NON-CONCURRENCE PROCESS
COVER PAGE

The U.S. Nuclear Regulatory Commission (NRC) strives to establish and maintain an environment that encourages all employees to promptly raise concerns and differing views without fear of reprisal and to promote methods for raising concerns that will enhance a strong safety culture and support the agency's mission.

Employees are expected to discuss their views and concerns with their immediate supervisors on a regular, ongoing basis. If informal discussions do not resolve concerns, employees have various mechanisms for expressing and having their concerns and differing views heard and considered by management.

Management Directive, MD 10.158, "NRC Non-Concurrence Process," describes the Non-Concurrence Process (NCP), http://nrcweb.nrc.gov:8600/policy/directives/catalog/md10.158.pdf.

The NCP allows employees to document their differing views and concerns early in the decision-making process, have them responded to (if requested), and attach them to proposed documents moving through the management approval chain to support the decision-making process.

NRC Form 757, "Non-Concurrence Process" is used to document the process.

Section A of the form includes the personal opinions, views, and concerns of a non-concurring NRC employee.

Section B of the form includes the personal opinions and views of the non-concurring employee's immediate supervisor.

Section C of the form includes the agency's evaluation of the concerns and the agency's final position and outcome.

NOTE: Content in Sections A and B reflects personal opinions and views and does not represent official factual representation of the issues, nor official rationale for the agency decision. Section C includes the agency's official position on the facts, issues, and rationale for the final decision.

At the end of the process, the non-concurring employee(s):

- [x] Concurred Robert M. Gallo
- [ ] Continued to non-concur
- [ ] Agreed with some of the changes to the subject document, but continued to non-concur
- [ ] Requested that the process be discontinued
  - [ ] The non-concurring employee(s) requested that the record be non-public.
  - [ ] The non-concurring employee(s) requested that the record be public.
- [ ] This record is non-public and for official use only.
- [x] This record has been reviewed and approved for public dissemination.

NRC FORM 757
NRC MD 10.158
(02-2015)

U. S. NUCLEAR REGULATORY COMMISSION

NON-CONCURRENCE PROCESS

NCP TRACKING NUMBER: NCP-2015-005

SECTION A - TO BE COMPLETED BY NON-CONCURRING EMPLOYEE

TITLE OF SUBJECT DOCUMENT	ADAMS ACCESSION NO.
Evaluation of UR Facilities Survey of Radon for Compliance with 10CFR 20.1301 (DUWP ISG-01) Final	ML14058A010

DOCUMENT SIGNER	SIGNER TELEPHONE NO.
Larry W. Camper	(301) 415-6673

TITLE	ORGANIZATION
Division Director (DUWP)	US NRC/NMSS/DUWP

NAME OF NON-CONCURRING EMPLOYEE(S)	TELEPHONE NUMBER
Rateb (Boby) Abu-Eid	(301) 415-5811

TITLE	ORGANIZATION
Senior Level Service (SLS) Advisor	US NRC/NMSS/DUWP

☐ DOCUMENT AUTHOR ☐ DOCUMENT CONTRIBUTOR ☑ DOCUMENT REVIEWER ☐ ON CONCURRENCE

NON-CONCURRING EMPLOYEE'S SUPERVISOR: Larry W. Camper

TITLE	ORGANIZATION
Division Director	US NRC/NMSS/DUWP

☑ I WOULD LIKE MY NON-CONCURRENCE CONSIDERED AND WOULD LIKE A WRITTEN EVALUATION IN SECTION B AND C.

☐ I WOULD LIKE MY NON-CONCURRENCE CONSIDERED, BUT A WRITTEN EVALUATION IN SECTIONS B AND C IS NOT NECESSARY.

WHEN THE PROCESS IS COMPLETE, I WOULD LIKE THE NCP FORM: ☑ PUBLIC ☐ NON-PUBLIC

REASONS FOR NON-CONCURRENCE AND PROPOSED ALTERNATIVES (use continuation pages or attach Word document)

The guidance has been developed as final document for NRC staff, inspectors, and licensees to use in demonstration of Uranium Recovery licensee surveys of Radon-222 (Rn-222) and Rn-222 progeny in air to demonstrate compliance with the public dose limit of 10 CFR 20.1301, and 10CFR 201302 "Compliance with dose limits for individual members of the public." Therefore, this guidance is important since it involves approaches, methods, data assessment, and techniques to demonstrate compliance with NRC regulations. My main reasons for the non-concurrence, include, but not limited to, the following aspects (see also continuation sheets on forthcoming pages). The guidance implementation methods/approaches will be difficult to achieve and will cause agency extra effort and time in licensing reviews and requests for additional information for justification of licensees practical approach to demonstrate compliance with 10 CFR 20.1301 and §20.1302. The main reasons for this conclusion are: (a) As shown on Figure 2 (Page 7 of the guidance), compliance level for radon concentration under 10 CFR 20.1302(b)(2) is 0.1 pCi/L and for §20.1302(b)1 is 0.2 pCi/L (assuming default values for occupancy and equilibrium factor, and doses from all other pathways = 0.0 mrem/y). In other words, these levels of 0.1 and 0.2 pCi/L are impossible to measure with reasonable certainty to enforce regulatory compliance because of inherent issues with: (i) radon detection limits using conventional techniques (e.g.; 0.1 - 0.2 pCi/L); (ii) uncertainties and variability in background measurements; (iii) assumptions of defaults (e.g.; occupancy and equilibrium factors unrealistic as they represent 100 percentile of the most extreme situation and inconsistent with Commission direction, with NUREG/CR-5512, with NCRP, and with IAEA default values. In addition, current submittal of monitoring data by licensees demonstrates that 0.1 - 0.2 pCi/L levels are unachievable and include uncertainties reaching an order of magnitude of the invoked compliance levels. It is noted that the compliance methods listed in Section 4.2 Table, either rely completely on measurements (e.g.; method 1 &4) or calculations and measurements for confirmation and validation. It is also noted that current staff common codes/models are unvalidated. Proposed Alternative: The guidance should be developed in two tier approach: (1) Screening Approach for Compliance; which may use a simplified formula with selection of defaults parameters at the 90th percentile of the conservative side of parameter distributions (e. g.; similar to the approach of DandD code for screening). (2) Site specific approach; which is used when screening cannot be achieved; then measurements at release points at the source and use computer simulations with probabilistic dose modeling approach.

SIGNATURE	DATE
Rateb m. Abu-Eid	05-11-2015

NRC FORM 757 NRC MD 10.158 (02-2015)	U. S. NUCLEAR REGULATORY COMMISSION	NCP TRACKING NUMBER
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TITLE OF SUBJECT DOCUMENT		ADAMS ACCESSION NO.

CONTINUATION OF SECTION ☑ A ☐ B ☐ C

Inherent Issues in Radon Measurements:
Analysis of data from "Co-Located Landauer, Inc. Radtrak Detectors (NMA)" showed the variability of results for these co-located "Radtrak" units is large. For example, in the case of location AS-202 from July 3 to October 4, 2012 there is a four-fold difference. In addition, in the case of detector 486927, it was taken out of its Mylar bag and immediately sealed with the gold seal that is provided and shipped to Landauer, Inc. for processing. A result of 1.5 pCi/L +/-0.09 (120.4 +/_7.1 pci/L-days) was reported by Landauer, Inc. for this detector. Quick MARSSIM assessment indicates on the order of 100's of samples are required at each station to ensure incremental radon below 0.1 pCi/L with reasonable accuracy and certainty (alpha =0.05). Therefore, the guidance is inconsistent with MARLAP in evaluating MDL and uncertainty. Staff should use standard methods for propagating uncertainty as provided in Chapter 19 of MARLAP manual (NRC 2004) to validate use of data. Further, the ISG is inconsistent with RG 4.14 recommendations that the measurement uncertainty (one standard deviation) should be no greater than 10% of the measured value.
Radon Issues in UR Licensing Activities NRC Staff Reviews - CBR Example: CBR established seven environmental air monitor (AM) stations with one location (AM-6) as the background location. The locations of these AM stations ranged from 1- 4 miles (see Figure 1 of CBR latest semiannual radiological effluent and environmental monitoring report (CBR, 2011a)). Radon samples were collected with Track-Etch devices (detectors) at these AM locations. CBR stated that the air radon detectors are exchanged every six months (semi-annual) to achieve the required lower limit of detection (LLD) which is 0.2 pCi/L. For calculations of dose to members of the public, (see Appendix F of CBR, 2011a), the applicant compares the measured radon concentrations with the 10 CFR Part 20, Appendix B, Column 2 effluent concentration value for Rn-222 "With daughters removed". For example, CBR used radon effluent concentration limit of 10 pCi/L (e.g.; 0.0 Equilibrium Factor). NRC staff concluded that Rn-222 daughters (progeny) have been removed from the point of public exposure; and realized that Rn-222 daughters, if present, provide significantly more dose than the radon gas itself. Therefore, NRC staff has determined that comparison of the applicant's radon monitoring results with 10 CFR Part 20 effluent concentration limits has no relevance as the monitor stations are far removed from the effluent source(s). To obtain more relevant data to assess occupational and public doses throughout the licensed area, and to verify compliance with 10 CFR 40.65 reporting requirements, NRC staff is imposing a license condition. This license condition is presented in SER Section 5.7.8.4.
Recent CBR Appendix F of radon data submitted on February 27, 2015 (3rd and 4th Quarter 2014) also showed an MDL of 0.2 pCi/L using Track Etch Cup. CBR showed that radon monitoring results ranged from 0.2 pCi/L to 3.7 pCi/L for the period 1997 to 2007. CBR stated that the concentrations at three locations ranged from 34 to 37 percent of the effluent concentration limit from 10 CFR Part 20, Appendix B, Column 2 (e.g.; 10 pCi/L); or 3.4 – 3.7 pCi/L. Sampling and analytical errors of applicant submittal of 2003 data were designated as anomalous results. On March 14, 2014, staff requested additional information for compliance of SMITH RANCH and CROW BUTTE IN-SITU URANIUM RECOVERY FACILITIES with 10 CFR 20.1301 AND 10 CFR 20.1302, (Letter signed by Drew Persinko). In brief, practical difficulties for demonstration of compliance has already been documented.
Concentration Range of Outdoor Radon: Range of outdoor radon (UNSCEAR 2006): Average = 0.27 pCi/L, range = 0.027 – 2.7 pCi/L. Factors impacting background radon concentrations (independent of measurement systems), include: long-term weather patterns; seasonal variation; small scale differences due to soil type and meteorological; "dispersion variability" of background can be much greater than the values we are trying to measure. Studies of outdoor air in Nevada indicate a median outdoor concentration of 0.4 pCi/L with concentrations of up to 1.4 pCi/L at measured locations (Price 1994). Radon levels change diurnally and by season; radon concentrations typically reach their maximum in the summer to early winter, whereas from late winter to spring, concentrations are usually at a minimum as a result of meteorological changes and soil moisture conditions (NAS 1999). The guidance should clearly request longterm measurements of 12 months in duration and should address statistical approaches to demonstrate compliance rather than to request the licensee for RAIs, or "give me another rock." Recommended devices for long term monitoring are "Alpha Track" detectors; "Electret Ion Chamber;" and/or "Digital Detectors." The guidance should discuss pros and cons of using different instrumentation techniques to support NRC inspections. Instruments of good low MDLs can be used for validation of models only.
The proposed resolution of using Site-Specific Risk-Informed dose modeling approach includes: (a) conduct accurate measurements at release points with determination of radon concentration and equilibrium factor and nature of the source in terms of geometry, elevation, its relationship to wind direction, (b) determine real receptor location and behavior characteristics (e.g.; time spent in doors time spent outdoors, and time off-site, etc); (c) conduct probabilistic dose analysis to derive best estimate of the annual dose; (d) derive outdoor radon concentration levels, if they are not directly derived by the model, convert best estimate of the dose dose into radon concentration levels for indoor and outdoor; (e) Compare with average annual background level at different locations. Consider values above 2 sigma of background values measured on annual basis. If radon levels above 2 sigma values and derived dose is above 100 mrem/y implement regulatory enforcement and actions; if derived radon levels within 2 sigma background; request optimization; and if below no action should be taken. (Boby Eid will provide additional information and references as needed).

Evaluation of UR Facilities Survey of Radon for Compliance with 10CFR 20.1301 (DUWP ISG-01) Final	ML14058A010

NAME
Larry W. Camper

TITLE	TELEPHONE NUMBER
Director, Division of Decommissioning, Uranium Recovery and Waste Programs	415-6673

ORGANIZATION
NRC/NMSS/DUWP

COMMENTS FOR THE NCP REVIEWER TO CONSIDER (use continuation pages or attach Word document)

The subject document has been discussed extensively with the staff including Dr. Abu-Eid. Specific discussions have taken place with Dr. Abu-Eid, other staff participating in the development of the guidance document and all involved staff collectively. Dr. Abu-Eid has presented his concerns to me and to all members of the staff team developing the guidance document and thus I believe we have taken the necessary actions to ensure that we fulfill the expectations set forth in MD 10.158 and MD 10.159 to fully examine the concerns of the staff member contemplating the filing of an Non-Concurrence or a Differing Professional Opinion. The issues of concern to Dr. Abu-Eid are very complex in nature (Refer to Section A for more detail) and focus upon measuring radon with progeny to rather precise levels amidst high radon background under complex meteorological conditions. The issue also considers the role of actual measurements versus the use of complex models to ensure regulatory compliance. It important that the cited ISG be published as soon as possible as the NRC has been criticized for taking to so long to finalize the guidance following two rounds of public comment gathering. Our path forward for addressing the issues which Dr. Abu-Eid cited in Section A as as follows: 1) Publish the ISG in final as quickly as possible, 2) Provide a presentation on the ISG during the upcoming National Mining Association (NMA) meeting during June in Denver, 3) Conduct a round table panel discussion during the NMA conference to discuss the final guidance with an emphasis on the radon measurement issue (Dr. Abu-Eid will participate in the panel), 4) Conduct a workshop (Dr. Abu-Eid to participate) at NRC headquarters in August/September time frame bringing together health physicists with substantial environmental health physics expertise to thoroughly examine the complex technical issues associated with measuring and modeling radon exposure from uranium recovery activities and 5) determine if any further adjustments are needed to the ISG via a Revision 1 and/or if any recommendations are needed for the Part 20 Working Group as it relates to the requirements in Part 20.1301 and 20.1302 relative to the uranium recovery regulated under Part 40. The actions cited above should be complete by the end of this calendar year and Dr. Abu-Eid should be positioned to know if his concerns have been addressed or if any further actions on his part such as filing of a Differing Professional Opinion seem warranted.

Dr. Abu-Eid's concerns are genuinely motivated and the issues which he has raised are very complex in nature. We will be certain to ensure that the various technical parameters and the questions of regulatory reasonableness which he has raised will be addressed during the two citied panel discussions and subsequent management considerations.

SIGNATURE	DATE
Larry W. Camper	5/14/15

NRC FORM 757
NRC MD 10.158
(02-2015)

U. S. NUCLEAR REGULATORY COMMISSION

NON-CONCURRENCE PROCESS

NCP TRACKING NUMBER: NCP-2015-005

SECTION C - TO BE COMPLETED BY NCP COORDINATOR

TITLE OF SUBJECT DOCUMENT	ADAMS ACCESSION NO.
Evaluation of UR Facilities Survey of Radon for Compliance with 10CFR 20.1301 (DUWP ISG-01) Final	ML14058A010

NAME	
Scott W. Moore	

TITLE	TELEPHONE NUMBER
Deputy Director, Office of Nuclear Material Safety and Safeguards.	(301) 415-0595

ORGANIZATION: NRC/NMSS

AGREED UPON SUMMARY OF ISSUES (use continuation pages or attach Word document)

NRC staff has developed the interim staff guidance (ISG) document, "Evaluation of Uranium Recovery Facilities Survey of Radon for Compliance with 10 CFR Part 20.1301 (DUWP ISG-01) Final." The primary issue leading to the non-concurrence is that the non-concurring employee (NCE) states that the methods and approaches for implementing the guidance would be difficult to achieve. Specifically, the NCE states that there may be significant challenges in measuring radon or ensuring appropriate measurements from a regulatory standpoint due to: 1) Rn-222 detection limits using conventional techniques, 2) uncertainty and variability in background concentrations of Rn-222, 3) potentially overly conservative default parameters for Rn-222 calculations; and 4) lack of risk-informed approach in the ISG implementation guide.

EVALUATION OF NON-CONCURRENCE AND RATIONALE FOR DECISION (use continuation pages or attach Word document)

See attached Word Document: NCP-2015-005 - SF757 Part C Attachment.docx

TYPED NAME OF NCP COORDINATOR	TITLE
Christopher T. Markley	Systems Performance Analyst

ORGANIZATION: NMSS/DSFM/RMB

SIGNATURE--NCP COORDINATOR	DATE
Christopher T Markley	6/7/2019

TYPED NAME OF NCP APPROVER	TITLE
Scott W. Moore	Deputy Director, Office of Nuclear Material Safety and Safeguard

ORGANIZATION: NMSS

SIGNATURE--NCP APPROVER	DATE
Scott W Moore	6/7/19

SUMMARY OF ISSUES

NRC staff has developed the interim staff guidance (ISG) document, "Evaluation of Uranium Recovery Facilities Survey of Radon for Compliance with 10 CFR Part 20.1301 (DUWP ISG-01) Final." The primary issue leading to the non-concurrence is that the non-concurring employee (NCE) states that the methods and approaches for implementing the guidance would be difficult to achieve. Specifically, the NCE states that there may be significant challenges in measuring radon or ensuring appropriate measurements from a regulatory standpoint due to: 1) Rn-222 detection limits using conventional techniques, 2) uncertainty and variability in background concentrations of Rn-222, 3) potentially overly conservative default parameters for Rn-222 calculations; and 4) lack of risk-informed approach in the ISG implementation guide.

EVALUATION OF NON-CONCURRENCE AND RATIONALE FOR DECISION

I appreciate the staff member taking the time to utilize the agency's differing views program. In this instance, the non-concurrence process was used to provide management a range of views on these technical issues. I also appreciate the willingness of the NRC staff to take the time to discuss the issues raised through the non-concurrence process. The non-concurring employee (NCE) identified highly technical issues, as described by the NCE in Section A, the Document Signer (DS) in Section B, and in the summary of issues.

In an effort to identify the path forward, I reviewed the relevant background material. This material included the internal draft interim staff guidance (ISG), previous versions of the ISG, presentations made by NRC staff members, and comments from members of the public on the previous ISG drafts. Reviewing this material provided me the background to engage in meaningful discussions with the NCE, the DS, the ISG author, and the Non-Concurrence Process Coordinator.

One key observation is that, as written in the internal draft ISG, it could be interpreted that there is either one method of compliance with 10 CFR 20.1301, or that the NRC prefers/endorses/requires a specific method of compliance with 10 CFR 20.1301. In discussions with the various NRC staff members, it appears that the internal draft ISG focuses on one specific method because it was historically the most common method used by applicants and licensees. Therefore, it was the method the staff was most familiar with. Also, in discussions with the various NRC staff members, it was confirmed that there are alternative methods of compliance. These methods have differing levels of technical complexity and costs. Given that the issues are of a highly complex nature, it seems appropriate that there be additional consultation with experts in the relevant technical fields before the draft ISG is issued in final form.

With this in mind, NRC staff should delay ISG issuance in order to revise and expand upon certain sections of the internal draft ISG. To finalize the ISG, staff should move forward with the following activities:

1. Enhance/expand the discussion indicating the ISG is guidance in section one, and elsewhere in the ISG as appropriate. This is consistent with NRC practices that state guidance is not a requirement.

2. Hold a publicly announced meeting with the objective to identify and document potential methods of compliance with 10 CFR 20.1301.

    a. The meeting format should be a facilitated discussion amongst a panel of experts. The facilitated discussion should focus on how licensees and applicants can demonstrate compliance with 10 CFR 20.1301, based on technology and best-available science as of today. Reasonable and potentially acceptable methods for compliance that are discussed should be documented.
    b. The panel should include the NCE, the author of the internal draft ISG (or his designee), 1-2 other well recognized and neutral health physicists (HPs) from within the Agency (from other offices or divisions), and 2-3 neutral outside experts (presumably HPs) that preferably are familiar with uranium recovery industry practices. Adequate background should be provided to the panel in advance of the meeting, and may include discussion of the non-concurrence if it would be beneficial.
    c. During the meeting, NRC should not endorse any specific methods. However, pros and cons of the methods should be discussed and documented.
    d. NRC staff should record and/or transcribe the meeting.

3. Expand the discussion on alternative compliance methods throughout the ISG using the methods identified and discussed in the meeting in step 2. This will resolve the impression that NRC is endorsing or requiring one specific method for compliance with 10 CFR 20.1301. It is understood that there will be varying levels of detail for the different methods identified in the meeting in step 2, and the length of the discussion in the ISG should be commensurate with the level of knowledge available.

4. In light of the revisions to the ISG as directed above, review the previously received public comments. Ensure NRC staff's response to the comments are still appropriate based on the revisions to the ISG. If needed, revise the NRC staff's response to the previously received public comments.

5. Issue ISG.

This direction is intended to capture a range of methods and approaches for implementing the guidance, thus alleviating the main concern that the guidance would be difficult to achieve. In following these actions, staff should establish reasonable due dates and ticket various milestones, as listed above, so that follow up is tracked and assured. This direction closes this non-concurrence, and the DS will be responsible to ensure that the direction above is adequately followed.

In discussion with the NCE, the NCE agrees that this is an acceptable path forward to attempt to address the issues identified. Since the draft ISG has not yet been modified, the NCE will continue to non-concur before reviewing the revised version.

Finally, I recognize the benefit of providing interim guidance to staff on how licensees and applicants can survey radon as a method for compliance with 10 CFR 20.1301. Final issuance of an ISG will provide staff with an acceptable approach to evaluate licensee or applicant submittals.

Subsequent to my initial decision, the staff requested the opportunity to jointly revise their ISG. Their goal was to determine whether the NCE's concerns could be resolved through additional revisions to the ISG, rather than holding the panel, as directed. The NRC staff indicated that because no new uranium recovery license applications or amendments were expected in the near-term, the additional time required to resolve these concerns would not impact the uranium recovery work involving the ISG. After consideration, I approved the staff's request to jointly revise the ISG but noted that the following conditions still apply:

1. Enhance/expand the discussion indicating the ISG is guidance in section one, and elsewhere in the ISG as appropriate. This is consistent with NRC practices that state guidance is not a requirement.

2. In light of the revisions to the ISG, review the previously received public comments. Ensure NRC staff's response to the comments are still appropriate based on the revisions to the ISG. If needed, revise the NRC staff's response to the previously received public comments.

NRC staff, including the NCE, worked to address issues raised in the non-concurrence. To document this process, the NRC staff developed a "resolution report" that identified the NCE's concerns, any proposed changes to the ISG, and resolution between staff and the NCE. This "resolution report" (ML18134A009) is included in the ISG package. Given the complexity of the material discussed in the ISG, there were some issues upon which the staff and the NCE did not achieve a consensus resolution. However, NRC staff were able to agree upon changes to the ISG that reflect the complexities raised in the non-concurrence. Prior to resuming concurrence, the NCP Coordinator reviewed the "resolution report" and compared the proposed ISG edits to the edits implemented in the draft ISG. The NCP Coordinator confirmed for the NCP Approver that the changes proposed were implemented in the draft ISG.

No additional edits of a substantive nature were made to the ISG during the concurrence review.

I have reviewed the final version of the ISG and believe the edits made are responsive to the issues raised by the NCE. The edits enhance the document by highlighting the complexity of the material and appropriately take into consideration the resulting differing viewpoints. With that, I approve release of the ISG.