



NPR EXPLORER

NEWS AND NOTES FOR THE NON-POWER REACTOR COMMUNITY

WINTER 2010-11

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Safety Culture Policy Statement



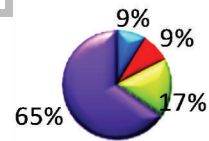
Safety matters

The NRC is preparing to publish its Safety Culture Policy Statement. The policy statement has been in development since 2008. During that time, NRC staff engaged in many outreach activities to solicit stakeholder input in developing a safety culture policy statement applicable to the entire

range of NRC-regulated nuclear activities. The NRC developed the Statement of Policy cognizant that individuals and organizations performing regulated activities bear the primary responsibility for safely handling and securing regulated materials, while the Commission, as the regulatory agency with an independent oversight role, reviews the perform-

ance of those individuals and organizations through its inspection and assessment processes. For research and test reactors (RTRs), the NRC staff discussed this at the 2010 TRTR Conference and continues to seek stakeholder input which may include, updating existing procedures in order to incorporate safety culture guidance.

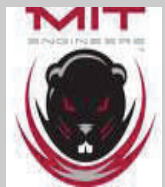
RTR License Renewal Completion



- 0-25% Complete
- 26-50% Complete
- 51-75% Complete
- 76-100% Complete

MIT License Renewed

The NRC issued renewed Facility Operating License No. R-37 for the Massachusetts Institute of Technology research reactor on November 1, 2010. The renewed license authorizes operation of the reactor for a period of 20 years from the date of issuance. The license renewal included an increase in the maximum authorized power level from 5 megawatts thermal (MW(t)) to 6 MW(t). The reactor is located on the Massachusetts Institute of Technology campus in Cambridge, MA. The reactor is operated primarily for teaching, training, and support of a diverse research program.



Moly-99 & The American Medical Isotope Act 2011

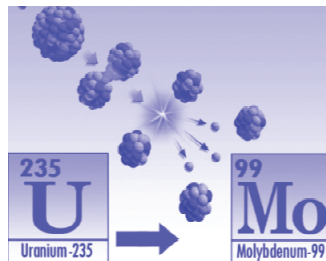
On Tuesday, February 1, 2011 the Senate Committee on Energy and Natural Resources received testimony on the American Medical Isotopes Production Act of 2011, a bill the 112th Congress will consider. The proposal contains similar provisions as its unsuccessful predecessor, the "Markey Bill," which previously passed the House nearly unanimously but was blocked from a Senate vote. The purpose of the hearing was to receive testimony on the proposed bill that would promote the production of molybdenum-99 in the United States for medical uses such as imaging and diagnostic purposes, and phase out the export of highly enriched uranium used in the foreign production of medical isotopes. An archive video of the proceedings is available at <http://energy.senate.gov/public> through the archived webcasts link on the left. If approved, the bill would appropriate \$143,000,000 for the period encompassing fiscal years 2011 through 2014 to the Secretary of Energy to carry out the provisions of the programs.

The Various Technologies that Produce Mo-99

At the present time Mo-99 is produced by fission; 6% of fissions result in this valu-

able medical isotope (but no domestic supply has been available since 1989). The molybdenum can be readily separated from other fission products, resulting in high specific activity material. The downsides of this technology are (1) the requirement for a reactor and (2) generation of large quantities of radioactive waste, two high cost items that are frequently subsidized by government entities of host countries. Four DOE cooperative agreements (CA) are currently sponsoring the demonstration of diverse technologies that may reduce Mo-99 production costs. They are:

- (1) Natural stable Mo, being 24% Mo-98, can be activated by neutrons to form Mo-99. One CA proposes to modify power reactors with insertion and extraction equipment similar to a traversing in-core probe (TIP) system to extract the isotope. (...Continued on Back)



New Staff on board!

- **Samina Kanwal** as RTR Oversight Branch foreign assignee!
- **Jason Lising** in RTR Projects Branch returning from military deployment!

Mind Teaser

If a pound of tea has 2x as much caffeine as a pound of coffee, & if a pound of tea is enough to make 160 cups of tea, & if a pound of coffee is enough to make 40 cups, & if a 12-ounce can of cola has about 1/4th the caffeine as a cup of coffee, How much caffeine does 1 cup of tea have compared to 1 cup of coffee? How much caffeine does 1 cup of tea have compared to a 12-ounce can of cola?

Answer on the back



Follow up: Another Recent Exposure Event Teaches Even More Lessons.

As a follow-up story to last editions *Explorer*, a different research reactor facility experienced another radiation exposure event. Although no radiological exposure limits were exceeded, a dose level at 30 Rem per hour was created by a stuck open beam port shutter. A certified radiographic technician performing routine neutron radiographs opened the door to the restricted area at the neutron imaging facility and entered while dose rates were in excess of the prescribed level. After realizing that the beam port shutter was still open, the technician exited the restricted area, but only after having traversed the beam. The actual time spent in the restricted area was 18 seconds as documented by time stamps on security cameras. Additionally, the technician had failed to wear his dosimeter following a lunch break. No finger dosimeter had been issued for the technician. The whole body dose to the individual was calculated to be 130 mrem. Based on NRC's Inspection Manual Chapter 0309, "Reactive Inspection Decision Basis for Reactors," a Special Inspection Team dispatched in response to this event. The inspection report is to follow. The licensee cited a number of lessons learned and implemented corrective actions.

*****HOC: (301)816-5100*****

All NPR licensees are reminded to call the NRC's Headquarters Operations Center to report any significant operational event or other reportable condition. The staff is undergoing incident response training to ensure an adequate response posture is constantly maintained at NRC headquarters. The staff has begun using a new form to internally document significant operational events at NPR facilities. If licensees would like to receive a copy of the new form, please contact Scott Sloan at (301) 415-1619, or email scott.sloan@nrc.gov.



The Latest on the Fingerprinting Rule

The NRC reopened the public comment period for the final rule that will implement fingerprint-based background checks for personnel with unescorted access to RTRs. The 1st public comment period closed October 4, 2011. The 2nd public comment period closed January 31, 2011. The non-power reactor community provided insights and concerns through written comments received which are being considered in development of the final rule. Due to the extended comment period, the rule is anticipated to publish in the 2nd half of 2011. It will rescind the Commission's security enhancement orders issued in 2007. Please contact Scott Sloan at (301) 415-1619, or email scott.sloan@nrc.gov, with any questions. Information can also be found at www.regulations.gov under Docket ID NRC-2008-0619.

Moly-99 (continued)

(2) Stable Mo also contains 10% Mo-100. Another group will attempt to demonstrate that in an accelerator they can produce Mo-99 by knocking a neutron off of Mo-100 target material.

(3) More efficient fission processes remain strong contenders. A method is being developed to use aqueous homogeneous reactors (AHR) wherein a solution containing uranium is alternately brought into a critical configuration to fission uranium for a few days after which the liquid core is placed in a subcritical configuration for chemical processing to remove the Mo from the solution.

(4) Another group supports a similar technology but with a subcritical reaction vessel that multiplies neutrons generated by accelerator reactions. Contact Marcus Voth at (301) 415-1210, email Marcus.Voth@nrc.gov with any questions.

Streamlining License Renewal through Rulemaking

The NRC is starting rulemaking to streamline the license renewal process. This project will implement the long-term actions presented to the Commission in Enclosure 2 of SECY-09-0095, "Long-Term Plan for Enhancing the Research and Test Reactor License Renewal Process and the Status of the Development and Use of the Interim Staff Guidance," dated June 24, 2009 (ML09215717).

The objective of the long-term plan is to develop, propose for comment, and implement rulemaking to achieve a streamlined process for the renewal of non-power reactor licenses. Key outcomes will prevent future backlogs of non-power reactor license renewals and minimize unne-

cessary regulatory burden on non-power reactor licensees. This rulemaking will also update the emergency preparedness requirements for RTR facilities.

In the 1st year of this effort, the staff will perform a review of existing Regulatory Requirements, solicit input from and interact with stakeholders, analyze the possibility for segregation of RTR regulations, and benchmark license renewal methodologies in use by other government agencies not regulated by the NRC to develop a draft and final regulatory basis. Please contact Duane Hardesty at (301) 415-3724, or email Duane.Hardesty@nrc.gov or Bob Beall at (301) 415-3874, or email Robert.Beall@nrc.gov with any questions.

69 Years Later... Enrico Fermi

Enrico Fermi was born in Rome on 29th September, 1901. He directed a classical series of experiments which ultimately led to the "atomic pile" and the first self-sustaining nuclear chain reaction which took place at the University of Chicago on December 2, 1942 - on a squash court situated beneath Stagg Field stadium. Using pure uranium and uranium oxide, the pile consisted of 40,000 pounds of graphite bricks to diffuse the nuclear reaction throughout the structure, with interstitial cadmium rods to control it. When the rods were removed, the pile went "critical" for twenty-eight minutes. It was the world's first controlled nuclear chain reaction and the beginning of a new era.



From Nobel Lectures, Physics 1922-1941, Elsevier Publishing Company, Amsterdam, 1965