

May 29, 2013

EA-13-103

Mr. Joel G. Himsl  
Garrison Manager – Rock Island Arsenal  
U.S. Department of the Army  
IMNE-RIA-ZA  
1 Rock Island Arsenal  
Rock Island, Illinois 61299-5000

SUBJECT: NRC INSPECTION REPORT NO. 04008838/2013001(DNMS) AND NOTICE OF VIOLATION - JEFFERSON PROVING GROUND

Dear Mr. Himsl:

This refers to the inspection conducted on April 4, 2013, with in office review through May 13, 2013, of the U.S. Department of the Army Jefferson Proving Ground (JPG) site in Madison, Indiana. The purpose of the inspection was to determine whether licensed activities were being conducted safely and in accordance with U.S. Nuclear Regulatory Commission (NRC) requirements. The enclosed report presents the results of this inspection. At the conclusion of the on-site inspection on April 4, 2013, the inspector discussed the interim inspection results with the Radiation Safety Officer (RSO). At the conclusion of the in-office review, a final telephone exit meeting was conducted on May 13, 2013, to discuss the final results with you and other members of your staff.

During this inspection, the NRC staff examined activities conducted under your license as they relate to public health and safety to confirm compliance with the Commission's rules and regulations, and with the conditions of your license. Within these areas, the inspection consisted of a site tour, personnel interviews, and a review of documents to assess your management organization and controls, radiation protection program, security and control of licensed material, and environmental monitoring for the JPG site.

Based on the results of this inspection, the NRC has determined that three Severity Level IV violations of NRC requirements occurred. These violations were evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at (<http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>).

The violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in the subject inspection report. The violations are being cited because the licensee either failed to identify them or had prior opportunities to identify them and failed to take actions to prevent their occurrence.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The guidance in NRC Information Notice 96-28, "Suggested Guidance Relating to Development and Implementation of Corrective Action," may be helpful. You can find the Information Notice on the NRC website at: <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/info-notices/1996/in96028.html>. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

Of the three violations being cited, one violation involved the failure to appoint a qualified RSO as required by your NRC license. The NRC Enforcement Policy would normally consider this violation to be classified as a Severity Level III violation. However, the NRC determined that a Severity Level IV violation was more appropriate because of the overall minimal safety impact of the violation given the facts of the case. Specifically, the RSO duties at JPG, while important, are minimal due to the type of radioactive material (depleted uranium), the form of the material (relatively insoluble metal penetrator rounds), and the limited authorized activity (possession only for decommissioning) at the site. In addition, the duration of the violation was relatively short (about 1.5 months) and upon identification of the issue, the licensee took immediate corrective actions and appointed a qualified individual as the RSO for the license. In your response to this letter and the cited violations, as specified in the instructions of the enclosed Notice, please address the specific long term corrective actions that you plan to take to prevent recurrence of this violation.

The NRC expects licensee management to be responsible for oversight of licensed activities and for ensuring compliance with NRC requirements. The cited violations indicate inadequate management involvement in the implementation of your license and radiation protection program. For example, licensee management failed to ensure that there was a documented radiation protection program for JPG, and in addition appointed a Radiation Safety Officer who was unqualified to oversee the program. Licensee management also failed to seek required NRC approval before implementing changes that adversely affected the implementation of your Security Plan and the effectiveness of the radiological controls for JPG. Consequently, in addition to your response to the specific violations, please also describe the actions taken or planned to enhance management involvement and oversight of the radiation protection program and ensure that the program is properly implemented.

In accordance with Title 10 of the Code of Federal Regulations (CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC 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, proprietary, or safeguards information so that it can be made available to the Public without redaction.

We will gladly discuss any questions you may have regarding this inspection.

Sincerely,

*/RA/*

Anne T. Boland, Director  
Division of Nuclear Materials Safety

Docket No. 040-08838  
License No. SUB-1435

Enclosures:

1. Notice of Violation
2. NRC Inspection Report No. 04008838/2013001(DNMS)

cc w/encls: Dr. Robert Cherry, U.S. Army  
Mr. Frederick Kopp, U.S. Army  
Mr. Scott Pruitt, U.S. Fish & Wildlife Service  
Dr. Joseph Robb, U.S. Fish & Wildlife Service  
Mr. Todd Bass, Indiana Air National Guard  
Mr. Joe Deaton, Indiana Air National Guard  
Ms. Karen Mason-Smith, U.S. EPA Region V  
Mr. Kevin Herron, Indiana Department of Environmental Management  
Mr. John Ruyack, Indiana State Department of Health  
Ms. Laura Dresen, Indiana Department of Homeland Security  
Mr. Bob Grew, JPG Regional Development Board Director  
Mr. Richard Hill, Save the Valley

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We will gladly discuss any questions you may have regarding this inspection.

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 Mr. John Ruyack, Indiana State Department of Health  
 Ms. Laura Dresen, Indiana Department of Homeland Security  
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## NOTICE OF VIOLATION

U.S. Department of Army  
Rock Island, Illinois

Docket No. 040-08838  
License No. SUB-1435  
EA-13-103

During a U.S. Nuclear Regulatory Commission (NRC) inspection at Jefferson Proving Ground (JPG) in Madison, Indiana, conducted between April 4, 2013 and May 13, 2013, three violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

- A. Condition 12.D of License No. SUB-1435 requires, except as specifically provided otherwise in the license, that the licensee conducts its program in accordance with the statements, representations, and procedures contained in the JPG Security Plan included with the letter dated December 10, 2003 (ML033650261).

Section 3.d. of the JPG Security Plan states, in part, that the JPG site is managed by a three-person site management team. In addition, section 7.a. of the JPG Security Plan states, in part, that the site management is a part of the staff of the Rock Island Arsenal, Rock Island, IL, with a duty station at JPG.

Contrary to the above, from the end of 2010 until the present, the licensee failed to have a three-person site management team that was a part of the staff of the Rock Island Arsenal, Rock Island, IL, with a duty station at JPG.

This is a Severity Level IV violation (Section 6.3).

- B. Condition 11.A of License No. SUB-1435 requires that licensed material be kept under the supervision of the Radiation Safety Officer (RSO), who shall have the education, training, and experience as stated on Conditions 11.A.1, 11.A.2, and 11.A.3 of the license.

Condition 11.A.1 states the RSO education requirements as a Bachelors degree in the physical sciences, industrial hygiene, or engineering from an accredited college or university or an equivalent combination of training and relevant experience in radiological protection. It also states two years of relevant experience are generally considered equivalent to one year of academic study.

Condition 11.A.2 states the RSO health physics experience requirement as at least one year of work experience in applied health physics, industrial hygiene, or similar work relevant to radiological hazards associated with site remediation. It also states that this experience should involve actually working with radiation detection and measurement equipment, not strictly administrative or "desk" work.

Condition 11.A.3 states the RSO specialized knowledge requirement as a thorough knowledge of the proper application and use of all health physics equipment used for depleted uranium and its daughters, the chemical and analytical procedures used for radiological sampling and monitoring, methodologies used to calculate personnel exposure to depleted uranium and its daughters, and a thorough understanding of how depleted uranium was used at the location and how the hazards are generated and controlled.

Contrary to the above, from October 28, 2010 until approximately December 14, 2010, the licensee failed to keep licensed material under the supervision of an RSO who had the education, training, and experience as stated on Condition 11.A of the license. Specifically, the licensee appointed an RSO who did not have the health physics experience or the specialized knowledge required by Conditions 11.A.2 and 11.A.3 of the license.

This is a Severity Level IV violation (Section 6.3).

- C. Condition 12.D of License No. SUB-1435 requires, except as specifically provided otherwise in the license, that the licensee conduct its program in accordance with the statements, representations, and procedures contained in the JPG Security Plan included with the letter dated December 10, 2003 (ML033650261).

Section 9.e of the JPG Security Plan describes the training for onsite personnel and visitors of the JPG site. Specifically, section 9.e.(1) states that all site management personnel have been given depleted uranium (DU) safety training by the NRC license Radiation Safety Officer. Section 9.e.(2) states, in part, that all personnel who are allowed entry into the area north of the firing line are given a DU safety briefing, including a description of the properties of DU, the harmful effects of DU, and what to do if contact is made with DU.

Contrary to the above, since December 2003 until the present, the licensee failed to provide the required training to onsite personnel and visitors as specified in the JPG Security Plan. Specifically, the NRC license Radiation Safety Officer had not provided DU safety training to site management personnel since the end of 2010 and the training provided to visitors since approximately 2003 did not cover all of the required DU safety briefing topics, as required by the JPG Security Plan.

Pursuant to the provisions of Title 10 of the Code of Federal Regulations (CFR) 2.201, the U.S. Department of Army is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region III, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation; IR 04008838/2013001(DNMS)" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (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 will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time. If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC 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, proprietary, or safeguards information so that it can be made available to the Public without redaction.

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

Dated this 29<sup>th</sup> day of May 2013.

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION III**

Docket No. 040-08838

License No. SUB-1435

Report No. 04008838/2013001(DNMS)

Licensee: U.S. Department of Army

Facility: Jefferson Proving Ground

Location: Madison, Indiana

Dates: April 4, 2013 (on-site)  
through May 13, 2013 (in-office review)

NRC Inspectors: Lionel Rodriguez, Reactor Inspector  
(Decommissioning)

Approved by: Christine A. Lipa, Chief  
Materials Control, ISFSI, and  
Decommissioning Branch  
Division of Nuclear Materials Safety



**EXECUTIVE SUMMARY**  
**Jefferson Proving Ground**  
**Inspection Report 04008838/2013001(DNMS)**

The Jefferson Proving Ground (JPG) site is located in southeastern Indiana and consists of 55,265 acres of land. It was established in 1940 by the U.S. War Department. The Department of the Army (Army) was originally issued Source Material License No. SUB-1435, on December 16, 1983, which authorized the possession of depleted uranium (DU) for DU projectile testing at JPG. From 1984-1994, the Army test fired 100,000 kg [220,462 lbs] of tank penetrator rounds containing DU. Approximately 70,000 kilograms of DU projectiles currently remain in the DU impact area. The DU impact area is approximately 1,280 acres.

In 1996, the U.S. Nuclear Regulatory Commission (NRC) amended the Army license to a DU "possession only for decommissioning" license. After several Decommissioning Plan (DP) submittals that were either rejected and/or withdrawn, the licensee now plans to submit a DP by August 30, 2013, that will support license termination under the provisions of Title 10 of the Code of Federal Regulations (CFR) 20.1403, "Criteria for license termination under restricted conditions." Under these provisions, if approved by the NRC, residual radioactive material would be left in place and institutional controls would be maintained to minimize exposure to the public and the environment.

**Management Organization and Controls**

- The inspector identified two Severity Level IV violations of NRC requirements for failure to have a three-person site management team and failure to appoint a qualified Radiation Safety Officer (RSO) for JPG. In addition, a minor violation was identified for failure to submit an adequate license amendment request to the NRC (Section 2.1).

**Radiation Protection**

- The inspector identified one Severity Level IV violation of NRC requirements for failure to provide DU safety training in accordance with the requirements of the JPG Security Plan. In addition, a minor violation was identified for failure to have a documented radiation protection program (Section 2.2).

**Security and Control of Licensed Material**

- The licensee, with the exception of the violations identified in sections 2.1 and 2.2 of this report, is adequately controlling access to and securing the radioactive material at JPG. The JPG site perimeter fence is being maintained in accordance with the license requirements (Section 2.3).

**Environmental Monitoring**

- The monitoring wells observed by the inspector were adequately covered and locked. The physical condition of the monitoring wells observed was generally good; however, some of the wells had degraded bases and labels which the licensee plans to assess (Section 2.4).

## **Report Details**

### **1.0 Background and Historical Information for JPG**

The JPG site is located in southeastern Indiana and consists of 55,265 acres of land. It is about 17.2 miles in length (north-south) and ranges from 4-6 miles in width (east-west). More than 75 percent of the JPG site is forested, and there are 6,000 acres of wetlands, 7 streams, and numerous ponds and lakes.

The JPG site was established in 1940 by the U.S. War Department. The site operated from 1941-1995 with the primary mission of supporting research, tests, and operations of the Army. Since 1977, the Indiana Air National Guard (INANG) has used approximately 1,033 acres of the installation as an air-to-ground impact area for operational training requirements. The Army was originally issued Source Material License No. SUB-1435, on December 16, 1983, which authorized the possession of DU for DU projectile testing at JPG. From 1984-1994, the Army test fired 100,000 kg [220,462 lbs] of tank penetrator rounds containing DU. The DU projectiles were fired at soft targets and impacted on the ground beyond the targets. Projectiles were periodically recovered from the impact area and stored onsite prior to shipment back to the manufacturer. Approximately 70,000 kilograms of DU projectiles currently remain in the impact area. The JPG site is currently divided into an approximate 51,000 acre northern firing range area and a 4,000 acre southern area. A firing line separates these areas. The DU impact area is approximately 1,280 acres and is located north of the firing line.

In 1996, the NRC amended the Army license to DU possession north of the firing line. The presence of Unexploded Ordnance (UXO), the associated risk of potential explosions, and the high cost for cleanup complicate remediation activities in the DU impact area. A Decommissioning Plan (DP) was submitted by the Army in 1999 and withdrawn in 2001 when a new DP was submitted. The NRC rejected the 2001 DP. A revised DP was submitted by the Army in 2002. Thereafter, the Army withdrew the revised 2002 DP and in 2003 requested that the possession-only license be issued for a 5-year renewable period indefinitely. Subsequently, the Army withdrew its 2003 request and began various studies aimed towards decommissioning the area. In 2012 the NRC approved a license amendment request extending the deadline for submittal of a DP in order to allow the Army to collect additional data to support a site specific dose model which will be included with their DP. Currently, the Army proposes to come in for license termination under the provisions of 10 CFR 20.1403, "Criteria for license termination under restricted conditions." Under these provisions residual radioactive material would be left in place and institutional controls would be maintained to minimize exposure to the public and the environment.

The Army's control and oversight of the JPG site has been delegated, over time, to other entities. In 1997, a Memorandum of Agreement (MOA) was established between the Army and the Department of the Interior-U.S. Fish and Wildlife Service (FWS) to develop an ecosystem-based plan for the 51,000 acre northern firing range area. In 1998, a Memoranda of Understanding (MOU) was signed by the Army, the Air National Guard (ANG), and the INANG. The MOU states that in exchange for continued use of the 1,033 acre bombing range, the ANG would maintain and operate the northern firing range area. The 1998 MOU was superseded by a May 2000 MOA signed between the Army, the Department of Air Force (Air Force), and the FWS which outlines the long-term institutional controls in effect for the JPG site.

The May 2000 MOA, currently in effect, delegates some of the Army NRC license responsibilities for the DU impact area to the Air Force and the FWS including site security, site maintenance, training for site personnel and visitors, and access controls to the site. The MOA also authorizes future use by the FWS and continued use by the Air Force north of the firing range for 25 years, with 10-year extensions thereafter. In June 2000, the FWS established the Big Oaks National Wildlife Refuge in which they allow hunting, fishing, and camping on about 30,000 acres north of the firing line on a controlled-access basis. The INANG continues to use the bombing range as a training facility, under a license from the Air Force, as allowed by the MOA.

## **2.0 Decommissioning Inspection Procedure for Materials Licensees (IP 87104)**

### **2.1 Management Organization and Controls**

#### **a. Inspection Scope**

The inspector reviewed the JPG license and license tie-downs to understand the management organization required for the JPG site. The inspector also reviewed past inspection and licensing history, and other site documentation, to understand changes made to the license and licensee programs for JPG. During the on-site inspection the inspector interviewed licensee, FWS, and INANG personnel to determine whether the site was being managed in accordance with license and regulatory requirements.

#### **b. Observations and Findings**

##### **Lack of Army Site Presence**

Through a review of documentation the NRC inspector noted that the Army was required to have a three-person site management team at JPG. Through interviews with licensee personnel, the inspector discovered that the Army no longer had any personnel with a duty station at JPG. In the past, the Army had personnel at JPG who monitored caretaker functions, coordinated with the FWS and the INANG per the MOA, monitored site security, and ensured postings were in place as required, among other responsibilities. As the Army personnel with a duty station at JPG retired, the Army eliminated the personnel positions. According to the information provided by the licensee, in 2007 the first of the four remaining on-site personnel retired. In September and November of 2010, two more Army personnel retired. Finally, in January of 2013, the only remaining Army employee with a duty station at JPG retired.

Condition 12.D of License No. SUB-1435 requires, except as specifically provided otherwise in the license, that the licensee conduct its program in accordance with the statements, representations, and procedures contained in the JPG Security Plan included with the letter dated December 10, 2003 (ML033650261).

Section 3.d of the JPG Security Plan states, in part, that the JPG site is managed by a three-person site management team. In addition, section 7.a. of the JPG Security Plan states, in part, that the site management is a part of the staff of the Rock Island Arsenal, Rock Island, IL, with a duty station at JPG.

The failure to maintain a three-person site management team with a duty station at JPG since the end of 2010 is a violation of license Condition 12.D. (VIO 04008838/2013001-01).

The violation was categorized as a Severity Level IV (very low safety significance) violation as provided in section 6.3 of the NRC Enforcement Policy and consistent with the guidance in section 2.4.C. of the NRC Enforcement Manual because although the licensee failed to receive prior NRC approval for changes to their site management team, the safety responsibilities of the team were being implemented through other means.

The three-person site management team responsibilities were transitioned to the FWS and the INANG as the Army personnel retired. The different responsibilities for the FWS and the INANG are described in the MOA. The FWS, among other things, was tasked with maintaining the roads inside the DU impact area and providing training to refuge visitors entering the JPG site north of the firing line. The INANG was tasked with, among other things, maintaining the JPG site perimeter fence (which surrounds the entire JPG site north of the firing line), controlling keys to the JPG site (including keys for road barricades into the DU impact area), and maintaining warning signs around the JPG site perimeter and the DU impact area.

The failure to have an Army site presence as required by the JPG Security Plan was discussed with the licensee. The licensee plans to submit a license amendment request to remove the requirement for a three-person site management team from the license.

#### Unqualified Radiation Safety Officer (RSO)

Through a review of licensing documents, and interviews with licensee personnel, the inspector determined that the licensee had appointed an unqualified person as the RSO for the license from October 28, 2010 until approximately December 14, 2010. On October 21, 2010, the licensee submitted a letter to the NRC (ML103010264) appointing Dr. David K. Goldblum as the new JPG RSO effective October 28, 2010. The licensee was appointing a new RSO because Mr. Paul D. Cloud, the RSO at the time, was retiring. Mr. Paul D. Cloud retired on October 31, 2010. On November 2, 2010, the NRC responded to the licensee's letter (ML103010166) and requested that they provide information demonstrating Dr. Goldblum met the RSO qualifications outlined in NRC guidance and condition 11.A of the JPG license. On December 14, 2010, the licensee provided the NRC a response (ML110050088) and stated Dr. Goldblum, while otherwise well qualified, did not meet the specific License SUB-1435 RSO requirements. Through subsequent discussions with licensee personnel, the inspector was informed that Dr. Goldblum did not have the health physics experience or specialized knowledge

required by the license for the JPG RSO position. In the same December 14, 2010, letter, the licensee named Dr. Robert Cherry as the RSO for JPG and provided documentation demonstrating he met the qualifications outlined in condition 11.A of the license.

Condition 11.A of License No. SUB-1435 requires that licensed material be kept under the supervision of the Radiation Safety Officer, who shall have the education, training, and experience as stated on Conditions 11.A.1, 11.A.2, and 11.A.3 of the license.

Condition 11.A.1 states the RSO education requirements as a Bachelors degree in the physical sciences, industrial hygiene, or engineering from an accredited college or university or an equivalent combination of training and relevant experience in radiological protection. It also states two years of relevant experience are generally considered equivalent to 1 year of academic study.

Condition 11.A.2 states the RSO health physics experience requirement as at least one year of work experience in applied health physics, industrial hygiene, or similar work relevant to radiological hazards associated with site remediation. It also states that this experience should involve actually working with radiation detection and measurement equipment, not strictly administrative or "desk" work.

Condition 11.A.3 states the RSO specialized knowledge requirement as a thorough knowledge of the proper application and use of all health physics equipment used for depleted uranium and its daughters, the chemical and analytical procedures used for radiological sampling and monitoring, methodologies used to calculate personnel exposure to depleted uranium and its daughters, and a thorough understanding of how depleted uranium was used at the location and how the hazards are generated and controlled.

The failure to appoint an RSO with the training and experience as required by license condition 11.A from October 28, 2010 until approximately December 14, 2010 is a violation of license condition 11.A. (VIO 04008838/2013001-02)

The violation was categorized as a Severity Level IV (very low safety significance) violation as provided in section 6.3 of the NRC Enforcement Policy and consistent with the guidance in section 8.3.5.C of the NRC Enforcement Manual. The NRC Enforcement Policy would normally consider a failure to appoint a qualified RSO as a Severity Level III violation. However, the NRC determined that a Severity Level IV violation was more appropriate because of the overall minimal safety impact of the violation given the facts of the case. Specifically, the RSO duties at JPG, while important, are minimal due to the type of radioactive material (depleted uranium), the form of the material (relatively insoluble metal penetrator rounds), and the limited authorized activity (possession only for decommissioning) at the site. In addition, the duration of the violation was relatively short (about 1.5 months) and upon identification of the issue, the licensee took immediate corrective actions and appointed a qualified individual as the RSO for the license.

DU presents a very minimal external radiation hazard. The more safety significant concern with DU is an internal exposure to the material (inhalation or ingestion of the material). At JPG the DU is generally in the form of solid metal penetrator rounds that have a relatively insoluble chemical form. This makes the internal radiation hazard at

JPG also very minimal. Therefore, due to the type and form of DU at JPG, there is a very low overall radiation safety hazard at the site.

As stated previously, on approximately December 14, 2010, the licensee appointed Dr. Robert Cherry as the RSO for JPG and provided documentation demonstrating he met the qualifications outlined in condition 11.A of the license.

#### Submittal of Inadequate License Amendment

Through a review of licensing documents, the inspector noted that the licensee had submitted an improper license amendment request to the NRC. On November 28, 2011, the licensee submitted a letter to the NRC (ML120050042) requesting a twenty month extension for the submittal of the DP and Environmental Report (ER) required by condition 13 of License No. SUB-1435 Amendment 16. The license condition required the Army to submit the DP and ER to the NRC no later than the end of calendar year 2011. On April 2, 2012, the NRC responded to the Army's letter (ML120690219). The NRC determined that the extension request was incomplete and unacceptable. Specifically, the request was not consistent with the regulations for requesting a license amendment or approval of an alternative schedule for submittal of a DP. On May 2, 2012, the Army provided a response (ML12138A174) which included an NRC Form 313 (NRC license amendment application form) and information supporting the DP submittal extension request. Ultimately, on December 27, 2012, the NRC issued a letter, safety evaluation report, and License No. SUB-1435 Amendment 17 (ML12272A271, ML12272A294, and ML12272A274, respectively) which extended the DP and ER required submittal date to the NRC to no later than August 30, 2013.

Title 10 CFR 40.44 requires that applications for amendment of a license be filed on NRC Form 313 in accordance with 10 CFR 40.31 and that they specify the respects in which the licensee desires the license to be amended and the grounds for such amendment.

The failure to file on an NRC Form 313 the amendment request for a twenty month extension for submittal of the DP and ER is a violation of 10 CFR 40.44, "Amendment of licenses at request of licensee." However, the violation was categorized as a violation of minor safety significance and is not subject to formal enforcement action as provided in the NRC Enforcement Policy section 2.3.1 because: (1) the licensee submitted a letter to the NRC in a timely manner on November 28, 2011; and (2) subsequently, the licensee submitted an appropriate license amendment request to the NRC on May 2, 2012.

#### c. Conclusions

The inspector identified two Severity Level IV violations of NRC requirements for failure to have a three-person site management team and failure to appoint a qualified RSO for JPG. In addition, a minor violation was identified for failure to submit an adequate license amendment request to the NRC.

## 2.2 Radiation Protection

### a. Inspection Scope

The inspector reviewed the JPG license and license tie-downs to understand the licensee's radiation protection program and its requirements. The inspector also reviewed licensee documents relating to radiological protection. Interviews of licensee, FWS, and INANG personnel were performed to determine the types of radiological and access controls at JPG. A site tour was also performed to assess the licensee's radiological controls over the DU impact area. Lastly, the inspector examined the licensee's radiological instruments used for contamination monitoring.

### b. Observations and Findings

The inspector observed an adequately posted NRC Form 3 in a general area within the office space at the facility. During the site tour, the inspector noted that "Caution, Radioactive Materials" labels were correctly posted around the perimeter of the DU impact area, and on all the barricades observed leading into the area. The inspector reviewed completed annual RSO audits for 2011, 2012, and 2013 and determined that the licensee was performing periodic reviews of their radiation protection program as required by 10 CFR 20.1101(c).

During the inspection, the inspector observed that the licensee had contamination monitoring survey instruments capable of detecting DU that were within calibration. While capable of detecting DU contamination, the Geiger-Mueller (GM) detectors used by the licensee are not the best suited for performing contamination surveys. Through discussions with the RSO, the inspector was informed that the licensee is aware of the instrument's suitability, and that actions were being taken to try to procure GM pancake probes better suited for contamination surveys.

#### Inadequate Radiation Protection Program

Through discussions with the FWS manager and the licensee, the inspector discovered that there have been at least a few unauthorized or inadvertent entries into the JPG site by members of the public since the time the Big Oaks National Wildlife Refuge was opened in June 2000. The licensee was not able to provide a specific number of instances when this had occurred, or when these entries occurred, but did state that they were more common when the refuge initially opened. However, to the best of their knowledge, none of the unauthorized or inadvertent entries was into the DU impact area itself.

The JPG Security Plan requires that contamination monitoring be performed for hunters who inadvertently enter the DU impact area. As discussed previously, the Army delegated access controls to the JPG site, including the DU impact area, to the FWS through the May 2000 MOA. However, the MOA does not address contamination monitoring requirements for the JPG site or DU impact area. In addition, FWS personnel have no access to the Army survey equipment, have not been trained on the use of the survey equipment, and were not aware of the JPG Security Plan contamination monitoring requirement. Since there was no longer an Army site presence at JPG, the licensee did not have an established process to perform contamination monitoring of

persons who may inadvertently enter the DU impact area, as required by the JPG Security Plan.

Through interviews with the RSO, the inspector was informed that there was no documented radiation protection program for JPG due to the nature of the site and the “possession only for decommissioning” authorized activity on the license. The RSO stated that, to his knowledge and based upon his interviews of licensee personnel associated with the JPG site, there has not been a documented radiation protection program since at least 2004. The inspector noted that the JPG Security Plan has some aspects that would normally be included in a documented radiation protection program. The JPG Security Plan has posting requirements for the DU impact area, DU safety training requirements for on-site personnel and visitors, and (as discussed previously) requires contamination monitoring for hunters who inadvertently enter the DU impact area. The MOA also has some access control and training requirements that would normally be included in a documented radiation protection program. In addition, the licensee’s Field Sampling Plan and Health and Safety Plan (ML051520319) outline radiation protection requirements for site characterization activities performed by the licensee’s contractor.

Title 10 CFR 20.1101(a) requires that each licensee develop, document, and implement a radiation protection program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions of 10 CFR Part 20.

Title 10 CFR 20.1101(c) requires that each licensee periodically (at least annually) review the radiation protection program content and implementation.

Although the licensee has documents in place that discuss radiation protection requirements, the inspector determined that the licensee does not have a documented radiation protection program. Specifically, the licensee is required to have a documented radiation protection program that, at a minimum, ensures compliance with the requirements of 10 CFR 20.1101(c), the requirement for periodic reviews of the radiation protection program. Even though the licensee was complying with the requirement to perform periodic reviews of the radiation protection program (as stated above), they do not have a documented program that ensures the required periodic reviews will be performed in accordance with 10 CFR 20.1101(c).

In addition, the licensee has little or no documentation describing specific access requirements to the DU impact area for Army personnel, FWS personnel, INANG personnel, and other persons who may enter the area. Access requirements would typically describe who can enter the DU impact area, specific training required to enter the DU impact area, limitations of activities performed inside the DU impact area, and contamination monitoring requirements when exiting the area, among other things.

The failure to have a documented radiation protection program since at least 2004 is a violation of 10 CFR 20.1101(a), “Radiation protection programs.” However, the violation was categorized as a violation of minor safety significance and is not subject to formal enforcement action as provided in the NRC Enforcement Policy section 2.3.1 because: (1) the licensee was in compliance with the provisions of 10 CFR Part 20, including compliance with the 10 CFR 20.1101(c) requirement to perform periodic reviews of the radiation protection program content and implementation; and (2) it resulted in relatively inappreciable potential safety consequences.



As discussed in section 2.1 of this report, due to the type and form of DU at JPG, there is a very low overall radiation safety hazard at the site. In addition, the licensee has a very limited scope and extent of licensed activities due to their "possession only for decommissioning" authorized activity on the license. Since the licensee has some radiological controls in place through the MOA, the JPG Security Plan, the Field Sampling Plan for site characterization, and the Health and Safety Plan for site characterization, it is highly unlikely that any of the 10 CFR Part 20 provisions would have been violated by the licensee due to the lack of a documented radiation protection program.

The failure to have a documented radiation protection program for JPG was discussed with the licensee. The inspector also discussed with the licensee the lack of a process to perform contamination monitoring for persons who may have inadvertently entered the DU impact area. The licensee plans to develop a documented radiation protection program for the JPG site to address the violation and the observations provided by the inspector.

#### Inadequate Training

During a review of the JPG Security Plan, and interviews with licensee and FWS personnel, the inspector noted that DU safety training was not being provided to on-site personnel and visitors as required by the JPG Security Plan. The JPG Security Plan requires that the RSO provide on-site personnel with DU safety training and that visitors be provided a DU safety briefing that covers a description of the properties of DU, the harmful effects of DU, and what to do if contact is made with DU. Instead, the inspector discovered that DU safety training was being provided to on-site personnel and visitors as specified in the MOA. The MOA initially required the Army to provide DU safety training for FWS and Air Force personnel, and currently requires the FWS and the Air Force to provide DU safety training to their respective personnel and visitors.

As stated in sections 1.0 and 2.1 of this report, the Army has delegated access controls to the FWS and the INANG, and they no longer have a site presence at JPG. Therefore, FWS and INANG on-site personnel can effectively be considered on-site Army representatives, and site management personnel. Through discussions with the licensee, the inspector discovered that since at least 2010, the NRC license RSO has not provided FWS or INANG on-site personnel with any DU safety training. In addition, by going through the FWS safety briefing video (in place since approximately 2003) and reviewing documentation to gain access to the JPG site, the inspector determined that the required DU safety briefing topics were not being provided to visitors entering the JPG site.

Condition 12.D of License No. SUB-1435 requires, except as specifically provided otherwise in the license, that the licensee conduct its program in accordance with the statements, representations, and procedures contained in the JPG Security Plan included with the letter dated December 10, 2003 (ML033650261).

Section 9.e. of the JPG Security Plan describes the training for on-site personnel and visitors of the JPG site. Specifically, section 9.e.(1) states that all site management personnel have been given DU safety training by the NRC license Radiation Safety Officer. Section 9.e.(2) states, in part, that all personnel who are allowed entry into the

area north of the firing line are given a DU safety briefing, including a description of the properties of DU, the harmful effects of DU, and what to do if contact is made with DU.

The failure to provide on-site personnel and visitors training as required by the JPG Security Plan is a violation of license condition 12.D. (VIO 04008838/20130001-03)

The violation was categorized as a Severity Level IV (very low safety significance) violation as provided in sections 2.2.2 and 6.3 of the NRC Enforcement Policy because although the licensee failed to provide the training as required in the JPG Security Plan, there were no potential safety consequences because sufficient training had been provided to on-site personnel and visitors.

As stated previously, the MOA requires that the FWS and the Air Force provide their personnel and visitors DU safety training. For the FWS and INANG personnel interviewed, the inspector determined that they had sufficient DU safety training to meet the intent of the JPG Security Plan training required. The personnel interviewed understood the safety concerns inside the DU impact area and the fact that they were to stay only on the roads inside the DU impact area. The RSO stated that the roads inside the DU impact area had been previously cleared from any UXO and DU. For FWS visitors to JPG, the safety briefing provided does not cover the DU safety briefing topics required. The briefing and FWS access controls do not allow visitors to go into or near the DU impact area, which limits the impact of the omitted training. INANG visitors are also not allowed to go into or near the DU impact area.

The failure to provide training as required by the JPG Security Plan was discussed with the licensee. The JPG RSO plans to provide FWS and INANG personnel DU safety training during his next site visit. The licensee also plans to submit a license amendment request to modify the license requirement and to develop a radiation protection program for the JPG site which will address training requirements, among other things.

c. Conclusions

The inspector identified one Severity Level IV violation of NRC requirements for failure to provide DU safety training in accordance with the requirements of the JPG Security Plan. In addition, a minor violation was identified for failure to have a documented radiation protection program.

2.3 Security and Control of Licensed Material

a. Inspection Scope

The inspector reviewed the JPG license, license tie-downs, and other site documents to understand the licensee's radioactive material security and control requirements. The inspector also interviewed licensee, FWS, and INANG personnel to understand roles and responsibilities for the security and control of the radioactive material at JPG. In addition, a site tour was performed to assess the licensee's control over the DU impact area.

b. Observations and Findings

The inspector noted, through a review of documents and interviews of personnel, three differences between the site security and controls that were specified in the license and license tie-downs (the JPG Security Plan), and those specified in the MOA. The MOA is the guiding document that is currently implemented at JPG to secure and control the site. The differences noted by the inspector between the requirements of the JPG Security Plan and the MOA are: (1) the army site presence requirements as described in section 2.1 of this report; (2) the contamination monitoring requirements as described in section 2.2 of this report; and (3) the training requirements as described in section 2.2 of this report.

During the site tour the inspector noted that there is an approximately eight foot chain link fence with barbed wire around the outside perimeter of the JPG site. The fence contained "No Trespassing" signs with UXO warning symbols. The DU impact area is in the center of the southern portion of the JPG site, and within the JPG site perimeter fence. The inspector observed that the roads leading to the DU impact area were controlled by locked barricades which had "Caution, Radioactive Materials" postings. In addition, there were "Caution, Radioactive Materials" signs on trees and/or stakes around the perimeter of the DU impact which aid in controlling access to it by persons on foot. Access to the DU impact area is controlled by the FWS and the INANG to only authorized personnel. The FWS access plan for visitors to the Big Oaks National Wildlife Refuge does not allow entry into the DU impact area. Visitors are provided daily permits that only allow access to assigned areas within the JPG site, away from the DU impact area, for recreational purposes. The inspector determined that access to the JPG site, with the exception of the differences between the JPG Security Plan and the MOA stated above, was being controlled in accordance with license and regulatory requirements.

During the site tour, a hole in the outer perimeter fence was noted by the inspector. Through interviews with the INANG and the licensee, the inspector was informed that there is a fence contractor who performs fence inspections on a weekly basis. The licensee provided the NRC inspector the fence inspection documents from January 2008 until March 2013. The documentation suggested that the hole observed by the inspector had been in place less than a week. The licensee performed a temporary fix of the hole on April 4, 2013, and afterwards, on approximately April 18, 2013, the fence contractor repaired the hole. The inspector concluded that the licensee was maintaining the JPG site perimeter fence in accordance with the license requirements.

No findings of significance were identified

c. Conclusions

The licensee, with the exception of the violations identified in sections 2.1 and 2.2 of this report, is adequately controlling access to and securing the radioactive material at JPG. The JPG site perimeter fence is being maintained in accordance with the license requirements.

## 2.4 Environmental Monitoring

### a. Inspection Scope

The inspector performed a site tour to observe the physical condition of the monitoring wells used to collect data in support of the JPG site decommissioning effort. The inspector also performed interviews of licensee personnel responsible for maintaining the monitoring wells.

### b. Observations and Findings

All of the wells observed by the inspector were adequately covered and locked. The physical condition of the monitoring wells observed was generally good; however, some of them had degraded bases which could impact the integrity of samples collected from them. In addition, some of the wells observed had degraded labels making it difficult to identify them in the field. The inspector discussed the degraded monitoring well conditions with the licensee. The licensee stated that the condition of the wells would be assessed by their environmental monitoring contractor during the next sampling event scheduled for the spring of 2013.

No findings of significance were identified.

### c. Conclusions

The monitoring wells observed by the inspector were adequately covered and locked. The physical condition of the monitoring wells observed was generally good; however, some of the wells had degraded bases and labels which the licensee plans to assess.

## 3.0 **Exit Meeting Summary**

The inspector presented the interim inspection results to licensee management at the conclusion of the onsite inspection on April 4, 2013. After in-office review was completed on May 13, 2013, a final exit teleconference was held on May 13, 2013. The licensee acknowledged the results presented and did not identify any of the documents reviewed by the inspectors as proprietary.

## SUPPLEMENTAL INFORMATION

### PARTIAL LIST OF PERSONS CONTACTED

<sup>2</sup>J. Himsl, Garrison Manager  
<sup>1,2</sup>Dr. R. Cherry, Radiation Safety Officer  
<sup>2</sup>Dr. T. Lineer, Program Manager  
<sup>2</sup>J. Briggs, Branch Chief  
<sup>2</sup>F. Kopp, Legal Counsel  
<sup>2</sup>J. Golden, Safety Manager  
<sup>2</sup>D. Hoag, Plans Analyst  
<sup>1</sup>J. Germano, Safety/Real Property Officer  
<sup>2</sup>Dr. J. Robb, Refuge Manager  
J. Deaton, Range Maintenance Non-Commissioned Officer in Charge

<sup>1</sup>Participated in interim site exit meeting on April 4, 2013.

<sup>2</sup>Participated on the final exit teleconference held on May 13, 2013.

### LIST OF PROCEDURES USED

IP 87104      Decommissioning Inspection Procedure for Materials Licensees

### ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Opened</u>	<u>Type</u>	<u>Summary</u>
04008838/20130001-01	VIO	Failure to maintain a three-person-site management team with a duty station at JPG
04008838/20130001-02	VIO	Failure to appoint an RSO with the training and experience as required by license condition 11.A
04008838/20130001-03	VIO	Failure to provide on-site personnel and visitors training as required by the JPG Security Plan

<u>Discussed</u>	<u>Type</u>	<u>Summary</u>
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None

<u>Closed</u>	<u>Type</u>	<u>Summary</u>
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None

### LIST OF ACRONYMS USED

ADAMS      Agencywide Documents Access and Management System  
ANG      Air National Guard

Enclosure

CFR	Code of Federal Regulations
DNMS	Division of Nuclear Materials Safety
DP	Decommissioning Plan
DU	Depleted Uranium
ER	Environmental Report
FWS	Fish and Wildlife Service
GM	Geiger-Mueller
INANG	Indiana Air National Guard
IP	Inspection Procedure
IR	Inspection Report
ISFSI	Independent Spent Fuel Storage Installation
JPG	Jefferson Proving Ground
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NRC	U. S. Nuclear Regulatory Commission
RSO	Radiation Safety Officer
UXO	Unexploded Ordnance
VIO	Violation

### **PARTIAL LIST OF DOCUMENTS REVIEWED**

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

Acknowledgment of Danger: Release and Hold Harmless Agreement and Access Permit Application for Big Oaks National Wildlife Refuge, current version on April 4, 2013

Big Oaks National Wildlife Refuge Map & Regulations, current version on April 4, 2013

Environmental Radiation Monitoring Program Plan for License SUB-1435 Jefferson Proving Ground, dated September 2003 (ML032731017)

Explosive Ordnance Incident Reports 706-20-13 and 706-21-13, dated April 9, 2013

Jefferson Proving Ground Fence Inspection Reports from January 2008 until March 2013

Jefferson Proving Ground Field Sampling Plan, dated May 25, 2005 (ML051520319)

Jefferson Proving Ground Firing Range Memorandum of Agreement (MOA), dated May 2000 (ML003729463)

Jefferson Proving Ground Site Map, dated June 21, 2002 (ML021960142)

Jefferson Proving Ground (JPG) Security Plan, dated December 10, 2003 (ML033650261)

Letter from the Department of the Army to the NRC, dated May 25, 1995 (9506140142)

Letter from the Department of the Army to the NRC, dated February 4, 2003 (ML030440093)

Letter from the Department of the Army to the NRC, dated October 26, 2005 (ML073090596)

Letter from the Department of the Army to the NRC, dated November 16, 2005 (ML053350356)

Letter from the Department of the Army to the NRC, dated February 9, 2006 (ML060590379)

Letter from the Department of the Army to the NRC, dated October 21, 2010 (ML103010264)

Letter from the Department of the Army to the NRC, dated December 14, 2010 (ML110050088)

Letter from the Department of the Army to the NRC, dated November 28, 2011 (ML120050042)

License Amendment Request, dated August 29, 1994 (ML003685257 and ML003685264)

License Amendment Request, dated February 4, 2008 (ML080460238)

License Amendment Request, dated September 29, 1995 (ML003685253)

License Amendment Request, dated May 2, 2012 (ML12138A174)

License SUB-1435 Decommissioning/Termination Plan, dated July 2001 (ML011800338)

NRC Letter, Replacement of Mr. Paul Cloud with Dr. David Goldblum as the Radiation Safety Officer for the Jefferson Proving Ground U.S. Nuclear Regulatory Commission License SUB-1435, dated November 2, 2010 (ML103010166)

NRC Letter, Response to Army Extension Request of November 28, 2011, Concerning JPG Decommissioning Plan, dated April 2, 2012 (ML120690219)

NRC Letter, Summary of May 4, 2000, Meeting to Provide Update on Jefferson Proving Ground Site in Madison, Indiana, dated May 22, 2000 (ML003717202)

NRC Memorandum, Notice of Withdrawal of License Amendment Request of the Department of the Army for the Jefferson Proving Ground Site, dated August 19, 2005 (ML052200658)

Science Applications International Corporation License No. 24-32591-01 Amendment No. 5 (ML100130061)

SECY-03-0031, Jefferson Proving Ground Decommissioning Status, dated March 3, 2003 (ML023430018)

Tri-fold Pocket Brochure, What is UXO, current version on April 4, 2013

Unexploded Ordnance (UXO) Identification Guide, current version on April 4, 2013

Unexploded Ordnance (UXO): An Overview, current version on April 4, 2013

U.S. Department of Army License No. SUB-1435 Amendment No. 9 and Associated Safety Evaluation Report, dated May 8, 1996 (9605150402)

U.S. Department of Army License No. SUB-1435 Amendment No. 10 and Associated Safety Evaluation Report, dated June 8, 2010 (ML003716868 and ML003716871)

U.S. Department of Army License No. SUB-1435 Amendment No. 11, dated December 31, 2003 (ML033560548)

U.S. Department of Army License No. SUB-1435 Amendment No. 12, dated November 26, 2004 (ML043270138)

U.S. Department of Army License No. SUB-1435 Amendment No. 13 and associated Safety Evaluation Report, dated April 26, 2006 (ML053320014)

U.S. Department of Army License No. SUB-1435 Amendment No. 14, dated December 4, 2007 (ML073030415)

U.S. Department of Army License No. SUB-1435 Amendment No. 15, dated April 13, 2009 (ML080360567)

U.S. Department of Army License No. SUB-1435 Amendment No. 16, dated February 3, 2011 (ML110130070)

U.S. Department of Army License No. SUB-1435 Amendment No. 17 and Associated Safety Evaluation Report, dated December 27, 2012 (ML12272A274 and ML12272A294)

2011 RSO Audit for License SUB-1435, dated November 30, 2010

2012 RSO Trip Report, dated April 2, 2012

2013 RSO Trip Report, dated March 29, 2013