UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

March 30, 2023

EA-22-086
EN55770
EN55956

Mr. Wyatt Padgett
Compliance Manager
Louisiana Energy Services
URENCO USA
P.O. Box 1789
Eunice, NM 88231

SUBJECT: URENCO USA – NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTY – $70,000; NRC INSPECTION REPORT NO. 07003103/2023006 AND EXERCISE OF ENFORCEMENT DISCRETION

Dear Wyatt Padgett:

This letter is in reference to two apparent violations (AVs) identified as a result of a U.S. Nuclear Regulatory Commission (NRC) inspection completed at your URENCO USA facility (UUSA) on August 25, 2022. The details of the AVs are documented in NRC inspection report 07003103/2022007, issued on December 8, 2022 (Agencywide Documents Access and Management System (ADAMS), Accession Number ML22341A606).

The AVs were related to the failure to meet the performance requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 70.61(b), in that UUSA failed to adequately establish and maintain items relied on for safety (IROFS) to reduce the likelihood of occurrence of a high consequence event accident sequence documented within its integrated safety analysis (ISA) summary. The first AV involved the failure to establish IROFS50b and IROFS50c barriers prior to admitting construction vehicles within the Controlled Access Area (CAA). The second AV involved the failure to maintain the independence of IROFS50b and IROFS50c, where UUSA incorrectly allowed a single individual to act as a construction vehicle flagger simultaneously for both IROFS controls. IROFS50b and IROFS50c are safety controls that provide defense in depth protection from vehicles potentially hitting and damaging cylinders containing uranium hexafluoride.

In response to the AVs, UUSA provided a written response by letter dated February 7, 2023 (ADAMS Accession No. ML23038A251). In the letter, UUSA did not dispute that the violations occurred as documented in the NRC's December 8, 2022, inspection report. UUSA provided additional details regarding the issues, including the reasons for the AVs, results from a root cause evaluation, and circumstances regarding identification of the apparent violations and corrective actions. UUSA also provided additional information regarding an uncredited safety control, IROFS27e, that was in place, which in UUSA's view mitigated the safety significance of the AVs. IROFS27e is related to the robustness of several building structures on-site that are capable of withstanding events, such as tornadoes, seismic events, and high winds. Finally,

UUSA noted and inferred that the total distance of the construction vehicles to the specific areas of concern was such that the risk of cylinder damage was reduced. The NRC's assessment of and response to the major points documented in UUSA's letter are provided in Enclosure 2.

Based on the information developed during the inspections, and the information provided by UUSA in its written response of February 7, 2023, the NRC has determined that two violations of NRC requirements occurred. The violations are cited in the enclosed Notice of Violation and Proposed Imposition of Civil Penalty (Notice) and additional circumstances surrounding the violations are described in detail in the above referenced inspection report dated December 8, 2022.

The first violation documented in the Notice (Violation No. 1) occurred beginning in February 2016, after the facility completed original construction activities and IROFS50b and IROFS50c were no longer required as safety controls, and the barriers were removed. In March of 2022, UUSA was preparing for a new construction project and recognized a need to reactivate IROFS50b and IROFS50c. However, UUSA did not adequately re-establish the IROFS prior to admitting construction vehicles within the Controlled Access Area (CAA), which increased the likelihood of occurrence of a high consequence event. UUSA later identified that this had happened previously on numerous occasions (over 35 potential instances since 2016). The NRC concluded that this failure caused UUSA to be in violation of 10 CFR 70.61(b), "Performance requirements."

The second violation documented in the Notice (Violation No. 2) occurred from March to June 2022. During this period, the barrier for IROFS50c was not appropriately implemented as separate and independent from IROFS50b such that both IROFS were available and reliable to reduce the likelihood of occurrence of a high consequence event. Specifically, one individual performed the flagging duties for both IROFS50b and IROFS50c concurrently, thus failing to maintain the required independence between IROFS50b and IROFS50c. This means that a single common mode human error could disable both IROFS. The NRC concluded that this failure caused UUSA to be in violation of 10 CFR 70.61(b), "Performance requirements."

The violations did not cause any actual consequences or operational challenges to the facility, in that no incidents occurred in which vehicles actually damaged cylinders containing uranium hexafluoride.

However, the potential consequences of the two violations, when viewed individually and together, are significant concerns to the NRC. The IROFS50 series of safety controls are in place to significantly decrease the likelihood of occurrence of high consequence events. For both violations documented within the Notice, these IROFS specifically reduce the probability of construction vehicles impacting, damaging, and breaching uranium hexafluoride cylinders, which could release hazardous chemicals into the atmosphere. Additionally, Violation No. 1 went undetected by UUSA for more than six years (February 9, 2016, to March 7, 2022), indicating that UUSA management and staff did not possess an appropriate safety sensitivity to the potential for a uranium hexafluoride cylinder damage incident from a vehicle impact. Considering the above and because the violations are interrelated and concern the same credited IROFS controls, these violations have been categorized as a Severity Level II problem in accordance with the NRC Enforcement Policy.

In accordance with the Enforcement Policy, a base civil penalty in the amount of $70,000 is considered for a Severity Level II violation or problem. Because the violations are significant safety concerns, the NRC considered whether credit was warranted for *Identification* and

Corrective Action in accordance with the civil penalty assessment process in Section 2.3.4 of the Enforcement Policy.

As discussed in UUSA's written response, Violation No. 1 was identified by a shift manager performing an inspection in preparation of declaring IROFS50b and IROFS50c operable. During this inspection, the shift manager identified multiple construction vehicles parked within the CAA and near areas of concern. Regarding Violation No. 2, a licensee manager observed an operational activity where IROFS50b and IROFS50c independence was not being maintained. Therefore, credit is warranted for the civil penalty assessment factor of *Identification* for both violations.

Regarding the civil penalty assessment factor of *Corrective Action*, in its February 7, 2023, written response, UUSA identified a number of corrective actions taken in response to Violation No. 1, including but not limited to: (1) performed an investigation (root cause evaluation); (2) issued a verbal and formal stop work request; (3) ceased all staging and construction activities involving construction equipment; (4) required the requalification of all involved individuals; and (5) ordered the procurement and installation of IROFS50b and IROFS50c barriers for all potential areas of concern. The NRC concluded that these actions reflect an appropriate, graded approach to address causes known by UUSA to exist at that time and were commensurate with the significance of the issue. As such, credit is warranted for the civil penalty assessment factor of *Corrective Action* for this violation.

In response to the June 21, 2022, event, and as documented in its written response of February 7, 2023, UUSA took the following actions in response to Violation No. 2, including but not limited to: (1) performed an investigation (detailed apparent cause evaluation); (2) issued a verbal and formal stop work for all barrier breaches; (3) completed revisions to operating procedures to ensure the independent protective measure for IROFS50a, IROFS50b, IROFS50c, and IROFS50h; (4) performed IROFS50 series training for logistics and operations personnel; and (5) completed additional revisions to the change management process. Based on the above, the NRC concluded that credit is warranted for the civil penalty assessment factor of *Corrective Action* for Violation No. 2, and for the Severity Level II problem.

In accordance with Section 2.3.4 of the Enforcement Policy, the NRC normally would not propose a civil penalty for this Severity Level II problem, because credit is warranted for the civil penalty assessment factors of *Identification* and *Corrective Action*. However, consistent with Enforcement Policy Section 3.6, "Use of Discretion in Determining the Amount of a Civil Penalty," the NRC has the flexibility to exercise enforcement discretion to propose a base civil penalty where application of the civil penalty assessment factors would otherwise result in zero penalty. In this case, the circumstances of the two violations reflect particularly poor licensee performance in providing supervisory oversight of the change management process regarding safety controls, increasing the likelihood of high consequence events. Additionally, numerous instances of the first violation have occurred since 2016, which is indicative of poor implementation of site operational safety controls for a substantial period of time, and of a lack of safety sensitivity to the potential for a uranium hexafluoride cylinder damage incident by a vehicle. As such, the NRC has concluded that the exercise of enforcement discretion is warranted to propose a base civil penalty in the amount of $70,000.

Therefore, in recognition of the significant potential safety consequences of the two violations, I have been authorized, after consultation with the Director, Office of Enforcement, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalty in the base amount of $70,000 for the Severity Level II problem.

You may choose to pay the proposed civil penalty, or the cumulative amount of the civil penalties if more than once civil penalty is proposed, by submitting your payment, with the invoice enclosed to this letter, to the following address:

Office of the Chief Financial Officer
U.S. Nuclear Regulatory Commission
P.O. Box 979051
St. Louis, MO 63197

In addition, you may pay the proposed civil penalty in accordance with NUREG/BR-0254. When using NUREG/BR-0254 to pay the civil penalty, the invoice number should be used as the "enforcement action identifier" when submitting your payment through one of the approved methods listed in the brochure. The NRC may consider a request for additional time to pay the proposed civil penalty, including the option to enter into an installment agreement, if payment of the civil penalty as a lump sum in the required timeframe would pose a financial hardship. To request additional time to pay, you must submit a written request, with appropriate justification explaining your financial hardship, to NRCCollections.Resource@nrc.gov. All requests should be submitted in sufficient time to allow the NRC the ability to review your request for additional time to pay before the 30-day payment period expires.

If you disagree with this enforcement sanction, you may deny the violation, as described in the Notice, or you may request alternative dispute resolution (ADR) with the NRC in an attempt to resolve this issue. ADR is a general term encompassing various techniques for resolving conflicts using a neutral third party. The technique that the NRC has decided to employ is mediation. Mediation is a voluntary, informal process in which a trained neutral party (the "mediator") works with parties to help them reach resolution. If the parties agree to use ADR, they select a mutually agreeable neutral mediator who has no stake in the outcome and no power to make decisions. Mediation gives parties an opportunity to discuss issues, clear up misunderstandings, be creative, find areas of agreement, and reach a final resolution of the issues. Additional information concerning the NRC's ADR program can be found at http://www.nrc.gov/about-nrc/regulatory/enforcement/adr.html.

The Institute on Conflict Resolution (ICR) at Cornell University has agreed to facilitate the NRC's program as a neutral third party. If you are interested in pursuing this issue through the ADR program, please contact: (1) the ICR at (877) 733-9415; and (2) Mr. Robert Williams of the NRC at (404) 997-4664 within 10 days of the date of this letter. You may also contact both ICR and Mr. Williams for additional information. Your submitted signed agreement to mediate using the NRC ADR program will stay the 30-day time period for payment of the civil penalties and the required written response, as identified in the enclosed notice, until the ADR process is completed.

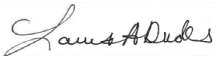
The NRC has concluded that information regarding: (1) the reason for the violations; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken; and (4) the date when full compliance was achieved was adequately addressed in UUSA's letter of February 7, 2023. Therefore, you are not required to respond to this letter unless the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

For administrative purposes, this letter is issued as NRC inspection report 07003103/2023006. AV 07003103/2022007-01 and AV 07003103/2022007-02 have been re-designated as Notice of Violation (NOV) 07003103/2022007-01 and NOV 07003103/2022007-02.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosures, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room and from the NRC's Agencywide Documents Access and Management System, accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction. The NRC also includes significant enforcement actions on its Web site at http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/

If you have any questions concerning this matter, please contact Mr. Robert Williams of my staff at (404) 997-4664.

Sincerely,


Signed by Dudes, Laura
on 03/30/23

Laura A. Dudes
Regional Administrator

Docket No.: 07003103
License No.: SNM-2010

Enclosures:
1. Notice of Violation and Proposed Imposition of Civil Penalty
2. NRC Assessment of UUSA's Written Response
3. Civil Penalty Invoice (EA 22-086)
4. NUREG/BR-0254 Payment Methods

cc: Distribution via ListServ

SUBJECT: URENCO USA (UUSA) – NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTY – $70,000; NRC INSPECTION REPORT NO. 07003103/2023006 AND EXERCISE OF ENFORCEMENT DISCRETION Dated March 30, 2023

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DATE	3/8/2023	3/8/2023	3/8/2023	3/8/2023	3/8/2023	3/9/2023
OFFICE	HQ: OGC	HQ:NMSS	HQ:OE	RII:ORA		
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NOTICE OF VIOLATION
AND
PROPOSED IMPOSITION OF CIVIL PENALTY

URENCO USA
Louisiana Energy Services
Eunice, New Mexico

Docket No.: 07003103
License No.: SNM-2010
EA-22-086

During an NRC inspection completed on August 25, 2022, violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the NRC proposes to impose a civil penalty pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (Act), 42 U.S.C. 2282, and 10 CFR 2.205. The violations and associated civil penalty are set forth below:

1. 10 CFR 70.61(b) requires, in part, that "the risk of each credible high-consequence event must be limited. Engineered controls, administrative controls, or both, shall be applied to the extent needed to reduce the likelihood of occurrence of the event so that, upon implementation of such controls, the event is highly unlikely..."

   10 CFR 70.62(d) requires, in part, that "each licensee shall establish management measures to ensure compliance with the performance requirements of 70.61. The management measures shall ensure that engineered and administrative controls that are identified as IROFS, are designed, implemented, and maintained, as necessary, to ensure they are available and reliable to perform their function when needed, to comply with the performance requirements of 70.61."

   NEF-BD-50b, "Administratively Control Proximity of Vehicles by Use of Barriers," Revision (Rev.) 9 and NEF-BD-50c, "Administratively Control Proximity of Vehicles by Use of Barriers," Rev. 9 implement the IROFS by establishing barriers of sufficient strength to alert the vehicle operator upon impact with the barrier. Barriers are to be implemented at all times while construction site preparation vehicles are in use and uranium hexafluoride cylinders are located in the areas of concern.

   Contrary to the above, from February 9, 2016, to March 7, 2022, IROFS barriers were not implemented as available and reliable to reduce the likelihood of occurrence of a high consequence event prior to construction vehicles being used (driven) on-site. Specifically, the IROFS barriers were not physically in place before the vehicles arrived on-site and had not been established properly by the time they were driven off-site.

2. 10 CFR 70.61(b) requires, in part, that "The risk of each credible high-consequence event must be limited. Engineered controls, administrative controls, or both, shall be applied to the extent needed to reduce the likelihood of occurrence of the event so that, upon implementation of such controls, the event is highly unlikely..."

   10 CFR 70.62(d) requires, in part, that "each licensee shall establish management measures to ensure compliance with the performance requirements of 70.61. The management measures shall ensure that engineered and administrative controls that are identified as IROFS are designed, implemented, and maintained, as necessary, to ensure they are available and reliable to perform their function when needed, to comply with the performance requirements of 70.61."

NEF-BD-50b, “Administratively Control Proximity of Vehicles by Use of Barriers,” Rev. 9 and NEF-BD-50c, “Administratively Control Proximity of Vehicles by Use of Barriers,” Rev. 9 state that, “for normal operations… an individual with flags will be used to replace the barriers when they need to be removed to allow normal operations to occur.” The Boundary Definition Documents also state that the IROFS50b “barrier is separate and independent from the barrier established for IROFS50c.”

Contrary to the above, from March 30 to June 21, 2022, the barrier for IROFS50c was not implemented as separate and independent from IROFS50b, such that both IROFS were maintained reliable to reduce the likelihood of occurrence of a high-consequence event to highly unlikely. Specifically, one individual performed the flagging duties of IROFS50b and IROFS50c concurrently, thus failing to maintain the required independence between IROFS50b and IROFS50c, so that a single common mode human error could disable both IROFS.

This is a Severity Level II problem (Enforcement Policy Section 6.2.b.1).
Civil Penalty - $70,000. (EA-22-086)

The NRC has concluded that information regarding the reason for the violations, the corrective actions taken and planned to correct the violations and prevent recurrence and the date when full compliance was achieved was adequately addressed with the licensee’s written response dated February 7, 2023. However, if the description therein does not accurately reflect your position or your corrective actions, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 within 30 days of the date of the letter transmitting this Notice of Violation. In that case, or if you choose to respond, clearly mark your response as a ‘Reply to a Notice of Violation – EA-22-086’, and send it to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, One White Flint North, 11555 Rockville, MD 20852-2738, with a copy to the Regional Administrator, U.S., Nuclear Regulatory Commission, Region II, 245 Peachtree Center Avenue, N.E., Suite 1200, Atlanta, GA, 30303, and the Document Control Desk, Washington, DC 20555-0001.

The Licensee may pay the civil penalty proposed above, through one of the following two methods:

1. Submit the payment with the enclosed invoice for Civil Penalty EA-22-086, issued to Louisiana Energy Services, LLC, to the following address:

   Office of the Chief Financial Officer
   U.S. Nuclear Regulatory Commission
   P.O. Box 979051
   St. Louis, MO 63197

   OR

2. Submit the payment in accordance with NUREG/BR-0254.

The Licensee may protest the imposition of the civil penalty in whole or in part, by a written answer addressed to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, within 30 days of the date of this Notice. Should the Licensee fail to answer within 30 days of the date of this Notice, the NRC will issue an order imposing the civil penalty. Should the Licensee elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalty, in

whole or in part, such answer should be clearly marked as an “Answer to a Notice of Violation” and may: (1) deny the violation(s) listed in this Notice, in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalty should not be imposed. In addition to protesting the civil penalty in whole or in part, such answer may request remission or mitigation of the penalty.

In requesting mitigation of the proposed penalty, the response should address the factors discussed in Section 2.3.4 of the Enforcement Policy. Any written answer addressing these factors pursuant to 10 CFR 2.205 should be set forth separately from the statement or explanation provided pursuant to 10 CFR 2.201 but may incorporate parts of the 10 CFR 2.201 reply by specific reference (e.g., citing page and paragraph numbers) to avoid repetition. The attention of UUSA is directed to the other provisions of 10 CFR 2.205 regarding the procedure for imposing a civil penalty.

Upon failure to pay any civil penalty which subsequently has been determined in accordance with the applicable provisions of 10 CFR 2.205 to be due, this matter may be referred to the Attorney General, and the penalty, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282c.

The responses noted above, i.e., Reply to Notice of Violation, Statement as to Payment of Civil Penalty, and Answer to a Notice of Violation, should be addressed to: Mr. David Pelton, Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, One White Flint North, 11555 Rockville Pike, Rockville, MD 20852-2738, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region II, 245 Peachtree Center Avenue, N.E., Suite 1200, Atlanta, GA, 30303, and the Document Control Center, Washington, DC 20555-0001.

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or in the NRC’s Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 30th day of March 2023

NRC ASSESSMENT OF UUSA'S RESPONSE TO APPARENT VIOLATIONS

Summary of Licensee Response

In its letter, "Response to Apparent Violations in Inspection Report 07003103/2022-007; EA-22-086," dated February 7, 2023 (Agency Documents Access and Management System (ADAMS) Accession Number: ML23038A251), URENCO USA (UUSA or licensee) acknowledged Apparent Violation (AV) 07003103/2022007-01 and AV 07003103/2022007-02 and did not contest that IROFS50b and IROFS50c were not met. In addition, the licensee discussed identification and corrective actions for both AVs. The applicability of accident sequence OC2-1 was not challenged by the licensee. The initiating event index of -1 used in the accident sequence OC2-1 was not challenged by the licensee.

The licensee did not contest that a violation of NRC requirements occurred but took the position that protective features from IROFS27e provided some additional safety controls for accident sequence OC2-1 and pointed out that the construction vehicles that were present from March 2 to March 7, 2022, were a significant distance from areas of concern.

NRC Evaluation

The NRC reviewed the following information: 1) the licensee's February 7, 2023 letter; 2) NEF-BD-27e, "Design Features of the SBM, CRDB Shell and the UBC Storage Pad Crane," Rev. 12; 3) NEF-BD-50b, "Administratively Control Proximity of Vehicles by Use of Barriers," Rev. 9; 4) NEF-BD-50c, "Administratively Control Proximity of Vehicles by Use of Barriers," Rev. 9; 5) the licensee's letter, "10 CFR 70 App A (b), 60 Day Report for EN 55770," dated September 1, 2022 (ML22245A024); 6) the licensee's letter, "60 Day Follow-up Report IROFS50b/c Independence," dated August 18, 2022 (ML22235A725); 7) Root Cause Evaluation: "Construction Equipment Brought into CAA Prior to IROFS50 Series Declared Operable," Rev. 3; and 8) the NRC's requirements found in 10 CFR Part 70 and applicable guidance including Inspection Manual Chapter (IMC) 2606, "Assessment of the Risk Resulting from a Potential Safety Noncompliance at a Fuel Cycle Facility," dated April 1, 2016.

In its response letter, the licensee stated, in part, that:

- the cause of AV 07003103/2022007-01 was that less than adequate change management occurred in 2016, after the facility ended construction activities, leaving inadequate management measures to control inactive IROFS. The inadequate management measures led to a poor implementation and reactivation of IROFS50b and IROFS50c when re-establishing these controls.
- the cause of AV 07003103/2022007-02 was that less than adequate change management of the IROFS50 series through multiple revisions, resulted in a loss of independence of the IROFS. Minor revisions over a three-year window of time took what was once a robust protective measure and reduced the level of performance that was needed.
- IROFS27e structures, although not credited to withstand the impacts identified in accident sequence OC2-1, are robust and designed with significant strength to resist collapse. IROFS27e exists for all areas that are protected by IROFS50b and IROFS50c.
- in the case of AV 07003103/2022007-01, the vehicles were a significant distance from the Area of Concern, greater than 100 yards.

Credit for IROFS27e:

The inspectors considered the licensee's position and noted that IROFS27e structures were not designed to protect against load drop/impact or against tornado missile impacts. Per NEF-BD-27e, Rev. 12: “IROFS27e includes design features of Separations Building Modules (SBMs), Interconnecting Corridor (ICC), Cylinder Receipt and Dispatch Building (SCRDB) Shell, and the UBC Storage Pad Crane for seismic, tornado, high wind, roof snow load, roof ponding, and site flooding due to local intense precipitation, to ensure a chemical release does not exceed the performance requirements of 10 CFR 70.61.”

Furthermore, NEF-BD-27e states:
j. Load Drop/Impact
Movement of heavy loads is conducted under closely-controlled procedures, minimizing the potential for damage. Administrative controls are established to prevent load movement over areas of concern which indirectly provide protection over the IROFS contained within.

l. Tornado
An IROFS27e structure is not required to withstand tornado-generated missiles.

A vehicle impact would be most similar to the two above conditions neither of which IROFS27e structures are designed to protect against. Thus, the inspectors consider it inappropriate to apply a -3 credit, as the IROFS27e structures are not designed to resist the impact of a vehicle. In this case, a -3 credit would only be appropriate for a passive vehicle-resistant barrier or structure. The IROFS27e structures might be credited with alerting the operator upon impact with the barrier, though, the inspectors note that NEF-BD-50b states: “Barriers cannot make use of the existing area(s) of concern building structures (e.g., building walls, structural steel, fencing, etc.).” However, it may not be unreasonable to apply a credit of -2 for areas where an IROFS27e structure was present and a hazard (e.g., a uranium hexafluoride cylinder) is not immediately next to the IROFS27e structure, which would be equivalent to crediting the impact with such a IROFS27e structure with alerting the operators to the fact that they are in a prohibited area.

It was also noted that the events described in AV07003103/2022007-02 occurred near the uranium hexafluoride cylinders stored on the UBC pad. IROFS27e does include the UBC Pad crane, rails, and aspects of the pad, but does not enclose or protect the whole UBC Pad. Because there is no such encompassing structure present, IROFS27e cannot be credited. Additionally, nothing was preventing similar breaches from being opened in the barriers at any location onsite and having the same issue due to the problems with the implementing procedure.

AV 07003103/2022007-01: If a credit of -2 for IROFS27e was applied to OC2-1 accident sequence, with IROFS50b and IROFS50c not being applied, a high consequence event would remain “Not Unlikely” with a value of -3 for those areas protected by IROFS27e structures. It would remain "Not Unlikely" at -1 for those areas not protected by IROFS27e structures.

AV 07003103/2022007-02: If a credit of -2 for IROFS27e was applied to OC2-1 accident sequence, with IROFS50c not being applied due to the loss of independence, the high consequence event would be “Highly Unlikely” with a value of -5 for those areas protected by IROFS27e structures. It would remain "Not Unlikely" at -3 for those areas not protected by IROFS27e structures.

Distance from Area of Concern:

In reviewing the licensee's positions described above, the NRC staff noted the licensee stated that "vehicles were greater than 100 yards" from the areas on concern in its February 7, 2023, letter.

NRC staff agrees that this was true for the construction vehicles that were onsite from March 2 to March 7, 2022. The NRC staff also agrees that increasing distance from an area of concern decreases the probability that a construction vehicle would strike an area of concern. However, the staff notes that numerous construction vehicles were operated onsite from 2016 to March 7, 2022, without controls on distance to an area of concern in place. Because there were no controls preventing construction vehicles from being operated in immediate proximity to areas of concern the staff considers that, in accordance with IMC 2606, no credit should be applied for this factor. IMC 2606 does allow the staff to credit non-IROFS controls when preforming risk assessments of enforcement issues, with credit given commensurate with the management measures applied to the non-IROFS controls. However, in this case, no non-IROFS control is available and reliable to prevent the accident sequence by enforcing the 100-yard distance that the licensee referenced.

Cause and Duration of AV 07003103/2022007-01:

The inspectors considered the licensee's position and noted that the licensee stated in their February 7, 2023, letter that:

As the facility ended construction activities in 2016, the implementation of IROFS50b and IROFS50c also ended. Reestablishment of the boundaries was being conducted in order to facilitate a construction project scheduled to be completed west of the Central Utilities Building and in the vicinity of an Area of Concern (SBM1001).

The proximate cause, as determined by a Root Cause Evaluation, was that less than adequate change management occurred in 2016 for ending the "Operate while Construct phase" leaving inadequate management measures to control an inactive IROFS. The inadequate management measures led to a poor implementation and reactivation of IROFS50b and [IROFS]*50c when re-establishing these controls.*

As a result of the staff's review, the NRC considers it appropriate to restate a portion of AV 07003103/2022007-01 as follows: "Contrary to the above, from February 9, 2016, to March 7, 2022, IROFS barriers were not implemented as available and reliable to reduce the likelihood of occurrence of a high-consequence event prior to construction vehicles being used (driven) on-site. Specifically, the IROFS barriers were not physically in place before the vehicles arrived on-site and had not been established properly by the time they were driven off-site."

As this wording more appropriately captures the fact that the failure to impose IROFS50 barriers resulted from the 2016 change to remove IROFS50 barriers and continued until the external construction vehicles were discovered to be onsite during the March 2022 event.

Cause and Duration of AV 07003103/2022007-02:

The inspectors considered the licensee's position and noted that the licensee stated in their February 7, 2023, letter that:
The Apparent Cause, as determined by a Detailed Apparent Cause Evaluation, is less than

adequate change management of the IROFS50 series through multiple revisions, resulting in a loss of independence of the IROFS. Minor changes over a 3 year window of time took what was once a robust protective measure and reduced the level of performance that was needed.

As a result of the staff's review, the NRC agrees that the changes to IROFS50-related procedures were a cause of the June 21, 2022, event that resulted in a loss of independence between IROFS50 barriers because only one individual was performing the procedurally required compensatory measures for breaches in both IROFS barriers. Therefore, the NRC considers it appropriate to restate a portion of AV 07003103/2022007-02 as follows: "Contrary to the above, from March 30 to June 21, 2022, the barrier for IROFS50c was not implemented as separate and independent from IROFS50b, such that both IROFS were maintained reliable to reduce the likelihood of occurrence of a high-consequence event to highly unlikely. Specifically, one individual performed the flagging duties of IROFS50b and IROFS50c concurrently, thus failing to maintain the required independence between IROFS50b and IROFS50c, so that a single common mode human error could disable both IROFS."

This date range better reflects the latent error that existed in the IROFS implementing procedures, from the time of the re-establishment of the IROFS following the March event, to the licensee's discovery of the issue on June 21, 2022.

NRC staff assessment of risk for AV 07003103/2022007-01 and -02:

Accident sequence OC2-1 (External Construction) is the bounding accident sequence for both these violations. OC2-1 leads to a High Consequence chemical release of uranium hexafluoride.

In their ISA Summary, Rev. 33b, the licensee describes the initiating event as "external construction site preparations vehicle failure or human error resulting in an impact to areas of concern." The licensee assigned this an initiating frequency index of -1, using the evidence-based criteria of "a few failures may occur during facility lifetime" and stated that "This failure frequency index was selected based on limited evidence from industry events involving chemical releases caused by construction vehicles."

IROFS50b was imposed to "administratively control the proximity of external construction site preparations vehicles around areas of concern by establishing a temporary barrier of sufficient strength to alert the operator upon impact with the barrier" and was assigned a failure probability index of -2.

IROFS50c was imposed to "administratively control the proximity of external construction site preparations vehicles around areas of concern by establishing a second and independent temporary barrier of sufficient strength to alert the operator upon impact with the barrier" and was also assigned a failure probability index of -2.

Notably, these barriers are not meant to physically stop an out of control vehicle, but instead merely intended to ensure that external construction vehicles are not operated in the vicinity of the areas of concern by alerting the operator upon impact with the barrier.

With IROFS50b and IROFS50c in place and working as intended, this accident sequence would have a total index of -5 and would be "highly unlikely" in accordance with the licensee's NRC approved ISA methodology.

In AV 07003103/2022007-01, the IROFS50b and IROFS50c barriers were not in place, so these IROFS would be scored at 0, resulting in the accident sequence's total index being reduced to -1.

As discussed above, IROFS27e does not apply for all approaches to all areas of concern, so it cannot be credited in the bounding accident sequence. For those subsets of accident sequences where it could be credited, because IROFS27e structures protect areas of concern, the total accident sequence index would be -3. However, both -1 and -3 are considered "not unlikely" in accordance with the licensee's NRC approved ISA methodology.

In AV 07003103/2022007-02, the IROFS50b and IROFS50c barriers lost independence because only one flagger was being used as a compensatory measure for breaches in both IROFS barriers. Thus, credit can be given for only one of the IROFS50 barriers, which would be scored at -2, resulting in the accident sequence's total score being reduced to -3.

As discussed above, IROFS27e cannot be credited in the bounding accident sequence. For those subsets of accident sequences where it could be credited, because IROFS27e structures protect areas of concern, the total accident sequence index is -5. However, because both -3 and -5 apply, the more limiting case of -3 will be assessed for enforcement purposes in determining significance. This resulting index score is considered "not unlikely" in accordance with the licensee's NRC approved ISA methodology.