



Department of Energy
National Nuclear Security Administration
Washington DC 20585

August 11, 2011

OFFICE OF THE ADMINISTRATOR

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Dr. Stephen M. Younger
President
National Security Technologies, LLC
2621 Losee Road
M/S NSF001
Las Vegas, Nevada 89030

NEA-2011-03

Dear Dr. Younger:

The Office of Health, Safety and Security's Office of Enforcement and Oversight has completed its investigation into the facts and circumstances associated with quality assurance (QA) related deficiencies in the inspection and installation of penetration fire seals and other components at the Criticality Experiments Facility (CEF) and the Device Assembly Facility (DAF) at the Nevada National Security Site. The results of the investigation were provided to National Security Technologies, LLC (NSTec) in an Investigation Report, dated August 31, 2010. An enforcement conference was held on October 27, 2010, at the National Nuclear Security Administration's (NNSA) Nevada Site Office in Las Vegas, Nevada. A summary of the enforcement conference is enclosed.

Based on an evaluation of the evidence in this matter, including information presented during the enforcement conference, NNSA has concluded that violations of 10 C.F.R. Part 830, *Nuclear Safety Management*, by NSTec have occurred. The enclosed Preliminary Notice of Violation (PNOV) cites four Severity Level II violations with a total proposed civil penalty of \$178,750. NNSA has exercised enforcement discretion by using the maximum base civil penalty amount authorized under 10 C.F.R. § 820.81 at the time that NSTec initially identified the inspection deficiencies. This decision was based on the fact that the majority of the noncompliances were identified by NSTec before January 13, 2010, when the maximum base civil penalty was increased from \$55,000 to \$75,000 per day for each Severity Level II violation.

NNSA considers the failure to perform required inspections on the penetration fire seals at the CEF to be of high safety significance. The penetration fire seals are safety class structures, systems, and components, designed to maintain the integrity of safety class walls and protect both workers and the public from the radiological hazards present in this hazard category 2 nuclear facility. According to the NSTec investigation, the quality control engineer responsible for performing the inspections was aware of the



requirement, but did not perform the inspections. In addition, the workers who installed the seals proceeded with their work despite the fact that the required inspections were not performed.

In determining the appropriate civil penalty, NNSA did not grant mitigation for timely self-identification and reporting of the noncompliances. NNSA believes that there was an unacceptable delay in NSTec's identification of the fire seal inspection deficiencies through its QA activities. It was almost a year after NSTec workers first began installing penetration fire seals in the CEF before NSTec determined that the required inspections had not been performed. NNSA believes that there was substantial opportunity for NSTec to discover these deficiencies through normal oversight processes. At no time during the fire seal installation and inspection process did NSTec monitor the quality management system processes for installation of fire seals, identify problems, or take timely and effective corrective action to ensure that quality control inspections were performed.

In addition, there was another nine month delay before NSTec became aware that these same inspection deficiencies extended to the DAF. Once a significant quality problem has been identified, NNSA's expectation is that the contractor will perform an extent-of-condition review to determine the full extent and generic implications of the problem. While NSTec did perform an extent-of-condition review in response to the inspection issues at CEF, it was not effective in identifying the full extent of the problem.

NNSA acknowledges that, once the systemic issues were recognized, NSTec took comprehensive actions to fully examine the issues and institute comprehensive corrective actions. NSTec recognized that the extent-of-condition review was deficient, and performed a second root cause analysis and extent-of-condition review to thoroughly investigate and resolve those deficiencies.

NNSA recognizes NSTec's commitment to improvement, as presented during the enforcement conference. It is clear that NSTec understands the underlying cultural issues will require a continuous, disciplined effort to address. NNSA believes that NSTec senior management is committed and involved, as evidenced by the establishment of the Executive Safety Review Board. NNSA commends NSTec for the development of its Formality of Operations Improvement Plan, and the stated goal to become a premier nuclear operations site. NSTec has also created a new Nuclear Operations Directorate, to focus resources on nuclear issues, and established a Quality Systems Assurance Division to integrate quality functions. NSTec has developed a sampling plan for the destructive evaluation of the penetration fire seals at the CEF and DAF, which uses a statistically valid approach to determine the status of the installed seals.

Based on the corrective actions taken by NSTec in response to these issues, 25 percent mitigation of the base civil penalty was applied to three of the four violations. Based on the time delays described above, mitigation was not considered appropriate for the quality improvement violation.

Pursuant to 10 C.F.R. § 820.24, *Preliminary Notice of Violation*, you are required to file a reply within 30 calendar days after the date of filing of the enclosed PNOV and to follow the instructions specified in the PNOV when preparing your reply.

After reviewing your reply to the PNOV, including any additional corrective actions entered into DOE's Noncompliance Tracking System, NNSA will determine whether further enforcement action is necessary to ensure compliance with DOE nuclear safety requirements. NNSA will continue to monitor the completion of corrective actions until these matters are fully resolved.

Sincerely,

A handwritten signature in black ink, appearing to read "T.P. D'Agostino". The signature is fluid and cursive, with a large initial "T" and a long, sweeping underline.

Thomas P. D'Agostino
Administrator
National Nuclear Security Administration

Enclosures: Preliminary Notice of Violation
Enforcement Conference Summary

cc: Stephen Mellington, NSO
Jason Prestridge, NSTec
Richard Azzaro, DNFSB

Preliminary Notice of Violation

National Security Technologies, LLC
Nevada National Security Site

NEA-2011-03

As a result of a U.S. Department of Energy (DOE) investigation into the facts and circumstances associated with failure to perform required inspections of penetration fire seals and other components at the Criticality Experiments Facility (CEF) and the Device Assembly Facility (DAF) located at the Nevada National Security Site, multiple violations of DOE nuclear safety requirements were identified. Violations committed by National Security Technologies, LLC (NSTec) include: (1) failure to effectively identify, control, and prevent recurrence of quality problems, (2) failure to follow procedures and ensure that procedures were adequate, (3) failure to inspect using established acceptance and performance criteria, and (4) failure to fully develop technical safety requirements (TSR) for penetration fire seals and failure to seal DAF building penetrations.

DOE has categorized the violations as four Severity Level II violations and, in consideration of the mitigating factors, imposes a total proposed civil penalty of \$178,750. According to 10 C.F.R. Part 820, *General Statement of Enforcement Policy*, Appendix A, § VI(b), “[s]everity level II violations represent a significant lack of attention or carelessness toward responsibilities of DOE contractors for the protection of public or worker safety which could, if uncorrected, potentially lead to an adverse impact on public or worker safety at DOE facilities.” As required by 10 C.F.R. § 820.24(a) and consistent with Part 820, appendix A, the violations are described below. Citations specifically referencing the quality assurance (QA) criteria of 10 C.F.R. § 830.122 also constitute a violation of § 830.121(a), which requires compliance with those QA criteria.

VIOLATIONS

A. Quality Improvement

Title 10 C.F.R. § 830.122(c) requires contractors to: “(1) [e]stablish and implement processes to detect and prevent quality problems[;] (2) [i]dentify, control, and correct items, services, and processes that do not meet established requirements[; and] (3) [i]dentify the causes of problems and work to prevent recurrence as a part of correcting the problem.”

Contrary to these requirements, NSTec failed to effectively identify, control, and prevent recurrence of quality problems related to the inspection and installation of penetration fire seals and other components. Specific examples include the following:

1. NSTec document RD-3200.001, *Quality Assurance Requirements Document*, Revision 3, Section 9, Subsection 3.1.F, states that “[t]he organization shall apply suitable methods for monitoring and, where applicable, measurement of the quality management system

processes. These methods shall demonstrate the ability of the processes to achieve planned results. When planned results are not achieved, correction and corrective action shall be taken, as appropriate, to ensure conformity of the product.” Subsection 4.1.[6].L requires NSTec managers to monitor, measure, and analyze processes needed to ensure effective planning, operation, and control for the achievement of quality. In June 2008, NSTec workers began the installation of penetration fire seals in the CEF. Over the next several months, approximately 540 fire seals were installed. The work packages for this activity required workers to adhere to established hold points to allow the Quality Control Engineers (QCE) to examine the work at specified points during installation. However, these inspections were not performed as required, and installation proceeded beyond the hold points without the benefit of these inspections. In April 2009, during a review of work packages in preparation for facility startup, an NSTec employee noticed that the Inspection Checklist Reports (ICR) for the penetration fire seals were not included in the work packages. At no time during the fire seal installation and inspection process did NSTec monitor the quality management system processes for installation of fire seals, identify problems, and take timely and effective corrective action to ensure that hold points were adhered to and that quality control (QC) inspections were performed.

2. NSTec Core Company Directive CCD-QA08.002, *Control of Nonconforming Items*, Revision 0, Section 4.2.[1], states that employees are to “[i]dentify and immediately notify their Manager/Supervisor when the employee discovers a potential nonconforming item.” In such a case, Section 4.2.[4].A requires that the appropriate Responsible Manager be notified and the potential nonconformance be documented. However, in several cases, QCEs identified items that failed to conform to established acceptance criteria but did not write nonconformance reports to document those deficiencies. Furthermore, the corresponding ICRs were signed off for “accuracy and completeness and ready for final processing” without ensuring that the identified deficiencies had been corrected. These deficiencies included:
 - a. Fifty-one ICRs documented cable/wire pulling tension that exceeded established limits for the cable/wire.
 - b. Two ICRs documented the rejection of the installation of anchor bolts.
 - c. Two ICRs documented the rejection of items because they exceeded spacing limits.
3. Core Company Directive CCD-QA08.001, *Inspection and Testing for Acceptance*, Revision 0, Sections 4.1.[8] through [19], defines the roles and responsibilities of the Quality Control Coordinator (QCC), which include: (1) reviewing and incorporating into work packages all approved final Project Inspection Plans (PIP) and ICRs as they are generated, (2) ensuring the closeout of completed PIPs and ICRs, (3) reviewing work packages to ensure that hold points and inspection attributes were properly executed and signed off by the applicable QCE, and (4) providing a signature in the work package to indicate that all inspection attributes were met. However, NSTec assigned the QCE as the QCC for the installation of the penetration fire seals in the CEF, thereby eliminating the important independent review associated with the QCC roles and responsibilities. This action contributed to NSTec’s failure to proactively identify and correct the

problems in the installation and inspection of fire seals, which were subsequently identified during work package review in preparation for facility startup.

4. NSTec document RD-3200.001, *Quality Assurance Requirements Document*, Revision 3, Section 9, Subsections 8.1.D.2.a and b, states that “[s]ampling procedures, when used, shall be based upon valid statistical methods” and “[s]ampling plans shall prescribe random sampling unless otherwise approved by the design authority and shall afford a sound statistical basis to ensure quality.” Upon discovery that the penetration fire seal inspections in the CEF had not been performed, NSTec decided to destructively sample one fire seal from each of the nine buildings in the CEF to provide confidence that the remaining seals were of acceptable quality. However, this sampling plan did not provide for a statistically valid sample size. Further, eight of the nine destructively sampled fire seals were of the same seal type, leaving other types of fire seals present in the CEF unevaluated. NSTec’s fire seal sampling process did not provide sufficient assurance of the quality of the penetration fire seals installed in the CEF.
5. NSTec document RD-3200.001, *Quality Assurance Requirements Document*, Revision 3, Section 9, Subsection 9.1.A.4, states that “[m]anagement and independent assessments shall be conducted to:
 - a. evaluate item and service quality,
 - b. evaluate the adequacy of work performance, and
 - c. promote improvement”

Subsection 10.0.G, states that “[i]nternal independent assessments will concentrate on performance and observation of work activities and the results of process implementation.” Over the past three years, NSTec performed management and independent assessments related to work control or QC inspection at the DAF and CEF. However, these assessments were not effective in identifying or correcting QA deficiencies associated with the installation and inspection of penetration fire seals in the DAF and CEF. The more significant deficiencies are related to work proceeding past hold points without the required inspections being performed, and the failure of the QCE to perform and document required inspections.

Collectively, these noncompliances constitute a Severity Level II violation.

Base Civil Penalty – \$55,000

Proposed Civil Penalty – \$55,000

B. Work Processes

Title 10 C.F.R. § 830.122(e)(1) requires contractors to “[p]erform work consistent with technical standards, administrative controls, and other hazard controls adopted to meet regulatory or contract requirements, using approved instructions, procedures, or other appropriate means.”

Contrary to this requirement, there were multiple instances in which NSTec procedures used to ensure proper installation and inspection of fire seals and other components were either inadequate or not followed. Specific examples include the following:

1. NSTec QCEs are responsible for performing QC inspections and documenting the results of the inspections in the associated PIPs and ICRs. Core Company Directive CCD-QA08.001, *Inspection and Testing for Acceptance*, Revision 0, Section 4.3.[3.1], states that QCEs will “[d]ocument the results of the inspections in the appropriate sections of the PIP and/or ICRs, indicating the status of the inspections as being accepted or rejected by placing an X or [check] in the appropriate block.” However, in several instances, inspection results were not fully documented in the ICRs as required by procedure. Specific examples include the following:
 - a. Post anchor installation inspections were missing on ICRs
 - b. Verifications that the drill bit is sized to the anchor were not performed.
2. NSTec uses PIPs and ICRs to document information important to quality in order to provide assurance that the item has been inspected and is acceptable for use in the facility. NSTec document RD-3200.001, *Quality Assurance Requirements Document*, Revision 3, Section 9, Subsection 8.1.G.1, states that “[a]ppropriate records shall be established, maintained and, as a minimum, identify the following paras. a through f:
 - a. Item Inspected
 - b. Date of Inspection
 - c. Inspector
 - d. type of observation
 - e. results or acceptability
 - f. reference to information on action taken in connection with nonconformances”

However, in some instances, CEF work packages were signed off as “work complete” by the work supervisor without the required documented date of inspection on the associated ICRs.

3. NSTec, as part of their work control process, establishes hold points in work instructions. Work is not to proceed beyond these hold points until the required QC inspections have been performed. NSTec document RD-3200.001, *Quality Assurance Requirements Document*, Revision 3, Section 9, Subsection 8.1.C, states that “[i]f mandatory inspection hold points are required beyond which work shall not proceed without the specific consent of the designated representative, the specific hold points shall be indicated in appropriate documents.” However, during the installation of penetration fire seals in the DAF and CEF, work proceeded beyond the hold points without the required inspections being performed and without the consent of the QCE.
4. Work instructions in the work packages associated with the installation of penetration fire seals define the actions necessary to complete the installation of the seals, including the hold points and in process points to allow for QC inspection of the fire seals as they are

being installed. However, the work instructions did not explicitly state that installation is not to proceed until the QC inspections have been performed. Instead, the work instructions stated that workers are to contact QC to accomplish the defined inspection. In addition, the work instructions did not explicitly direct workers to complete the hold point log. This lack of specificity in the work instructions may have contributed to the workers proceeding past established hold points without the required QC inspections.

5. Timely documentation of QC inspection results is important to ensure both accuracy and completeness of the activity. NSTec Core Company Directive CCD-QA08.001, *Inspection and Testing for Acceptance*, Revision 0, Section 4.3, delineates the inspection requirements for NSTec construction projects. While the requirement specifies that QC inspectors must document the results of their inspections, there are no expectations or requirements indicating how soon these inspections are to be documented on the ICRs and subsequently incorporated into associated work packages. It was not uncommon for multiple ICRs to accumulate for extended periods of time (sometimes years) with the intention of issuing a single comprehensive ICR.
6. As part of its work package QA process, NSTec used the *CEF Task and Material Installation Traveler* to document completion of work activity and hold point QC inspection for construction-related activities within the CEF. However, the use of this traveler was not formally addressed in any NSTec work instructions or procedures.
7. NSTec Core Company Directive CCD-QA08.001, *Inspection and Testing for Acceptance*, Revision 0, Section 4.1.[14], states that the QCC is to “[e]nsure the closeout of the PIPs and/or ICRs when all required inspection activities have been completed and found acceptable.” Closure of the PIP is documented through a signature and date attesting to the fact that “[a]ll quality verifications of this Project Inspection Plan have been completed with supporting inspection documentation included into the applicable Work Package.” Contrary to these requirements, NSTec surveillance SR-09-P240-008, conducted July 6-29, 2009, identified that PIP work packages associated with the CEF were not signed off as closed. It should also be noted that CCD-QA08.001 does not explicitly state an expectation or requirement for how soon the closure verification and signature have to be accomplished after completion of the inspection activities defined in the PIP.

Collectively, these noncompliances constitute a Severity Level II violation.

Base Civil Penalty – \$55,000

Proposed Civil Penalty (as adjusted) – \$41,250

C. Inspection and Acceptance Testing

Title 10 C.F.R. § 830.122(h)(1) requires contractors to “[i]nspect and test specified items, services, and processes using established acceptance and performance criteria.”

Contrary to this requirement, NSTec QCEs failed to inspect penetration fire seals and conduit runs using established acceptance and performance criteria as described below:

One of the primary barriers that NSTec used to control item quality was QC inspections. NSTec assigned QCEs to perform QC inspections by visually examining items during and after installation, and documenting the inspection results on PIPs and ICRs. NSTec document RD-3200.001, *Quality Assurance Requirements Document*, Revision 3, Section 9, Subsections 8.1.A.2 and 3, states that “[i]nspection and testing of specified items, services, and processes shall be conducted under controlled conditions using established acceptance and performance criteria” and “[i]nspection and test requirements and results shall be documented.” Core Company Directive CCD-QA08.001, *Inspection and Testing for Acceptance*, Revision 0, Section 1.1.2, states that QCEs “will perform inspection and/or testing of construction and/or maintenance installations and activities to verify that acceptance criteria have been met.” Quality Inspection Plan 06012-QIP-FP-285, *Installation of Fire Stop and Fire Foam in DAF Wall and Floor Penetrations*, Revision 2, states that the QCE is to verify that: (1) the fire stop material to be used is the Hilti FS-One, CP 620, or mineral wool; (2) installation of the material is in accordance with Hilti instructions; (3) the material used is MASTERFLOW 928 Grout; (4) the grout completely fills the penetration with no voids; and (5) the final installation in the penetrations meets the requirements of the selected Hilti drawing. However, in several instances, these required inspections were not performed (or no ICRs could be found) to verify completion of the inspections for the following installations:

- a. Approximately 540 penetration fire seals in the CEF
- b. Eight conduit runs in the CEF
- c. An indeterminate number of penetration fire seals in the DAF.

This noncompliance constitutes a Severity Level II violation.
 Base Civil Penalty – \$55,000
 Proposed Civil Penalty (as adjusted) – \$41,250

D. Technical Safety Requirements

Title 10 C.F.R. § 830.201 requires that “[a] contractor must perform work in accordance with the safety basis for a hazard category 1, 2, or 3 DOE nuclear facility and, in particular, with the hazard controls that ensure adequate protection of workers, the public, and the environment.”

Title 10 C.F.R. § 830.205(a)(1) requires contractors to “[d]evelop technical safety requirements that are derived from the documented safety analysis.”

Contrary to these requirements, NSTec failed to ensure that adequate controls (penetration fire seals) were in place to ensure protection of workers, the public, and the environment from the spread of airborne radioactive material, and failed to ensure that TSRs were derived from the DAF documented safety analysis (DSA) to provide for the visual inspection of penetration fire seals, as described below:

1. NSTec document UCRL-ID-154613, *Nevada Test Site Device Assembly Facility Documented Safety Analysis*, Revision 2, Table 4-2, identifies the building structures in the 370 corridor as safety structures, systems, and components (SSC) for confinement of airborne radioactive material. Section 4.3.1.2.4 of the DAF DSA states that “[c]onfinement for buildings identified in Table 4-2 is provided by the structure itself, including structure penetration seals, the blast doors, and high efficiency particulate air (HEPA)-filtered ventilation systems.” Section 4.3.1.4.4 of the DAF DSA states that “[b]uilding wall and ceiling penetrations must be sealed with a rigid and pliant sealing media.” Section 4.3.1.5 of the DAF DSA lists the TSR controls for the DAF associated with eight facility safety functions. One such control states that the 370 building structures “must maintain their design integrity to confine radioactive material and mitigate releases to the environment.” However, in March 2010, NSTec discovered that 58 penetrations were not sealed with rigid and pliant media between the first floor and the second floor of the DAF 370 building (DAF corridor). The failure to seal these penetrations compromised the building’s ability to confine radioactive material and mitigate releases to the environment.

2. The DAF DSA, in part, identifies passive design engineered building features (e.g., penetration fire seals) that could have a significant impact on safety if altered or modified. One control to ensure that these design features are not altered or modified is the use of in-service inspections and the associated TSRs. NSTec document UCRL-ID-154613, *Nevada Test Site Device Assembly Facility Documented Safety Analysis*, Revision 2, Section 5.6.1, requires that in-service inspections be performed to maintain building structural capabilities. Specifically, NSTec is to “[v]isually inspect building structures (including penetration seals) for degradation, damage, and unauthorized modifications that could adversely affect the confinement of radioactive materials within the building.” For building 370, which is within the DAF, this in-service inspection requirement was not carried forward into section 6.1 and table 6-1 of the DAF TSRs.

Collectively, these noncompliances constitute a Severity Level II violation.

Base Civil Penalty – \$55,000

Proposed Civil Penalty (as adjusted) – \$41,250

REPLY

Pursuant to 10 C.F.R. § 820.24(b), NSTec is hereby obligated, within 30 calendar days after the date of filing of this Preliminary Notice of Violation (PNOV), to file a written reply, signed by the person filing it. The reply should be clearly marked as a “Reply to the Preliminary Notice of Violation.”

If NSTec chooses to terminate this enforcement action by not contesting the PNOV, then pursuant to 10 C.F.R. § 820.24(d): (1) the reply should state that NSTec agrees to comply with the proposed remedy and waives any right to contest the PNOV or the remedy; and (2) this PNOV will constitute a Final Order upon the filing of the reply. In such cases and in accordance with 10 C.F.R. § 820.32(c), the total civil penalty of \$178,750 must be remitted within

30 calendar days after the PNOV becomes a Final Order. Payment of the civil penalty must be made by check, draft, or money order payable to the Treasurer of the United States (Account 891099) and mailed to the address provided below.

If NSTec chooses to contest any aspect of this PNOV or the proposed remedy, then as applicable and in accordance with 10 C.F.R. § 820.24(c), the reply should include: (1) any facts, explanations, and arguments which support a denial that a violation has occurred as alleged; (2) any extenuating circumstances or other reason why the proposed remedy should not be imposed or should be mitigated; (3) a discussion of the relevant authorities which support the position asserted, including rulings, regulations, interpretations, and previous decisions issued by DOE. In addition, 10 C.F.R. § 820.24(c) requires that the reply include copies of all relevant documents.


Corrective actions that have been or will be taken to avoid further violations should be delineated with target and completion dates in DOE's Noncompliance Tracking System.

Please send the appropriate reply by overnight carrier to the following address:

Director, Office of Enforcement
Attention: Office of the Docketing Clerk
U.S. Department of Energy
19901 Germantown Road
Germantown, MD 20874-1290

A copy of the reply should also be sent to my office and the Manager of the Nevada Site Office.

Pursuant to 10 C.F.R. § 820.33(a), if NSTec does not submit a written reply within 30 calendar days after the date of filing of this PNOV, the NNSA Administrator will request that a Default Order be issued against NSTec.



Thomas P. D'Agostino
Administrator
National Nuclear Security Administration

Washington, D.C.
this 11th day of Aug. 2011