

Follow-up Requests for Additional Information to Support the  
International Isotopes, Inc., Application (Public)

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## Observations and Minor Edits

### FINANCIAL ASSURANCE

Page 10, response to RAI-4:

1. The response states that there are no changes to the license needed to address the RAI. It would be helpful to include the basis for the crew hours and labor hours as a footnote to Table 10-13.
2. The response states that 4740 hours of labor is associated with packaging of wastes. However, the hours associated with packaging on Table 10-13 sum to 3557 hours.

### QUALITY ASSURANCE

3. Page A-8: Section A.1.4, Paragraph 4 – missing a parenthesis
4. Page A-14: Section A.2.2.2, Paragraph 3 – missing final punctuation
5. Page A-23: Section A.5.1, First sentence – International Isotopes, Inc., (INIS) indicated it was going to clarify the first sentence, and there were no changes.
6. Page A-36: Section A.15.1 First sentence – should the word “affect” be replaced by “effect,” please clarify.
7. Page A-37: Section A.15.2 First sentence/second paragraph – when the word “managers” is mentioned, does this mean “line managers”?
8. Page A-38: Section A.15.3, last sentence – “COO/Plant Manager” is mentioned, please clarify if this is the right term?

## Follow-up RAI Responses for Financial Assurance

Consistent with the financial assurance requirements in 40.36, please provide the following clarifications to the RAIs.

**FA-F1-1** Issue:

Please clarify INIS's assumption that the remaining depleted uranium hexafluoride (DUF6) at the site would be shipped and processed at another facility. It appears that the U.S. Department of Energy (DOE) is only required to take DU from licensed enrichment facilities (see Section 3113 of the USEC privatization act, paragraph A on page 233 of this PDF <http://www.nrc.gov/reading-rm/doc-collections/nureqs/staff/sr0980/v1/sr0980v1.pdf>), and it is unclear whether DOE would take title to DU from INIS.

Request:

Please clarify how INIS intends to dispose of any remaining DUF6 at the site (e.g., does INIS's contracts with enrichment facilities include a clause that provides for the return of any remaining DUF6 to the DUF6 generator?)

**FA-F1-2** Issue:

Please clarify the basis for the depleted uranium tetrafluoride (DUF4) disposal rate. It appears that there may be a moratorium in Utah with respect to disposing of depleted uranium. Therefore, the disposal facility in Utah might not be able to accept DUF4 at this time.

Request:

Please clarify whether INIS will ship DUF4 to the Utah disposal facility, or whether INIS is solely relying on the rates of this disposal facility as a basis for the DUF4 disposal rate.

**FA-F1-3** Issue and Request:

FA-2: Please verify computations in Table 10-18. The "Transportation and Disposal" figure does not appear to match the figure stated in Table 10-16 plus \$100,000 for Equipment as stated in Table 10-17.

**FA-F1-4** Issue and Request:

FA-2: Please clarify whether the following facility components should be disposed of as Low Level Radioactive Waste (LLRW) (they are currently listed for disposal as non-LLRW):

- a. DUF6 to DUF4 Process Autoclaves
- b. Transfer Piping DUF4 Storage Hoppers to Surge Hopper

**FA-F1-5** *[Official Use Only – Proprietary Information (sensitive financial information)]*

**FA-F1-6** Issue:

The response to FA-7 states that "the NRC will be notified of any material changes to the decommissioning cost estimate and associated funding levels (e.g., significant increases in costs beyond anticipated inflation)."

Request:

Does this statement mean that INIS intends to notify NRC of such material changes prior to a scheduled update to the cost estimate?

**FA-F1-7** Issue and Request:

(FA-8 Page 18) INIS provided draft financial instruments; however, a draft Certification of Financial Assurance should also be included. The guidance for this document may be found in NUREG-1757, Volume 3, Appendix A.2.

## Follow-up RAI Responses for Instrumentation and Controls

### I&C-F1-1. Issue:

Follow-up to RAI 6: This RAI involves the regulations in 10 CFR 70.64(a)(10) regarding the baseline design criteria for the inclusion of instrumentation and control (I&C) systems to monitor and control the behavior of items relied on for safety (IROFS).

### Requests:

- a. Explain if the following is true: IROFS DUF-22 and IROFS DUF-24 each make use of a programmable logic controller within the IROFS boundary and are therefore digital I&C IROFS. All other instrumentation and control IROFS listed in Table 6-1 of the Integrated Safety Analysis (ISA) Summary (for example, those which contain within the description, the term, "hardwired" such as IROFS DUF-17 or DUF-31) make use only of hardwired, analog controls within the IROFS boundary.
- b. Explain if the following is true: If any additional IROFS are identified during detailed design, an evaluation of appropriate detail would be performed, and the ISA and ISA Summary would be updated as required.
- c. Clarify the version of the following guidance and standards that will be used:
  - ANSI/ISA-67.04.01-2006 "Setpoints for Nuclear Safety-Related Instrumentation," (ANSI/ISA, 2006) {applicant identifies ANSI/ISA-67.04.01-2000}
  - IEEE 336-2010, "IEEE Recommended Practice for Installation, Inspection, and Testing for Class 1E Power, Instrumentation, and Control Equipment at Nuclear Facilities" (IEEE, 2010) {applicant identifies IEEE 336-1985}
  - IEEE 344-2004, "Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations," (IEEE, 2004) {applicant identifies IEEE 344-1987}
  - IEEE 338-2006, "Standard Criteria for Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems," (IEEE, 2006) {applicant identifies IEEE 338-1987}
  - NRC, "Seismic Qualification of Electrical and Active Mechanical Equipment and Functional Qualification of Active Mechanical Equipment for Nuclear Power Plants," Regulatory Guide 1.100. Washington, D.C.: U.S. Nuclear Regulatory Commission, 2009. (applicant specifies 1998)
- d. Explain if the most recent versions for regulatory guides and Branch Technical Positions HICB-11 and HICB-17 will be used as the version is not specified in the response.
- e. Explain if the following withdrawn standard will be used:
  - IEEE 518-1982, "IEEE Guide for the Installation of Electrical Equipment to Minimize Electrical Noise Inputs to Controllers from External Sources," (IEEE, 1982) {standard has been withdrawn}

**I&C-F1-2. Issue:**

Follow-up to RAI 7: This RAI involves the regulations in 10 CFR 70.64(a)(4) regarding the baseline design criteria for adequate protection from environmental conditions and dynamic effects.

**Requests:**

- a. With regard to environmental conditions and dynamic effects, clarify if the applicant intends to use the following guidance in addition to what is specified in the response:
  - Regulatory Guide 1.180 (listed in response to RAI 6)
  - Regulatory Guide 1.100 (listed in response to RAI 6 as 1988 version, current version is 2009)
- b. Clarify what version of the following standard will be used:
  - "IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations," IEEE 7-4.3.2 Institute of Electrical and Electronics Engineers. {Current version is 7-4.3.2-2010}

## Follow-up RAI Responses for Seismic

[Please note that background for all four follow-up RAIs is same as that of SS-7]

**SS-F1-1** Issue:  
Drawing numbers 400-M-1202-B and 500-M-1202-C of response to Item 1 of SS-7 show vertical crosssections of foundation structures and floor slabs. But they show only line diagrams instead of vertical crosssections of slabs of upper floors, roof, and walls. Also no drawing has been provided that shows horizontal cross-sections of walls and columns.

Request:  
Provide vertical crosssections of slabs of upper floors, roofs, and walls in drawings 400-M-1202-B and 500-M-1202-C. Also, provide drawings that will show horizontal crosssections of walls and columns.

**SS-F1-2** Issue:  
Response to Item 2 of SS-7 does not provide adequate information on design bases, design criteria, design methodology for reinforced concrete and steel structures. This information for example could include material properties related to design (i.e., strengths of steel, concrete, etc.), design methods, connections and joints (welded/bolted), rebar detailing concept (ductility), etc.

Request:  
Provide information on design and design methodology for reinforced concrete and steel structures that are not dependent on complete site characterization.

**SS-F1-3** Issue:  
Response to Item 3 of SS-7 does not provide information on methods to be used to conduct structural analyses of Process Buildings. Such information could be; for example, analysis type (modal or time history analysis, lump mass or finite element analysis), concept of foundation (fixed support or soil structures interaction), or computer codes to be used etc.

Request:  
Provide information on structural analysis methodology for Process Buildings that are not dependent on complete site characterization.

**SS-F1-4** Issue:  
Response to Item 4 of SS-7 is exactly same as Item 3 of SS-7. During the teleconference on May 16, 2011, the applicant recognized that it was an error.

Request:  
Provide a description of the methods used to conduct seismic analysis of equipment, piping, silos, and other mechanical systems.

**SS-F1-5 Background:**

The regulations in 10 CFR 70.64(a)(4) require the applicant to include adequate protection against environmental conditions and dynamic effects in its design of the facility, and 10 CFR 70.62(c)(iv) requires the applicant to conduct and maintain an ISA that identifies potential accident sequences caused by credible external events.

**Issue:**

License Application Section 1.6.4, Geology and Seismology; and ISA Summary Section 1.5, Geology and Seismology, did not include the information needed to assess the potential effects of site soil seismic amplification. The seismic hazard information provided as the design basis for the facility is based on the U.S. Geologic Survey 2,500-year return period ground motions from the 2002 U.S. Geologic Survey National Seismic Hazards Map. Seismic ground motions for the U.S. Geological Survey maps are based on assumed “firm-rock” site conditions. Field-free ground motions at the facility site may be different than the U.S. Geological Survey ground motions because the local site soil conditions may amplify or de-amplify the predicted ground motions. The applicant has proposed geophysical and geotechnical studies for the site that would classify these site conditions and thereby allow for the site response to be evaluated. However, those studies have not yet been conducted. In lieu of this data, the site response of the 2,500-year return period ground motions could be estimated based on reasonable assumptions of the site’s soil conditions.

**Request:**

Provide an estimate of the field-free ground motion response spectra for the site based on the input 2,500-year return ground motions and a reasonable assumption of the site’s soil conditions.

## Follow-up RAI Responses for Structural

### SS-F1-6 Clarification on RAI SS-2:

#### Background:

The regulations in 10 CFR 70.64(a)(2) require the applicant to include adequate protection against natural phenomena in its design of the facility, and 10 CFR 70.62(c)(iv) requires the applicant to conduct and maintain an Integrated Safety Analysis (ISA) that identifies potential accident sequences caused by credible external events. In addition, 10 CFR 70.61(b) and 70.61(c) require the applicant to demonstrate that an accident event can be excluded from further consideration based on either its likelihood or its consequences.

#### Issue:

The applicant provided a written response to a staff request for additional information (RAI) SS-2 that includes requesting information on site flooding hazards. In its response, the applicant indicated that it used Department of Energy (DOE) standards to evaluate the flood hazards and provided the evaluation conclusion that a flood is not a safety concern to the proposed facility. However, the applicant's response did not include any explanation on how this evaluation conclusion is reached and why flooding is not a hazard to the proposed facility.

#### Request:

- a. Provide a technical justification for the conclusions drawn in the applicant's response to RAI SS-2 that flooding is not a hazard to the proposed facility.
- b. Clarify how berms/dams are used to prevent site flooding and whether these measures should be declared IROFS and the associated technical basis.

## Follow-up RAI Responses for Integrated Safety Analysis

### ISA-F1-1 Follow-up RAI on Structural Failure from a Seismic Event

Issue:

Under 10 CFR 70.61(e), each engineered or administrative control or control system necessary to comply with the performance requirements in 10 CFR 70.61(b), (c), and (d) must be designated as an IROFS. To meet the performance requirements for a high- or intermediate-consequence event, in accordance with 10 CFR 70.61(b), the risk of each credible accident sequence must be limited. Engineered controls, administrative controls, or both, must be applied to the extent needed to reduce the likelihood of structural failure so that, upon implementation of such controls, a high-consequence event resulting from the structural failure is highly unlikely. An intermediate-consequence event resulting from the structural failure is unlikely, or the consequences are mitigated to less severe than those in 10 CFR 70.61(b)(1)-(4) for high-consequence events or 10 CFR 70.61 (c)(1)-(4) for intermediate-consequence events.

Request:

Identify as IROFS appropriate prevention and/or mitigation features for accident sequences caused by external events. For example, identify as IROFS portions of a structure that is relied on to prevent failure of the structure due to a 10,000-year return period external event which could cause a high-consequence accident sequence. Similarly, identify as IROFS appropriate prevention and/or mitigation features such as portions of structures that are relied on to prevent failure of the structure due to a 1,000-year return period external event which could cause an intermediate consequence accident sequence.