

Progress Report 2008 - 2010

1956 IEA foundation

1958 IEA-R1 nuclear reactor startup



1963 Radioisotopes production

1964 Nuclear fuel elements fabrication

1979 IEA changed its name to IPEN

1988 IPEN/MB-01 nuclear reactor startup



2010 Espaço Cultural Prof. Marcello Damy



Marcello Damy de Souza Santos

IEA's founder and National Commission for Nuclear Energy president



Progress Report 2008 - 2010



Marcello Damy de Souza Santos

IEA founder and National Commission for Nuclear Energy president

Progress Report 2008-2010 is an extraordinary publication with limited edition.

All the research activities, products and services are responsibility of the scientific staff of IPEN.

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Mission

Our mission is to improve the Brazilian people quality of life by producing scientific knowledge, developing technologies and services and promoting human resources for nuclear and correlated areas.

Short Profile

IPEN - Nuclear and Energy Research Institute is a State of São Paulo autarchy, associated to the University of São Paulo - USP for educational purposes and supported and operated technically and administratively by the National Nuclear Energy Commission - CNEN, a federal agency of the Ministry of Science, Technology and Innovation.

The Institute was founded in 1956 with the main purpose of doing research and development in the fields of nuclear energy and its applications. It is located at the campus of USP, in the city of São Paulo, in an area of nearly 500,000 m². It has over 1000 employees and 40% of them have qualification at master or doctor level.

IPEN is recognized as a national leader institution in research and development in the areas of radiopharmaceuticals, industrial applications of radiation, basic nuclear research, nuclear reactor operation and nuclear applications, materials science and technology, laser technology and applications.

Along with the R&D, it has a strong educational activity, having a graduate program in Nuclear Technology, in association with the University of São Paulo, USP, ranked as the best university in the country. The Federal Government Evaluation institution CAPES, granted to this course grade 6, considering it a program of Excellence. This program started at 1976 and has awarded 575 doctorates and 1238 master's degrees since them. The actual graduate enrollment is around 550 students.

The internal organization structure comprehends two levels, one for strategic and political issues and for decision making composed by its a Board and a Technical and Administrative Council - CTA and another for the executive and operational actions, coordinated by the Research and Development Centers, grouped according to their research, development and innovation activities.

IPEN has a rigorous program of radiological control and nuclear safety for the activities related to nuclear and radiological aspects. This program comprises personal and environmental monitoring and radiological emergency assistance.

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O *Ipen* é uma autarquia vinculada à Secretaria de Desenvolvimento Econômico, Ciência e Tecnologia do Estado de São Paulo, associada à Universidade de São Paulo e gerida técnica, administrativa e financeiramente pela Comissão Nacional de Energia Nuclear, órgão do Ministério da Ciência, Tecnologia e Inovação.

Foreword

The period covered by this report, from 2008 to 2010, is marked by the renaissance of the Nuclear Area, meaning for IPEN, as the most important Nuclear Research Institute of Brazil, a retake of its origins. The institute is ruled by a Convenium between the Federal government and the São Paulo State government that started in 1982 and lasted 25 years, ending in 2007. This rebirth of the importance of nuclear activity came to provide a firm direction to the efforts of the Institute and, as a consequence, a new term for this agreement was designed, and it is underway to be signed, to restore the necessary conditions for the success of the 25 years ahead.

The role of IPEN, responsible for distributing more than 95% of radiopharmaceuticals used in the country, was highlighted during the international crisis of ^{99}Mo supply that hit Brazil, letting the country in a very difficult situation. The reason for this situation is that Brazil has a nuclear medicine of first world level (~5% from the total attendance of the world), with 1,5 million patients attended per year. The response of the institution was crucial for mitigating the crisis, providing new ways to acquire ^{99}Mo from different suppliers, and, at that moment, Argentina was our main supplier.

This deal was accomplished in a week, a rare event for the public service. The crisis also pointed out our fragility by the dependence on foreign supply for such a large demand, and was the main reason for defining the need of a Brazilian Multipurpose Reactor. IPEN was the responsible for convincing the society and the government leaders of the urgency to construct our reactor, with the main purpose of producing the ^{99}Mo . This structural project is reorganizing the nuclear area, particularly at IPEN, that has the advantage of taking part of the graduate program of University of São Paulo and achieved the mark of 1813 titles concluded: 1238 masters and 575 doctorates and still keeps its excellence mark (grade 6) granted by the CAPES evaluation program. Its technological programs gained new energy, with the upgrade of the IEA-R1 reactor boosting its power to 3.5 MW and aiming to 5 MW. Also, the ^{99}Mo supply challenge is orienting the whole institute to cooperate in the development of alternative means for supplying ^{99}Mo because the situation is still fragile.

This new situation is already shown in this progress report, where the results of the R&D centers are presented according to the main programs: Biotechnology, Lasers Technology, Renewable Energies, Nuclear Reactors and Fuel Cycle, Applications of Ionizing Radiations, Nuclear Science and Technology, Materials and Nanotechnology, Environmental Science and Technology and Radiopharmacy. It must be stressed that all these results were accomplished due the efforts and dedication of the IPEN staff and were supported by CNEN, MCTI, SDECT/SP, University of São Paulo, IAEA, FAPESP, CAPES and CNPq.

Dr. Nilson Dias Vieira Junior
IPEN Superintendent

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