic Centre (*Fundación Centro de Diagnóstico Nuclear, FCDN*) in 1994 with a PET-CT system associated with a baby cyclotron.

Together with this, the production of radioisotopes for medical uses has been one of the main tasks of CNEA over decades in the area of health, producing almost all of radioisotopes used in our country, exporting them to several countries in Latin America.

The activities undertaken by CNEA in the area of health, developed mainly in Ezeiza Atomic Centre (CAE) and in their nuclear medicine centres engulf a group of projects and work lines devoted to research and development, production of goods and services, training of human resources in different topics and assistance to patients. The topics covered are radiobiology, radiochemistry, radiopharmacy, nuclear medicine, radiotherapy, therapy through accelerators, boron neutrons capture therapy, biomedical materials irradiation, radioisotope metrology, ionizing radiation dosimetry, production of radioisotopes, nuclear analytical techniques and other related areas, radiation protection and training of human resources.

There is a strong link with other national agencies such as ANMAT, the Argentine Institute of Industrial Technology (*Instituto Nacional de Tecnología Industrial, INTI*), the Argentine Institute of Agriculture and Livestock Technology (*Instituto Nacional de Tecnología Agropecuaria, INTA*), universities and other international agencies, such as the IAEA and other agencies, CNEA acting as a national benchmark in almost all of the abovementioned topics. The interaction between provincial governments is fruitful in terms of the creation of medical diagnostic centres and high technology treatment centres.

Within the framework of new projects, the National State is making major investments on design and construction of new facilities joining existing facilities, such as RA-3 and production facilities at CAE. These new facilities are the RA-10 Argentine Multipurpose Nuclear Reactor, the fabrication facility of fuel assemblies for research reactors, the fission production plant and the new building of Radiopharmacy, all of which are located in the abovementioned atomic centre.



There is an informative initiative called Pet Network for management and technical purposes which will join CNEA nuclear medicine centres in an initial stage and, in the future, other centres external to the Institution. This Network entails the transfer and exchange of medical images for interconsultations between health professionals, videoconferences for interactions between medical doctors and medical physicists as well as training of human resources, exchange of information on medicine, physics, management, and technical topics, among other activities.

As part of the plan, CNEA federalises the access to nuclear medicine through the construction of nuclear medicine centres in different parts of Argentina within the framework of a Nuclear Medicine National Plan, which have the support of INVAP S.E. Currently, there are centres being built in Bariloche, Formosa, Entre Ríos, Rio Gallegos, Santiago del Estero and La Pampa, and, in the near future, also there will be this type of centres in the provinces of Jujuy, Córdoba, Chubut and Buenos Aires; moreover, there is also a projection in the mid term to build these centres all around Argentina.

OBJECTIVES:

Strategic Objective 1: Contribute to improve public health by means of CNEA acting as a benchmark for research, development and innovation in producing radioisotopes and radiopharmaceuticals, nuclear medicine and radiotherapy, contributing towards assistential activities by means of promotion and use of new technologies.

Strategic Objective 2: Supply radioisotopes and radiopharmaceuticals to the system of national health and strengthen the role of CNEA as an exporter of products and related technologies.

Strategic Objective 3: Create, manage and update highly complex nuclear medicine and radiotherapy centres distributed along Argentina and integrated in a national network, which enables population to have access to state-of-the-art technologies for diagnosis, treatment and prevention of different diseases.



MAIN PROJECTS:

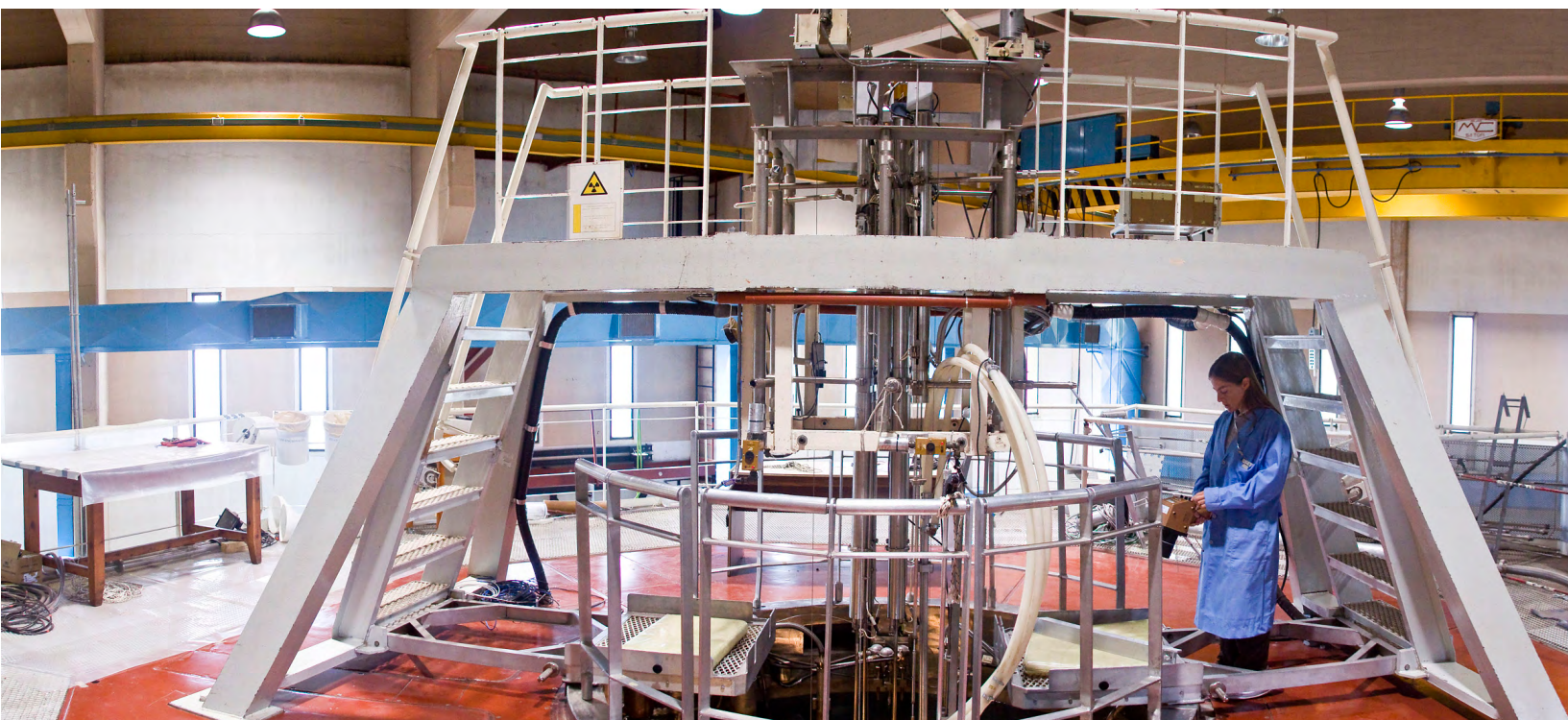
- /// *Nuclear Medicine National Plan.*
- /// *Reequipment of the Nuclear Medicine Centre of the Clinical Hospital and Institute Ángel H. Roffo.*
- /// *Project on Therapy by Boron Neutronic Capture.*
- /// *Development of new radioisotopes and radiopharmaceuticals.*
- /// *Cancer therapy accelerators.*

RESEARCH AND RADIOISOTOPE PRODUCTION REACTORS

DESCRIPTION:

Research and radioisotope production reactors cover a major role in the preparation of scientific, industrial and technological infrastructure applied by the country to its nuclear programme.

During 65 years of existence of CNEA, multidisciplinary research has been conducted through these reactors covering training of human resources, including activities such as outreach, education and training; irradiation applications for the production of radioisotopes of medical and industrial uses, material studies, component



RA-6 REACTOR

tests and research in nuclear medicine; research through neutron beams; and, finally, fuel tests and experiments through trials.

RA-1 reactor started up in Constituyentes Atomic Centre in 1957. This was the first Argentine nuclear reactor and the first to operate in Latin America. Currently, it is used to train human resources and to provide support for research and development activities.

RA-3 reactor located in Ezeiza Atomic Centre produces the largest part of radioisotopes used in Argentina. In this reactor, there is a new generation of low enrichment irradiation targets under development by means of which the continuity of

production of Mo-99 is guaranteed. Molybdenum-99 is an important radionuclide applied to nuclear medicine.

RA-6 reactor is installed in Bariloche Atomic Centre and the main activities of this reactor are teaching, training of employees as well as research and development in close relationship with Institute Balseiro. In 2009, a repowering to 1 MW_t was performed whereby U-235 was changed from 90% to 20% in line with the Argentine policy on peaceful uses of nuclear energy and on non-proliferation issues.



RA-0

RA-0 and RA-4 reactors are critical facilities (or almost zero power reactors) which were granted as loans from CNEA to the University of Córdoba and the University of Rosario. These educational institutes operate these reactors by training professionals in the nuclear energy R&D. RA-8 is another critical facility located in Pilcaniyeu Technological Complex and was designed to undertake experiments related to the design of CAREM reactor.

Argentina is at the forefront of research and radioisotope production reactors, a leading position which Argentina has achieved due to six of these reactors in the country and due to later exports to countries such as Peru, Algeria, Egypt and Australia. INVAP S.E. was in charge of the last three reactors which had the technological support of CNEA.



The development of the RA-10 Argentine Multipurpose Nuclear Reactor, together with its twin reactor developed in Brazil, the Brazilian Multipurpose reactor (*Reator Multipropósito Brasileiro*, RMB), are the milestones in this area. This reactor has state-of-the-art technology worldwide and a contract for its construction has already been put out to tender and it is expected to be fully operational within the next 5 years. The project also has the development of a new fission radioisotope production facility and another production facility of fuel assemblies for research reactors.



RA-3 REACTOR

OBJECTIVES:

Strategic Objective 1: Strengthen and improve the design, operation and use of research and radioisotope production reactors in Argentina, enlarging the service of irradiation service for production, applications to research and development, training of human resources and provision of services.



Strategic Objective 2: Strengthen and develop capacities in management, engineering and licensing related to design, construction and use of research reactors; therefore CNEA has consolidated its position as the worldwide leader in this area.



RA-4

Strategic Objective 3: Design, construct and start up the research and radioisotope production RA-10 reactor in order to guarantee the local supply of radioisotopes, contribute towards meeting international demand and enlarging research and development capacities in Argentina.

MAIN PROJECTS:

- /// *New RA-10 Research and Production reactor.*
- /// *Increase of the radioisotope production capacities.*
- /// *New Fission Facility.*

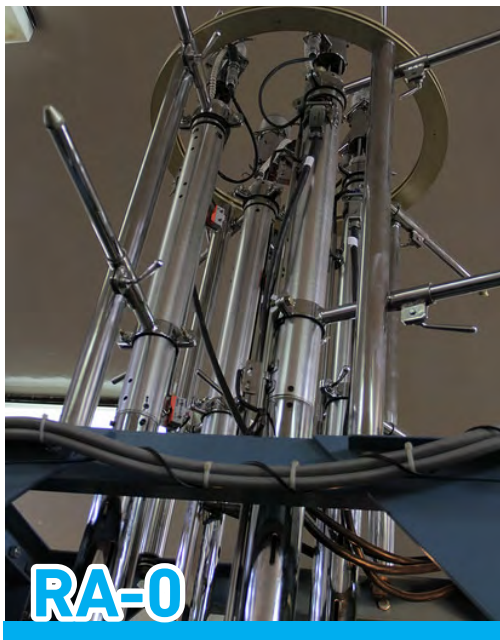


ARGENTINA AND RESEARCH REACTORS

IN ARGENTINA



1957



1965



1967

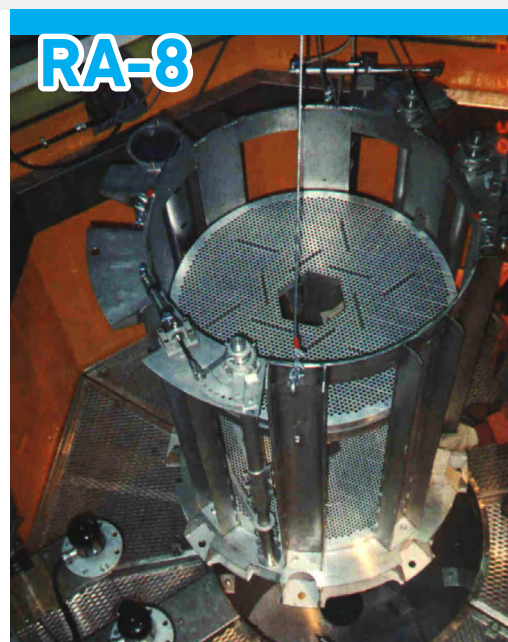
1972



1982



1997



WORLDWIDE EXPORTED REACTORS



1978



1988



1989

1998



2006





NUCLEAR TECHNOLOGY APPLICATIONS TO INDUSTRY AND AGRICULTURE

DESCRIPTION:

One of the most relevant products related to nuclear energy is knowledge, easily transferrable to the multiple economic activities performed in the country. Since its beginnings, in CNEA, research and development pieces of equipment were made and used in nuclear technology applications to increase competitiveness in different areas of industry, agriculture and livestock of Argentina. These activities have been constantly developed and have contributed several benefits towards the community.



CAE - NUCLEAR TECHNOLOGY APPLICATIONS TO INDUSTRY AND AGRICULTURE

The first pieces of research were done in 1965 within the scope of ionizing radiation applications in food and medical products. In 1970, the Multipurpose Semi Industrial Irradiation Facility (*Planta de Irradiación Semi Industrial*, PISI) was built in order to investigate the effects of ionizing radiations in different fields. Currently, there is a project for a new irradiation plant with an electron source instead of gamma radiation. This will allow new lines of research as well as enlarging capacities for CNEA to provide irradiation services.

There have been developments with sterilization purposes, microbial and parasitic decontamination, and fumigation of different products, applied to medical equipment, pharmaceuticals, veterinary and laboratory products, and decontamination of food in general, particularly for immunocompromised people.



Currently, in PISI, services are provided for companies to advise and process products. Moreover, research and development is conducted for internal groups of the Institution.

In the field of food irradiation, CNEA contributed towards increasing scientific knowledge about this process and succeeded in including the Argentine Food Code in the Regulation of the Argentine Service of Agricultural Food Health Quality (*Servicio Nacional de Sanidad y Calidad Agroalimentaria*, SENASA) and, in national regulations of the Argentine Institute of Normalization and Certification (*Instituto Argentino de Normalización y Certificación*, IRAM). Over the last five years, CNEA has intensified spreading of these applications, providing advice for national companies and other organizations from neighbouring countries interested in installing multipurpose irradiation plants and in treating new products.

Cobalt-60 sealed sources for industrial and medical uses applied in Argentina are produced and commercialized by the Argentine corporation DIOXITEK S.A. in the cobalt-60 sealed sources production facility. This production has enabled Argentina to achieve a third place worldwide and around 90% is used for export.

CNEA has developed equipment to measure and control radioactive sources for the chemical industry and has undertaken radiotracer studies, applied to water courses, the oil industry and the cement industry, among others.

In 2004, the National Institute of Industrial Technology (*Instituto Nacional de Tecnología Industrial*, INTI) officially delegated CNEA ionizing radiation and metrology for radioisotopes dosimetry lab to develop and provide custody of national standards for metrology as well as dissemination of the relevant measurement units. Both institutions integrate the Working Group for Ionising Radiation in the Inter American Metrology System (IMS) and participate in international comparisons of doses and radioisotopes. CNEA has recently been accepted as an observer of the Consultative Committee for Ionising Radiations from the International Bureau of Weights and Measures.

Applications in agronomy entail studies of natural resources (water and soil) by applying nuclear techniques. Livestock applications entail the study of animal production specially focused on health and nutrition.

Among some applications developed, it is worth mentioning that the Sterile Insect Technique was undertaken to fight the Mediterranean fruit fly. This technique is a biologically-based method; it does not damage the environment and does not have a negative impact on the biodiversity since it is species-specific. The implementation of this technique reduces or prevents the use of agrochemicals or pesticides and was developed in CNEA between 1977 and 1985. The National Program for Control and Eradication of Fruit Flies started up and was addressed through these research and development works.



Other areas of work cover the effects of farming on crops and soil properties, the control of diseases in beehives, development of biomonitors, studies of animal nutrition and determination of a vaccine for eradicating and eliminating brucellosis. CNEA is deeply involved in these topics and holds permanent consultations with the Argentine Institute of Agriculture and Livestock Technology (*Instituto Nacional de Tecnología Agropecuaria*, INTA) and SENASA. CNEA also undertakes studies jointly with national and international universities.

OBJECTIVES:

Strategic Objective 1: Contribute to the sustainable agricultural, livestock and industrial development within the national scope, by generating, adapting and transferring nuclear and related technologies that increase competitiveness and productivity of different involved sectors.

Strategic Objective 2: Keep and increase capacities and competences of CNEA in the field of metrology of radioisotopes and dosimetry of ionizing radiations as a lead agency at a national level.

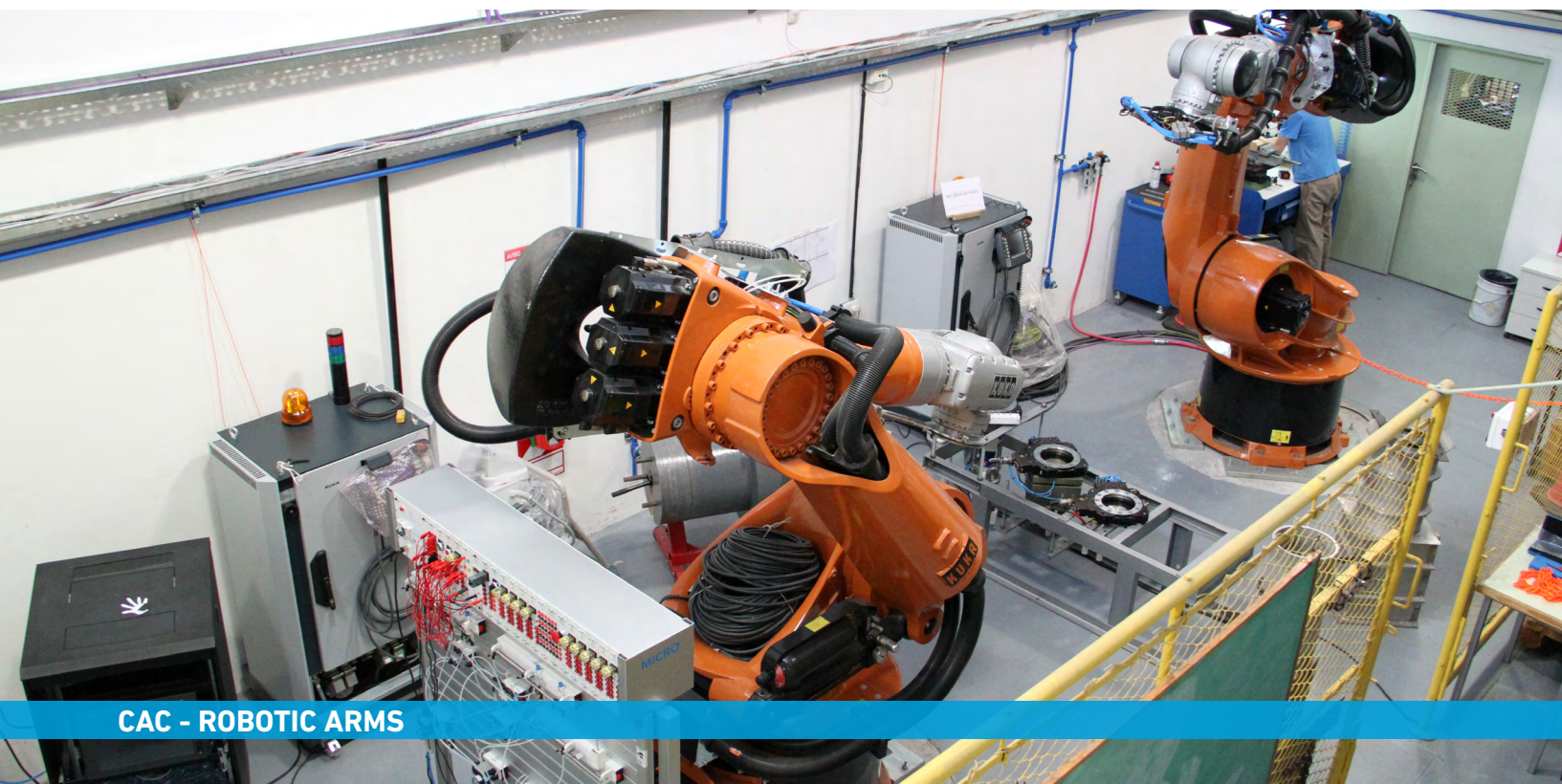
MAIN PROJECT:

/// ***Electron Accelerator Irradiation Facility.***

RESEARCH AND DEVELOPMENT

DESCRIPTION:

Since its creation, CNEA has displayed wide successful research and development (R&D) in physical sciences, chemistry, radiobiology, metallurgy, science and technology of materials and engineering. These activities are pioneering and have been oriented towards acquiring, producing and storing knowledge so as to back the autonomous productive national development.

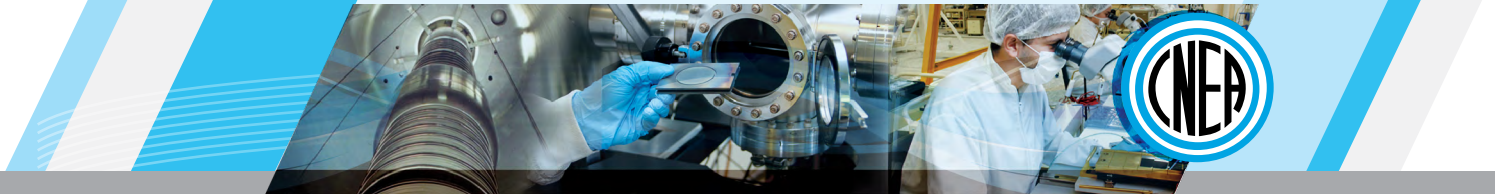


CAC - ROBOTIC ARMS

The level of excellence achieved in this activity has enabled trained personnel to become experts in several fields of knowledge according to the needs and requirements of society.

The importance of R&D in CNEA dates back to its beginnings. In 1951, the first research labs in radiochemistry were inaugurated, succeeding in the separation and discovery of new radioisotopes, excelling at an international level due to the quality of contribution. Later, research in cosmic radiation started.

In Bariloche, along with teaching activities, there was a decision to develop solid-state physics and nuclear physics, two main branches in nuclear issues, under a research programme to meet interests of CNEA. The construction of an electron



linear accelerator was planned to produce radiation damage with electrons or gamma radiation. Later the electrostatic accelerator of heavy ions of 20 MeV (TANDAR) was inaugurated in CAC.

In CAC, a Department of Metallurgy was established to meet the scientific-technological demand in different areas such as nuclear fuels, special alloys, non-destructive assays, technical assistance services to industry and manufacturing plants. This department became the centre of the national and Latin American metallurgical activity, which offered the Pan American course of Metallurgy in 1958.

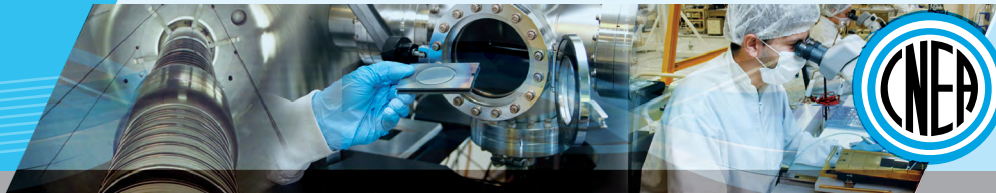
Due to R&D capacities of CNEA, there were technologies developed which transferred knowledge from labs to industrial plants. This was the support of major national projects and allowed the transfer of technology to companies due to the high quality demands of the processes which characterise nuclear requirements. Research in metallurgy and nuclear physics enabled the construction in Argentina of the first research reactor in Latin America, named RA-1 reactor. Expertise in radiochemistry enabled the early production of radioisotopes satisfying demand for medical, industrial and agricultural applications. Research and development in extractive metallurgy enabled the production of concentrate and uranium oxides for Argentine NPPs.

Research in ceramics and membranes provided the country with the capacity to develop a uranium enrichment plant by gaseous diffusion. Expertise in radiobiology enabled the successful application of research programmes on alterations produced by radiations, pollutants and carcinogenic in biological systems. Moreover, therapeutic effects of radiations are under study.

Currently, there are pieces of equipment in CNEA labs which enable them to respond to demands in its areas of competence. There are around 1000 researchers working there who also contribute significantly towards the national scientific technological system which is one of the mainstays of this system.

In these labs, monitoring of greenhouse gases of the Argentine electricity generation is conducted. Analytical nuclear techniques respond to requirements of CNEA and society through their precision and reliability.

The Pierre Auger Observatory is the major facility designed to detect ultra-high energy cosmic rays. Scientists of CNEA coordinate this international project together with the collaboration of 400 scientists. The Institute of Detection Technologies and Astroparticle Physics (*Instituto de Tecnologías en Detección y Astropartículas*, ITeDA) was created in 2009 to contribute to the study and detection of radiation coming from outer space. Other Institutes that have been created are the Centre for International Earth Science (CIE), the Institute of Energy and Sustainable Development (*Instituto de Energía y Desarrollo Sustentable*, IEDS) and the Public Private Consortium Interconnection to Distributed Urban Solar Energy Network (*Proyecto de Interconexión a Red de Energía Solar Urbana Distribuida*, IRESUD).



Currently, the micro and nanotechnological development is undertaken for nuclear, space and health applications. In Argentina, developments in this area were sustained by years of research in CNEA. Thanks to the creation of the Institute of Nanoscience and Nanotechnology, CNEA expects to group an increasingly relevant sector that had been spread in different areas in Argentina.

In the mid term, there are challenges in the area of materials, oriented towards solving deactivation of nuclear facilities, treatment of low, medium and high level waste, prevention of failures and PLEX and components life extension, development of coatings and welding processes, automation and robotic processes, among others. In the long term, R&D activities intend to address fusion and advanced reactors, high level waste repository, new sources of power generation, optimization of energy transport and permanent training of human resources.

OBJECTIVES:

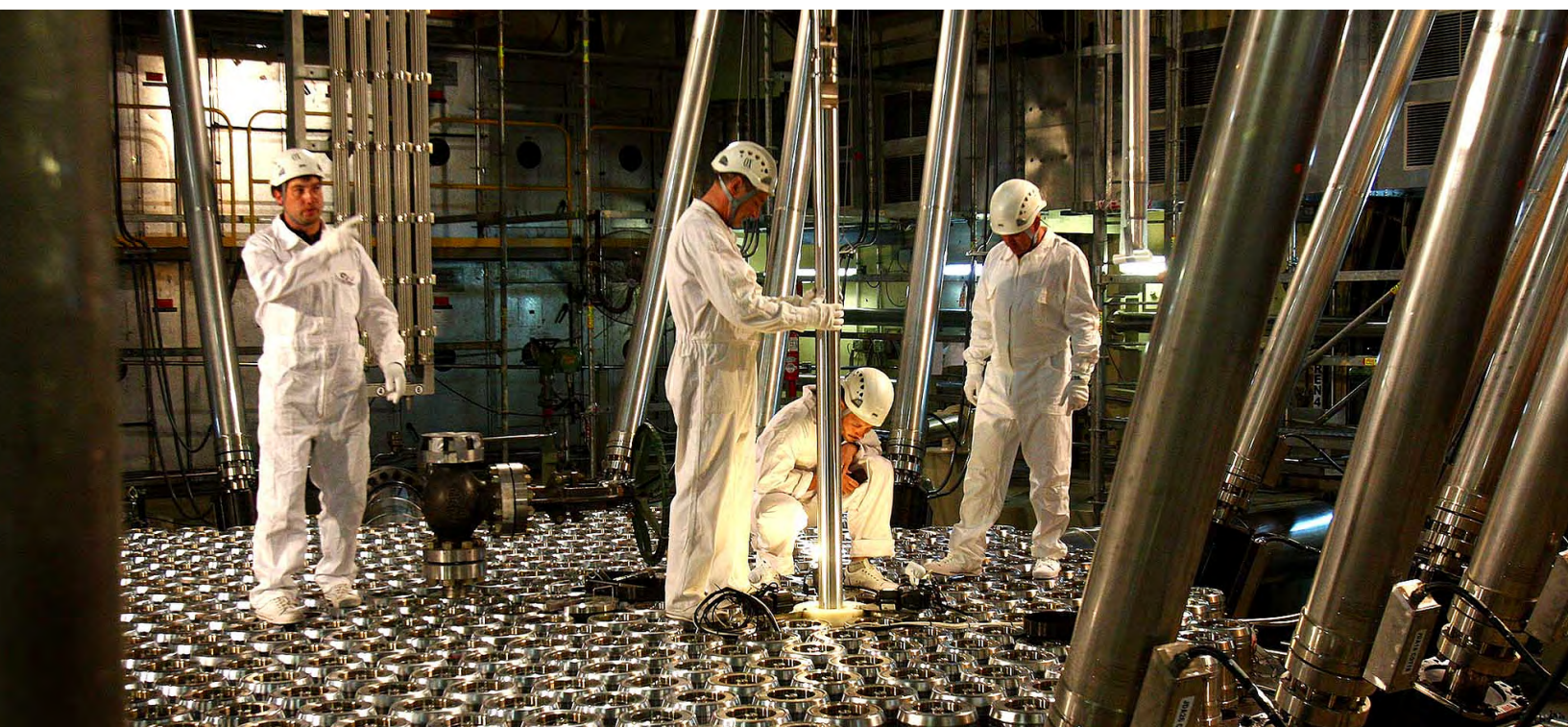
Strategic Objective 1: Strengthen and increase research and development in physics, chemistry, materials science, biology and engineering to face the challenges of the nuclear industry in the 21st century.

Strategic Objective 2: Place CNEA as an excelling centre of basic and applied research of nuclear technology sciences.

INNOVATION AND TECHNOLOGY TRANSFER

DESCRIPTION:

CNEA has had a long tradition in transferring the results of its Research and Development activities in the nuclear industry to the productive sector. Through the Service of Technical Assistance to Industry (*Servicio de Asistencia Técnica a la Industria*, SATI), the Nuclear Plans that covered the development of suppliers for nuclear power plants construction, promotion of “spin-off” such as INVAP S.E., CNEA developed linking mechanisms with and technology transfer to both nuclear and non nuclear productive sectors.



TECHNOLOGICAL SERVICES FOR CNA-II NPP

During the nineties, a regulatory framework was created for these activities through the Act No. 24467 “Law of Science, Technology and Innovation”. In this regulatory context, Article 2 of the Act No. 24804 “National Law on the Nuclear Activity” established that, among CNEA tasks, it was necessary to tend to “foster technology transfer programmes for the technology that was acquired and developed by the Institution, and for which the Institution has a patent, in compliance with the non-proliferation commitments signed by the Argentine Republic.”

Thanks to the relaunch of the Argentine Nuclear Plan in 2006 and to the sanctioning of the National Executive Power Decree 981/2005 by means of which CNEA became a shareholder in NA-SA, CNEA undertook activities with the rest of the



companies of the nuclear industry. Therefore, it undertook engineering works for fuel assemblies for CNA-II and provided technological assistance for nuclear power plants.

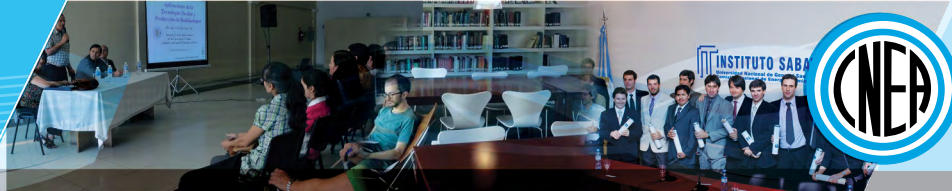
In agreement with governmental directives as part of the scope of science and technology, the production of miniplates for research reactors continued, along with advice on design and construction of nuclear facilities, among other projects.

Moreover, activities of scientific, basic and applied research and technological developments in different areas undertaken by CNEA have enabled it to be in a position to offer a significant variety of advisory services and technological assistance to sectors, such as aerospace, telecommunications, metamechanical, petrochemical, health, among others.

Currently, CNEA provides assistance and technological transfer to more than 500 agencies, which include companies, research centres, universities, judicial bodies, hospitals and regulatory bodies with an average increase of over 15% between 2010 and 2014. This shows the importance CNEA lays in improving the quality of national, social and productive activities.

OBJECTIVE:

Strategic Objective 1: Make it possible to transfer knowledge and developments generated in CNEA to the private sector as a result of nuclear projects.



EMPLOYEES, THEIR EXPERTISE AND THEIR ACADEMIC QUALIFICATIONS

DESCRIPTION:

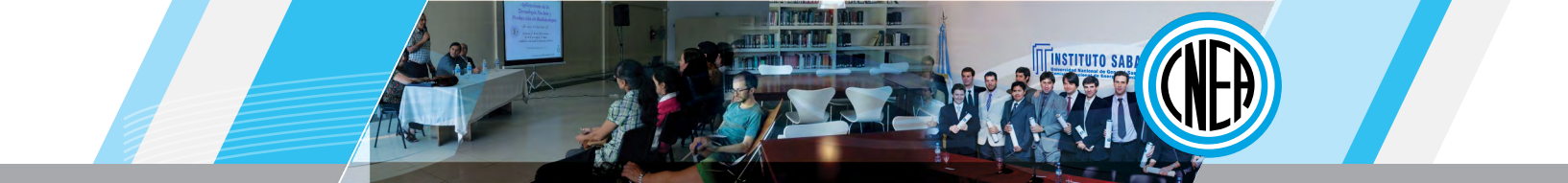
CNEA has an invaluable asset made up of its employees who work to achieve its institutional strategic objectives. Expertise brought, developed and transferred by employees, along with capacities acquired, increased and accumulated throughout CNEA history constitutes the main asset of the Institution: its Intellectual Capital.

It is crucial to guarantee the benefits of nuclear energy and technology applications to society in a safe, efficient and continuous way. CNEA intellectual capital



is a key element to duly face current challenges of the Institution, whose specific demands pass from generation to generation.

Currently, there are 3100 employees, among professionals, technicians and administrative workers, who undertake their tasks together with other 1050 employees that come from other agencies, a number which in November 2014 totalled 4150 workers. It has been a policy of the Institution to train its personnel permanently, both within the country and abroad. Knowledge gained is one of the milestones for the social, cultural and economical development of Argentina and has enabled CNEA to meet challenges and obtain acknowledgements both at a national and international level.



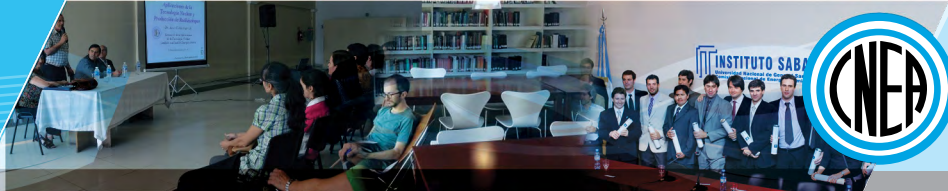
Since its creation, CNEA has showed a strong commitment to training professionals and technicians at the highest academic level. Undergraduate and postgraduate courses in science and engineering are offered at CNEA academic institutes: Balseiro, Sabato and Dan Beninson, created jointly with national universities. They contribute to the development of the nuclear energy R&D in Argentina and the Latin American region. By means of a scholarship programme, CNEA encourages young students to receive an excellent academic education.

Moreover, since 1962, internships have been offered to professionals, technicians and advanced university students. These interns are trained by means of the programme “Learn By Doing” in technical and scientific groups of CNEA in different specific topics,



who are under the supervision of their specialists. By the end of 2014, 284 interns were trained within the framework of this programme.

By taking into consideration the time passed since the nuclear renaissance at a national and international scale, it is crucial to continue with the existing active and challenging programme to hire and retain young employees as well as with activities to transfer knowledge. This programme covers the following points:



Identifying areas of knowledge that seek to fulfil the Institutional Strategic Plan and those areas with a high risk of losing Intellectual Capital.

Consolidating proper planning and human resource management as well as establishing action guidelines intended to provide career development.

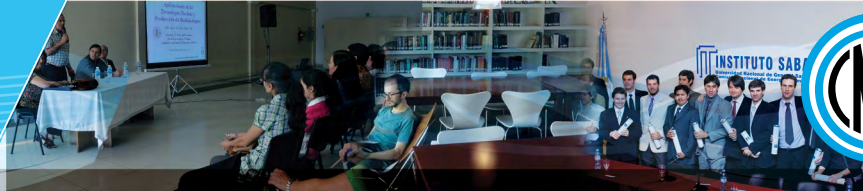
Strengthening preservation and transfer of knowledge of strategic value, spreading, making this knowledge available and reusing such knowledge published in documents, reports and patents, which are key to develop major activities of CNEA.



INSTITUTE DAN BENINSON

Consolidating, creating a hierarchy and strengthening the topics of courses of Academic Institutes, as well as adding new courses and training professional and technical activities, providing continuous and permanent education to meet new challenges of the nuclear industry.

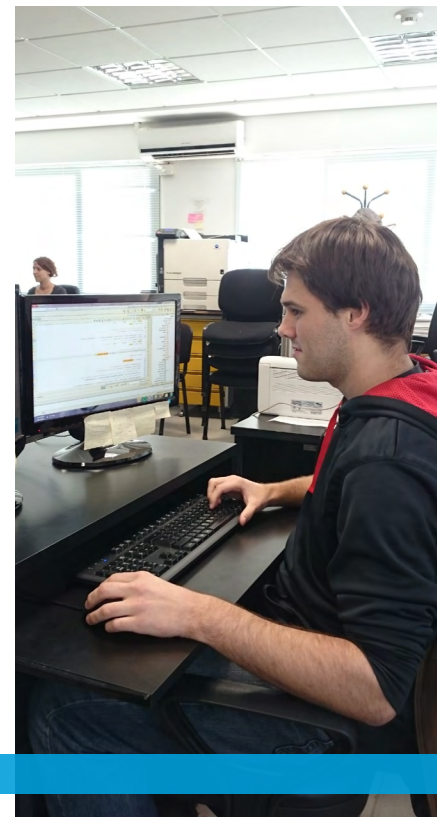
Consolidating academic institutes as national and international benchmarks for training highly qualified professionals and technicians in areas of science and engineering related to strategic activities of CNEA.



OBJECTIVES:

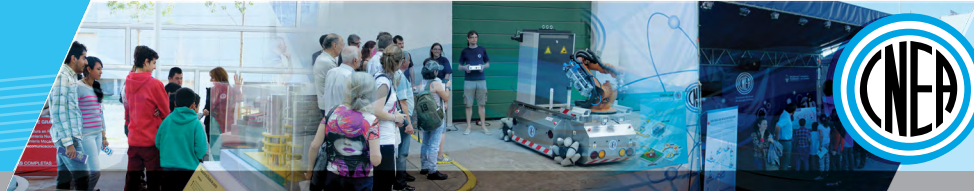
Strategic Objective 1: Conduct a strategic management of Human Resources that cover planning, development and retention of employees.

Strategic Objective 2: Ensure the development, preservation and transfer of knowledge and experiences in order to contribute to sustainability of the nuclear industry.



INTERNSHIP PROGRAMME "LEARN BY DOING"

Strategic Objective 3: Strengthen education and training activities of CNEA academic institutes and other CNEA educational centres by meeting needs and priorities for the development of the nuclear industry.



RELATIONS WITH THE COMMUNITY

DESCRIPTION:

CNEA was created on 31 May 1950 through the Decree No. 10936 in response to the decision made by the President Juan Domingo Perón, which marked the start of the nuclear energy R&D in Argentina and became a pioneer in Latin America. Since its beginnings, the agency was devoted to the study, development and application of the peaceful uses of nuclear energy with the main aim of improving the life quality of society.

It has been a long time since that moment and in spite of some downturns in political projects which caused deindustrialization in the country, nuclear technology is



TECNÓPOLIS (ARGENTINE SCIENCE AND TECHNOLOGY PARK)

considered strategic for the technological, productive and social development of Argentina, especially after the National Government relaunched the Nuclear Plan in 2006.

The reactivation of the nuclear industry should be seen as a political decision to boost development, industrialization, sovereignty and mainly social inclusion.

This is shown by means of the advancement of uranium enrichment projects, the RA-10 Argentine Multipurpose Nuclear Reactor, CAREM 25 nuclear power plant, CNE PLEX, the Nuclear Medicine National Plan, the increase in uranium dioxide production



of DIOXITEK, the finalization of CNA-II, the reactivation of the Heavy Water Industrial Plant, redesign of fuels for nuclear power plants and research reactors made by CNEA and its companies CONUAR S.A. and FAE S.A., among other initiatives launched over the past eight years.

In this process of transformation, institutional communication has gained a major role when it was constituted as a link that facilitated the relation between the State and society, guaranteeing access to knowledge and the right to democratic, free and plural information and, also, it has contributed towards transparency in the actions by the State.

In 2011, CNEA created the Department of Social Communication which develops a communication policy which enables the Institution to hold a dialogue with the community and to give visibility, social validation and strategic positioning to nuclear activities through its advances and results.

The construction of the link with the different parts of society requires a dual process: on the one hand, there has to be a direct contact with different sectors of the public to present and deepen the multiplicity of peaceful uses of nuclear technology, its development in Argentina and the benefits for daily life; on the other, participation must be fostered so as to know what the community wants and expects from the nuclear sector, together with its doubts and concerns.

The task means planning communication in strategic points in order to foster and strengthen public acceptance of the nuclear energy R&D with peaceful ends and CNEA institutional image as a benchmark in the sector by means of:

- **Communication of characteristics of nuclear technology by means of its own channels.**

- **Undertaking of studies and research.**

- **Strengthening of external communication.**

- **Participation in areas of training and exchange of experiences in nuclear topics.**

As part of this framework, the strengthening of CNEA institutional image is complemented with informing society about the applications of different aspects that conform nuclear energy R&D in order to consolidate the positive image that society has of this activity.

The different aspects of the current nuclear development, linked to educational, scientific, productive, technological, and political topics, among others, are fully communicated by CNEA as a response to its leading role in the network of institutions,



companies, academic institutes and medicine centres that form the nuclear sector in Argentina and should be perceived as a whole by its community.

Under the current scenario, the challenge is to focus on strengthening the structure of communication and the way it works after an evaluation, planning, execution and systematization of activities in communication. This process consists of coordinating and unifying the message of the Institution among all of the sectors and activities conducted in CNEA by means of an efficient internal communication. Besides, the objective of this is to contribute towards consolidating the federal characteristic of CNEA as a government agency thus establishing bonds with the community throughout the country.

OBJECTIVES:

Strategic Objective 1: Give CNEA the status of an agency in charge of providing and advising on reliable information about nuclear science and technology for the Argentine society by means of an efficient and effective structure of communication.

Strategic Objective 2: Give society the necessary elements to make a judgment about the nuclear energy R&D by highlighting its permanent contribution towards wellbeing and development of the country by means of a transparency and open-door policy.



DOMESTIC AND INTERNATIONAL AFFAIRS

DOMESTIC AFFAIRS

Since its creation, CNEA has established different types of links with agencies at a national, provincial and municipal level, as well as with other institutions, companies and private entities according to particular objectives in the field of peaceful uses of nuclear energy. These links have been formalized through scientific and technical cooperation agreements enabling the creation of interinstitutional strategic alliances and associations which have enabled advances in the development of key projects framed within the National Nuclear Plan.

Interinstitutional links are a valuable strategy for scientific and technological development for CNEA since it transcends the achievement of objectives for the Institution and its counterparts, continuously boosting a search of synergies to improve and broaden knowledge and joint management of projects within the scope of science, technology and production. In this sense, by including a number of requirements in



BILATERAL RELATIONS WITH A PRIVATE SUPPLIER FROM THE PEOPLE'S REPUBLIC OF CHINA

binding legal instruments, a strict followup and control have been done which tend to evaluate gains and benefits which are related to the mission and objectives of CNEA as long as these instruments are effective and, also, when they are later renewed.

It should also be noted that CNEA is part of the National System of Science, Technology and Innovation (*Sistema Nacional de Ciencia, Tecnología e Innovación, SNCTI*)



in agreement with the Law No. 25467. In this sense, the representation in this system has been strengthened, thus increasing collaboration with other agencies and institutions of the Inter Institutional Council of Science and Technology (*Consejo Interinstitucional de Ciencia y Tecnología, CICyT*) and with other agencies advised by CNEA in its specialty field, such as non-profit organizations and universities, among others.

INTERNATIONAL AFFAIRS

The relaunch of the main nuclear projects within the framework of the National Nuclear Plan has enabled the Argentine Republic to recover a leading place in terms of peaceful uses of nuclear energy at an international level. CNEA has gained a highlighted role in the design and implementation of an autonomous and sovereign foreign policy allowing



BILATERAL RELATIONS WITH THE PLURINATIONAL STATE OF BOLIVIA

our country to consolidate its position and international insertion through different instances at a multilateral and bilateral level.

Within the multilateral scope, CNEA actively works at a global and regional scale reaffirming commitments assumed at a national level defending the interests and position of the country in different international forums and regimes such as the Nuclear Supplier Group (NSG), the Nuclear Safety Summit, the Global Initiative to Combat Nuclear Terrorism (GICNT) and the International Framework For Nuclear Energy Cooperation (IFNEC).



The intense participation that CNEA develops within the framework of the IAEA is highlighted through technical and political debates as part of the framework of the Technical Cooperation Programme contributing in a highlighted way at a regional level through the Cooperation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean (*Acuerdo Regional de Cooperación para la Promoción de la Ciencia y Tecnología Nucleares en América Latina y el Caribe*, ARCAL).

CNEA has increased bilateral relations with different counterparts and foreign science and technology agencies by strengthening its strategy for international insertion. In this sense, there is an important interaction with a number of developed countries which enables active participation in projects of technological development with agencies from the most advanced countries in order to foster strengthening of local capacities. Also, they foster exchanges and assistance to the relatively less developed countries in order to foster knowledge of the Argentine nuclear technology abroad and promote the opening of potential markets for the national nuclear sector. Lastly, complementation and collaboration with countries with a similar development is boosted by integrating efforts in search of synergies and economies of scale with other countries.

The autonomy in nuclear technology has managed to become the guiding principle throughout the history of Argentina in furtherance of acquiring the necessary knowledge and infrastructure that bring about predictability and sustainability, which are characteristic of a real state policy. In this way, the experience gained by CNEA in fields such as nuclear safety and radiation protection, technological transfer, non proliferation and safe management of radioactive waste guarantees the sovereign nuclear development for peaceful ends at the same time that it places it as a benchmark at a regional and international level.

OBJECTIVES:

Strategic Objective 1: Optimize institutional relations at national, provincial and municipal levels.

Strategic Objective 2: Foster and defend the national interests of the nuclear energy R&D before international forums.

Strategic Objective 3: Establish strategic alliances at an international level by strengthening the position of Argentina as a benchmark of peaceful uses of nuclear energy.



MAJOR NUCLEAR PROJECTS



CAREM ARGENTINE NUCLEAR POWER PLANT

DESCRIPTION:

During the beginning of the construction of the pressure vessel and the beginning of works in the reactor building, the prototype CAREM 25 NPP, the first nuclear power plant with 100% Argentine design has started the last stage towards its finalization. Conceived of as an Argentine Modular Elements Nuclear Power Plant, CAREM is a type of Pressurized Water Reactor that uses enriched uranium as fuel and that incorporates a series of distinctive safety measures that provides a higher level of safety and reliability.

Since the relaunch of the Argentine Nuclear Plan in 2006, the national authorities gave CAREM a major boost that kept this ambitious project at the worldwide forefront of the low power reactors segment, one of the main objectives of CNEA since the first conceptual sketches of CAREM at the beginning of the 1980's. After it was officially presented internationally in 1984 (in an IAEA convention about small and medium reactors, which was held in Peru) over almost two decades during which nuclear energy R&D was characterized by strong political uncertainties (both in Argentina and worldwide), specialists of CNEA managed to further consolidation of CAREM 25 NPP design being recognised in different international forums such as one of the innovative reactors in a bigger state of development.

The relaunch of the nuclear energy R&D is characterized by a strong political decision about increasing nuclear participation in the national electricity generation grid and strengthening the position of the country in the group of countries suppliers of nuclear technologies and with a capacity to design and build nuclear power plants. In this context, the Decree No. 1107/2006 issued by the Executive can be signalled like the beginning of the new stage of the CAREM Project that declared "the construction and start up of CAREM" a matter of national interest.

The consequence of this support statement was the creation within CNEA of a Department specifically devoted to the development of the project, which started with intense work of hiring and training professionals and technicians to form and rebuild working groups necessary to consolidate and define engineering of CAREM. Moreover, equipment was acquired and facilities were built (or refurbished in some cases) which were required for a development of these characteristics. The boost that was missing happened in 2009 with the Law No. 26566 which (among other relevant nuclear projects) declared again that the project was of national interest and gave CNEA the design, execution and start up of the CAREM 25 nuclear power plant aside from giving it a series of administrative tools designed to accelerate the management of the Project.

In 2009, a series of recovery and remodelling works took place in the site where the Experimental Heavy Water Reactor was located and later decommissioned (in Lima, province of Buenos Aires). Later, on 8 February 2014, the construction of the civil building of the reactor CAREM 25 NPP started formally with the first nuclear concrete. This milestone, which places it among over 70 reactors which are officially “under construction” worldwide (according to the IAEA standards), includes another aspect of special relevance since CAREM will be installed in the first building of a nuclear power plant which will be fully developed in Argentina.



CAREM BUILDING WORKS

Aside from the process to recover the site, the beginning of this work was possible thanks to different geotechnical studies that enabled them to establish the ideal site to construct the building and to prepare an Environmental Management Plan (with its Environmental Impact Evaluation), measures which made it possible to obtain the required licenses previously to the beginning of works of the reactor issued by two regulatory bodies: the Nuclear Regulatory Body, ARN, and the Provincial Agency of Sustainable Energy (*Organismo Provincial para el Desarrollo Sostenible*, OPDS) under the charge of the environmental legislation of the province of Buenos Aires.

It should be highlighted that, at this point, after submitting the first Safety Preliminary Report, ARN has decided to modify the methodology of the licensing process of CAREM as there were no records of another type of reactor with the same characteristics worldwide. This is why there is a established process of licensing in

stages (non routine practice) through which CNEA presented all the documentation required, therefore obtaining the first stage license in September 2013: the "Authorization for the Use of the Site and Construction" which allowed works to be done, together with the "Environmental Aptitude Certificate" issued by the Provincial Sustainable Development Agency (*Organismo Provincial para el Desarrollo Sostenible*, OPDS). Then, the regulator required more information about the construction of the "Nuclear Module", finally authorizing the construction of the sector of the building where the reactor containment will be placed, along with the spent fuel assemblies pools, the main control room and the remaining pieces of equipment and systems related to its own operation of CAREM 25 NPP already under execution.

Regarding the main contracts related to the reactor and in agreement with another objective of the proposed ones (which at least two thirds of all the supplies, components and services of CAREM will be provided by national companies) during 2013, a complex process of tender for the construction and assembly of the Reactor Pressure Vessel (RPV) was designed by CNEA which is constructed by IMPSA, an Argentine corporation that awarded the job through a contract signed in early December 2013. The RPV is a cylindrical steel vessel that is about 11 m high, the inner diameter is 3.40 m and its weight amounts to approximately 200 tons. The vessel is made out of a series of rings (forged in Italy since there does not exist any forges with the magnitude necessary for this task anywhere in Latin America), which will be welded in IMPSA facilities in Mendoza, where all the details of completion will be performed. After that, the vessel will be transferred to the site in Lima for its assembly in the building.

Among other local developments, it is worth highlighting that CNEA designed fuel assemblies after developing a couple of pilot "dummies" already built by the company CONUAR S.A.. The contract signed with this company in 2013 includes not only the production of fuel assemblies but also the control bar compounds. After that, in 2014, there was an agreement with the same company for the conclusion of detail engineering and fabrication of steam generators and CNEA also finished enriched uranium pellets, transferring technology for its fabrication to CONUAR S.A..

Another advancement achieved in 2014 was the beginning of the tender of the conventional island and the tertiary circuit (Balance of Plant, BOP) including also the demineralization plant and auxiliary boiler. Under the modality turnkey project, it entails design, engineering, fabrication, supply, transport, construction, assembly, start up and essays up to the commercial authorization of all the facilities, equipment and electric generation systems of CAREM 25 NPP. There were offers of seven companies and consortiums (all of which were Argentine even though several of them present foreign partners): TECNA, IECSA, the consortium ROGGIO-SADE-SENER, CONUAR S.A., HELPORT, ELECTROINGENIERIA and the consortium IMPSA-AESA. According to prior schedules, the contract could be awarded in July and August 2015.

Also, aside from what is specifically referred to the building and reactor pressure vessel of CAREM 25 NPP, the Project has considerably advanced in other engineering works related to the reactor operation, especially to those linked to safety systems, process engineering, the lay out of the plant and electric engineering currently in an advanced execution state (even in the process of equipment acquisition, hiring of detail engineering or assembly of necessary facilities for its final development).

As a first step towards the possible start up of this type of reactors (in its commercial format) in different places of the country and the world, it should be reminded that since 2010 there has been an agreement between CNEA and the province of Formosa to build a CAREM reactor of around 100/150 MW_e. So far, CNEA conducted the study of macrolocalization and the one of microlocalization is in its final stage. At the same time, different training activities of specialists are conducted while the prototype CAREM 25 NPP is concluded. This prototype will make it possible to undertake all the necessary tests for its escalation at a greater power.

As its main advantage for the country, the prototype will be able to export this type of technology to different countries interested in starting nuclear power generation through low power reactors, many of which have already explicitly shown their interest and are expecting the final results of the project, building a market that is more than attractive for Argentine nuclear companies and their partners in the national industry.

OBJECTIVES:

Strategic Objective 1: Strengthen and create management and technical capacities to build projects of low and medium power reactors.

Specific Objective 1.1: Create and consolidate a working group with the capacity to manage complex nuclear projects.

Specific Objective 1.2: Create new engineering groups and consolidate those existing to develop a project duly and in a timely manner.

Specific Objective 1.3: Create and consolidate inspection and control groups of the building works to carry out the project.

Strategic Objective 2: Consolidate the design of small and medium-sized nuclear power plants and guarantee the construction, start up, licensing and operation of prototypes.

Specific Objective 2.1: Conclude the prototype of CAREM 25 NPP and verify its technology.

Specific Objective 2.2: Consolidate engineering in modules of higher power of the CAREM concept, particularly for its planned development in the province of Formosa.

Strategic Objective 3: Contribute to the technological development of the national industry for the nuclear energy R&D by means of technological assistance and development of suppliers.

RA-10 ARGENTINE MULTIPURPOSE NUCLEAR REACTOR

DESCRIPTION:

The use of radioisotopes for medicine purposes presents sustained growth, whereby molybdenum-99 is the most used radioisotope worldwide with a percentage of use over 90%.

The worldwide market of supply of Mo-99 is strongly concentrated, five companies control over 80% of it which is produced in reactors which have been in operation for over 30 years. In the last years, successive failures in the reactors produced shortage of this radioisotope.



RA-10 REACTOR

In this context, Argentina could avoid local and partly regional deficits increasing the production in RA-3 reactor, which doubled its production. However, this reactor has been in operation for over forty years, and the construction of a new reactor was planned so that it would make it possible to meet the demand and give security to the supply in the future taking into account the strong impact on society of the shortage of this radioisotope.

In 2010, CNEA began the design and defined an engineering project, construction and operation of a new facility called the RA-10 Argentine Multipurpose Nuclear Reactor. This reactor is an optimized and wider version of the reactor that INVAP S.E. sold to Australia, known as OPAL reactor. Thanks to this project, our country seeks to increase current

capacities of radioisotope production destined for diagnosis and treatment of illnesses, adding the technological development to the field of nuclear fuels and materials and scientific research in general.

In a stage of a strong national commitment with the development of nuclear technology, the RA-10 Argentine Multipurpose Nuclear Reactor is a new challenge for CNEA that will show scope of its power to place it at the service of population. Within the cooperation framework with the region under the Binational Commission in Nuclear Energy (*Comisión Binacional de Energía Nuclear, COBEN*) in Brazil there will be a twin reactor, known as Brazilian Multipurpose Reactor (*Reator Multipropósito Brasileiro, RMB*).

In terms of radioisotope production, with the reactor in operation, it is expected to consolidate and increase the production in order to guarantee national demand and to face international growing demand more aggressively, it is designed with a capacity to cover up to 10% of the requirements and needs of worldwide demand.

As regards nuclear technology, this reactor will have the capacity to undertake essays of new nuclear fuels and materials, which will make it possible to consolidate the national position in production of nuclear fuels for experimental and power reactors.

In the area of research and development, the RA-10 Argentine Multipurpose Nuclear Reactor will offer opportunities based on neutronic techniques to the scientific-technological system, which will have a major importance in areas such as biology, material science and technology, design of pharmaceuticals, biotechnology and information technology. Moreover, facilities will be used to train professionals and technicians.

This is a major step towards achieving a great challenge for our country in the area of science and technology, which will provide direct benefits for the population and guarantee uninterrupted supply of radioisotopes.

This leading position in supplying radioisotopes for medical applications gives the possibility of increasing the regional integration and the South-South Cooperation presented by the National Government.

OBJECTIVES:

Strategic Objective 1: Increase production of radioisotopes to guarantee self-supply at a national level; contribute to future needs of the region and potentially to the worldwide market.

Specific Objective 1.1: Have an operating facility, adjusted to design requirements in time and at the foreseen costs.

Specific Objective 1.2: Form and consolidate qualified staff and technical groups to back up functioning and safety of the facility.

Specific Objective 1.3: Have developed working groups and the right facilities associated to foreseen applications.

Specific Objective 1.4: Carry out a project with all the available capacities in the Institution fostering the organic structure among all of the sectors involved.

Specific Objective 1.5: Develop new capacities in vacancy areas, strengthening working groups to increase its potential in order to contribute to new projects as a part of the new organizational culture.

Strategic Objective 2: Consolidate national capacities related to production of facilities that supply nuclear fuels for material and fuel irradiation.

Strategic Objective 3: Offer new capacities to the scientific and technological system based on neutronic techniques.

CNEA IN THE NATIONAL PLAN OF NUCLEAR MEDICINE



BARILOCHE NUCLEAR MEDICINE CENTRE



The National Government, through the Ministry of Planning, Public Investment and Services and the Ministry of Health of Argentina, has undertaken actions that will make it possible to take the infrastructure and technology necessary to face public health problems throughout the country. In this sense, the Cyberhealth National Plan (integral connectivity plan for hospitals and national medical centres, provincial and municipal from all over the country) should be highlighted along with the Nuclear Medicine National Plan (NMNP) in order to provide state-of-the-art technology for diagnoses and treatment for different regions of the country.

In particular, the NMNP aims at providing Argentina with the tools that the nuclear industry offers to prevent, control and treat non transmissible cronic illnesses, such as cancer, respiratory diseases, cardiovascular and endocrine diseases.

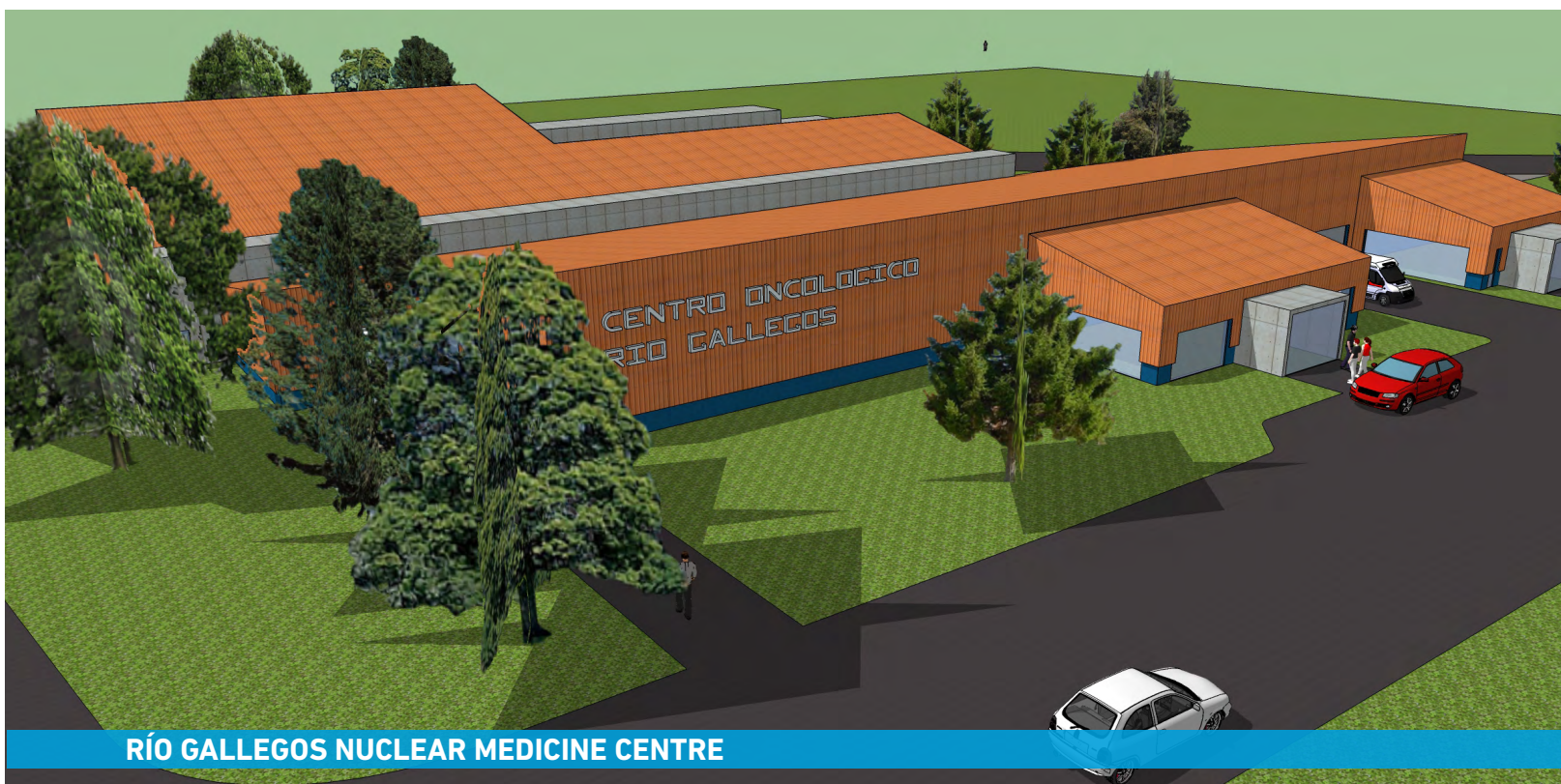


The National State expects to invest on this Plan around USD500 million through the construction of new centres in different parts of Argentina and strengthening of the existing centres. CNEA is the agency responsible for coordinating all of the actions that must be undertaken to achieve the set objective; in this sense, the institution is responsible for the technical definition of the type of equipment to be purchased, coordination, creation and control of instruments (contracts, agreements, conventions) that should be subscribed for each centre that is expected to be built.

The main points of this Plan to achieve nuclear medicine are based on the following topics:

/// **Social inclusion:** Equity is sought in providing access to high complexity services of nuclear medicine and radiotherapy, covering the widest part of Argentina in furtherance of increasing access to this service for all the population, independently of their health insurance. The need to place nuclear medicine and radiotherapy centres strategically should be met in a country like Argentina which has large areas and low population density.

/// **Technology:** Current centres, as well as those under construction and those that are planned to start up in the future, must offer a set of services that are at



a compatible level of technological development. Each centre should be equipped with the technology that enables it to meet the needs of the region in accordance with the existing infrastructure in this region and to the epidemiological profile of the population.

/// **Training of human resources:** The new centres are possible thanks to the highly qualified human resources required for them, whereby it is necessary to train professionals and technicians who, at a local level, will be in charge of assuming responsibilities before regulatory bodies and who will also operate the different services.

It is expected that the personnel belongs to the area where each centre is located in order to foster growth and development of the region. In this sense, there are working plans for each case which are being elaborated jointly with training institutes of CNEA (Institutes Balseiro and Dan Beninson).

Currently and during this first stage, the installation of the Radiotherapy and Nuclear Medicine Centres in the provinces of Formosa, Entre Ríos, Santa Cruz, Río Negro, Santiago del Estero and La Pampa has started up, and, in the near future, there will be centres installed in the provinces of Jujuy, Córdoba, Chubut and Buenos Aires. On the other hand, new state-of-the-art equipment has been taken to already existing centres where



ENTRE RÍOS NUCLEAR MEDICINE CENTRE

CNEA participates in Mendoza (FUESMEN) and in the City of Buenos Aires (FCDN). Both centres, together with CNEA, are the cornerstone of this Plan based on the experience in handling their technology, its capacity to train human resources and its management model.

As part of the National Plan in Nuclear Medicine, the first Latin American Proton Therapy Centre will be installed, which will be located in a nearby area of the Nuclear Diagnostic Centre and of the Institute Ángel H. Roffo, creating an Oncological Pole in the City of Buenos Aires with institutes for excellence in cancer diagnosis and treatment.

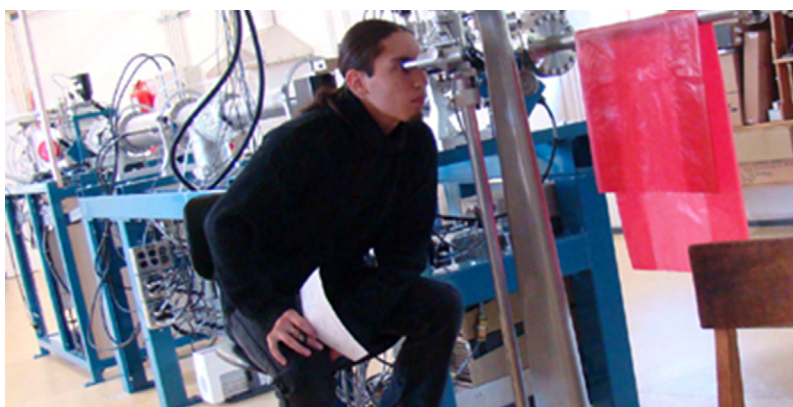
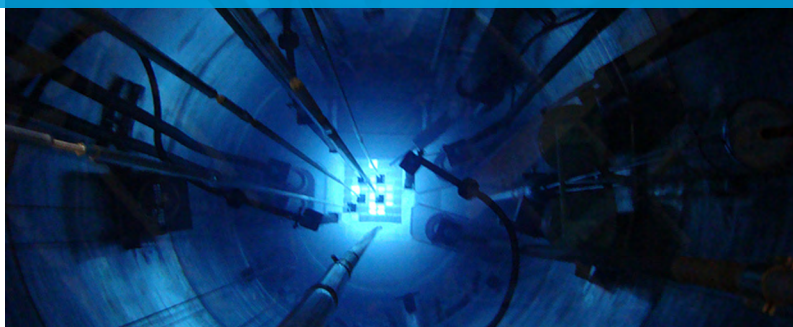
Currently, there are over 40 proton therapy centres around the world, but none of them is located in Latin America.

Proton therapy is an innovative treatment that provides a number of improvements in radiotherapy owing to characteristics of heavy charged particles interaction, which have a well-defined range of action and the characteristic to present a maximum in the dose deposited in a narrow region at the end of its path (Bragg peak). In this way, it is possible to irradiate a small region located in the body with a dose that is higher than the one received at the entrance in the superficial tissue.

These properties of protons considerably reduce the deposited dose in healthy tissues and decreases the number of sessions applied to patients. Therefore, this technique is especially indicated for deep tumours located in an area close to critical tissues of the body or pediatric tumours where a possible irradiation of healthy organs would be unacceptable.



THEMATIC AREAS: MISSION - VISION - OBJECTIVES



In the Strategic Plan 2015-2025, budgetary needs and requirements of intellectual capital were taken into account for the following areas:

Raw Materials Exploration
Raw Materials Production
Uranium Mining Environmental Restoration
Nuclear Fuels
Uranium Enrichment
Research and Radioisotope Production Reactors
Nuclear Power Reactors
Nuclear Technology Applications to Health, Industry and Agriculture
Research and Development
Radioactive Waste and Spent Fuel Management
Decommissioning
Safety, Radiation Protection, Physical Security and Safeguards
Environmental Management
Quality Management
Planning
Human Resources
Administration and Finance
Institutional Communication
Institutional Relations, Domestic and International Affairs
Development and Promotion of Economic Resources Related to Science and Technology Entities
Assistance and Technology Transfer
Academic Institutes
Resource Management and Scientific-Technological Information Services
Infrastructure
Information and Communication Technologies
Legal Affairs
Administrative and Technical Management

RAW MATERIALS EXPLORATION

Mission

"Undertake mineral prospecting used in the nuclear field"

Vision

"Guarantee the existence of necessary uranium resources to meet national requirements within a framework of sustainable development"



Objectives:

Strategic Objective 1: Increase the Reasonably Ensured Resources, which intend to supply national uranium for nuclear power plants in operation, under construction and planned.

Specific Objective 1.1: Develop exploration-evaluation projects up to the completion of the pre-feasibility stage.

Specific Objective 1.2: Quantify the Reasonably Ensured Resources.

Strategic Objective 2: Increase inferred resources in areas of exploration.

Specific Objective 2.1: Develop exploration programmes in favourable areas to define new Inferred Resources.

Specific Objective 2.2: Comply with what was set forth in Article 217 of the Argentine Federal Mining Code in the development of mining areas.

Specific Objective 2.3: Quantify Inferred Resources of the exploration of mineral deposits.

Strategic Objective 3: Increase knowledge about the geological potential of Argentina and define areas for mineral prospecting which are of interest to the nuclear industry.

Specific Objective 3.1: Develop favourability geological maps of uranium favourability to delimit new prospecting areas.

Specific Objective 3.2: Prospecting and exploring prospecting areas.

Specific Objective 3.3: Estimate Projected and Speculative Uranium Resources.

Specific Objective 3.4: Create a register of thorium occurrences in Argentina.

Strategic Objective 4: Establish a transparent and participating communication system with the community in agreement with communication policy of CNEA.

RAW MATERIALS PRODUCTION

Mission

"Provide backup for the national production of uranium and heavy water which ensures the supply of nuclear power plants"

Vision

"Own technological autonomy and decision making capacity to ensure uranium and heavy water supply for current and future national nuclear power plants"



SAN RAFAEL INDUSTRIAL MINING COMPLEX

Objectives:

Strategic Objective 1: Ensure domestic production of uranium to supply national nuclear power plants.

Specific Objective 1.1: Fulfill the re-engineering of San Rafael Industrial Mining Complex.

Specific Objective 1.2: Resume the production in San Rafael Industrial Mining Complex fostering the necessary actions and verifying the appropriate technology application.

Strategic Objective 2: Develop mining extraction and mineral processing methods in accordance with the characteristics of each site and other proceedings for the production of uranium concentrates.

Specific Objective 2.1: Definition of extraction feasibility and production for Cerro Solo and new sites.

Specific Objective 2.2: Establish production technology for Cerro Solo and new sites.

Strategic Objective 3: Control the correct application and preservation of technologies in ENSI S.E. and DIOXITEK S.A. to guarantee uranium dioxide and heavy water supply to the nuclear power plants.

Specific Objective 3.1: Undertake the technological control and operation of ENSI S.E. for heavy water production.

Specific Objective 3.2: Undertake the control of technology, operation and stock of uranium dioxide production.

URANIUM MINING ENVIRONMENTAL RESTORATION

Mission

"Conduct the environmental restoration of sites where uranium industrial mining activities have been undertaken in agreement with binding regulations and within the framework of CNEA environmental policy by engaging and informing the community"

Vision

"Ensure a comprehensive management of uranium mining liabilities within the framework of CNEA environmental policy"



MALARGÜE ENVIRONMENTAL RESTORATION

Objectives:

Strategic Objective 1: Conclude restoration of sites where uranium industrial mining activity was developed, conduct monitoring plans and develop post closure plans.

Specific Objective 1.1: Conclude the environmental restoration of Malargüe site.

Specific Objective 1.2: Conclude the environmental restoration of the following sites: Los Gigantes and Córdoba.

Specific Objective 1.3: Conclude the management of environmental liabilities of Huemul, La Estela, Los Colorados, Pichiñán and Tonco.

Strategic Objective 2: Establish a transparent and participative communication system with the community in accordance with CNEA communication policy.

Specific Objective 2.1: Implement a communication and information system in Malargüe site.

Specific Objective 2.2: Implement a communication and information system for Córdoba and Los Gigantes sites.

Specific Objective 2.3: Implement a communication and information system for Uranium Mining Environmental Restoration Project (*Proyecto de Restitución Ambiental de la Minería de Uranio*, PRAMU).

Strategic Objective 3: Undertake restoration activities within the framework of CNEA quality policy, implementing a quality management system in the labs of CNEA that are related to these activities.

Specific Objective 3.1: Strengthen and consolidate the quality management system in the PRAMU.

Specific Objective 3.2: Strengthen and consolidate the quality system in labs located in Ezeiza, Mendoza and Constituyentes.

Strategic Objective 4: Implement mechanisms for environmental management of industrial mining activities jointly with municipal, provincial and national agencies related to PRAMU activities.

NUCLEAR FUELS

Mission

"Study, plan and develop activities of scientific research, technological development, design, operation of facilities, service supply and participation in related projects with fuels and nuclear materials and advise the Presidency of CNEA"

Vision

"Become a benchmark of scientific technological autonomy in nuclear fuels to satisfy domestic needs sustaining a sovereign policy in agencies and international forums with an active participation in worldwide and regional markets"



FUEL FOR EXPERIMENTAL REACTORS

Objectives:

Strategic Objective 1: Maintain and increase the technological autonomy for development, design, engineering and manufacturing of fuel assemblies for current and future Argentine nuclear power plants.

Specific Objective 1.1: Develop fuel assemblies for CAREM NPP.

Specific Objective 1.2: Optimize the design of fuel assemblies for Argentine PHWRs.

Specific Objective 1.3: Develop knowledge, engineering and technology for application of advanced nuclear fuel cycles in Argentine nuclear power plants.

Specific Objective 1.4: Advance in the development of engineering and technology of fuel element fabrication for PWRs.

Specific Objective 1.5: Preserve and consolidate the technology of fuel element fabrication of mixed oxides consisting of plutonium adding the development of mixed fuels consisting of other elements.

Specific Objective 1.6: Advance in the development of Generation IV fuel assemblies.

Specific Objective 1.7: Develop new processes to obtain uranium dioxide and its former products.

Specific Objective 1.8: Develop methodologies for structural and hydrodynamic characterization and evaluation of fuel assemblies.

Specific Objective 1.9: Develop processes to obtain, fabricate tubes, rods and zirconium based alloy structural components for PHWR and PWR.

Specific Objective 1.10: Provide the technological support for national companies related to fuel element fabrication (CONUAR S.A. and DIOXITEK S.A.).

Strategic Objective 2: Maintain and increase the technological autonomy for development, design, engineering and fabrication of fuel assemblies and irradiation targets for current and future experimental reactors and current and future radioisotope production reactors.

Specific Objective 2.1: Continue with fabrication, recovery and purification of materials and nuclear components.

Specific Objective 2.2: Develop and fabricate fuel assemblies and irradiation targets of high and very high intensity which meet the needs of national and international supply.

Specific Objective 2.3: Develop and optimize processes to obtain, recover and purify materials and nuclear components.

Specific Objective 2.4: Design and develop new fuel assemblies particularly those of RA-10.

Specific Objective 2.5: Develop new methodologies and processes for the fabrication, assays and inspections of fuel assemblies.

Specific Objective 2.6: Undertake the construction and start-up of a new Fuel Fabrication Facility (*Planta Industrial de Elementos Combustibles para Reactores de Investigación, PIECRI*) for Experimental Reactors.

Specific Objective 2.7: Provide technical support in the field of nuclear fuels and irradiation targets to associated companies.

Strategic Objective 3: Consolidate the domain of irradiated fuel reprocessing technology.

Specific Objective 3.1: Consolidate the capacity of recovery of fissionable material.

Specific Objective 3.2: Optimise separation technology of fissile material for the fabrication of MOX fuel assemblies.

URANIUM ENRICHMENT

Mission

"Consolidate the status of Argentina regarding uranium enrichment technology to achieve its independence in formulating energetic strategies"

Vision

"Place Argentina as a uranium enrichment supplier"



PILCANIYEU FACILITY

Objectives:

Strategic Objective 1: Consolidate uranium enrichment technology by gaseous diffusion process.

Specific Objective 1.1: Operate the Mock-up facility.

Specific Objective 1.2: Keep and optimize the fluoride production electrochemical facility.

Specific Objective 1.3: Recover the operating capacity of the current uranium hexafluoride production facility as a strategic supply.

Strategic Objective 2: Develop laser uranium enrichment technologies.

Specific Objective 2.1: Complete the infrastructure for the development of the laser isotopic separation process.

Specific Objective 2.2: Conduct research into isotopic separation methods by laser at a lab scale.

Specific Objective 2.3: Demonstrate the technical-operational feasibility of methods which have been studied and define which is going to be implemented.

Specific Objective 2.4: Develop methods of laser isotope separation at a pilot scale.

Strategic Objective 3: Develop uranium enrichment ultracentrifuge technology.

Specific Objective 3.1: Finish facilities to assembly the prototype.

Specific Objective 3.2: Develop critical and supercritical ultracentrifuge prototypes.

Specific Objective 3.3: Assembly uranium ultracentrifuge cascade prototypes.

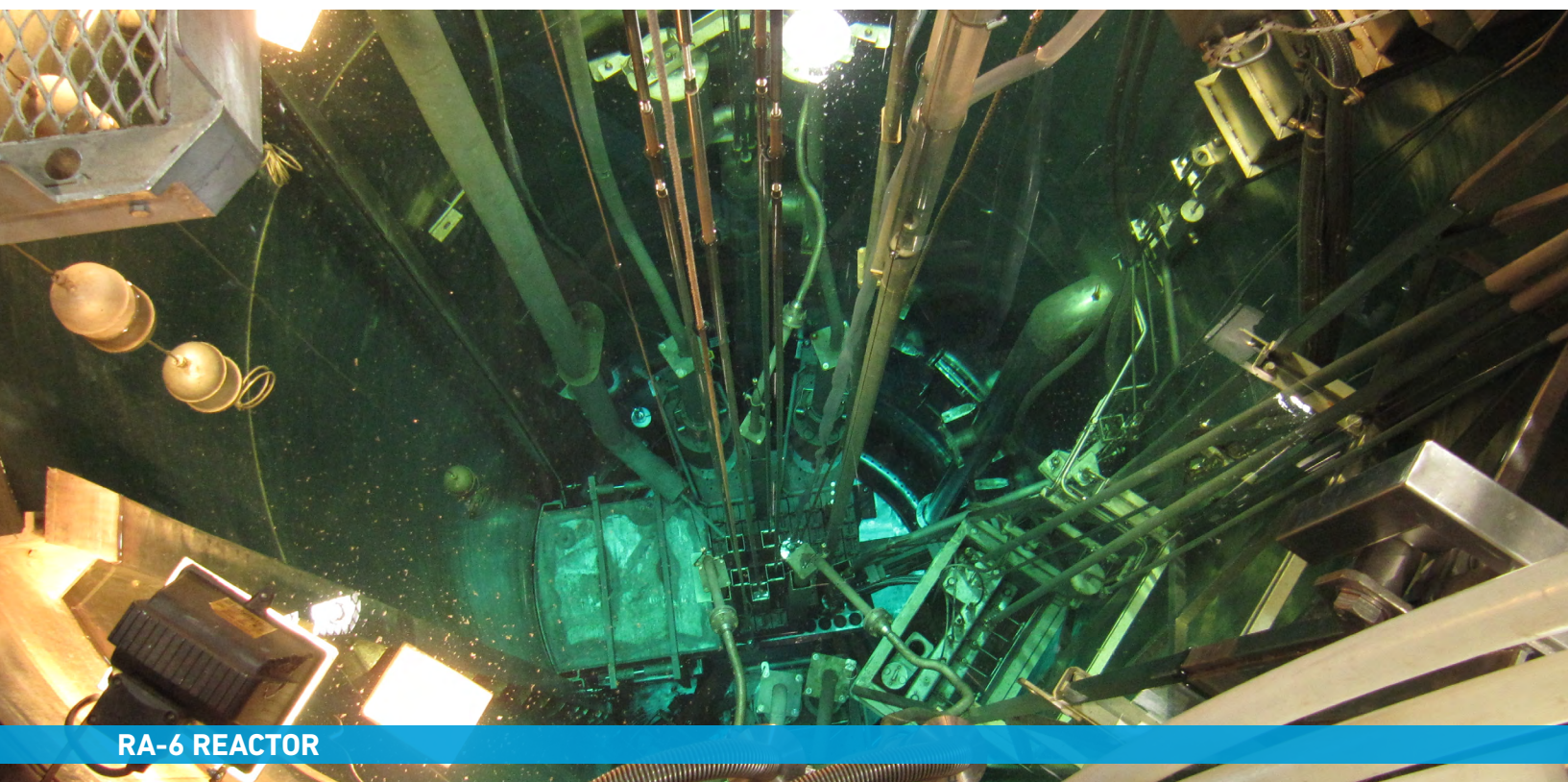
RESEARCH AND RADIOISOTOPE PRODUCTION REACTORS

Mission

"Keep and increase the capacities of research and radioisotope production reactors to use wide nuclear techniques in order to develop the activity in a safe, reliable and sustainable manner"

Vision

"Be at the forefront in the field of research and radioisotope production reactors contributing towards welfare of society through production of radioisotopes and applications of research reactors in the areas of health, education, industry, science and technology"



RA-6 REACTOR

Objectives:

Strategic Objective 1: Promote and contribute to fulfil designs, construction, licensing, start up and operation of future research and radioisotope production reactors.

Strategic Objective 2: Guarantee the irradiation service for radioisotope production.

Specific Objective 2.1: Optimize the planned and efficient operation of RA-3 for production of radioisotopes.

Strategic Objective 3: Strengthen and improve the design, operation and use of research and radioisotope production reactors in Argentina.

Specific Objective 3.1: Guarantee the operation of experimental and radioisotope production reactors.

Specific Objective 3.2: Adapt and modernize existing facilities.

Specific Objective 3.3: Strengthen the capacity for licensing process of research and radioisotope production reactors.

Specific Objective 3.4: Implement life management programs of research and radioisotope production reactors.

Specific Objective 3.5: Strengthen the bonds between facilities of the country and other Ibero American countries within the scope of experimental and radioisotope production reactors.

Strategic Objective 4: Increase capacity for research, development and innovation in science and technology through the use of research and radioisotope production reactors.

Specific Objective 4.1: Increase existing applications and develop new applications in the field of medicine, agriculture, industry, and in science and technology.

Specific Objective 4.2: Increase existing applications and develop new ones in the specific field of nuclear technology.

Strategic Objective 5: Contribute to sustainability and development of nuclear power generation.

Specific Objective 5.1: Provide training options for operation and maintenance groups to participate actively during start up, operation and maintenance of nuclear power reactors.

Specific Objective 5.2: Contribute to the training and development of qualified human resources to participate in the design, operation, life management and construction of nuclear power reactors.

Specific Objective 5.3: Perform testing and calibration of instrumentation for nuclear power plants.

NUCLEAR POWER REACTORS

Mission

"Plan, implement and manage activities in research, technological development, design, engineering, start up, services and training of human resources in the area of nuclear power reactors, assisting CNEA authorities in its topics which are its responsibility"

Vision

"Become the technical-scientific area to undertake the technological development and nuclear power reactor design fulfilling the development of projects and acting as the benchmark for the nuclear system"



Objectives:

Strategic Objective 1: Promote and contribute towards the development of designs, construction, licensing, start up and operation of future nuclear power plants.

Strategic Objective 2: Act as the Technical Support Organization (TSO) of nuclear power plants supplying technological assistance in design, licensing, construction, operation and decommissioning.

Specific Objective 2.1: Maintain and increase the capacity of research and technological development and of specialized engineering areas.

Specific Objective 2.2: Implement engineering capacities to evaluate new technologies and develop an active participation in those projects of future nuclear power plants.

Specific Objective 2.3: Constantly update technological information of nuclear power plants in every stage and optimize its use.

Specific Objective 2.4: Provide technological support for CNE PLEX, for nuclear power plants IV and V and future nuclear power plants to be defined.

Strategic Objective 3: Continue with the follow-up programme of new technologies of Generation IV nuclear reactors and its nuclear fuel cycles to evaluate and conduct related research and development.

Specific Objective 3.1: Further elaborate studies and evaluations in order to develop an action line of Generation IV.

Specific Objective 3.2: Promote participation in international projects through collaboration with specific projects.

Strategic Objective 4: Ensure the intellectual property and value developments of the area of nuclear power reactors for eventual agreements of use and transfer and/or technological assistance.

Specific Objective 4.1: Foster and supervise the intellectual property culture of CNEA developments.

Specific Objective 4.2: Record and strengthen research, development, innovation, capacities, engineering, facilities and research facilities of CNEA and value its products.

NUCLEAR TECHNOLOGY APPLICATIONS TO HEALTH, INDUSTRY AND AGRICULTURE

Mission

"Conduct research, develop and promote production and use of radioisotopes and radiation to the benefit of people through its applications in health, industry and agriculture, livestock and the environment safeguarding the intellectual and technological property of CNEA"

Vision

"Become leaders and a benchmark at a local and international level of the area of nuclear applications for the benefit of society"



CLINICAL HOSPITAL

Strategic Objective 1: Ensure the supply of radioisotopes at a domestic scale and actively participate at an international level, placing Argentina as an exporter of radioisotopes.

Specific Objective 1.1: Sustain and optimize the production of radioisotopes at the RA-3 reactor.

Specific Objective 1.2: Have back-up capacity and increase and diversify production of radioisotopes by means of the construction of the new RA-10 reactor and a new fission radioisotope production facility.

Specific Objective 1.3: Optimize and increase the capacity of production of radioisotopes and develop new radioisotopes by means of a multiparticle cyclotron and other necessary facilities for this purpose.



IRRADIATION SEMI INDUSTRIAL PLANT FACILITY

Specific Objective 1.4: Develop the Alpha Project to produce alpha emitters and its radiopharmaceuticals to be used in a metabolic therapy.

Specific Objective 1.5: Place CNEA as an exporter of radioisotope production technology thus developing its management.

Strategic Objective 2: Consolidate the technological autonomy in applications of radioisotopes, radiopharmaceuticals and ionizing radiations.

Specific Objective 2.1: Increase capacities for research, development, training of Human Resources, assistance and spreading of the use of radioisotopes and ionizing radiations in the field of health, industry, agriculture and the environment.

Specific Objective 2.2: Boost the incorporation and operation of an electron accelerator and increase the capacity of other industrial irradiation facilities.

Specific Objective 2.3: Increase research, development, education, assistance and outreach capacities in nuclear analytical techniques, basic radiochemistry and nuclear data.



PLAGUE CONTROL - MEDITERRANEAN FRUIT FLY

Specific Objective 2.4: Sustain, diversify and increase the production of animals for experiments including an area of research, development and services.

Specific Objective 2.5: Increase the scope of use of research reactors, accelerators and neutron sources in the area of applications to biology, health, industry, agriculture, the environment and nuclear analytical techniques.

Specific Objective 2.6: Increase capacities to develop numerical simulation codes to solve specific problems and nuclear technology applications.

Specific Objective 2.7: Have the operating capacity of an Accelerator Mass Spectrometry (AMS) Centre.

Strategic Objective 3: Maintain and increase metrology capacities as a national lead agency in the field of radioisotopes and ionising radiations.

Specific Objective 3.1: Maintain and increase capacities of the Ionising Radiations Dosimetry Capacity Regional Centre and CNEA facilities.

Strategic Objective 4: Contribute to the improvement of public health through nuclear applications and place CNEA as a national and international benchmark for its capacities in radiochemistry, radiobiology, nuclear medicine, radiopharmacy, medical physics and radiotherapy.

Specific Objective 4.1: Consolidate the role of CNEA in terms of clinical and applied research, training of human resources and promotion of nuclear medicine in those centres where CNEA participates, including the necessary assistance for these purposes.

Specific Objective 4.2: Contribute to keeping the availability of radiopharmaceuticals within the health system especially in the public domain.

Specific Objective 4.3: Undertake clinical validations, register and prepare new diagnostic and therapeutic radiopharmaceuticals as well as the preparation of marked molecules which are unavailable on the local market.

Specific Objective 4.4: Foster and participate in the creation and management of diagnostic and treatment regional centres as well as in the production of radiopharmaceuticals to facilitate and increase the access of people to these medical practices.

Specific Objective 4.5: Establish a strategic network among the nuclear medicine centres in which CNEA participates.

Specific Objective 4.6: Increase capacities in medical physics and consolidate the role of CNEA as a benchmark for this discipline at a national and international level.

Specific Objective 4.7: Conduct research, development and applications of Boron Neutron Capture Therapy (BNCT) for cancer treatment and increase its application to other pathologies.

Specific Objective 4.8: Boost the introduction to ion beam cancer therapy in Argentina.

Specific Objective 4.9: Promote basic and applied research in radiobiology and biological dosimetry.

Specific Objective 4.10: Collaborate with the Programme on Radiation Protection of Patients regarding radiotherapy equipment calibration and diagnostic imaging (including X-rays) as well as the regulatory framework jointly with the Nuclear Regulatory Authority and the Argentine Ministry of Health.

Strategic Objective 5: Contribute to the sustainable agricultural development at a national level, thus creating, applying and transferring associated and nuclear technologies to increase competitiveness and productivity in the nuclear field.

Specific Objective 5.1: Develop and promote the application of nuclear and associated techniques in soil conservation, plant nutrition, plague control, use of agrochemicals and development of productive management to ensure sustainability of the system.

Specific Objective 5.2: Develop and foster the application of nuclear techniques and techniques associated to production, nutrition, animal health and bee health.

Strategic Objective 6: Contribute to surveillance and environmental sustainability, by creating, applying and transferring nuclear technology and other associated technology for these purposes.

Specific Objective 6.1: Foster the application of nuclear and other associated techniques of environmental contamination from agricultural, urban and industrial origin and develop mitigation methodologies.

Specific Objective 6.2: Develop techniques applicable to effluent treatment and remediation of contaminated soils.

Strategic Objective 7: Add value and ensure the intellectual property of the developments in the Area of Nuclear Technology Applications for eventual contracts of usage and transfer, technical cooperation and/or technological assistance.

RESEARCH AND DEVELOPMENT

Mission

"Acquire knowledge and innovative solutions by means of research and development for projects and activities undertaken by CNEA and the rest of the Argentine nuclear sector"

Vision

"The aim of the area is to be recognized both at a national and international level as a leader due to the quality of its scientific research and technological developments and due to its innovative characteristic, contributing to the growth of the country"

Research and development were classified in: Physics, Chemistry, Materials and Non Destructive Assays.

RESEARCH AND DEVELOPMENT IN PHYSICS



NANOTECHNOLOGY

Strategic Objective 1: Generate knowledge and technologies related to physical sciences.

Specific Objective 1.1: Undertake research in controlled nuclear fusion.

Specific Objective 1.2: Generate knowledge in atomic, molecular, nuclear and optical physics, elemental particles and astrophysics.

Specific Objective 1.3: Generate knowledge in the fields of condensed matter and surface physics.

Specific Objective 1.4: Generate knowledge in complex systems and neurosciences for medical applications.

Specific Objective 1.5: Generate knowledge and applications in forensic physics.

Specific Objective 1.6: Generate knowledge and technologies in an interdisciplinary way related to earth sciences within the framework of International Council for the Exploration of the Sea (ICES) Project.

Specific Objective 1.7: Conduct research and development in energy efficiency, alternative energies, hydrogen technology and fuel cells.

Strategic Objective 2: Generate knowledge and developments related to nuclear medicine and medical physics.

Strategic Objective 3: Undertake research and development in science and technology of accelerators for nuclear applications.

Specific Objective 3.1: Conduct research and develop technology for applications to environmental and engineering problems in general by means of analysis techniques of high sensitivity.

Specific Objective 3.2: Conduct research and develop technology for detection of explosives, load control and special nuclear materials.

Specific Objective 3.3: Conduct research and development of technology for accelerators and devices associated to medical and nuclear applications.

Specific Objective 3.4: Have the capacity to evaluate ionizing radiation effects in devices by means of the use of accelerators, heavy ions, electrons and gamma radiation sources.

Strategic Objective 4: Support through research technological projects related to nuclear reactors.

Specific Objective 4.1: Coordinate and implement Neutron Beams Project related to RA-10 reactor in agreement with requirements established by CNEA.

Specific Objective 4.2: Provide support for the Generation IV programme through research in accordance with requirements set forth in the working plan in the Area of Power Reactors.

Strategic Objective 5: Conduct research and develop frontier technologies in order to contribute to major national and international scientific and technical projects.

Specific Objective 5.1: Collaborate with developing and providing subsystems for the Argentine Spatial and Satellite Plan.

Specific Objective 5.2: Collaborate in developing and implementing the upgrade of Pierre Auger and Andes Project.

Strategic Objective 6: Conduct research and develop nanoscience and nanotechnology.

Specific Objective 6.1: Generate knowledge and technologies to develop sensors, microactuators and devices for applications in biomedicine, telecommunications, the environment and nuclear energy.

Specific Objective 6.2: Generate knowledge and technologies for developing nanomaterials and nanosystems.

RESEARCH AND DEVELOPMENT IN CHEMISTRY

Strategic Objective 1: Generate scientific-technical capacities in the area of chemistry to meet technological developments required by CNEA and the rest of the nuclear sector.

Specific Objective 1.1: Develop methodologies and conceptual engineering of processes to obtain and purify uranium and other elements of nuclear interest and recovery of associated elements of industrial interest.

Specific Objective 1.2: Develop and design technology, controls, processes and conceptual design of equipment and systems associated to the chemistry of water for nuclear power plants, experimental reactors and related facilities.

Specific Objective 1.3: Study the behaviour of oxides over the structural materials of nuclear power plants and facilities in the presence of cooling and process fluids.

Specific Objective 1.4: Evaluate properties and conceptual design of experimental devices for coolings of Generation IV nuclear reactors.

Specific Objective 1.5: Develop advanced treatments for water purification and for technologies and environmental remediation.



DESALINATION EXPERIMENTAL PROCESS

Specific Objective 1.6: Develop and implement support activities for environmental monitoring of CNEA.

Specific Objective 1.7: Develop design capacities for the use of energy of low power nuclear power plants for desalination of seawater and other industrial uses as well as optimization of water use in nuclear facilities and undertakings.

Specific Objective 1.8: Maintain, update and develop the operational capacity of chemical and isotopic analysis to provide support for projects and activities of CNEA and the nuclear sector.



HYDROMETALLURGY

Strategic Objective 2: Generate and apply original and innovative knowledge related to chemical sciences oriented towards CNEA needs.

Specific Objective 2.1: Develop and apply adsorbents for separation processes and immobilization of heavy metals and radionuclides.

Specific Objective 2.2: Generate scientific knowledge about surface chemistry for the design, optimization and control processes.

Specific Objective 2.3: Generate scientific knowledge for the development of functional nanomaterials as well as new materials and its application in processes.

Specific Objective 2.4: Generate and apply scientific knowledge to use fluids in subcritical and supercritical and benign solvents as the means for processes.

Specific Objective 2.5: Develop scientific and technological capacities for diagnostic and environmental remediation.

Specific Objective 2.6: Generate knowledge about dispersion mechanisms and physical chemical transformations of chemical species in water, air and soil.

RESEARCH AND DEVELOPMENT IN MATERIALS AND NON DESTRUCTIVE ASSAYS

Strategic Objective 1: Generate and apply scientific and technological knowledge in the area of structural materials and non destructive assays to meet requirements of CNEA and enable its transfer to other technological sectors.

Specific Objective 1.1: Keep and increase research and development capacity in nuclear materials: new fuels, structural and functional materials, containment barriers and matrixes for radioactive waste immobilization.

Specific Objective 1.2: Generate knowledge, develop techniques and methodologies to apply them to characterization and evaluation of materials, surfaces, components and facilities for destructive and non destructive assays. Conduct the followup of processes and improve its safety.

Specific Objective 1.3: Conduct research and implement the necessary experiences in order to study, develop, fabricate and rate materials to be applied in the development of ultracentrifuges.

Specific Objective 1.4: Study materials under or after neutron radiation.

Specific Objective 1.5: Develop and apply chemical, nuclear and physical techniques for the study and preservation of materials of cultural value.

Specific Objective 1.6: Increase knowledge and develop new materials and coatings which are of interest to the technological sector.



NON DESTRUCTIVE AND STRUCTURAL ASSAYS

RADIOACTIVE WASTE AND SPENT FUEL MANAGEMENT

Mission

"Develop safe radioactive waste management of spent fuels derived from the nuclear energy R&D and its applications undertaken throughout Argentina in order to guarantee the protection of the environment, public health and rights of future generations"

Vision

"Consolidate the National Radioactive Waste Management Programme (Programa Nacional de Gestión de Residuos Radiactivos, PNGRR) as a recognized organization by the Argentine society by its technical capacity, environmental care as a priority, population and future generations in order to guarantee the sustainability of benefits of nuclear technology for the Argentineans"



TRANSPORT OF SPENT FUEL ASSEMBLIES

Objectives:

Strategic Objective 1: Build new facilities and refurbish the existing ones within Ezeiza Management Area (*Área de Gestión Ezeiza, AGE*) in order to build the capacities of radioactive waste management and disused sources that are taken to this facility.

Specific Objective 1.1: Establish the conditions to treat and/or fix radioactive waste generated in public and private facilities as well as CNEA facilities and improve AGE facilities.

Specific Objective 1.2: Continue with the periodic safety assessment of final disposal systems in AGE until the conditions of decommissioning are established.

Strategic Objective 2: Safely store spent fuels from experimental reactors and radioisotope production reactors.

Specific Objective 2.1: Optimize storing conditions of spent fuels from experimental and radioisotopes production reactors.

Specific Objective 2.2: Study dry storage systems for spent fuels of experimental and radioisotope production reactors.

Strategic Objective 3: Define and obtain approval of the site for new repositories of intermediate, low and very low level waste.

Specific Objective 3.1: Generate the technical capacity for environmental characterization of formations suitable for the site of new near surface repositories.

Specific Objective 3.2: Conduct environmental studies in pre-selected sites.

Specific Objective 3.3: Suggest a suitable site for its approval.

Strategic Objective 4: Design and license new repositories of low, very low and intermediate level waste.

Specific Objective 4.1: Evaluate the radiological inventory which will be available in disposal systems according to current requirements of waste characterization.

Specific Objective 4.2: Design engineering barriers for new repositories.

Specific Objective 4.3: Undertake the necessary activities for licensing of facilities.

Strategic Objective 5: Evaluate conditions and strategies of transport of radioactive waste from current storage facilities up to future final disposal repositories.

Strategic Objective 6: Complete and keep the national inventory of radioactive waste and spent fuels updated.

Specific Objective 6.1: Update the inventory system of radioactive waste disposed of in AGE.

Specific Objective 6.2: Standardize the National Inventory Report on Radioactive Waste, Disused Sources and Spent Fuels.

Strategic Objective 7: Update technologies and spent fuels and radioactive waste management methods in agreement with advances in knowledge and experience.

Specific Objective 7.1: Have capacities for the radiochemical characterization of radioactive waste from nuclear power plants and facilities of CNEA and for verification of conditioned waste quality.

Specific Objective 7.2: Develop and establish processes of treatment and conditioning of either different waste flows from nuclear power plants or waste which should be managed in AGE.

Specific Objective 7.3: Study the behaviour of different materials used as engineering barriers for disposal systems.

Specific Objective 7.4: Evaluate and define systems of treatment and conditioning of spent fuels of research reactors and radioisotope production reactors.

Strategic Objective 8: Establish acceptance criteria and recommendations for radioactive waste and spent fuel generators and supervise its compliance in order to conduct the right transfer so as to be dealt with by the Argentine Programme on Radioactive Waste Management (*Programa Nacional de Gestión de Residuos Radiactivos*, PNGRR).

Strategic Objective 9: Conduct information and spread activities about the topic in agreement with the communication policy of CNEA.

Strategic Objective 10: Conduct activities that lead to selection and characterization of possible sites for the final disposal of high level radioactive waste.

DECOMMISSIONING

Mission

"Plan and undertake the necessary activities for decommissioning of radioactive and nuclear facilities in a sustainable way"

Vision

"Have the technological capacity in different disciplines for decommissioning activities at the end of the lifetime of major nuclear facilities and, therefore, become a benchmark for regional technology"

Objectives:

Strategic Objective 1: Formulate preliminary decommissioning plans by estimating radioactive waste flows and volumes from all of the nuclear and radioactive facilities of CNEA.

Strategic Objective 2: Boost, coordinate and undertake technological developments in decontamination and in cutting of structures and radiologically active components.

Strategic Objective 3: Undertake decommissioning plans of nuclear and radioactive facilities at the end of their lifetime.

Strategic Objective 4: Develop capacities to evaluate decommissioning plants for nuclear power plants in operation.

SAFETY, RADIATION PROTECTION, PHYSICAL SECURITY AND SAFEGUARDS

Mission

"Provide an understanding for all the topics related to radiation protection, nuclear safety, physical security of nuclear materials and facilities, security of radioactive sources, safeguards, safe transport of radioactive material and health and safety at work throughout CNEA in order to protect workers, population, the environment and goods"

Vision

"Strengthen the safety culture in CNEA in an integrated way, with qualified personnel to develop its nuclear energy R&D in an efficient, effective and transparent way in order to become a benchmark of the topic"

Objectives:

Strategic Objective 1: Guarantee safety in CNEA for the personnel, the public and the environment as well as for its facilities from design to decommissioning at the end of its life time.

Specific Objective 1.1: Strengthen the capacity in safety issues in the whole scope of CNEA.

Specific Objective 1.2: Optimize the environmental radiological monitoring programmes of CNEA sites and make official announcements of its results.

Specific Objective 1.3: Strengthen a system of radiation health medical emergencies system and optimize the occupational medicine system.

Specific Objective 1.4: Optimize radiation monitoring programmes of personnel who work at radioactive facilities.

Specific Objective 1.5: Optimize monitoring programmes of facilities and local monitoring programmes.

Specific Objective 1.6: Strengthen and maintain control systems and provide support for facilities.

Specific Objective 1.7: Implement a network to support licensing of facilities.

Strategic Objective 2: Strengthen participation of CNEA in the area of safety at a national and international level.

Specific Objective 2.1: Foster adequation of binding legislation in the context of the Strategic Plan of CNEA.

Specific Objective 2.2: Develop and implement a Programme on Radiation Protection of Patients at a national level, placing CNEA as a benchmark of this area.

Specific Objective 2.3: Foster activities related to safety, radiation protection and safeguards by participating actively in national and international forums representing CNEA.

ENVIRONMENTAL MANAGEMENT

Mission

"Develop an environmental management system and develop knowledge and sustainable technologies which meet CNEA needs"

Vision

"Strengthen the environmental management system along with commitment by the personnel once there has been strengthening of reliability of CNEA environmental performance"



ENVIRONMENTAL MANAGEMENT

Objectives:

Strategic Objectives 1: Strengthen the system of environmental management of CNEA.

Specific Objective 1.1: Complete and strengthen CNEA regulatory framework.

Specific Objective 1.2: Control and improve the environmental performance in CNEA sites and evaluate its evolution in a continuous way.

Strategic Objective 2: Strengthen the relationship between society and CNEA regarding the environmental performance of CNEA.

Specific Objective 2.1: Strengthen the links with enforcement authorities.

Specific Objective 2.2: Systematize and provide environmental information for the Institution.

Specific Objective 2.3: Include the environmental decision making process to the socio-economical and cultural context of CNEA sites.

Strategic Objective 3: Develop scientific-technological capacities for environmental management.

Specific Objective 3.1: Identify needs and strengthen research and development scientific technological capacities for the environmental management.

Specific Objective 3.2: Develop and implement sustainable technologies.

Specific Objective 3.3: Conduct studies and develop strategies related to energy efficiency.

QUALITY MANAGEMENT

Mission

"Participate in the formulation and periodic revision of the Quality Policy of CNEA undertaking the necessary actions to implement said policy in every sector in furtherance of continuous improvement"

Vision

"Succeed in making CNEA personnel, guided by the authorities, become an active part in the enforcement of CNEA Quality Policy"



QUALITY CONTROL

Objectives:

General Objective 1: Succeed in making heads and personnel of CNEA commit to the Quality Policy.

Particular Objective 1.1: Develop quality objectives aligned with the Policy and current Institutional Quality Objectives and become responsible for coordinating its implementation.

General Objective 2: Contribute towards implementing quality management systems.

Particular Objective 2.1: Develop a qualified quality management system in sectors that provide services for projects, third parties or those who undertake scientific, technical or priority operational activities.

Particular Objective 2.2: Conduct diagnoses, self-evaluations and internal audits in those sectors with quality management systems.

General Objective 3: Strengthen CNEA quality network and its interactions with external agencies related to the topic.

Particular Objective 3.1: Keep and improve the network capacity to exchange information, experiences and other ways of collaboration among participants.

Particular Objective 3.2: Foster and participate in training programmes internal and external to the organization in the aspects referred to quality.

Particular Objective 3.3: Keep and improve participation in governing bodies in the area of quality and with organizations of the nuclear industry in topics of quality.

General Objective 4: Keep and improve the work of the Qualification of Labs and Facilities Committee (Comité de Calificación de Laboratorios e Instalaciones, CoCaLIN).

Particular Objective 4.1: Guarantee availability of auditors, evaluators to conduct internal audits and quality management evaluations.

Particular Objective 4.2: Establish and implement a qualification plan for every sector with quality management systems and periodically requalify sectors without certification or accreditation.

General Objective 5: Establish the functioning of CNEA Inter Laboratory Management Committee - INTERLAB.

Particular Objective 5.1: Establish and implement interlaboratories programmes that meet institutional needs and priorities in the area.

General Objective 6: Contribute towards metrologic reliability of activities undertaken in CNEA laboratories and facilities.

Particular Objective 6.1: Keep and increase the offer of calibration services.

Particular Objective 6.2: Qualify and/or manage the accreditation of all the laboratories of CNEA to provide calibration services.

PLANNING

Mission

"Manage the strategic and operative planning of CNEA, coordinate and construct processes and activities, take control, necessary dealings for the agency and provide information to ease the way for making decisions"

Vision

"Consolidate the culture of planning in CNEA and contribute to an efficient management"



PLANNING, COORDINATION AND CONTROL

Objectives:

General Objective 1: Coordinate strategic planning of projects and activities undertaken by CNEA by optimizing available resources.

Particular Objective 1.1: Direct the preparation of CNEA Strategic Plan and its periodic updates and revisions.

Particular Objective 1.2: Design and implement a management system with indicators to provide information for the authorities.

General Objective 2: Plan and propose the assignment of budgetary resources by supervising the physical and financial execution of projects and activities by keeping the relevant information updated.

Particular Objective 2.1: Coordinate and harmonize requirements for CNEA Preliminary Budget and Draft and coordinate its preparation with the Area of Administration and Finance.

Particular Objective 2.2: Consolidate and keep an updated record destined for economic resources available in CNEA for an efficient assignment of budgetary credits.

Particular Objective 2.3: Suggest that authorities distribute budgetary credits assigned to CNEA.

Particular Objective 2.4: Exercise the management control over the use of budgetary credits assigned to activities and projects.

Particular Objective 2.5: Consolidate and keep information up to date which needs to be sent to other agencies in charge of undertaking of activities and projects.

Particular Objective 2.6: Coordinate actions to keep information updated about Law No. 24354 related to public investment projects tending to provide specific training for different sectors responsible for its execution.

General Objective 3: Plan and promote preservation, growth and transference of the intellectual capital accumulated and generated in CNEA.

Particular Objective 3.1: Develop a plan to identify, preserve and transfer critical knowledge and implement it in the Area of Human Resources and Academic Institutes.

Particular Objective 3.2: Boost the system of internships as a tool for training, education and knowledge transfer in CNEA.

Particular Objective 3.3: Plan the needs for intellectual capital in agreement with CNEA Strategic Plan.

Particular Objective 3.4: Implement and coordinate an institutional network to promote and organize a Nuclear Knowledge Management Programme.

Particular Objective 3.5: Coordinate and administer the Regional Node of the Latin American Network for Education in Nuclear Technology (LANENT).

General Objective 4: Coordinate and undertake activities related to prospecting, energy and nuclear planning.

Particular Objective 4.1: Advise CNEA officials on nuclear and energetic prospecting and planning.

Particular Objective 4.2: Evaluate competitiveness of nuclear energy and undertake technical-economical feasibility studies of nuclear facilities.

Particular Objective 4.3: Coordinate and conduct studies to locate potential NPP sites and other nuclear facilities.

Particular Objective 4.4: Disseminate relevant technical information about nuclear and energetic sectors by means of periodical publications.

Particular Objective 4.5: Strengthen and increase cooperation links with the actors of the energetic sector and agencies undertaking planning activities at a national, regional and international level.

Particular Objective 4.6: Consolidate and keep technical information updated about prospecting and nuclear planning that has to be sent to other entities.

General Objective 5: Plan, coordinate and promote actions tending to protect technology developed in CNEA.

Particular Objective 5.1: Strengthen protection of intellectual property and favour transfer of new technologies.

Particular Objective 5.2: Foster the protection of nuclear technologies in Argentina, through the follow-up of third party patents in order to prevent interests of CNEA and Argentina from being affected.

Particular Objective 5.3: Create a protection network of intellectual production of CNEA tending to safeguard property of new knowledge.

Particular Objective 5.4: Develop and keep an invention patent record on nuclear topics in Argentina up to date.

General Objective 6: Consolidate a management control system and follow up of nuclear projects of CNEA.

Particular Objective 6.1: Strengthen the control group in charge of preventing deviations from execution of projects.

Particular Objective 6.2: Design and implement procedures to control management of projects.

HUMAN RESOURCES

Mission

"Foster the development and wellbeing of the employees in accordance with the institutional values"

Vision

"Achieve an area that stands out due to efficient management of human resources which fosters provision, wellbeing, development of personnel and retention of talents in order to consolidate the sense of belonging to the Institution"



Objectives:

General Objective 1: Optimize the Management Procedures of the Human Resources Area from a strategic viewpoint.

Particular Objective 1.1: Update and improve Human Resources Computing Systems.

Particular Objective 1.2: Develop and elaborate management indicators.

Particular Objective 1.3: Analyse and update procedures and its management within a framework of quality system.

General Objective 2: Foster the well-being of personnel and strengthen labour and interpersonal relations.

Particular Objective 2.1: Strengthen the organizational culture.

Particular Objective 2.2: Implement the approved collective employment agreement.

Particular Objective 2.3: Establish the methodology and guidelines to prepare the Handbook of Job Posts.

Particular Objective 2.4: Develop tools destined to optimize Policies of Remunerations, Compensations and Benefits.

General Objective 3: Establish actions intended for Professional Development.

Particular Objective 3.1: Continuously evaluate personnel performance and potential.

Particular Objective 3.2: Develop a personnel training plan in agreement with the areas of Intellectual Capital and Academic Institutes.

Particular Objective 3.3: Define a working career plan.

ADMINISTRATION AND FINANCE

Mission

"Conduct and optimize budgetary, economic and financial services, by means of the governing body setting the corresponding tools within the binding regulatory framework to achieve institutional objectives"

Vision

"Succeed in implementing a fast, reliable and compatible administrative system in the economic-financial area by keeping an active update and training in this area and integrating it in a harmonic way across the Institution"



ADMINISTRATION AND FINANCE

Objectives:

General Objective 1: Keep and improve an efficient and integrated system of Administration and Finance to advise the Authorities and those responsible for the thematic areas.

Particular Objective 1.1: Keep a coordinated working system, by strengthening the link with different branches of CNEA.

Particular Objective 1.2: Advise on assigning responsibilities within the area of Administration and Finance.

General Objective 2: Work jointly with all of the sectors of CNEA.

Particular Objective 2.1: Keep and improve efficient communication mechanisms.

Particular Objective 2.2: Authorize and apply computing tools in real time.

Particular Objective 2.3: Coordinate the operational decentralization by setting relevant legislation and transferring knowledge through continuous training.

General Objective 3: Optimize the system by generating dynamic and efficient mechanisms to execute the budget.

Particular Objective 3.1: Foster an economic and financial planning culture channelling acquisitions through an annual purchase plan.

Particular Objective 3.2: Analyse and develop appropriate management systems.

Particular Objective 3.3: Develop and foster external management mechanisms that include characteristics that are intrinsic to the nuclear energy R&D.

INSTITUTIONAL COMMUNICATION

Mission

"Foster and strengthen public acceptance of the nuclear energy R&D with peaceful uses and the institutional image of CNEA as a benchmark of the sector"

Vision

"Place CNEA in society as a benchmark for providing reliable communication about nuclear activities and position it at the core of a network of institutions and companies dedicated to the development of nuclear technology"



CNEA MOBILE CINEMA

Objectives:

General Objective 1: Provide suggestions of CNEA communications policy.

Particular Objective 1.1: Establish guidelines for different instances of communication of the agency to give coherence to the institutional message.

Particular Objective 1.2: Provide coordination with different areas in relation to activities that include communication actions.

General Objective 2: Consolidate a positive image in the community of applications of nuclear energy for peaceful purposes, highlighting the social benefits derived from nuclear energy.

Particular Objective 2.1: Undertake communication actions in different regions with major projects for the Institution.

Particular Objective 2.2: Strengthen links with related entities, both national and international.

General Objective 3: Strengthen the communication structure and its functioning thanks to diagnosis, planning, execution and systematization of activities.

Particular Objective 3.1: Systematize practices, procedures and experiences undertaken.

Particular Objective 3.2: Consolidate and improve the federal structure of communication of the Institution.

General Objective 4: Optimize internal communication by strengthening the institutional identity of workers and by reinforcing the sense of belonging.

INSTITUTIONAL, DOMESTIC AND INTERNATIONAL AFFAIRS

Mission

"Advise CNEA authorities on formulating the institutional policy and coordinating the strategy of domestic and international affairs and manage its implementation with different sectors of CNEA"

Vision

"Become the area to advise, provide understanding and implement relations at a domestic and international level in agreement with interests and objectives of CNEA and of the Institutional Policy"



Objectives:

General Objective 1: Strengthen management capacities in relation to Institutional, Domestic and International Affairs.

Particular Objective 1.1: Give the area a functional organizational structure.

Particular Objective 1.2: Foster new Regulatory Procedures and optimize those in relation to the activities of the area.

Particular Objective 1.3: Implement a communication system and intrainstitutional interaction through the Internet.

General Objective 2: Manage the implementation of an institutional policy at international forums and agencies.

Particular Objective 2.1: Generate and consolidate a follow-up and consultation mechanism of international agencies and forums related to the interests of the Institution.

Particular Objective 2.2: Coordinate the participation of the Institution in different international agencies and forums with national stakeholders.

Particular Objective 2.3: Establish a documentary record of the activities of the international forums and agencies dealing with the interests of the Institution.

General Objective 3: Strengthen the role of the Institution as a national liaison agency in technical areas and technical cooperation areas with the IAEA.

Particular Objective 3.1: Give an understanding of and advise CNEA authorities on the elaboration of the National Programmatic Framework.

Particular Objective 3.2: Consolidate and increase the role of CNEA in the activities conducted by the Regional Cooperation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean (ARCAL).

Particular Objective 3.3: Give an understanding of and advise CNEA authorities on the elaboration of the "Regional Strategic Profile" and frame the activities of the Regional Cooperation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean (ARCAL).

General Objective 4: Manage the international insertion of CNEA as a result of bilateral relations with foreign institutions, agencies and companies in the field of peaceful purposes of the nuclear energy.

Particular Objective 4.1: Strengthen the capacity of the area for institutional advice, orientation and framework with different sectors of CNEA related to bilateral cooperation.

Particular Objective 4.2: Coordinate with national stakeholders international affairs of the institution within the bilateral scope.

General Objective 5: Manage institutional relations with public and private organizations and institutions at a national level.

Particular Objective 5.1: Strengthen the capacity of the area for advice, orientation and institutional framework with different CNEA sectors for the relationship with public and private organizations at a national level.

Particular Objective 5.2: Give an understanding of formalization of institutional relations at a national level.

DEVELOPMENT AND PROMOTION OF ECONOMIC RESOURCES RELATED TO SCIENCE AND TECHNOLOGY ENTITIES

Mission

"Provide CNEA with instruments to relate with entities of the private and public sector which financially support scientific-technological projects in order to enable CNEA to boost the activities of its different sectors"

Vision

"Be the area in charge of advising and giving an understanding of relations of CNEA with entities that support Science and Technology creating and administering instruments to establish relations with these bodies"

Objectives:

General Objective 1: Strengthen the management capacity of the area for developing linking mechanisms with agencies that support scientific-technological projects.

Particular Objective 1.1: Giving the area a functional organizational structure.

Particular Objective 1.2: Optimize mechanisms for follow-up and control of Science and Technology projects.

General Objective 2: Consolidate relations with agencies which integrate the National System of Science, Technology and Innovation and create mechanisms that enable the access to sectors which are financed within this system.

Particular Objective 2.1: Provide information and training to analyse Science and Technology projects for different sectors of CNEA in order to link and execute different sources of funding.

Particular Objective 2.2: Develop joint programmes with the National Science, Technology and Innovation System agencies.

General Objective 3: Consolidate linking mechanisms of CNEA with science and technology sectors all over Argentina.

Particular Objective 3.1: Create linking mechanisms with different scientific and technical agencies from the provinces and the City of Buenos Aires.

Particular Objective 3.2: Establish a system to follow up agreements and contracts subscribed within the framework of Law No. 25467.

Particular Objective 3.3: Propose new models of contracts and associations with the National System of Science, Technology and Innovation from the Provinces, Municipalities and the City of Buenos Aires to the authorities by participating in the analysis and developments of these instruments.

Particular Objective 3.4: Collect information about the needs of the Science and Technology Agencies from the National, Provincial and/or Municipal Jurisdictions in the subject matter of CNEA.

General Objective 4: Foster an active participation of CNEA in the Federal Council of Science and Technology and in the Inter Institutional Council of Science and Technology (National Law of Science, Technology and Innovation No. 25467).

General Objective 5: Advise different sectors of CNEA on which are the best instruments to establish connections with technological companies and companies demanding services.

Particular Objective 5.1: Advise authorities and analyse the relation with the private sector, within the framework of CNEA policies.

Particular Objective 5.2: Develop instruments and mechanisms for public private cooperation which align with the institutional policy.

Particular Objective 5.3: Participate in the analysis and development of new models of contracts and association with Technological Companies, government agencies, provincial and/or municipal agencies and the National System of Science, Technology and Innovation.

ASSISTANCE AND TECHNOLOGY TRANSFER

Mission

"Provide scientific-technological assistance for external sectors to CNEA by meeting the requirements of society"

Vision

"Become a benchmark for national scientific technological assistance by being organized in such a way that CNEA is able to coordinate and integrate services provided for different sectors of society"



CNEA - TECHNOLOGICAL ASSISTANCE IN CNA-II

Objectives:

General Objective 1: Coordinate and foster innovation and technological activities undertaken in CNEA and conduct the accounting and operational supervision.

Particular Objective 1.1: Create databases to register technical capacities of each group and technological assistance services conducted by CNEA.

Particular Objective 1.2: Plan and undertake internal and external spreading of technical capacities (technological offer) of CNEA.

Particular Objective 1.3: Foster new procedures, regulations and improvements in order to optimize innovation and technological assistance activities.

General Objective 2: Contribute technological assistance and developments towards strengthening of the nuclear sector and other sectors of society.

Particular Objective 2.1: Provide technological developments and assistance for the Argentine nuclear sector.

Particular Objective 2.2: Contribute technological assistance and developments towards the health sector.

Particular Objective 2.3: Provide technological assistance and developments for the industrial, energetic and aerospace sector.

Particular Objective 2.4: Contribute to technical assistance and advise towards environmental conservation.

Particular Objective 2.5: Contribute technological capacities towards the areas of culture, justice and other sectors that bring common good to society.

General Objective 3: Give value to technology transfer of developments and assistance provided for socio-productive sectors.

Particular Objective 3.1: Establish a methodology to quantify technology transfer.

Particular Objective 3.2: Evaluate the impact of the scientific-technological assistance provided.

ACADEMIC INSTITUTES

Mission

"Train professionals and technicians so that they reach the highest academic level in the areas of science and technology and they develop leadership skills and/or in participating in research, development and innovation projects and in areas of operation and production in order to contribute to the development of the nuclear energy R&D and the scientific, technological and productive system in Argentina"

Vision

"Become a national and international benchmark for training highly qualified professionals and technicians and meet the demand of Human Resources in the areas of science and engineering in the topics related to the strategic activities of the Argentine nuclear system"

Objectives:

General Objective 1: Strengthen educational and training activities of CNEA academic institutes by meeting the needs and interests of the Argentine nuclear system.

Particular Objective 1.1: Consolidate, prioritize and strengthen the topics of the current courses of study.

Particular Objective 1.2: Foster permanent educational activities and connections with different levels of formal education.

Particular Objective 1.3: Strengthen CNEA educational institutes within the scope of the Argentine higher educational system (education at university level).

Particular Objective 1.4: Strengthen areas of support for the functioning of CNEA Academic Institutes.

General Objective 2: Support the development of the nuclear energy R&D as well as the scientific, technological and productive system of Argentina by acquiring technologies and instruments for education, training and knowledge transfer.

Particular Objective 2.1: Incorporate new undergraduate, graduate and postgraduate courses of study into the educational system.

Particular Objective 2.2: Provide technical and professional training courses, continuous training and permanent education.

Particular Objective 2.3: Contribute to preserve and increase intellectual capital of CNEA and of the nuclear sector.

General Objective 3: Articulate all of the academic activities undertaken in CNEA.

General Objective 4: Propose and develop mechanisms to supervise university thesis undertaken in CNEA at an institutional level.

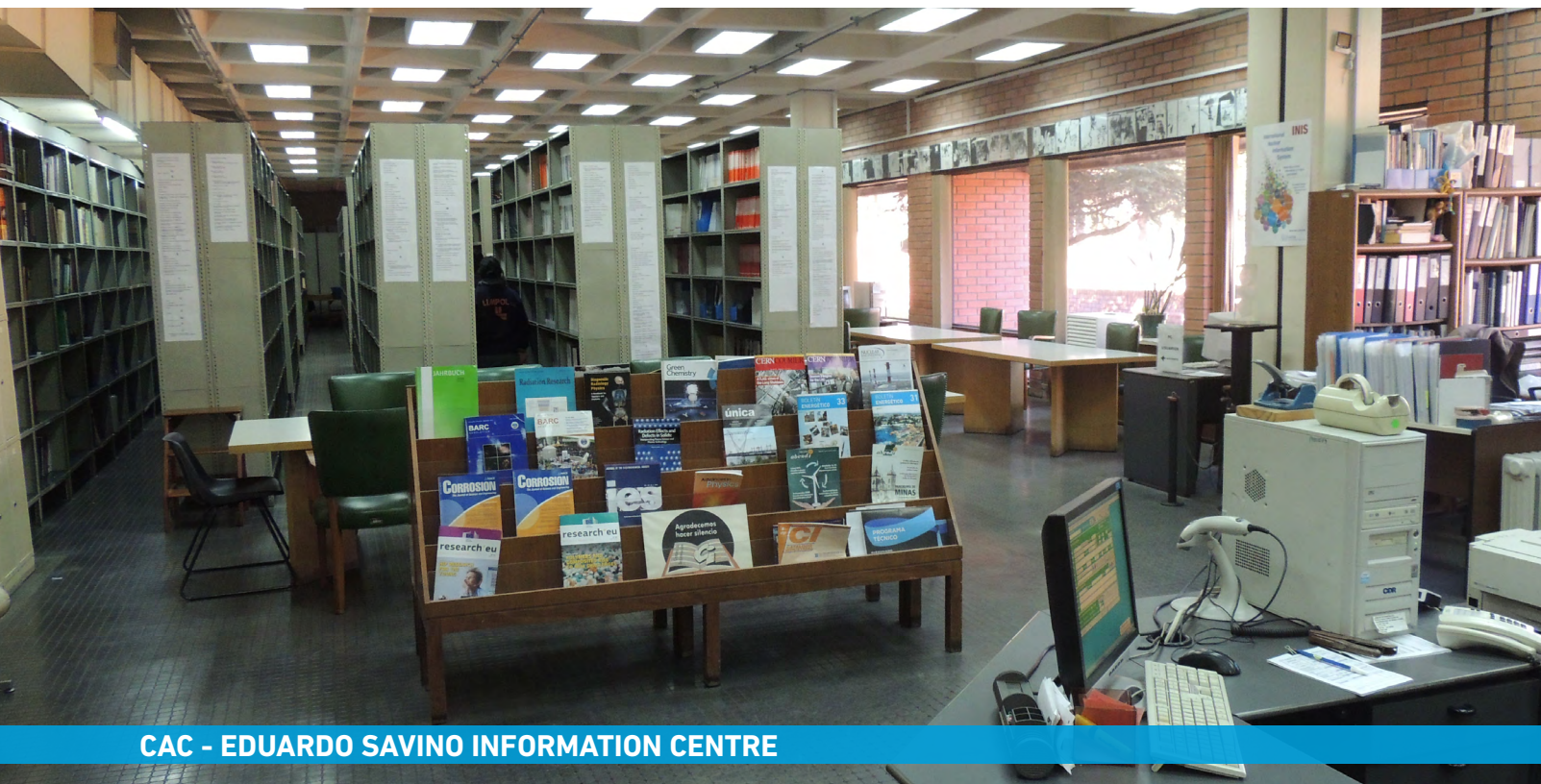
RESOURCE MANAGEMENT AND SCIENTIFIC-TECHNOLOGICAL INFORMATION SERVICES

Mission

"Provide in an efficient and effective way the information required for users who are part of the academic, scientific and technological community of CNEA and of other national and international institutions related to the nuclear field"

Vision

"Become a prestigious benchmark for providing information services in nuclear science and technology and other related areas oriented towards meeting user needs"



CAC - EDUARDO SAVINO INFORMATION CENTRE

Objectives:

General Objective 1: Duly optimize the access to information resources, which are necessary for the development of institutional activities.

Particular Objective 1.1: Establish a policy towards the development of information collection in order to meet current information needs of the Institution.

Particular Objective 1.2: Develop a virtual environment to guarantee the access and visibility to digital content.

Particular Objective 1.3: Implement the Unique Institutional Repository that gathers institutional scientific-technological public information in order to provide visibility and guarantee its access to it.

General Objective 2: Suggest and implement an institutional policy to preventively preserve and restore paper documents and to preserve digital documents.



CAB - LEO FALIKOV LIBRARY

General Objective 3: Strengthen and increase the status of CNEA Information Units Network (*Red de Unidades de Información, REDIN*) at a national and international level.

INFRASTRUCTURE

Mission

"Plan, develop and maintain an infrastructure in agreement with the needs to fulfil CNEA Strategic Plan"

Vision

"Succeed in providing adequate and enough services and facilities in every office of CNEA"



CAB - NEW BUILDINGS

Objectives:

General Objective 1: Plan and execute an infrastructure plan to include general and particular requirements in every office of CNEA.

Particular Objective 1.1: Develop and implement a master plan to verify the viability of projects of infrastructure.

Particular Objective 1.2: Develop an integral infrastructure plan by taking into account needs of growth of the Institution and its relationship with the environment.

Particular Objective 1.3: Make regulations on procurement of building works and services.

General Objective 2: Provide maintenance and general services in CNEA offices.



CAC - NEW BUILDINGS

General Objective 3: Establish a programme on the rational use of consumption of basic services by considering constructive techniques which are efficient from an energetic viewpoint.

General Objective 4: Strengthen technical sectors responsible for management and direction of building works.

General Objective 5: Establish infrastructure management systems.

Particular Objective 5.1: Develop mechanisms for control and followup of modifications to original projects.

Particular Objective 5.2: Develop management mechanisms to enable georeferenced information of infrastructure related to plans, technical specifications and calculation memories.

INFORMATION AND COMMUNICATION TECHNOLOGIES

Mission

"Give an understanding of aspects related to information and communication technologies, ICT, to efficiently meet institutional requirements"

Vision

"Become a benchmark of information and communication technologies in the scientific-technological system in Argentina by integrating every area of CNEA"



ICT'S - CLUSTER

Objectives:

General Objective 1: Create and implement a high value organization which includes every ICT activity in CNEA.

General Objective 2: Create and implement an integral plan of ICTs in CNEA by applying regulations specifically issued for the Argentine Public Administration.

Particular Objective 2.1: Suggest periodical updates of the institutional Information Technology policies.

Particular Objective 2.2: Suggest periodical updates of the Information Technology security policies.

Particular Objective 2.3: Set regulations and procedures.

Particular Objective 2.4: Implement policies approved by CNEA and verify their fulfilment.

General Objective 3: Strengthen ICT in CNEA by using highest level technological paradigms which are recommended by the National Government and technologically advanced institutions in the world.

Particular Objective 3.1: Develop and implement institutional systems.

Particular Objective 3.2: Strengthen and develop the capacity for high performance calculation.

Particular Objective 3.3: Improve massive information storage systems.

Particular Objective 3.4: Develop a voice and data network infrastructure in CNEA designed and installed according to standards, regulations and rules for these technologies.

Particular Objective 3.5: Meet requirements of services related to the data network required by the Institution.

Particular Objective 3.6: Implement the videoconference system in every office of CNEA.

Particular Objective 3.7: Guarantee a continuous supply of institutional Information Technology services.

Particular Objective 3.8: Provide technical support for different job posts.

LEGAL AFFAIRS

Mission

"Provide CNEA with legal advice, trial defense and representation of its interests in order to contribute towards the development of the nuclear energy R&D in Argentina"

Vision

"Strengthen and consolidate knowledge in those legal aspects which are relevant for CNEA in order to provide better legal advice and assistance in the topics dealt with by this area"

Objectives:

General Objective 1: Articulate legal activities with other sectors of CNEA.

Particular Objective 1.1: Suggest the implementation of legal mechanisms to optimize the development of activities conducted by CNEA.

Particular Objective 1.2: Elaborate studies, reports and documents on specific legal subjects upon the request of the sectors of CNEA.

Particular Objective 1.3: Participate in elaborating, revising and, when appropriate, advising negotiations and management of contracts, conventions and agreements.

Particular Objective 1.4: Advise on the legislative construction so that activities undertaken by CNEA are conducted in agreement with the binding regulatory framework.

Particular Objective 1.5: Provide preventive legal assistance in order to avoid the judicialization of conflicts.

General Objective 2: Analyse and suggest improvements in the national legislation.

Particular Objective 2.1: Elaborate proposals of adequation of binding legislation.

Particular Objective 2.2: Create institutional bonds with national and international nuclear agencies specific to the subject.

General Objective 3: Tend to decrease conflicts in different areas with a subject matter specific to this sector.

General Objective 4: Keep knowledge up to date in the different areas of the law that is relevant for the activity of the Institution.

General Objective 5: Implement a quality management system.

Particular Objective 5.1: Keep the database of the legal advisory committee's legal opinions up to date.

Particular Objective 5.2: Develop and implement procedures for different thematic areas.

Particular Objective 5.3: Keep the information about trials appearing in the Judicial Management System Platform (*Sistema de Gestión Judicial*, SIGEJ) up to date. This system is implemented by the Argentine Attorney General's Office.

Particular Objective 5.4: Implement systems and procedures established by the Judiciary in order to improve the informatic court system.

ADMINISTRATIVE AND TECHNICAL MANAGEMENT

Mission

"Provide an efficient and effective assistance and advise in terms of the Administrative Technical Management for those responsible for the different sectors of CNEA"

Vision

"Achieve the development and implementation of a sustainable Integral Administrative Technical Management system"

Objectives:

General Objective 1: Optimize the application of the binding regulation for all of the employees of the Administrative and Technical Management, especially those who develop their tasks in receiving and sending documents in each major agency.

Particular Objective 1.1: Study and analysis of the regulation of obligatory use and internal application rules in this area.

Particular Objective 1.2: Revision of management procedures and elaboration of new procedures to answer institutional needs.

Particular Objective 1.3: Instrumentation of communication channels and spreading of procedures of this area within the scope of CNEA.

General Objective 2: Evaluate and implement information technology tools to optimize the technical administrative management and establish consultation systems among the responsible of each Department.

Particular Objective 2.1: Optimize the use of Documentary Communications in agreement with CNEA requirements.

Particular Objective 2.2: Implement the use of new information technology systems and/or tools to optimize the technical administrative management.

Particular Objective 2.3: Design and instrumentation of a consultation system for the personnel working within the technical administrative management.

Particular Objective 2.4: Implement harmonization of criteria with those responsible for receiving and sending documentation within each Department.

General Objective 3: Foster training, specialization and leadership of employees of this area.

Particular Objective 3.1: Advise the authorities on optimizing resources of the technical and administration management in terms of intellectual capital, evaluate responsibilities assigned and availability of the personnel to undertake them.

Particular Objective 3.2: Encourage heads and employees of this area to participate in training, specialization and leadership programmes by contributing towards increasing the quality level of the services provided in this area.

CNEA AND ITS EMPLOYEES





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COORDINATION AND DIRECTION OF THE FORMULATION OF THE STRATEGIC PLAN

Responsible Official:

Gómez de Soler, Susana Marta

Deputy Responsible Official:

Coppari, Norberto Ruben

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Intellectual Capital Planning:

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Raw Materials Production

Responsible Participant: Grüner, Roberto

Participants: Arrondo, Marisa; Battaglia, Julio; Cardozo, Damián; Dieguez, Sergio; López, Julián

Uranium Mining Environmental Restoration

Responsible Participant: Kurtz, Roberto

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Nuclear Fuels

Responsible Participant: Marchi, Daniel

Participants: Álvarez, Luis; De Lío, Liliana; Denis, Alicia; Esteban, Adolfo; Fernandez, Eduardo; López, Marisol; Martinelli, Maximiliano; Micelli, Mateo; Sassone, Ariel; Taboada, Horacio; Vizcaíno, Pablo

Uranium Enrichment

Responsible Participants: Isnardi, Edgardo; Lamagna, Alberto; Marchi, Daniel

Participants: Clavijo, Santiago; Sassone, Ariel

Research and Radioisotope Production Reactors

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Participants: Blaumann, Herman; Cristini, Pablo; Solari, Hugo O.; Vigna, Gustavo

Nuclear Power Reactors

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Participants: Blaumann, Herman; Cristini, Pablo; Furnari, Juan Carlos; Solari, Hugo O.; Vigna, Gustavo

Nuclear Technology Applications to Health, Industry and Agriculture

Responsible Participant: Furnari, Juan Carlos

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Radioactive Waste and Spent Fuel Management

Responsible Participant: Maset, Elvira

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Decommissioning

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Safety, Radiation Protection, Physical Security and Safeguards

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Environmental Management

Responsible Participant: Cicerone, Daniel

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Quality Management

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Administration and Finance

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Institutional, Domestic and International Affairs

Responsible Participant: Deluchi, Facundo Abel

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Development and Promotion of Economic Resources related to Science and Technology Entities

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Assistance and Technology Transfer

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Infrastructure

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Legal Affairs

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Administrative and Technical Management

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CAREM Argentine Nuclear Power Plant

Responsible Participant: Calzetta, Osvaldo

RA-10 Argentine Multipurpose Nuclear Reactor

Responsible Participant: Blaumann, Herman

Participants: Gho, Carlos; Vertullo, Alicia

CNEA in the National Plan of Nuclear Medicine

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