Response to Public Comments on Draft Regulatory Guide DG-4019, "Environmental Dosimetry- Performance Specifications, Testing, and Data Analysis" Proposed Revision 2 of Regulatory Guide 4.13

On December October 17, 2018, the U.S. Nuclear Regulatory Commission (NRC) published a notice in the *Federal Register* (83 FR 52576) announcing that Draft Regulatory Guide DG-4019 (proposed Revision 2 of Regulatory Guide 4.13) was available for public comment. The public comment period closed on December 17, 2018 and the NRC staff received the following comments:

Mr. Jerry Hiatt, CHP Nuclear Energy Institute, 1201 F Street, NW, Suite 1100 Washington, DC 20004 Telephone (202) 739-8171 Email: jwh@nei.org ADAMS Accession No.: ML19016A416	Mr. Duane DeMore, CHP Chesapeake Nuclear Services 788 Sonne Drive Annapolis, MD, 21401-7101 Office: (248) 513-3376 Cell: (410) 271-4397 ddemore@chesnuc.com ADAMS Accession No.: ML19016A425

No.	Commenter	Comment	NRC Resolution
1	Mr. Jerry Hiatt, Nuclear Energy Institute	Section B, "Discussion" Paragraph 3, Page 7 It should be recognized that facilities using passive environmental dosimeters such as TLDs and OSLs for environmental measurements may not be able to measure very low doses below the minimum detectable dose. In those situations additional calculations or measurements may be performed by the licensees. Request for clarification: Is it normal to perform calculations if the environmental measurements are below the minimum detectable dose or is this something new?	The staff disagreed with the comment. This is not something new, because licensees have been required per 10 CFR 20.1302 to perform surveys sufficient to demonstrate compliance with the dose limits for the members of the public. If environmental dosimetry is used to perform surveys but does not have adequate measurement sensitivity, then additional surveys or calculations may be necessary in order to demonstrate compliance. The specific type of additional surveys or calculations needed will likely depend on the type of licensee and their radiological exposure conditions. For example, at a uranium recovery facility undergoing decommissioning, there are different radiation exposure source terms and exposure pathways (e.g., inhalation, ingestion, and direct radiation) requiring different types of measurement and calculations.

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2	Mr. Jerry Hiatt, Nuclear Energy Institute	Section D, "Implementation" Paragraph 1 & 3, Page 10. TEXT: Paragraph 1: "The NRC staff does not intend or approve any imposition of the guidance in this regulatory guide. The NRC staff does not expect any existing licensee to use or commit to using the guidance in this regulatory guide, unless the licensee makes a change to its licensing basis." TEXT—Paragraph 3: "If an existing licensee voluntarily seeks a license amendment or change and (1) the NRC staff's consideration of the request involves a regulatory issue directly relevant to this revised regulatory guide, and (2) the specific subject matter of this regulatory guide is an essential consideration in the staff's determination of the acceptability of the licensee's request, then the staff may request that the licensee either follow the guidance in this regulatory guide or provide an equivalent alternative process that demonstrates compliance with the underlying NRC regulatory requirements." Request for clarification: What type of change to the licensing basis would require the facility to implement this RG? The document is not clear.	The staff agreed with the comment, and is providing an example of a change to a facility's license. A change to the licensing basis would normally involve a new license application, or an amendment request by the licensee. For example, a licensee could request a public dose limit in excess of 0.1 rem (1mSv) under 10 CFR 20.1301(d). In this case, a licensee or license applicant may apply for a prior NRC authorization to operate on an annual dose limit for an individual member of the public of 0.5 rem (5 mSv). As stated in paragraph 3 of Section D. "Implementation," of the RG, an essential consideration in the NRC staff's determination of the acceptability of the requested license amendment could be whether the environmental dosimetry system is capable of providing an adequate demonstration of compliance with the revised public dose limit.
3	Mr. Jerry Hiatt, Nuclear Energy Institute	Appendix A, Step 2, "Data Analysis" Paragraph d.1, Page A-2 "Calculate the gross (uncorrected) field dosimeter average dose, standard deviation, and CV. Investigate the cause of any CV greater than 10 percent. Remove any dosimeter reading from the	The staff received several comments regarding Appendix A that identified some confusion regarding the information set out in Appendix A and ANSI/HPS N13.37-2014. ANSI/HPS N13.37-2014 is being endorsed in its entirety. As a result, and to avoid any future confusion

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		data set that has a justifiable reason for being an outlier. The following are justifications for the removal of outlier dosimeter data …" Request for clarification: Is 10% the CV of the entire quarter's measurements of all TLDs? I don't understand the value in this. REMP TLD locations for any given site have very different readings, and have > 10% CV. Comment: The list of justifications (items a–f) reads like it is all-inclusive when it should not be. There needs to be allowances to justify positive net field doses as not FRD for things like vegetation management, construction, etc. around the location. Most of the positive readings we see occur from TLD locations at >5 miles from the site, where it is nearly impossible to technically justify FRD, but the guidance would force us down a path of saying it was FRD. Recommended wording: Item d. Determine the net field doses. 1. Calculate the gross (uncorrected) monitored locations' field dosimeter average dose, standard deviation, and CV. Investigate the cause of any monitored locations' CV greater than 10 percent. Remove any dosimeter reading from the data set that has a justifiable reason for being an outlier. The following are justifications for the removal of outlier dosimeter data (list not all-inclusive): a. Abnormal high or low readings on some chips as compared to those on other chips (high standard deviation among chips). b. Dosimeters that have been lost and later recovered. c. Dosimeters that were annealed at a different time and were not issued with the remaining group of dosimeters.	regarding the endorsed standard and Appendix A, the staff removed Appendix A from RG 4.13. Licensees and applicants should refer directly to ANSI/HPS N13.37-2014.

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		d. A sealed plastic bag ripped open and exposed to weather conditions. e. Dosimeters that were damaged by vandalism. f. Known processing problems (bad glow curves, a dosimeter history that suggests poor quality or damage, and poor quality control results). g. Location characteristics changed affecting results (e.g., vegetation management, construction, etc.). h. Routine radioactive effluent releases, average meteorological data, or distance from facility, do not support high dosimeter data.	
4	Mr. Jerry Hiatt, Nuclear Energy Institute	Appendix A, Step 2, "Data Analysis" Paragraph e.2, Page A-3 "For each monitored location, subtract the sum of the baseline background dose and the quarterly MDD from the current quarter normalized field dose." Comment/Request for Clarification: ANSI 13.37 appears to use a mean normalized baseline quarterly background not the sum of the baseline dose for the determination of the quarterly FRDs.	The NRC staff disagreed with the comment as justified below. The baseline background dose is the "mean normalized" baseline dose as stated in DG-4019 Revision 2, Appendix A, to RG 4.13, step 2.a.1. In determining if there is a facility related dose (FRD), in the current quarter, the normalized field dose rate is compared to the baseline background dose rate plus the quarterly minimum detectable dose rate (MDD). If the current quarter, normalized field dose rate exceeds the baseline background dose rate by the MDD (>3σ), then the FRD is the current quarter normalized field dose rate minus the baseline background dose rate (without subtracting the 3σ value).
5	Mr. Jerry Hiatt, Nuclear Energy Institute	Appendix A, Step 2, "Data Analysis" Paragraph e.2.b, Page A-3 "For each monitored location, subtract the sum of the baseline background dose and the quarterly MDD from the current quarter normalized field dose.	The NRC staff agrees with the need for an investigative step. This is the step where investigation is performed and removes any justifiable discrepancies. However, since the staff received several comments regarding Appendix A that identified some confusion

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		a. If the value is negative, there is no detectable FRD. b. If the value is positive, FRD is detected." Comment/Recommendation: The FRD term needs to be removed and simply called "Investigative Dose" or "Detected Dose." After the investigation the site needs to explain whether it was from the facility (FRD) or if the dose was from another non-facility source. Example: A site processed a TLD located several miles from the site. Result indicated an exposure of approximately 40 mrem for a quarter (after subtracting extraneous dose and converting to a 91-day quarter). There were 3 TLDs at that location and that all indicated real exposure. All other TLD location results were non-detectable. The 40 mrem was recorded, and at this point, the site began an investigation into the origin of the radiation exposure. Results determined that the exposure was not from the facility (FRD). With the DG as written the concern is that the 40 mrem would need to be reported as FRD and then removed after the investigation was completed.	regarding the information set out in Appendix A and ANSI/HPS N13.37-2014 and ANSI/HPS N13.37-2014 is being endorsed in its entirety, the staff removed Appendix A from RG 4.13. Licensees and applicants should refer directly to ANSI/HPS N13.37-2014.
6	Mr. Duane DeMore, Chesapeake Nuclear Services	Appendix A, 2.b.4. This item says to "Calculate the standard deviation and the CV at each field location." This entire section (2b) is to look at the raw field results, take their average (assuming multiple dosimeters at each location) and get a normalized, standard quarter dose. We have not yet removed extraneous dose, determined net dose or any other evaluation yet. What standard deviation and CV are we talking about here? Are we comparing to historical standard deviation at each location? If so, that doesn't make sense to do based only on averaged, normalized gross field results.	The staff received several comments regarding Appendix A that identified some confusion regarding the information set out in Appendix A and ANSI/HPS N13.37-2014. ANSI/HPS N13.37-2014 is being endorsed in its entirety. As a result, and to avoid any future confusion regarding the endorsed standard and Appendix A, the staff removed Appendix A from RG 4.13. Licensees and applicants should refer directly to ANSI/HPS N13.37-2014.

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7	Mr. Duane DeMore, Chesapeake Nuclear Services	App. A, 2.d.1. This item says to “Calculate the gross (uncorrected) field dosimeter average dose, standard deviation and CV. Investigate the cause of any CV greater than 10 percent.” This seems to be a repeat of what was described in App. A, 2.b.2 through 2.b.4. And, I still don’t know what the standard deviation and CV are here.	The purpose for calculating the average reading, the standard deviation and the CV is to assist in identifying those chips/elements which are outliers (at each monitoring location). Appendix A, step 2.d.1 of DG-4019 was mistakenly a duplicate of steps 2.b.2 through 2.b.4. However, since the staff received several comments regarding Appendix A that identified some confusion regarding the information set out in Appendix A and ANSI/HPS N13.37-2014 and ANSI/HPS N13.37-2014 is being endorsed in its entirety, to avoid any future confusion regarding the endorsed standard and Appendix A, the staff removed Appendix A from RG 4.13. Licensees and applicants should refer directly to ANSI/HPS N13.37-2014.