

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

September 19, 2017

NRC REGULATORY ISSUE SUMMARY 2017-06
NRC POLICY ON USE OF COMBINATION DOSIMETRY DEVICES DURING INDUSTRIAL
RADIOGRAPHIC OPERATIONS

ADDRESSEES

All holders and applicants of a U.S. Nuclear Regulatory Commission (NRC) materials license authorizing the use of byproduct material for industrial radiography, Agreement State radiation control program directors, and State liaison officers. The NRC provides this regulatory issue summary (RIS) to the Agreement States for their information and for distribution to their licensees, as they deem appropriate.

INTENT

The NRC is issuing this RIS to provide a clarification of the regulation on the use of combined dosimetry devices during industrial radiographic operations under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 34, "Licenses for Industrial Radiography and Radiation Safety Requirements for Industrial Radiographic Operations." Specifically, this RIS provides clarification on the use of combination dosimetry devices to simultaneously satisfy multiple functions required by 10 CFR 34.47, "Personnel monitoring." The NRC requires no specific action or written response to this RIS.

BACKGROUND INFORMATION

The regulations in 10 CFR 34.47(a) require, in part, that:

The licensee may not permit any individual to act as a radiographer or a radiographer's assistant unless, at all times during radiographic operations, each individual wears, on the trunk of the body, a direct reading dosimeter, an operating alarm ratemeter, and a personnel dosimeter...

During recent inspections of industrial radiography licensees, the NRC identified that an increased number of licensees are using combination dosimetry devices to simultaneously serve multiple functions with the intent of satisfying the requirements of 10 CFR 34.47(a). Specifically, on multiple occasions, NRC inspectors identified licensees who equipped their radiographers with a single device to simultaneously serve as both a direct reading dosimeter and an operating alarm ratemeter.

The NRC licensees asserted that the use of a combined dosimetry device meets the requirements in 10 CFR 34.47(a) because the combined devices meet or exceed the design quality and measurement accuracy of a single device pocket dosimeter (direct reading dosimeter) and alarm ratemeters. Additionally, these licensees asserted that the additional

features of these combined function devices, such as improved visible alarms and exposure data logging and analysis, enhance personnel safety.

SUMMARY OF ISSUE

Since the promulgation of 10 CFR Part 34, there have been several technological advances in dosimetry for personnel monitoring during industrial radiographic operations. As a result, the NRC staff is using this RIS to address the use of combined dosimetry devices to meet the requirements of 10 CFR 34.47(a).

The function of an electronic operating alarm ratemeter is to alarm when the radiation field is higher than expected. In industrial radiography, an alarm ratemeter can provide warning to a radiographer that he or she is approaching an exposed source. The alarm ratemeter provides some redundancy or defense in depth where: (1) the radiographer fails to perform a survey, (2) the radiographer fails to make a fully adequate survey, or (3) the survey meter has malfunctioned, unknown to the radiographer.

The function of a direct reading pocket dosimeter is to provide an immediate reading of the wearer's radiation exposure. Also, if the radiographer's personnel dosimeter malfunctioned, the direct reading dosimeter can be used to help estimate the dose received by the radiographer for the permanent record.

In a memorandum dated April 4, 2017 (Agencywide Documents Access and Management System Accession No. ML17095A319), the NRC staff concluded that combined dosimetry devices, generally known as electronic alarming dosimeters (EADs), have a proven track record at nuclear power plants. Electronic alarming dosimeters have provided adequate protection and have been used routinely and reliably for over 25 years as a secondary dosimeter.

The operating environment of a nuclear power reactor is as varied as would be experienced in industrial radiography (e.g., extreme temperatures, humidity, physical labor, high-radiation areas) and EADs have performed adequately under these conditions with no subsequent degradation in personnel safety. Modern EADs come with internal electronic checks and low battery alarms that are easily displayed to the end user to notify of failure or need to replace a battery.

The NRC staff did not find any evidence of generic performance problems with EADs in an industrial setting in a review of the recent literature and NRC documents, or in discussions with NRC, military, and industry health physicists with EAD experience. The NRC staff identified no discernable adverse trends that would preclude using EADs as a dual-function device in industrial radiography operations to meet the requirements in 10 CFR 34.47(a).

Electronic alarming dosimeters have the capability in one device of providing: (1) multiple functions of a direct reading dosimeter, (2) a visual and audible dose rate alarm, and (3) a visual and audible integrated dose alarm. Furthermore, the EAD has gained national and international acceptance worldwide in the medical and academic arenas for use as a secondary and, in some cases, a primary dosimeter replacing the optically stimulated luminescence dosimeter (OSL) or thermoluminescent dosimeter (TLD).

Regulations in 10 CFR 34.47(a) do not require the audio/visual combined dose alarm function. However, this function is an enhancement to the existing requirements and provides an extra layer of protection by alerting the user when a preset dose limit has been triggered without

requiring a visual check (as is done with a self-reading dosimeter only (e.g., pocket ion chamber, or PIC)).

The many years of operational experience in the reactor arena has demonstrated that the EAD is an effective device for monitoring dose and dose rate, and for providing visual/audible alarms for preset thresholds. Therefore, the NRC staff determined that licensees may use combined dosimetry devices, also known as electronic alarming dosimeters, as a dual-function device for meeting the direct reading dosimeter and the alarm ratemeter device requirements specified in 10 CFR 34.47(a).

FEDERAL REGISTER NOTIFICATION

A notice of opportunity for public comment on this RIS was not published in the *Federal Register* because comments were received on this topic when the *Federal Register* notice for a petition for rulemaking, PRM-34-7, was issued on November 9, 2016 (81 FR 78732).

CONGRESSIONAL REVIEW ACT

This RIS is a rule as defined in the Congressional Review Act (5 U.S.C. §§ 801-808). However, the Office of Management and Budget has not found it to be a major rule as defined in the Congressional Review Act.

PAPERWORK REDUCTION ACT STATEMENT

This RIS does not contain information collections and, therefore, is not subject to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, et seq.).

Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond to a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

CONTACT

This RIS requires no specific action or written response. If you have any questions about this summary, please contact the individual listed below or the appropriate regional office.

/ra/ (Kevin Williams for)

Daniel S. Collins, Director
Division of Material Safety, State, Tribal
and Rulemaking Programs
Office of Nuclear Material Safety
and Safeguards

Technical Contact: Richard K. Struckmeyer
(301) 415-5477
Richard.Struckmeyer@nrc.gov

SUBJECT: REGULATORY ISSUE SUMMARY 2017-06, "NRC POLICY ON USE OF COMBINATION DOSIMETRY DEVICES DURING INDUSTRIAL RADIOGRAPHIC OPERATIONS," DATED: September 19, 2017

ADAMS Accession No.: ML16137A077

* concurred via e-mail

TAC No. MF9878

OFFICE	NMSS/MSTR/TL*	Tech Editor (QTE)*	NMSS/MSTR/BC*	OE/EB/BC*	OIS*	OGC*
NAME	RStruckmeyer	CHsu	HGonzalez	JPeralta	DCullison	SClark
DATE	08/14/17	08/09/17	08/16/17	08/11/17	08/11/17	08/28/17
OFFICE	NRR/DPR/PGCB/PM	NRR/DPR/PGCB/LA*	NRR/DPR/PGCB/BC (A)	NMSS/MSTR/DD		
NAME	TMensah	ELee	AGarmoe* (w/comments)	DCollins (KWilliams for)		
DATE	09/19 /17	09/19/17	09/19/17	09/19/17		

OFFICIAL RECORD COPY