UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SECRETARY

January 11, 2013

COMMISSION VOTING RECORD

DECISION ITEM: SECY-12-0167

TITLE: CLOSURE OF PETITION FOR RULEMAKING TO REQUIRE INSTALLATION OF RADIATION ALARMS FOR ROOMS HOUSING NEUTRON SOURCES (PRM-73-15)

The Commission (with all Commissioners agreeing) approved the subject paper as recorded in the Staff Requirements Memorandum (SRM) of January 11, 2013.

This Record contains a summary of voting on this matter together with the individual vote sheets, views and comments of the Commission.

Kenneth R. Hart
Acting Secretary of the Commission

Attachments:
1. Voting Summary
2. Commissioner Vote Sheets

cc: Chairman Macfarlane
Commissioner Svinicki
Commissioner Apostolakis
Commissioner Magwood
Commissioner Ostendorff
OGC
EDO
PDR

SECY NOTE: This Voting Record will be released to the public 5 working days after dispatch of the letter to the petitioner.

VOTING SUMMARY - SECY-12-0167

RECORDED VOTES

	APRVD	DISAPRVD	ABSTAIN	NOT PARTICIP	COMMENTS	DATE
CHRM. MACFARLANE	X					12/28/12
COMR. SVINICKI	X				X	1/9/13
COMR. APOSTOLAKIS	X					1/7/13
COMR. MAGWOOD	X					1/9/13
COMR. OSTENDORFF	X				X	1/7/13

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: Chairman Allison M. Macfarlane

SUBJECT: SECY-12-0167 – CLOSURE OF PETITION FOR RULEMAKING TO REQUIRE INSTALLATION OF RADIATION ALARMS FOR ROOMS HOUSING NEUTRON SOURCES (PRM-73-15)

Approved X **Disapproved** _____ **Abstain** _____

Not Participating _____

COMMENTS: **Below** ___ **Attached** ___ **None** X

SIGNATURE

12/28/12

DATE

Entered on "STARS" Yes X **No** ___

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: COMMISSIONER SVINICKI

SUBJECT: SECY-12-0167 – CLOSURE OF PETITION FOR RULEMAKING TO REQUIRE INSTALLATION OF RADIATION ALARMS FOR ROOMS HOUSING NEUTRON SOURCES (PRM-73-15)

Approved XX **Disapproved** _____ **Abstain** _____

Not Participating _____

COMMENTS: **Below** XX **Attached** XX **None** ___

I approve the denial and closure of the petition for rulemaking and publication of the *Federal Register* notice, subject to the attached edits.

SIGNATURE

01/9/13
DATE

Entered on "STARS" Yes ✓ No ___

SUPPLEMENTARY INFORMATION:

The Petition

On December 7, 2011 ~~(76 FR 76327)~~, the NRC published a notice of receipt and request for comment (76 FR 76327) of a PRM filed by George Hamawy. The petitioner requested that the NRC amend its regulations to require installation of radiation alarms in rooms housing neutron sources. The petitioner stated that the use of alarms can be effective in preventing source removal, especially when an in-house person may be taken hostage to get the intruder into the room housing the source. The petitioner noted that the construction of the neutron sources used by universities for irradiating foils makes the source an easy target for theft. The petitioner also noted that the source is located at the end of a rod in the middle of a 55-gallon drum and that the drum has a cover that can be easily removed, facilitating the removal of the source. The petitioner stated that radiation alarms should be installed that are connected to the Public Safety Department. The alarm would be triggered when the source is removed.

Public Comments on the Petition

The notice of receipt of the petition for rulemaking invited interested persons to submit comments. The comment period closed on February 21, 2012. The NRC received 2 comment letters from industry, 1 comment letter from an individual, and 1 comment letter from the Organization of Agreement States. The commenters all opposed the petition. Two of the commenters stated that the petition should not apply to the well logging industry. The commenters stated that the petition request was vague in terms of the definition of room, types of radiation alarms, connectivity to law enforcement, the isotopes included, and the threshold for

action. Two of the commenters noted that their sources are stored by methods approved by the NRC (or Agreement State) and as prescribed in national standards established by the well logging industry and that additional requirements are not necessary. One of the commenters questioned why anyone would want to steal a neutron source and asked if any neutron sources have ever been stolen. The commenter also stated that natural background may contain more radiation than the neutron sources and, therefore, a radiation detector would not detect the removal of the sources. The commenter also asked if it would be possible to shield the neutron source from the detector while stealing the source. The commenter also stated that there is no reason that any person would respond to the alarm. The commenter stated that the best solution is to put the barrel in a locked room. One of the commenters noted that ~~that~~ the typical strength of a neutron source used in ~~the~~ a university is less than the category 2 threshold. The commenter also stated that the regulations currently require a licensee to have security measures in place to "secure from unauthorized removal or access licensed materials that are stored in controlled or unrestricted areas."

Reasons for Denial

As noted by the commenters on the petition, the petitioner did not provide information relative to the source strength of the neutron sources or the particular radionuclides for which the petitioner is requesting additional security measures be imposed by rulemaking. It is not clear whether the petitioner is requesting rulemaking on all neutron sources or only on the americium-241/beryllium (Am-241/Be or Am/Be) and plutonium-239/beryllium (Pu-239/Be or Pu/Be) sources mentioned in the petition. The NRC is taking the view that the petitioner is requesting rulemaking for all neutron sources regardless of source strength.

There are a number of different sources of neutrons, ranging from radioactive sources to operating and research reactors and spallation sources. Neutron sources are used in diverse applications in areas of physics, engineering, medicine, nuclear weapons, petroleum exploration, biology, chemistry, nuclear power, and other industries.

Radioactive materials used as neutron sources by NRC licensees include Am-241/Be, Pu/Be, and californium-252 (Cf-252). A licensee's decision to use a specific type of source may depend upon cost, availability, and the dependence upon historical data with which to compare current measurement results. The Am-241/Be and Pu/Be sources generate neutrons by the (α,n) reaction in which the americium or plutonium decays and emits an alpha particle, which is absorbed by the beryllium. Neutron sources that are not integrated into a specific device, regardless of type, are generally stored surrounded by paraffin wax or other similar low atomic number material as shielding.

Both Am-241/Be and Pu/Be sources have a wide range of uses. Neutron sources can be used with online elemental coal analyzers and bulk material analyzers in the coal and cement industries. Neutron penetration into materials makes these sources useful in analytical techniques such as radiography of aircraft components to detect corrosion, imperfections in welds, cracks, and trapped moisture. Moisture gauges use neutrons to find water and petroleum layers in oil wells, known as well logging. Neutron sources can be used for gold and silver prospecting for on-the-spot analysis, and to detect ground water movement for environmental surveys. Neutron sources are also used as calibration sources.

Californium-252 sources produce neutrons during spontaneous fission. The Cf-252 splits apart producing a number of neutrons in the process. Beyond the uses mentioned above for Am/Be and Pu/Be sources, the neutrons from Cf-252 are employed as a treatment of certain cervical and brain cancers where other radiation therapy is ineffective. The Cf-252 sources are also used to start up nuclear reactors.

The categorization of sources is established in International Atomic Energy Agency (IAEA) Safety Series RS-G-1.9, Categorization of Radioactive Sources. Safety Series RS-G-1.9 provides a risk-based ranking of radioactive sources in five categories in terms of their potential to cause severe deterministic effects for a range of scenarios that include both external exposure from an unshielded source and internal exposure following dispersal. The categorization system uses the 'D' values as normalizing factors. The 'D' value is the radionuclide specific activity of a source that, if not under control, could cause severe deterministic effects for a range of scenarios that include both external exposure from an unshielded source and internal exposure following dispersal of the source material. Safety Series RS-G-1.9 is available on the IAEA Web site at: http://www-pub.iaea.org/MTCD/publications/PDF/Pub1227_web.pdf.

As previously noted, neutron sources are used for a variety of purposes and in varying source strength. Depending on the source strength (activity), the source is considered a category 1 (higher activity) to a category 5 (lower activity) source. The threshold is established for each individual radionuclide. For Am-241/Be and Pu-239/Be, a category 5 source is any source with an activity of less than 0.0006 Terabequerels (TBq) (0.016 curies (Ci)) and a category 1 sources is any source with an activity of 60 TBq (1,620 Ci) or above. For Cf-252, the category 5 threshold is 0.0002 TBq (0.0.0054 Ci) and the category 1 threshold is 20 TBq (540 Ci).

The NRC's regulations in § 20.1801 of Title 10 of the *Code of Federal Regulations* (10 CFR), "Security of stored material," and 10 CFR 20.1802, "Control of material not in storage," require licensees to: 1) secure, from unauthorized removal or access, licensed materials that are stored in controlled or unrestricted areas; and 2) ~~to~~ control and maintain constant surveillance of licensed material that is in a controlled or unrestricted area and that is not in storage. The NRC's regulations in 10 CFR 20.2201, "Reports of theft or loss of licensed

material," requires licensees to report lost, stolen, or missing radioactive material. Further, throughout the NRC's regulations for licensing byproduct material, there are educational and training requirements to ensure that individuals with access to radioactive materials have adequate knowledge and skills to safely use the radioactive material as intended. These requirements are adequate for the protection of most radioactive material that is not subject to 10 CFR part 73, "Physical Protection of Plants and Materials;" however, after the terrorist attacks of September 11, 2001, the Commission determined that certain risk-significant radioactive material should be subject to enhanced security provisions. The NRC issued several security orders to licensees that possessed category 1 and category 2 quantities of radioactive material of 16 radionuclides or combinations. Included in the list of radionuclides considered to be risk-significant are Am-241/Be, Pu-239/Be, and Cf-252. In general, the orders provided requirements for enhanced security measures for such things as license verification before transfer, intrusion detection and response, use of security zones, access control, and coordination with local law enforcement agencies (LLEAs). The orders also contain requirements for the licensee to determine the trustworthiness and reliability of individuals permitted unescorted access to category 1 or category 2 quantities of radioactive material through fingerprinting and criminal history checks and other elements of a background investigation.

The Commission recently approved a final rule (will add citation for part 37 after publication expected in December/January) that establishes the security requirements for category 1 and category 2 quantities of radioactive material (including Am-241/Be, Pu-239/Be, and Cf-252) in the regulations. Once the final rule is implemented, the security orders will be rescinded. The final rule establishes a new part to 10 CFR part 37, "Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material." This final rule also applies to material that if aggregated equals or exceeds the category 2 threshold. Both the orders and 10

The NRC appreciates the views of the petitioner and encourages public feedback through any of our NRC processes.

For the reasons cited in this document, the NRC denies this petition.

Dated at Rockville, Maryland, this _____ day of _____, ~~2012~~2013.

For the Nuclear Regulatory Commission.

_____
Annette Vietti-Cook,
Secretary of the Commission.

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: Commissioner Apostolakis

SUBJECT: SECY-12-0167 – CLOSURE OF PETITION FOR RULEMAKING TO REQUIRE INSTALLATION OF RADIATION ALARMS FOR ROOMS HOUSING NEUTRON SOURCES

Approved X **Disapproved** _____ **Abstain** _____

Not Participating _____

COMMENTS: Below ___ Attached ___ None X

SIGNATURE

1/7/13

DATE

Entered on "STARS" Yes ✓ No ___

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: COMMISSIONER MAGWOOD

SUBJECT: SECY-12-0167 – CLOSURE OF PETITION FOR RULEMAKING TO REQUIRE INSTALLATION OF RADIATION ALARMS FOR ROOMS HOUSING NEUTRON SOURCES (PRM-73-15)

Approved X **Disapproved** _____ **Abstain** _____

Not Participating _____

COMMENTS: **Below** ___ **Attached** ___ **None** X

SIGNATURE

9 January 2013

DATE

Entered on "STARS" Yes X **No** ___

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: COMMISSIONER OSTENDORFF

SUBJECT: SECY-12-0167 – CLOSURE OF PETITION FOR RULEMAKING TO REQUIRE INSTALLATION OF RADIATION ALARMS FOR ROOMS HOUSING NEUTRON SOURCES (PRM-73-15)

Approved __X__ **Disapproved** _____ **Abstain** _____

Not Participating _____

COMMENTS: **Below** _X__ **Attached** ___ **None** ___

I appreciate the staff's timely and concise response to the petition. I agree with the staff and the Chairman that the petition should be denied.

/RAO/

SIGNATURE

1/7/13

DATE

Entered on "STARS" **Yes** _X__ **No** ___