REPORT ON THE PARTICIPATION OF ARGENTINA (AGREEMENT HOLDER) IN THE "SMALL-SCALE INDIGENOUS PRODUCTION OF MO-99 USING LEU TARGETS OR NEUTRON ACTIVATION" COORDINATED RESEARCH PROJECT

1. INTRODUCTION

Argentina's National Atomic Energy Commission (CNEA) began a program for radioisotope production in the early '50s. With the construction and starting-up of the RA-3 reactor in 1967, the first irradiations of different targets were performed, leading to commercial production of several radioisotopes for nuclear medicine.

Argentina, through its CNEA, has participated in the CRP from the very beginning, attending the July 2003 meeting of consultants. During that first meeting, Argentine activities related to ^{99}Mo production were presented and discussed the advantages of establishing a CRP, the Agency role and contract and agreement holders' roles.

Argentina established its position of being able to transfer the technology for producing ^{99}Mo from LEU targets on commercial basis. Because of this situation, contract holders decided to accept the modified Cintichem technology, offered by the USA representatives with no cost for the receivers, employing uranium metal foil targets. With this scenario, participation of CNEA in the CRP finally was limited to being an adviser for receiving countries.

During 2005, CNEA hosted an RCM (17-19 May) with the participation of representatives from Algeria, Australia, Brazil, Chile, Egypt, France, India, Indonesia, Kazakhstan, Libya, Morocco, Pakistan, Poland, Romania, Thailand and the USA.

During the RCM different aspects of ^{99}Mo production were addressed, such as irradiation conditions, processing, QC and QA, transport, training of human resources, waste treatment, safety issues, safeguards, target design and fabrication and many others.

Also CNEA received the visit of a Libyan professional, Elghannudi Younnes, for two weeks during June 2008, receiving training in quality control of ^{99}Mo and visiting all the facilities related to its production.

During the different RCMs, contract holders received from CNEA advice and assistance regarding all different subjects related to fission ^{99}Mo production, from radiochemical processes, infrastructure needed and process and quality control to waste management, licensing and training of human resources among others.

During the CRP period, CNEA continued with the weekly commercial production of fission ^{99}Mo from LEU targets, increasing the production volume to help in the mitigation of the supply crisis that began in 2009.

Since then, CNEA's ^{99}Mo production is covering the regional demand and one third of the Brazilian market.

In parallel, the technology transference to ANSTO (Australia) was completed for the production of ^{99}Mo and at the time of writing a new production plant is being started up in Egypt, including fission ^{99}Mo and ^{131}I as well as other radioisotopes. This plant was supplied by INVAP-CNEA in addition to the research and production reactor previously supplied.

2. OTHER ACTIVITIES AND PROJECTS

Argentina also participates as a member of the High Level Group on the Security of Supply of Medical Radioisotopes (HLG-MR) created by OECD/NEA to address the supply crisis in order to find solutions to achieve a sustainable supply capacity.

CNEA is carrying out a project to install a new reactor (RA-10) not only for radioisotope production, but for materials testing, qualification of fuel elements, basic research and other activities.

At the time of writing, the project is in the engineering stage, the establishment of its main features has been performed and siting has been studied. Regarding fission ^{99}Mo production, the new reactor is expected to allow a weekly production of 2500–3000 6-day curies. The reactor is programmed to start irradiation activities by 2018.

As a complement of this project, a new fission radioisotope production plant is being projected, in order to chemically process those targets irradiated at RA-10 reactor. The budget has been approved and it will be built next to the new reactor. The capacity of the new plant will be enough to obtain the referred 2500–3000 6-day curies of ^{99}Mo and also ^{131}I.

On the other hand, an enlargement of the present ^{99}Mo plant has been projected with the design of new hot cells, specifically for waste management and is expected to begin during 2013.