UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
MARQUIS ONE TOWER
245 PEACHTREE CENTER AVENUE, NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

December 8, 2011

Jay Laughlin, Chief Nuclear Officer
and Vice President of Operations
National Enrichment Facility
P.O. Box 1789
Eunice, NM 88231

SUBJECT: LOUISIANA ENERGY SERVICES, L.L.C., NATIONAL ENRICHMENT FACILITY NRC INSPECTION REPORT NO. 07003103/2011009 AND NOTICE OF VIOLATION

Dear Mr. Laughlin:

The U.S. Nuclear Regulatory Commission (NRC) conducted an inspection of activities associated with the construction of the Louisiana Energy Services, L. L. C., National Enrichment Facility from September 26 to October 7, 2011 and from October 31 to November 4, 2011. The purpose was to inspect the procurement, installation, and dedication of mechanical components used to meet Items Relied On for Safety 41.

The inspection primarily focused on the dedication activities associated with the centrifuges, pipe works and upper steelworks for Cascades 1.5 and 1.6. The inspection was conducted in three parts. One inspection was conducted on site at the National Enrichment Facility from September 26 to 30, 2011; and the other two inspections were conducted in the NRC Region II office in Atlanta, GA from September 26 to October 7, 2011, and from October 31 to November 4, 2011.

The enclosed narrative inspection report, which documents the inspection results, was discussed with you and members of your staff on September 30, 2011, October 7, 2011, November 3, 2011 and then again on November 4, 2011.

Based on the results of this inspection, two violations were identified.

These violations were evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is available on the NRC's Web site at www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html. These violations are cited in the enclosed Notice of Violation (Notice), and the circumstances surrounding them are described in the subject inspection report. The violations are being cited in the Notice because they were identified by the NRC.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. For your consideration in presenting the corrective actions, the guidance from NRC Information Notice 96-28, Suggested Guidance Relating to Development and Implementation of Corrective Action, is available on the NRC website and may be helpful. If you have additional information that you believe that NRC should

consider, you may provide it in your response to the Notice. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

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

Should you have any questions concerning this letter, please contact me at (404) 997- 4437.

Sincerely,

/RA/

M. Scott Freeman, Chief
Construction Inspection Branch 3
Division of Construction Inspection

Docket No. 70-3103
License No. SNM-2010

Enclosures:
1. Notice of Violation
2. NRC Inspection Report 07003103/2011-009 w/attachments

cc w/encl: (See page 3)

consider, you may provide it in your response to the Notice. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

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M. Scott Freeman, Chief
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Enclosures:

3. Notice of Violation
4. NRC Inspection Report 07003103/2011009 w/ attachments

cc w/encl: (See page 3)

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ADAMS: ☐ Yes ACCESSION NUMBER: ML11342A131 ☐ SUNSI REVIEW COMPLETE ☐ FORM 665 ATTACHED

OFFICE	RII/DCI	RII/DCI	RII/DCI	RII/DCI	RII/DCI	RII/DCP	RII/DCP
SIGNATURE	JPB2	JXH13	AFP1	DJS3	TCS	MSM4	CDT
NAME	J. Bartleman	J. Heisserer	A. Ponko	J. Seat	T. Steadham	M. Magee	C. Taylor
DATE	12/05/2011	12/06/2011	12/06/2011	12/05/2011	12/05/2011	12/05/2011	12/05/2011
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
OFFICE	RII/DFFI	HQ:NMSS					
SIGNATURE	JOC1	SDC2					
NAME	J. Calle	S. Atack					
DATE	12/07/2011	12/06/2011					
EMAIL	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: G:\CCI\DCI\CIB3\INSPECTION PLANS\2011\LES\LES 2011-009 (FINAL).DOCX

cc w/encl:
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Letter to Jay Laughlin from S. Freeman, dated

SUBJECT: NRC INSPECTION REPORT NO. 07003103/2011009

DISTRIBUTION w/encl:
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PUBLIC

NOTICE OF VIOLATION

Louisiana Energy Services, LLC
National Enrichment Facility
Eunice, NM

Docket No. 70-3101
License No. SNM-2010

During a Nuclear Regulatory Commission (NRC) inspection conducted onsite September 26-30, 2011, and in the NRC Region II office September 26 to October 7, 2011 and October 31 to November 4, 2011, violations of NRC requirements were identified.

In accordance with the NRC Enforcement Policy, the violations are listed below:

A. Special Nuclear Material License No. 2010 requires, in part, that the licensee shall conduct authorized activities at the Louisiana Energy Services, L.L.C., National Enrichment Facility (LES NEF) in accordance with statements, representations, and conditions in the approved Quality Assurance Program Description (QAPD), dated April 9, 2004, and supplements thereto.

   Section 16, Corrective Action, of the QAPD states, in part, that conditions adverse to quality including activities and services shall be identified promptly and corrected as soon as practical.

   Contrary to the above, a condition adverse to quality associated with an NRC violation was not corrected as documented in the licensee's corrective action program. By removing fixing plates from the latest revision of the commercial grade dedication plan for Cascade 1.5 upper steel, without creating another plan, the licensee reversed a corrective action on which the NRC had based closure of a previous violation.

This is a Severity Level IV violation (Enforcement Policy 6.5.d)

B. Special Nuclear Material License No. 2010 requires, in part, that the licensee shall conduct authorized activities at the LES NEF in accordance with statements, representations, and conditions in the approved QAPD, dated April 9, 2004, and supplements thereto.

   Section 3, Design Control, of the QAPD states, in part, that design changes are governed by control measures commensurate with those applied to the original design. Section 3 further states, in part, that changes from approved design inputs and reasons for the changes shall be identified, approved, documented and controlled.

   Contrary to the above, changes made to critical characteristics and key attributes associated with the commercial grade dedication of components associated with Items Relied On for Safety (IROFS) 41 were not controlled commensurate with those applied to the original design, and the reasons for changes to critical characteristics and key attributes were not identified, approved, documented and controlled. The licensee removed material hardness as a critical characteristic without identifying, approving, documenting and controlling the reason for the change, as required by the QAPD. The minimum bolt pretension value for structural steel bolts was changed and the technical justification for this change failed to evaluate whether the reduced allowable preload would still conform to the minimum required bolt preload.

This is a Severity Level IV violation (Enforcement Policy 6.5.d)

Concerning Violations A & B the NRC has concluded that the actions taken to date by Louisiana Enrichment Services with respect to Cascade 1.5 are acceptable. However, pursuant to the provisions of 10 CFR 2.201, Louisiana Energy Services, LLC is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, with copies to the Chief, Technical Support Group, Division of Fuel Cycle Safety and Safeguards, NMSS, and the Regional Administrator, Region II, 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" and should include for this violation a required response: (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 to avoid further violations, 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 with the time specified in this Notice, an order or Demand for Information may be issued as to why the licensee should 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 the enforcement action for a Violation, 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.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or safeguards 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 delete such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (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 8th day of December 2011

NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-3103
License:	SNM-2010
Report No.:	07003103/2011009
Licensee:	Louisiana Energy Services, L.L.C. (LES)
Location:	National Enrichment Facility (NEF) Eunice, New Mexico
Inspection Dates:	September 26 – October 7, 2011 and October 31 – November 4, 2011
Inspectors:	J. Bartleman, Senior Construction Inspector, RII/DCI J. Heisserer, Senior Construction Inspector, RII/DCI M. Magee, Construction Resident Inspector, RII/DCP A. Ponko, Construction Inspector, RII/DCI S. Atack, QA Inspector, HQ/NMSS C. Taylor, Senior Project Inspector, RII/DCP J. Seat, Construction Inspector, RII/DCI T. Steadham, Sr. Construction Project Inspector, RII/DCP
Accompanying Personnel:	None
Approved:	M Scott. Freeman, Chief, Construction Inspection Branch 3, RII/DCI

EXECUTIVE SUMMARY

Louisiana Energy Services, L.L.C., National Enrichment Facility
Nuclear Regulatory Commission Inspection Report No. 07003103/2011009

Quality Assurance: Control of Materials, Equipment, and Services (Pre-licensing and Construction) - Inspection Procedure 88108

The NRC conducted an inspection to evaluate the procurement, fabrication, and installation of Items Relied on for Safety 41 mechanical components by verifying Quality Level-1 criteria. The inspection included review of applicable commercial grade dedication activities for critical characteristics of Cascades 1.5 and 1.6 centrifuges, and header pipe works and upper steelworks located in Cascade Mini-hall 1B of the Separations Building Module 1001.

The inspectors reviewed the applicant's work plans to determine if measurements verifying critical characteristics of piping and steelworks were performed in accordance with the Commercial Grade Dedications Plans. Several samples were selected from centrifuges, pipe works, and upper steelworks by the inspectors for verification of the critical characteristics that were performed by Louisiana Energy Services personnel.

Two violations were identified. The first violation was cited against Section 16 of the Louisiana Energy Services National Enrichment Facility Quality Assurance Program Description for failure to correct a condition adverse to quality. The second violation was cited against Section 3 of the Louisiana Energy Services National Enrichment Facility Quality Assurance Program Description for inadequate control of changes to critical characteristics and key attributes related to Items Relied on for Safety 41.

Structural Concrete Activities - Inspection Procedure 88132

Inspectors reviewed structural concrete documentation associated with safety related construction of Items Relied on for Safety 41 for the Separations Building Module 1003. The inspectors observed on-going construction activities associated with installation of Flomels, bases of lower cascade steel (stools), and in-fill slabs in Assay Hall 1003 to determine if work was being conducted in conformance with applicable quality assurance and technical requirements.

Mechanical Components - Inspection Procedure 88136

The inspectors conducted inspections to assess the fabrication and installation of the centrifuges, pipe works and upper steelworks for Cascades 1.5 and 1.6. The inspectors reviewed applicable commercial grade dedication packages and supporting documentation (including drawings and work packages) to determine whether the critical characteristics specified were adequately verified for the centrifuges, pipe works, and upper steelworks. In addition, to a review of the licensee's verification activities, the inspectors conducted independent field verifications of critical characteristics/key attributes for both Cascades 1.5 and 1.6. The inspectors also conducted inspections to assess the documentation associated with the installation of centrifuges for Cascades 1.5, 1.6, 1.7, 1.8 and 2.1. The inspectors also conducted inspections to observe the final installation of centrifuges located in Cascade 2.5.

REPORT DETAILS

1. Summary of Facility Status

The licensee continued to perform construction activities for Separations Building Modules (SBM) 1001/1002 and 1003/1004, and the Cylinder Receipt and Dispatch Building, at the Louisiana Energy Services, L.L.C. (LES), National Enrichment Facility (NEF).

2. Quality Assurance: Control of Materials, Equipment, and Services (Pre-licensing and Construction) Inspection Procedure 88108 *(In-office Inspection)*

a. Centrifuges

1. Scope and Observations

The inspectors reviewed the commercial grade dedication (CGD) of Items Relied on for Safety (IROFS) 41 mechanical components in Cascade 1.5. The inspectors interviewed personnel, reviewed documentation, and evaluated activities associated with IROFS 41 to determine if commercial-grade item dedication was appropriately performed in accordance with the LES NEF Quality Assurance Program Description (QAPD).

The inspectors reviewed commercial grade dedication plan (CGDP) CGDP 041-0004, Centrifuge Parts, Rev. 0, and the supporting documentation for acceptance of a sample of critical characteristics (CCs) to verify the adequacy of dedication activities for centrifuge parts verified using Methods 1 and 2, as applicable. The CCs reviewed covered fabrication and testing of components within the centrifuge, including chemical, mechanical and dimensional verifications. The inspectors reviewed Method 1 and Method 2 CC verification documentation from Technical Controlling. Technical Controlling is an independent oversight organization which has been surveyed by LES NEF to provide oversight and CC verification of centrifuge components.

2. Conclusions

The NRC inspectors determined that, based on the sample of records reviewed, the dedication control system implemented by the licensee was sufficient to control verification of CCs for QL-1 items associated with the centrifuges installed in cascade 1.5. The inspectors determined that the QL-1 items associated cascade 1.5 met the requirements of the QAPD. No findings of significance were identified.

b. Upper Steelworks (Methods 1 and 2)

1. Scope and Observations

The inspectors reviewed CGDP 041-0013, Cascade Fastener Material, Revision, Rev. 2, for cascade fastener assemblies (i.e. bolts, nuts, and washers) used in the cascade upper steel works. In addition, the inspectors reviewed the supporting documentation for acceptance of a sample of CCs to verify the adequacy of the

upper steelworks dedication activities verified using Methods 1 and 2, as applicable. The sample of CCs reviewed included:

CCs #1 and 2, "Centrifuge Mounting Bolt – Bolt Tensile Strength and Hardness," required verification of Proof Load and Wedge Loading requirements.

CCs #4 and 5, "Upper Steel Bolt and Nut – Item is Steel," required verification through ferromagnetic testing.

CC #6, "Upper Steel Assembly – Washer is Present," required verification of visual configuration.

The inspectors reviewed a sample of data in test reports LOU031-07-16-85843-5, LOU031-04-22-74929-18, LOU031-04-22-74929-8, and LOU031-04-22-74929-9 to verify that supporting documentation for CCs #1, 2, 4 and 5 met the acceptance criteria for CGDP 041-0013.

The inspectors reviewed a sample of data in Work Plan (WP) 1001-CIVIL-823-054, to verify that the supporting information for CC #6 met the acceptance criteria defined in CGDP 041-0013 and CGDP 041-0007.

The inspectors reviewed nonconformance reports (NCRs) 2011-0972 and 2011-1017 associated with CC #6 to verify implementation of corrective actions for a nonconforming washer used with the M12 X 60 fastener assembly and the installation of incorrect bolt assemblies, M12 X 40 instead of M12 X 50 fasteners, for the connection of units to the back frame of the upper steel cascade structure. Both issues were initially dispositioned as rework but later changed to reject and replaced under WP 1001-CIVIL-823-043.

The inspectors reviewed surveillance report, 2010-S-09-723, to verify that the licensee had reasonable assurance that the vendor, Stork Materials Laboratory, controlled activities associated with CCs # 1, 2, 3 and 4 as required for Method 2 verification. The inspectors reviewed the LES NEF approved supplier list, to verify that the vendor, was designated as a quality level 1 (QL-1) vendor to perform inspection and testing of the specified bolt material.

2. Conclusions

The NRC inspectors determined that, based on the sample of records reviewed, the work package documentation and replacement of items was acceptable for items associated with the upper steelworks for cascade 1.5. No findings of significance were identified.

c. Units, Subunits, and Connectors (Method 1)

1. Scope and Observations

The inspectors reviewed the CGDP 041-0003, Cascade Upper Steel Units, Subunits, and Connectors, Rev. 3, for the cascade steelwork material composition and configuration. The inspectors reviewed the supporting documentation for

acceptance of a sample of CCs to verify the adequacy of the dedication activities using Method 1. The sample of CCs reviewed included:

CC #1, “Base Metal Materials,” required verification through material’s chemical composition that met the applicable American Society of Testing Materials (ASTM) requirements. Hardness testing was required to verify the material’s yield strength.

CC #2, “Weld Filler Material,” required verification through chemical analysis of weld material that met the classification requirements of American Welding Society (AWS) D1.1 Structural Steel Welding Code 2006 edition for the structural steel.

CC #3, “Weld Quality,” required that the welders, inspectors, welding procedures, non-destructive examination (NDE), and procedural compliance and documentation used to manufacture the Cascade 1.5 upper steelworks met the requirements of AWS D1.1 Structural Steel Welding Code, 2006 edition.

CC #4,”Configuration,” required that items installed do not show visible bending, twisting or damage.

The inspectors reviewed a sample of data in WPs 1001-CIVIL-823-068, 1001-CIVIL-823-059, 1001-CIVIL-823-063, 1001-CIVIL-823-072, and 1001-MECH-453-030, to verify information supporting the verification of CCs #1, 2, 3 and 4 met the acceptance criteria defined in CGDP 041-0003. The inspectors also reviewed the selection of sample sizes for each CC to verify that the licensee followed the recommended Electric Power and Research Institute guidelines.

The inspectors reviewed NCRs 2011-1164 and 2011-1198 related to CC #1; NCRs 2011-0826 and 2011-1197 related to CC #2; NCRs 2011-1099, 2011-3067, and 2011-1313 related to CC #3 to verify that the final dispositions were adequately evaluated and documented.

The inspectors noted that the revision change page of CGDP 041-0003, Rev. 3, removed fixing plates from the dedication plan and stated that a new dedication plan would be created for fixing plates. When the inspectors asked for a copy of the new dedication plan for fixing plates, the licensee determined that a new plan was never generated.

The NRC had previously written VIO 70-3103/2011004-03 regarding the dedication of fixing plates, which was closed on the basis of corrective actions implemented, and documented in condition report (CR) 2011-0958. One of the corrective actions described in CR 2011-0958 was that the fixing plates were added to CGDP 041-0003, Rev 1. The licensee closed CR 2011-0958 in July 2011.

Special Nuclear Material (SNM) License No. 2010 requires that the licensee conduct authorized activities in accordance with the approved QAPD and its supplements. Section 16 of the QAPD requires that conditions adverse to quality, including activities and services, shall be identified promptly and corrected as soon as practical.

Contrary to the above, the licensee failed to correct a previously identified condition adverse to quality. By removing fixing plates from CGDP 041-0003, Rev 3 without

generating a new dedication plan, the licensee reversed a corrective action on which the NRC based the closure of violation. This was identified as VIO 70-3103/2011009-01, Failure to Correct a Condition Adverse to Quality.

As a result of the inspectors' questions, the licensee generated CGDP 041-0034 to dedicate the fixing plates. The inspectors reviewed the documentation associated with the dedication plan and accompanied LES personnel during a re-inspection of all fixing plates installed in Cascade 1.5. During this fixing plate re-inspection, the inspectors chose a sample of locations for further inspection, including the locations specified in CRs 2011-1120 and 2011-0958. The inspectors performed as-built dimensional inspections of the fixing plates to verify that sizes and positions were consistent with the approved drawing and installation requirements. The inspectors reviewed work plan 1001-MECH-843-011, "Ferromagnetic Testing of Fixing Plates on Upper Steel Cascade 1.5," to verify concurrence with the as-built configuration of the fixing plates.

2. Conclusions

The inspectors identified one violation. Violation (VIO) 70-3103/2011-009-01 of Section 16 of the licensee's QAPD was identified for Failure to Correct a Condition Adverse to Quality.

The inspectors determined that 43 documented inspections of fixing plates were inadequately performed by licensee quality control (QC) staff. Between April 4, 2011 and April 7, 2011, two QC inspectors inspected 44 fixing plate locations and documented satisfactory inspection results of 44 fixing plates; however, only one of those locations had a fixing plate installed due to the QC inspectors being confused on what a fixing plate was. The licensee identified this issue on October 30, 2011, and promptly notified the inspectors. LES issued CR 2011-3558 and performed a 100% re-inspection of all 196 possible fixing plate locations on Cascade 1.5 on November 2, 2011. The inspectors accompanied the licensee on this re-inspection and had no concerns with the technical adequacy of the fixing plates installed in Cascade 1.5. Due to the prompt identification by the licensee staff this issue has been classified as a Non-Cited Violation (NCV), NCV 70-3103/2011009-02.

The NRC inspectors determined that, based on the documentation reviewed and the in-field inspections, the inspectors determined that all fixing plates for Cascade 1.5 met the applicable technical requirements for dedication as basic components.

d. Cascade Hexagon Bolt Torque Verification (Method 1)

1. Scope and Observations

The inspectors reviewed the CGDP 041-0007, Cascade Hexagon Bolt Torque Verification for the cascade upper steelwork. The inspectors reviewed the supporting documentation for acceptance of a sample of CCs to verify the adequacy of the dedication activities using Method 1. The sample of CCs reviewed included:

CC #1, "Correct Fasteners Installed in Correct Locations," required verification of fastener configuration and installation per Enrichment Technology Corporation (ETC)

design drawing. This also included correct installation of washers and correct bolt (diameter and length) locations.

CC #2, Proper Bolt Pre-Tensioning," required pre-tension of each bolt by the torque wrench method that included acceptable torque values determined by a Skidmore-Wilhelm pre-tension calibrator.

The inspectors reviewed a sample of data in WP 1001-CIVIL-823-054 that contained ETC drawing identifiers, identification of applicable bolt types, ETC traveler calibration records for the Skidmore-Wilhelm calibrators and torque wrenches to verify that the supporting information for CCs #1 and 2 met the acceptance criteria defined in CGDP 041-0007.

The inspectors reviewed NCRs 2011-1017 and 2011-0972 related to CC #1 and NCRs 2011-0973, 2011-1097, and 2011-1133 to verify that the final dispositions were adequately evaluated and documented.

2. Conclusions

The NRC inspectors determined that, based on the documentation reviewed, the inspectors determined that bolt torque verification for Cascade 1.5 met the applicable technical requirements. No findings of significance were identified.

e. Pipe Works

1. Scope and Observations

Cascade Fastener Assemblies (Method 1)

The inspectors reviewed the CGDP 041-0013, Cascade Fastener Material, Rev. 2, for cascade fastener assemblies (i.e. bolts, nuts, and washers) used in the cascade pipe works. The inspectors also reviewed CGDP 041-0005, Cascade Pipework - Installation, Rev. 0 through 5, for installation activities of cascade pipe works. In addition, the inspectors reviewed the supporting documentation for acceptance of a sample of CCs to verify the adequacy of the dedication activities using Method 1. The sample of CCs reviewed included:

CCs #8 and 9, "Pipe Clamp Bolt and Nut – Item is Steel," required verification through ferromagnetic testing.

CC #10, "Pipe Clamp Assembly Configuration," required verification of presence of Washer(s) in correct locations.

The inspectors reviewed a sample of data in WP 1001-CIVIL-823-095, to verify that the supporting information and test data results for CC #8 and 9 met the acceptance criteria defined in CGDP 041-0005 and CGDP 041-0013. The inspectors reviewed a sample of data in WP 1001-CIVIL-823-095, to verify that the supporting information (test data results) for CC #10 met the acceptance criteria defined in CGDP 041-0005 and CGDP 041-0013. The inspectors reviewed CR 2011-2928 related to CC #10 to verify that the final dispositions requiring re-alignment and re-installation of nuts in

the correct orientation were adequate and met the corrective action description for Cascade 1.5.

Cascade Pipe Work - Installation (Method 1)

The inspectors reviewed CGDP 041-0005, Cascade Pipework Installation, Rev. 3, and the supporting documentation for acceptance of a sample of CCs to verify the adequacy of dedication activities using Method 1. The sample of CCs reviewed included:

CC #1, "UF6 Pipework – All Clamps of Main Header – Material," required nondestructive testing on the clamps.

CC #1a, "UF6 Pipework – All Clamps of Main Header – Proper Installation," required torque and installation configuration verifications.

CC #5a, "UF6 Pipework, tubes – diameter, wall thickness," required various dimensional verifications of pipeworks.

CC #5b and #5c, ""UF6 Pipework, main header – wall thickness and ovality," required dimensional verifications and ovality measurements.

The inspectors reviewed a sample of data in WP 1001-MECH-453-066, WP 1001-MECH-453-061, WP 1001-MECH-453-068, WP 1001-MECH-453-069, and WP 1001-CIVIL-823-095 to verify that the CCs above met the acceptance criteria defined in CGDP 041-0005.

The inspectors noted that hardness testing of pipe work clamps was no longer a critical characteristic as it had been in the dedication of earlier cascades, and there was no documented technical justification for the removal of the hardness testing. The inspectors also reviewed QPS/Sk/09/019, Agreement on Key Attributes TC 12 Cascade Header Pipework in the NEF Project. QPS/Sk/09/019 was the agreement on key attributes (KAs) for cascade header pipe work and upper steelwork. The inspectors noted that various key attributes were changed or removed between the revisions without technical justification. Procedure ETC-WI-98 noted that KAs were "the basis for assuring that identified IROFS fulfill their intended safety function in the cascade." KAs and CCs formed the basis for selection and suitability of application of materials, parts, equipment and processes that are essential to the functions of IROFS 41.

As a result of inspector questioning, the licensee generated ETC4196072, Technical Justification of All Revisions to QPS/Sk/09/019 Revisions 1 through 4. During an in-office inspection, the inspectors reviewed ETC4196072, QPS/Sk/09/019 through revision 4, CGDP 041-0003 through revision 3, and CGDP 041-0005 through revision 5 and determined that the changes to the respective documents, including the hardness testing of pipe work clamps, were technically adequate as they related to Cascade 1.5. The inspectors determined that the technical justifications used to evaluate the changes to KAs 7a and 7b in QPS/Sk/09/019 did not adequately verify that the new defined CCs/KAs met the original requirements.

KA 7a was changed from requiring that bolts, nuts, and washers meet certain specifications to, "…material is steel and satisfies the requirements of Key Attribute 7b." KA 7b was changed from, "Bolts, nuts, washers, proper tightening RCSC guidelines" to, "…For structural steel bolts the minimum bolt pretension is 80% of the load specified on the detail design drawings…" The inspectors reviewed the technical justification for this change and identified a joint, as shown on pg. B3-9 of calculation ETC4054564, Issue 2, with bolts that would have required at least 84% of the load specified on the detail design drawings. In addition, ETC4196072 failed to evaluate whether the reduced allowable preload would have still conformed to the minimum bolt preloads in the Research Council for Steel Connections (RCSC) guidelines, which was part of the facility licensing basis.

The inspectors reviewed the CGDPs for Cascade 1.5 and determined that the acceptance criteria used for Cascade 1.5 was full specified bolt preload and not the reduced value of 80% of the specified preload. As a result, the inspectors determined that this KA change did not affect Cascade 1.5.

Special Nuclear Material License No. 2010 requires that the licensee conduct authorized activities in accordance with the approved QAPD and supplements. Section 3 of the QAPD states that design changes are governed by control measures commensurate with those applied to the original design and that changes from approved design inputs, and reasons for the changes, shall be identified, approved, documented and controlled.

Contrary to the above, changes made to critical characteristics and key attributes associated with the commercial grade dedication of components associated with IROFS 41 were not controlled commensurate with those applied to the original design, and the reasons for the changes were not identified, approved, documented and controlled. The licensee removed material hardness as a critical characteristic without identifying, approving, documenting and controlling the reason for the change, as required by the QAPD. The licensee also failed to provide adequate evaluation to reduce the allowable preload and still be able to meet the minimum bolt preload. This was identified as VIO 70-3103/2011-009-03, Failure to Control Changes Made to Critical Characteristics and Key Attributes.

<u>Cascade Pipe Work - Pipe Replacement (Method 1)</u>

The inspectors reviewed CGDP 041-0032, Remove and Replace Section of Pipe in Cascade 1.5, Rev. 2, and the supporting documentation for acceptance for all CCs to verify the adequacy of dedication activities using Method 1. As documented in CR 2011-3063, LES identified damaged pipe during walk downs and subsequently replaced the pipe. Because the pipe was not replaced under a quality level 1 (QL-1) WP, LES dedicated the pipe using CGDP 041-0032.

The inspectors reviewed data in WPs 1001-MECH-454-001, 1001-MECH-454-004, 1001-MECH-454-005, 1001-MECH-454-006 to verify that the supporting information and test data results for all CCs met the acceptance criteria defined in CGDP 041-0032.

2. Conclusions

The NRC inspectors identified one violation. VIO 70-3103/2011-009-03, with two examples, of Section 3 of the licensee's QAPD was identified for Failure to Control Changes Made to Critical Characteristics and Key Attributes. The first example was for removal of the CC of material hardness testing of pipe works clamps without using the design control process, and the second example was failure to adequately evaluate whether the reduced allowable preload would have still conformed to the minimum bolt preloads.

The inspectors determined that the CGD of mechanical components on Cascade 1.5 for IROFS 41 was implemented in accordance with the QAPD.

f. Floor Mounted Elements for Cascades 1.5 to 1.8 and 2.1 to 2.8

1. Scope and Observations

Floor Mounted Elements (Method 1 and 2)

The inspectors reviewed the CGD of IROFS 41 floor mounted elements (Flomels) in Cascades 1.5 to1.8 and 2.1 to 2.8 to determine if commercial-grade item dedication was appropriately implemented to provide the necessary assurance of quality. The inspectors interviewed personnel, performed walkdowns, reviewed documentation, and evaluated activities associated with IROFS 41 to determine if commercial-grade item dedication was appropriately performed in accordance with the QAPD.

The inspectors reviewed the CGDP D2010-031, IROFS 41 Flomels-Assay Hall 1 (Cascades 4 thru 8) & Assay Hall 2 (Cascades 1 thru 8), Rev. 0, for cascade flomel assemblies. In addition, the inspectors reviewed the supporting documentation for acceptance of a sample of CCs to verify the adequacy of the dedication activities using Methods 1 and 2, as applicable. The sample of CCs reviewed included:

CC #1, "Centrifuge Anchor Bolt Internal Threads," required verification of thread dimension and condition by use of calibrated Go/No Go gauges.

CCs #4a and 4b, "Centrifuge Anchor Bolt Material," required verification of anchor bolt material by hardness testing and chemical analysis.

CC #6, "Centrifuge Anchor Bolt Length," required verification of anchor bolt length.

CC #8, "Concrete Material," required verification of concrete compressive strength.

CC #9, "Rebar Placement," required verification that the rebar cage was present in the flomel.

CCs #11 and 12, "Flomel Width and Depth," required verification of flomel width and depth.

The inspectors reviewed a sample of data in WP 1001-CIVIL-852-001; WP 1001-CIVIL-852-005; and QA-09-0931, Inspection Report of Flomels for use in SBM1001,

to verify that the supporting information for CCs #1, 4a, 4b, 6, 8, 9, 11, and 12 met the acceptance criteria as defined in CGDP D2010-031.

Method 2 verification was used to supplement the Method 1 verification of CCs #8, 9, 11, and 12. The inspectors reviewed surveillance reports, 2009-S-05-003, 2009-S-09-216, 2010-S-02-044, and 2010-S-02-045 to verify that the licensee had reasonable assurance that the Flomel vendor, Voorbij Prefab Benton B.V., controlled activities associated with CCs #8, 9, 11, and 12, as required for Method 2 verification.

The inspectors reviewed CR/NCRs 2011-3039, 2010-3159, and 2011-1349. CR/NCR 2011-3039 identified anchor bolt thread discrepancies associated with CC #1. CR/NCR 2010-3159 identified inadequate test results associated with CCs #4a and 4b. CR/NCR 2011-1349 identified anchor bolt length discrepancies associated with CC #6. Inspectors verified that the discrepancies were adequately documented, evaluated, and resolved.

Grout (Method 1)

The inspectors reviewed CGDP 2008-045, BETEC 140, and CGDP 2008-046, BETEC 110, for grout used during the installation of flomel assemblies. The inspectors reviewed the supporting documentation for acceptance of a sample of CCs to verify the adequacy of the dedication activities using Method 1, as applicable. The sample of CCs reviewed included:

CC #1, “Part Number,” required that the appropriate part number was visible on each container.

CC #2, “Date Code,” required that each container had a visible date code.

CC #3, “Compressive Strength,” required verification of compressive strength in accordance with ASTM C109.

The inspectors reviewed a sample of data in WP 1001-MH2-RUST-FLOMELS-001 and WP 1001-CIVIL-853-005, to verify that information supporting the verification of CCs #1, 2, and 3 met the acceptance criteria as defined in CGDP 2008-045 and CGDP 2008-046. The inspectors also reviewed NCR 2011-1179, which identified missing documentation related to CC #3, to verify that the discrepancy was adequately documented, evaluated, and resolved.

2. Conclusions

The inspectors determined that the CGD of flomels on Cascades 1.5 to 1.8 and 2.1 to 2.8 for IROFS 41 was implemented in accordance with the QAPD. No findings of significance were identified.

3. Quality Assurance: Control of Materials, Equipment, and Services (Pre-licensing and Construction) Inspection Procedure 88108 *(Onsite Inspection)*

a. Procurement Control System

1. Scope and Observations

The inspectors conducted interviews and reviewed purchase orders (POs), procedures, and supplier oversight measures to verify that the licensee quality assurance (QA) program implemented the necessary controls for IROFS in Cascades 1.5 and 1.6. Specifically, the inspectors verified that POs issued to suppliers of QL-1 bolts, nuts, and washers used in the lower steel works of Cascade 1.5 and suppliers of the upper steel works for Cascades 2.1-2.8 contained technical and QA requirements, Part 21 applicability, right of inspection of vendor facilities and records by UUSA, requirements for maintaining configuration management and for reporting of supplier deviations, and requirements for supplier furnished documentation, such as certificates of conformance.

Procurement documentation included a receipt inspection plan specifying the characteristics to be verified upon receipt of the items, acceptance requirements, documentation required at receipt and any post delivery testing required. The NRC inspectors found that the technical and quality requirements identified in POs issued for QL-1 bolts, nuts, and washers were consistent with the specifications in the WP.

The inspectors verified that suppliers of the QL-1 bolts, nuts, and washers were listed on the approved suppliers list. The inspectors reviewed a sample of triennial audits and annual evaluations performed to qualify the suppliers to provide QL-1 items and services. The audits examined areas that were consistent with the scope of supply provided by the vendor and provided sufficient objective evidence to support the evaluation findings. The inspectors verified that vendors provided documentation of corrective actions to UUSA for negative findings identified during audits.

2. Conclusions

The inspectors determined that, based on the sample of records reviewed, the procurement control system implemented by the licensee was sufficient to control sourcing activities for QL-1 items and services in accordance with the QAPD. No findings of significance were identified.

b. Nonconforming Materials, Parts, or Components

1. Scope and Observations

The inspectors performed walk downs, conducted interviews, and reviewed documentation associated with the licensee's measures for the control of items that did not conform to specified requirements and to prevent their inadvertent use. The inspectors walked down the warehouse and verified that the item identification, quantity, and receipt of required procurement documentation (i.e., certificates of conformances) were adequately verified by receiving personnel. The inspectors also verified that nonconforming items were clearly marked with orange tags attached to

the item or package and were segregated from accepted items in order to prevent inadvertent use or installation.

The inspectors found that warehouse personnel were readily able to trace materials, parts, and components stored in the warehouse to their associated hard copy documentation files and to the electronic material tracking database. The licensee used bar codes to trace the location and status of IROFS parts at LES NEF. The licensee scanned packages upon entering the warehouse and throughout the receipt, acceptance, assembly, and installation phases. When a nonconforming condition with an item is identified, the electronic database will not allow the item to be scanned for further use until the nonconforming condition has been resolved.

2. Conclusions

The inspectors determined that, based on the sample of records reviewed, the measures implemented by the licensee provided adequate control of nonconforming items and prevented their inadvertent installation or use. The licensee's control of nonconforming items or materials was in accordance with the QAPD. No findings of significance were identified.

4. Structural Concrete Activities Inspection Procedure 88132

a. Flomels

1. Scope and Observations

The inspectors reviewed documentation and evaluated installation activities related to Flomels associated with Cascades 3.9, 3.10, 3.11, and 3.12 in Assay Hall 1003. The inspectors observed on-going construction activities associated with installation of flomels, lower cascade steel bases (stools), and in-fill slabs and determined work was being conducted in conformance with applicable technical requirements and QAPD.

The inspectors observed placement of reinforcing steel for in-fill slab pour number 3 located between Cascades 3.9 and 3.10 to verify concrete reinforcement was installed in accordance with specifications, codes, drawings, and procedures. The inspectors verified that steel bar sizes, locations, and layout were consistent with structural and reinforcement steel placement drawings included in WP 1003-CIVIL-828-051, 'Install Concrete Slab in Assay Hall 1003".

The inspectors observed grouting between flomels comprising Cascade 3.11, Row 2 (East) and Cascade 3.12, Row 1 (East), verifying that work activities were being performed in accordance with procedure EG-3-6000-24, "Grouting of Flomels", and the contractor's grouting checklist. The inspectors also verified that QC measures for proportioning, mixing, placing, in-process testing, and curing of grout were established and being implemented.

The inspectors reviewed WP 1003-CIVIL-843-025, "Welding of Stools" and observed welding preparation for the bases of the lower steel of Cascade 3.12, Row 2 (West)

to embedment plates installed in the slab of grade (Detail X1 per drawings included in work plan).

The inspectors verified that identification and control measures were established and being implemented during installation of flomels and lower cascade steel bases. The general layout of flomels comprising Cascade 3.11, Row 2 (East) and Cascade 3.12, Rows 1 & 2 (East) were verified by inspection of uniquely identifying characteristics – material identification numbers, production dates, and mold numbers and were consistent with that documented in Flomel Verification Sheet 2 of WP 1003-Civil-853-001, "Installation of Flomels in Assay Hall 1003". In addition, the inspectors verified that the material identification numbers of stools for Cascades 3.10 & 3.11, Rows 1 & 2 (West) matched the weld history record included in WP 1003-CIVIL-843-025, "Welding of Stools" (Detail X1 per drawings included in work plan).

The inspectors reviewed WP 1003-CIVIL-400-001, "UF6 Area Floor Pre-drilling - Assay Hall 1003" and observed drilling of a typical hole for final depth and setting of jig for initial drilling of holes. All observed work activities were being conducted in accordance with procedures included in the work plan.

The inspectors reviewed WP 1003-CIVIL-823-092, "Installation of Welded Pipe Supports in the UF6 Area EG-3-6000-30 Weld Supports".

2. Conclusions

The inspectors determined that, based on the sample of records and work activities reviewed, the measures implemented by the licensee provided adequate control over flomel installation and documentation were in accordance with the QAPD. No findings of significance were identified.

5. Mechanical Components Inspection Procedure 88136

a. Centrifuges

1. Scope and Observations

The inspectors verified that the placement of centrifuges in Cascades 1.5, 1.6, 1.7, 1.8, and 2.1 were consistent with the on-site records and electronic record database. The inspectors selected a sample of randomly located centrifuges within each cascade and recorded the serial number and position identification number of each centrifuge. The inspectors sampled a quantity of 22 centrifuge positions located in Cascade 1.5; 21 centrifuge positions located in Cascade 1.6; 22 centrifuge positions located in Cascade 1.7; 22 centrifuge positions located in Cascade 1.8; and 20 centrifuge positions located in Cascade 2.1.

The inspectors cross referenced the field data against hard copy QA records stored in the Centrifuge Assembly Building. The inspectors also verified that the serial numbers and locations of centrifuges within the sample population had been accurately transcribed from the hard copy QA records into the electronic record database. The inspectors verified that the electronic record database contained traceability information to identify the specific internal subcomponents that were assembled into the final centrifuge assembly.

The inspectors verified two KAs associated with the centrifuges. These KAs were associated with the centrifuge footer bolting and centrifuge recipient (shell). The inspectors reviewed the manufacturer supplied certified material test reports (CMTRs) associated with the materials used for centrifuge footer bolts and centrifuge recipient/shell to verify that they met the applicable specification requirements.

The inspectors witnessed the final installation of centrifuges in Cascade 2.5. The inspectors observed that process tubing was bent to facilitate the placement of the centrifuges onto the flomels. The licensee initiated CR 2011-3485 for the bending of the tubing that is connected to the centrifuge. The licensee's vendor ETC provided a technical evaluation of the tube bending to facilitate centrifuge installation. ETC documented their technical evaluation in document nos. ETC4196642, Issue No. 1 and 2. The inspectors reviewed CR 2011-3485, and ETC4196642, Issue No. 1 and 2. The inspectors found CR 2011-3485 and ETC4196642, Issue No. 2 documents to be adequate.

2. Conclusions

The inspectors determined that, based on the sample of hard copy records that were reviewed and the examination of the electronic record database content, the tracking and documentation of centrifuge subcomponents and of the assembled centrifuge placement implemented by the licensee was sufficient to maintain traceability of centrifuges in Cascades 1.5, 1.6, 1.7, 1.8, and 2.1. The manufacturer supplied CMTRs for the centrifuge footer bolts and recipient shell material meet the specified code material requirements. No findings of significance were identified.

b. Pipe Works and Upper Steelworks

1. Scope and Observations

The inspectors reviewed documentation, and evaluated installation and CGD activities related to Cascades 1.5 and 1.6 pipe works and upper steelworks. The inspectors interviewed responsible Verification Team (VT) inspection personnel and conducted direct observations of CC measurement activities. The inspections were performed to determine whether the licensee's activities related the verification of the CCs of the mechanical components in IROFS 41 were controlled and accomplished in accordance with the QAPD.

The inspectors reviewed various mechanical WPs for Cascades 1.5 and 1.6, and conducted field observations of work activities. Observations were conducted to determine whether work was performed using written instructions in the WP and whether the VT inspectors were specifically qualified for IROFS 41 measurement work. The inspectors observed initial and follow-up verifications of multiple component measurements, including: Pipe Diameter, Pipe Wall Thickness, Clamp Material Hardness, Clamp Bolt Configuration and Torquing, and Positive Material Identification (PMI) testing. The inspectors observed that workers appropriately stopped work and initiated a CR when it was discovered that the WP differed from the CGD plan with regard to the number of samples.

The inspectors reviewed NDE records and radiographic testing (RT) results on welds associated with a variety of pipe sizes for the pipe works associated with Cascades 1.5 and 1.6 to determine if adequate quality measures associated with CGD of the cascades had been established and implemented. Specifically, the inspectors reviewed electronic versions of RT film records for pressure boundary welds to determine if welds were acceptable and were consistent with code requirements based on NDE results. The inspectors reviewed 22 weld records for Cascade 1.5, and 24 weld records for Cascade 1.6. The inspectors reviewed the records of good welds, defective welds, and repaired welds to provide a representative sampling of completed welds associated with the pipe works for Cascades 1.5 and 1.6.

The inspectors also reviewed the NDE RT results on two 42 mm diameter pipes that were replaced in Cascade 1.5 due to defective welds and a damaged pipe. For Cascade 1.5 the inspectors reviewed a total of 12 weld records on the two replaced 42 mm diameter pipes. The inspectors reviewed the records of good welds, defective welds, and repaired welds associated with the two replaced pipes located in Cascade 1.5.

The inspectors also reviewed welds on the upper steel of Cascade 1.6 to determine if adequate quality measures associated with CGD of the cascades had been established and were being implemented. Specifically, the inspectors visually examined 18 welds to determine if weld accessibility, length, and size were consistent with that documented in WP 1001-CIVIL-823-066, "Upper Steel Weld Quality Verification Commercial Grade 041-0003 MH1B Cascade 6". Two welds identified as accessible or partially accessible by the licensee's QA personnel and documented as such in Data Table 3 of the work plan were determined by NRC inspection to be inaccessible.

2. Conclusions

The inspectors determined that two welds that were recorded as being accessible for inspection were determined to not be accessible for inspection as was documented. The licensee failed to adequately implement procedures associated with Criterion 15. Specifically, EG-3-2100-05, Rev. 10 required that deviations from the plan be handled under a NCR and give additional or modified instructions to verify CCs. However, during verification of CCs, via WP 1001-CIVIL-823-066, two welds were found to be inaccessible. This issue was promptly identified by the LES VT inspector and brought to the attention of the NRC inspector. CR #2011-3202 was promptly initiated by the VT personnel to address this issue and NCR # NCR-2011-3049 was generated to evaluate this condition. Due to the prompt identification by the licensee staff this issue has been classified as a NCV, NCV 70-3103/2011009-04.

The inspectors determined that the activities related to CGD of IROFS-41 pipe works and upper steelworks was controlled in accordance with the QAPD.

6. Exit Meeting/Interviews

Issues identified during the inspection were summarized daily during the inspection periods of September 28 – 30, 2011, and from October 31, - November 4 2011 by the inspection team. Formal exit meetings were held on September 30, 2011, October 7, 2011, November 3, 2011 and on November 4, 2011, with the licensee's management

team. The inspectors described the areas inspected and discussed the inspection results in detail with the licensee staff. Although security-in-confidence and proprietary documents were reviewed during this inspection, the security and/or proprietary nature of these documents is not included in this report.

SUPPLEMENTAL INFORMATION

1. List of Personnel Contacted

B. Bare, Programs and Performance Director
G. Beckett, CGD Group Supervisor
D. Cummings, Level II Verification Inspector
D. Dauner, Mechanical Engineer
K. Garner, Level II Certified Visual Examiner & CWI Inspector
J. Geiger, ETUS Cascade Supply Manager
R. Griffin, ETUS, Engineering Team Lead
L. Lorati, CGD Project Manager
J. Marchi, QA Supervisor
P. Robinson, VP Licensing/General Counsel
M. Rhoads, Level II Verification Inspector
G. Sergeant, URENCO USA Verification Team Manager
A. Sorrell, Compliance Director
O. Torres, QA Manager
T. Taylor, Licensing Engineer

2. Inspection Procedures Used

IP 88108	Quality Assurance: Control of Materials, Equipment, and Services (Pre-licensing and Construction)
IP 88132	Structural Concrete Activities
IP 88136	Mechanical Components

3. List of Items Opened, Closed and Discussed

VIO 70-3103/2011-009-001	Opened	Failure to Correct a Condition Adverse to Quality (Section 2.c)
NCV 70-3103/2011-009-02	Closed	Failure to Adequately Inspect Fixing Plates (Section 2.c)
VIO 70-3103/2011-009-003	Opened	Failure to Control Changes Made to Critical Characteristics and Key Attributes (Section 2.e)
NCV 70-3103/2011-009-04	Closed	Failure to Document Weld Inspections Correctly (Section 5.b)

4. List of Acronyms Used

ADAMS	Agency Document Access and Management System
AIT	Action Item Tracking
ASTM	American Society of Testing and Materials
AWS	American Welding Society
CC	Critical Characteristic
CGD	Commercial Grade Dedication
CGDP	Commercial Grade Dedication Plan
CMTR	Certified Material Test Report
CR	Condition Report
ETC	Enrichment Technology Corporation
ETUS	Enrichment Technology US
IP	Inspection Procedure
IROFS	Items Relied on For Safety
KA	Key Attribute
LES	Louisiana Energy Services, LLC
NCR	Nonconformance Report
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NEF	National Enrichment Facility
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
PO	Purchase Order
QA	Quality Assurance
QAPD	Quality Assurance Program Description
QC	Quality Control
QL-1	Quality Level 1
RCSC	Research Council for Steel Connections
RII	NRC Region II
RT	Radiographic Testing
SBE	Societa Bulloneria Europea S.p.A.
SBM	Separations Building Module
SNM	Special Nuclear Material
UUSA	Urenco USA
VIO	Violation
WP	Work Plan

5. List of Documents Reviewed

Procedures

EG-3-2100-05, “Commercial Grade Dedication Process”, Revisions 10, 11, and 12
EG-3-6000-23, “Alignment and Leveling of Flomels”, Revision 1, dated January 11, 2010
EG-3-6000-24, “Grouting of Flomels”, Revision 1, dated September 10, 2010
ETC-WI-98, “Key Attributes,” Issue 3
QA-3-1000-01, “QA Evaluation of Nuclear Industry Assessment Committee (NIAC) Assessment Reports,” Revision 0, dated December 12, 2008
QA-3-2000-08, “Approved Supplier List,” Revision 6, dated November 15, 2010

Work Plans

1001-CIVIL-823-043, “Remove, Re-install bolts & Torque Verification SBM 1001 Cascade 5,” Revision 0, dated January 19, 2011
1001-CIVIL-823-054,”Perform Cascade 5 Field Inspections for CGDP 041-0007,” Revision 0
1001-CIVIL-823-059, “Perform Cascade 5 Field Inspections for CGDP 041-0003,” Revision 0
1001-CIVIL-823-063,”Weld Wire Analysis Commercial Grade 041-0003 Cascade 5,” Revision 0
1001-CIVIL-823-066, “Upper Steel Weld Quality Verification Commercial Grade 041-0003 MH1B Cascade 6”
1001-CIVIL-823-068, “Hardness Testing Commercial Grade 041-0003 MH1B Cascade 5,:” Revision 0
1001-CIVIL-823-072, “Re-inspection of Welds at Weld Wire Sampling Locations MH1B Cascade 5,” Revision 0
1001-CIVIL-823-095,”MH1B Cascade 5 Fixing and Sliding Process Piping Clamp Bolts Nuts Ferromagnetic Testing, and Washer Installation Verification”
1001-CIVIL-823-096, “Cascade 6 Fixed and Sliding Process Piping Clamp Bolts, Nuts, Ferromagnetic Testing, and Washer Installation Verification”
1001-CIVIL-852-001, “QA Level Requirements Determination for Cascade Hall Components,” Revision 0
1001-CIVIL-852-005, “Cascade 5 Flomel Anchor Bolt Repair,” Revision 0
1001-CIVIL-853-005, “Installation of the Flomels in MH1B,” Revision 0
1003-CIVIL-400-001, “UF6 Area Floor Pre-drilling – Assay 1003”
1003-CIVIL-823-092, “Installation of Welded Pipe Supports in the UF6 Area EG-3-6000-30 Weld Supports”
1003-CIVIL-828-051, “Install Concrete Slab in Assay Hall 1003”
1003-CIVIL-828-092, “Installation of Welded Pipe Supports in the UF6 Area EG-3-6000-30 Weld Supports”.
1003-CIVIL-843-025, “Welding of Stools”
1003-CIVIL-853-001, “Installation of Flomels in Assay Hall 1003”
1001-MECH-453-030, “NDE of Cascade 5 Upper Steel,” Revision 0
1001-MECH-453-061, “Perform Cascade 5 Field inspection for CGDP-041-005” Revision 0
1001-MECH-453-062, “Perform Cascade 6 Field Inspections for CGDP-041-005”
1001-MECH-453-066, “PMI Testing on Fixed and Sliding Clamps MH1B Cascade 5,” Revision 0
1001-MECH-453-067, “PMI Testing of Main header Fixed and Sliding Aluminum Clamps – Cascade 1.6”
1001-MECH-453-068, “Complete Pipeworks Inspections for Wall Thickness and Diameter – Cascade 5” Revision 0
1001-MECH-453-069, “Complete Pipeworks Inspections for Wall Thickness and Diameter” Revision 0

1001-MECH-453-072, “Complete Pipeworks Inspection for Wall Thickness and Diameter – Cascade 6 – MH1B”
1001-MECH-454-001, “Remove and Replace Damaged Section of Piping”
1001-MECH-454-004, “Remove and Replace Damaged Section of Piping”
1001-MECH-454-005, ‘Perform Commercial Grade Dedication of Piping”
1001-MECH-454-006, ‘Perform Commercial Grade Dedication of Piping”
1001-MECH-843-011, “Ferromagnetic Testing of Fixing Plates on Upper Steel Cascade 1.5”
1001-MH2-RUST-FLOMELS-001, “Installation of the Flomels in Mini Hall 2,” Revision 1

Condition Reports (CR) & Nonconformance Reports (NCR)

CR 2008-3501
CR 2008-3502
CR 2008-3503
CR 2010-3159
CR 2011-0958
CR 2011-1095
CR 2011-1120
CR 2011-1128
CR 2011-1349
CR 2011-1470
CR 2011-2928
CR 2011-3039
CR 2011-3063
CR 2011-3173
CR 2011-3178
CR 2011-3219
CR 2011-3309
CR 2011-3324
CR 2011-3485
CR 2011-3558
CR 2011-3575
CR 2011-3578
CR 2011-3579
CR 2011-3600
CR 2011-3602
CR 2011-3605
NCR 2010-3159
NCR 2011-0826
NCR 2011-0972
NCR 2011-0973
NCR 2011-1017
NCR 2011-1097
NCR 2011-1099
NCR 2011-1133
NCR 2011-1164
NCR 2011-1179
NCR 2011-1197
NCR 2011-1198

NCR 2011-1313
NCR 2011-1349
NCR 2011-3039
NCR 2011-3067

Commercial Grade Dedication Plans

CGDP 041-0003, “Cascade Upper Steel Units, Subunits, Connectors, and Fixing Plates Dedication,” Revisions 1 through 3
CGDP 041-0004, “Centrifuge Parts,” Revision 0
CGDP 041-0005, “Cascade Pipework – Installation,” Revisions 0 through 5
CGDP 041-0007, “Cascade Hexagon Bolt Torque Verification”
CGDP 041-0013, “Cascade Fastener Material,” Revision 2
CGDP 041-0032, “Remove and Replace Section of Pipe in Cascade 1.5,” Revisions 1 and 2
CGDP 041-0034, “Cascade 1.5-2.8 Fixing plate Dedication Upper Steel Units,” Revision 2
CGDP D2010-031, “IROFS 41 Flomels-Assay Hall 1 (Cascades 4 thru 8) & Assay Hall 2 (Cascades 1 thru 8),” Revision 0
CGDP 2008-045, BETEC 140
CGDP 2008-046, BETEC 110

Vendor/Supplier Documents

ETC4196072, Technical Justification of All Revisions to QPS/Sk/09/019 Revisions 1 through 4
ETC4196642, Issue 1, Displacement of Tri-Flange (Pigtails) During Centrifuge Installation, dated October 24, 2011
ETC4196642, Issue 2, Displacement of Tri-Flange (Pigtails) During Centrifuge Installation, dated November 7, 2011
Fuchs Inspection Certificate, DIN EN 10204 3.1, Lot No.: W3479-03, Drawing No.: 2_091_120_61 01 Rev. 01, PO No.: 102149, dated October 30, 2009
Fuchs Inspection Certificate, DIN EN 10204 3.1, Lot No.: W5159-00, Drawing No.: 2_091_120_61-02 Rev. 02, PO No.: 4336889, dated January 19, 2010
Fuchs Inspection Certificate, DIN EN 10204 3.1, Lot No.: W5160-02, Drawing No.: 2_091_120_61-02 Rev. 02, PO No.: 4336889, dated January 25, 2010
Fuchs Inspection Certificate, DIN EN 10204 3.1, Lot No.: W5296-02, Drawing No.: 2_091_120_61-02 Rev. 02, PO No.: 4336889, dated January 25, 2010
Fuchs Inspection Certificate, DIN EN 10204 3.1, Lot No.: W5352-02, Drawing No.: 2_091_120_61-02 Rev. 02, PO No.: 4336889, dated February 19, 2010
Fuchs Inspection Certificate, DIN EN 10204 3.1, Lot No.: W5636-01, Drawing No.: 2_091_120_61-02 Rev. 02, PO No.: 4336889, dated March 1, 2010
Fuchs Inspection Certificate, DIN EN 10204 3.1, Lot No.: W5637-02, Drawing No.: 2_091_120_61-02 Rev. 02, PO No.: 4336889, dated March 4, 2010
Fuchs Inspection Certificate, DIN EN 10204 3.1, Lot No.: W5638-00, Drawing No.: 2_091_120_61-02 Rev. 02, PO No.: 4336889, dated March 10, 2010
Fuchs Inspection Certificate, DIN EN 10204 3.1, Lot No.: W5752-00, Drawing No.: 2_091_120_61-02 Rev. 02, PO No.: 4336895, dated March 19, 2010
Fuchs Inspection Certificate, DIN EN 10204 3.1, Lot No.: W5753-02, Drawing No.: 2_091_120_61-02 Rev. 02, PO No.: 4336895, dated March 24, 2010

Fuchs Inspection Certificate, DIN EN 10204 3.1, Lot No.: W6041-02, Drawing No.: 2_091_120_61-02 Rev. 02, PO No.: 4336895, dated March 30, 2010
SBE Inspection Certificate / EN 10204 3.1, Batch No.: 225306, Drawing No.: M-27 X 120, Property Class: 12.9, Heat No.: 36681A, dated March 7, 2008
SBE Inspection Certificate / EN 10204 3.1, Batch No.: 232435, Drawing No.: M-27 X 120, Property Class: 12.9, Heat No.: 40268A, dated October 23, 2008
SBE Inspection Certificate / EN 10204 3.1, Batch No.: 235984, Drawing No.: M-27 X 120, Property Class: 12.9, Heat No.: 40269A, dated May 18, 2009
SBE Inspection Certificate / EN 10204 3.1, Batch No.: 258441/0+1, Drawing No.: M-27 X 120, Property Class: 12.9, Heat No.: 42925A, dated April 15, 2010
SBE Inspection Certificate / EN 10204 3.1, Batch No.: 258441 3, Drawing No.: M-27 X 120, Property Class: 12.9, Heat No.: 42925A, dated April 15, 2010
Stork Materials Technology CMTR, PO No.: LES-GSA-3526, W/O No.: LOU031-04-22-74929-18, M27 X 120MM Grade 12.9, Heat Lot No.: 225306, Specification: ISO 898-1 (1999), dated May 5, 2010
Stork Materials Technology CMTR, PO No.: LES-GSA-3526, W/O No.: LOU031-07-16-85843-5, M27 X 120MM Bolt, M27 Washer, Heat Lot No.: 232435, Specification: ISO 898-1 (2009) (E) Cl. 12.9, dated July 23, 2010
Stork Materials Technology CMTR, PO No.: LES-GSA-3526/WA#10, W/O No.: LOU031-02-16-13832-10, M27 X 120MM Bolt, Grade 12.9, HU78999-63113897, Specification: ISO 898-1 (1999) Gr. 12.9, dated February 23, 20101
Technical Controlling (TC) Verification Documents for CGDP 041-0004, MH1B Cascade 5

Miscellaneous Documents

Action Item Tracking (AIT) Report 2008-3476
AIT-2008-3475
AIT-2008-3423
Centrifuge Placement Records
Drawing ETC4052687-2, “Cascade Hall 1: Workshop Drawing Fixing Plates POS 129, 135, 136, 147, 151-153, 155, 158, FP/100-FP/115 for Upper Steel Work”
EG-TQ-2011-052, “Technical Question on Material Requirements,” Dated August 12, 2011
ETC4196072, “Technical Justification of All Revisions to QPS/Sk/09/019,” Dated October 14, 2011
ETC4196072, “Technical Justification of All Revisions to QPS/Kar/09/003,” Dated October 14, 2011
ETC4054566, “Static and Dynamic Design of NEF-CS for Operation and DBE Loads,” Dated October 20, 2008
ETC4054564, “Strength Analysis Report,” Dated March 1, 2011
Evaluation Report 2011-E-05-080, dated June 11, 2011
Evaluation Report 2010-E-11-159, dated November 11, 2010
Evaluation Report 2010-E-11-163, dated November 13, 2010
Purchase Order 302683, dated June 24, 2009
Purchase Order 302857, dated September 18, 2009
QA-09-0931, Inspection Report of Flomels for use in SBM1001
QAPD, Revision 30
QPS/Sk/09/019, “Agreement on Key Attributes TC 12 Cascade Header Pipework in the NEF Project,” Revisions 1 through 4
Quality Assurance Audit 2008-3139-EXT-AUD, performed Oct.27-29, 2008

Surveillance 2009-S-05-003
Surveillance 2009-S-09-216
Surveillance 2010-S-09-723
Surveillance 2010-S-02-044
Surveillance 2010-S-02-045
Test Report LOU031-07-16-85843-5
Test Report LOU031-04-22-74929-18
Test Report LOU031-04-22-74929-8
Test Report LOU031-04-22-74929-9