



SAFETY INSPECTION REPORT AND COMPLIANCE INSPECTION

1. CERTIFICATE/QUALITY ASSURANCE PROGRAM (QAP) HOLDER:

NAC International
3930 East Jones Bridge Road
Norcross, GA 30092

2. NRC/REGIONAL OFFICE

Headquarters
U. S. Nuclear Regulatory Commission
Mail Stop TWFN-4B34
Washington, DC 20555-0001

REPORT NUMBER(S)

07109225/2015-201

3. CERTIFICATE/QAP DOCKET NUMBER(S)

07109225

4. INSPECTION LOCATION

Columbiana Hi-Tech LLC
Greensboro and Kernersville, NC

5. DATE(S) OF INSPECTION

April 14-16, 2015 &
July 14-16, 2015

CERTIFICATE/QUALITY ASSURANCE PROGRAM HOLDER:

The inspection was an examination of the activities conducted under your QAP as they relate to compliance with the Nuclear Regulatory Commission (NRC) rules and regulations and the conditions of your QAP Approval and/or Certificate(s) of Compliance. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector. The inspection findings are as follows:

- ☒ 1. Based on the inspection findings, no violations were identified.
- ☐ 2. Previous violation(s) closed.
- ☐ 3. The violation(s), specifically described to you by the inspector as non-cited violations, are not being cited because they were self-identified, non-repetitive, and corrective action was or is being taken, and the remaining criteria in the NRC Enforcement Policy, to exercise discretion, were satisfied.

_____ Non-cited violation(s) was/were discussed involving the following requirement(s) and Corrective Actions(s):

- ☐ 4. During this inspection, certain of your activities, as described below and/or attached, were in violation of NRC requirements and are being cited in accordance with NRC Enforcement Policy. This form is a NOTICE OF VIOLATION, which may be subject to posting in accordance with 10 CFR 19.11.

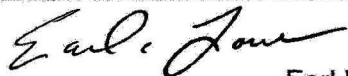
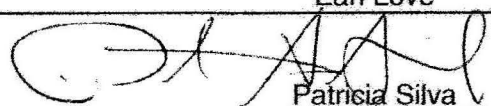
(Violations and Corrective Actions)

Statement of Corrective Actions

I hereby state that, within 30 days, the actions described by me to the Inspector will be taken to correct the violations identified. This statement of corrective actions is made in accordance with the requirements of 10 CFR 2.201 (corrective steps already taken, corrective steps which will be taken, date when full compliance will be achieved). I understand that no further written response to NRC will be required, unless specifically requested.

TITLE	PRINTED NAME	SIGNATURE	DATE
CERTIFICATE/QAP REPRESENTATIVE	Howard R. Smith		8-24-15
NRC INSPECTOR	Earl C. Love		8-24-15
BRANCH CHIEF	Patricia Silva		8/27/15

INSPECTOR NOTES COVER SHEET

Licensee/Certificate Holder (name and address)	NAC International, Inc. (NAC) 3930 East Jones Bridge Road Norcross, GA 30092
Licensee/Certificate Holder contact and phone number	Howard Smith, Vice president Quality Assurance 678-328-1276
Docket No.	071-09225
Inspection Report No.	7109225/2015-201
Inspection Dates(s)	April 14-16, 2015 and July 14-16, 2015
Inspection Location(s)	Columbiana Hi Tech, LLC (CHT) Greensboro and Kernersville, NC
Inspectors	Earl Love, Team Leader, Transportation and Storage Safety Inspector Jeremy Tapp, Safety Inspector Jon Woodfield, Safety Inspector Marlone Davis, Transportation and Storage Safety Inspector
Summary of Findings and Actions	<p>On April 14-16, 2015 and July 14-16, 2015 the team performed inspections of NAC at Columbiana Hi Tech (CHT), Greensboro and Kernersville, NC, respectively. CHT is under contract to NAC for the fabrication of (4) high enriched uranyl nitrate (HEUNL) inner containers for use in NAC-LWT steel-encased, lead-shielded shipping cask.</p> <p>The NAC-LWT package is a Type B(U)F-96 radioactive material transportation package. It is authorized to transport several types of contents, including light-water reactor and research reactor spent fuel, and HEUNL in containers specifically designed for the liquid.</p> <p>The purpose of the inspection is to assess NAC and CHT fabrication activities of the inner containers are being performed in accordance with the requirements of 10 CFR Parts 71 and 21, the applicable Certificate of Compliance No. 71-9225, Revision No. 64, Final Safety Analysis Report, and NAC's NRC-approved QA program.</p> <p>The inspection was performance based and consisted of observing shop fabrication, inspection and test activities, interviews of individuals, verification of implementation of quality procedures, and records.</p> <p>The inspection team assessed that NAC's implementation of its NRC-approved QAP was adequate. No violations were identified.</p>
Lead Inspector Signature/Date	 8/28/15 Earl Love
Inspector Notes Approval Section Chief Signature/Date	 8/28/15 Patricia Silva

Inspection Background

NAC's customer is Canadian Nuclear Laboratories Ltd. (CNL), previously Atomic Energy Canada Limited (AECL). HEUNL material is coming from the Chalk River Lab/FISST to the United States Department of Energy (USDOE) Savannah River Site. Shipper of record is CNL via material reclamation agreement between Canadian Government and the United States National Nuclear Security Administration (NNSA).

Chalk River Laboratories (CRL) is a Canadian nuclear research facility located in Deep River, Renfrew County, Ontario. In November 2014, all licenses for the operation of CRL were transferred from AECL to CNL. CNL is a new entity that manages, operates and performs all functions previously done by AECL at CRL and has the contract with NAC. As previously stated, the shipper of record is CNL via material reclamation agreement between Canadian Government and the NNSA.

Description and Status of Packaging:

The NAC-LWT package is a Type B(U)F-96 radioactive material transportation package. It is authorized to transport several types of contents, including light-water reactor and research reactor spent fuel, and HEUNL in containers specifically designed for the liquid. CHT is under contract to NAC for the fabrication of (4) high enriched uranyl nitrate (HEUNL) inner containers for use in NAC-LWT steel-encased, lead-shielded shipping cask. The HEUNL inner containers correspond with Certificate of Compliance (CoC) 71-9225, Revision 64.

Inspection Purpose

The purpose of the inspection was to assess NAC and CHT fabrication and test activities of the HEUNL inner containers that are being performed at CHT in accordance with the requirements of 10 CFR Parts 71 and 21, the applicable CoC 71-9225, Revision 64, Final Safety Analysis Report, and NAC's NRC-approved QA program.

Inspection Results

April 14-16, 2015

The inspection was performance based, to the extent possible, and consisted of observing shop fabrication activities, interviews of individuals, verification of implementation of quality procedures, and records. The inspection was limited scope and included design controls (i.e., NAC transition from design to CHT production), procurement of important-to-safety (ITS) category 'A' components, welding of a container lid, material/traceability control, calibration, and record reviews of completed work including but not limited to shell rolling, longitudinal seam welding and liquid penetrant nondestructive examinations.

Because of the limited fabrication activity and in order to obtain sufficient objective evidence for regulatory compliance the team determined that a re-inspection (performed July 14-16, 2015) was necessary in order to witness pressure (hydrostatic), volumetric, helium leak, load, and component weight measurement testing.

July 14-16, 2015

The inspection was performance based and consisted of witnessing various functional tests, interviews of individuals, verification of implementation of quality procedures, and records. Because of limited fabrication and testing activities at the time of the April 14-16, 2015

inspection and in order to obtain sufficient objective evidence of regulatory compliance, the team witnessed to the extent possible, pressure (hydrostatic), volumetric, helium leak, load, and component weight measurement testing.

Overall, with respect to the inspection, the team concluded that NAC's implementation of its Quality Assurance Program for transport of the HENUL inner containers for use in NAC-LWT steel-encased, lead-shielded shipping cask was adequate. No violations were identified.

INSPECTOR NOTES: APPLICABLE PORTIONS OF 02.02 THROUGH 02.10 OF IP 86001 WERE PERFORMED DURING THE INSPECTION WITH RESULTS DOCUMENTED BELOW:

02.02 Verify that the CoC holder's activities related to transportation packagings are being conducted in accordance with the CoC, as well as the NRC-approved QAP (reference Regulatory Guide 7.10), and that implementing procedures are in place and effective.

The NAC-LWT package is a Type B(U)F-96 radioactive material transportation package. It is authorized to transport several types of contents, including light-water reactor and research reactor spent fuel, and HEUNL in containers specifically designed for the liquid. The team noted that CHT is under contract to NAC for the fabrication of (4) high enriched uranyl nitrate (HEUNL) inner containers for use in NAC-LWT steel-encased, lead-shielded shipping cask. The team verified that the HEUNL inner containers correspond with Certificate of Compliance (CoC) 71-9225, Revision 64. The team verified that NAC and CHT fabrication and test activities of the inner containers were performed in accordance with the requirements of the applicable CoC (71-9225, Revision 64), Final Safety Analysis Report, and NAC's NRC-approved QA program and that implementing procedures were in place and effective.

The team reviewed CHT's documentation control program to assess the effectiveness of controls established for the approval, issuance, and revision control of shop traveler and job-specific quality documents. The team reviewed the two implementing procedures for traveler and job-specific document control: E-02, "Traveler Preparation, Verification, and Control," Revision 2, and E-01, "Drawing, Specification, Procedure and Customer Contract Review and Control," Revision 5. The team assessed that the procedures provided adequate guidance for the processing of traveler and job-specific procedure approvals, issuance to the appropriate location, and revision control at each documented location. The team verified that travelers and job-specific procedures were approved per procedure by appropriate personnel who were qualified as required, were the most current revision as documented on the master list, and were marked as required and available at the job location where the prescribed activity was performed. The team interviewed personnel responsible for the program as well as reviewed several fabrication document packages on the shop floor that included travelers and drawings and job-specific procedures for the NAC project. The team assessed that for the shop travelers and job-specific quality procedures reviewed, they were approved by appropriate personnel having the required qualification, were adequately marked, and the correct revision was issued to the appropriate location(s). The team reviewed NAC's project specific document approval status log and compared a sample of fabrication and inspection documents (i.e., weld specifications, control of temporary attachments and material, and nondestructive examinations) at a specific job location and noted adequate configuration controls. Overall, the team assessed that the documentation controls at CHT were adequate and no concerns were identified.

02.03 Verify that provisions are in place for reporting defects which could cause a substantial safety hazard, as required by 10 CFR Part 21.

Since the fabrication activities at CHT were relatively early in the process, no nonconformance reports had been generated at the time of the April 2015 inspection for the NAC project. Therefore, the team did not review the nonconformance program further. The team reviewed program controls for 10 CFR Part 21, "Reporting of Defects and Noncompliances," including Policy/Procedure No. Q-07, "Reporting of Defects and Noncompliance in Compliance with 10 CFR Part 21," Revision 4. The team verified that CHT was meeting the current posting requirements of both the regulations and Q-07. The team found that CHT posted the current 10 CFR Part 21 regulations, Section 206 of the Energy Reorganization Act of 1974, and Q-07 on boards at the entrance for workers and in each manufacturing building. No concerns were

identified by the team regarding 10 CFR Part 21 program controls or implementation at CHT.

02.04 Interview selected personnel and review selected design documentation to determine that adequate design controls are implemented.

CHT is only the fabricator of the HEUNL container assembly for the Light Weight Transport (LWT) cask packaging. The holder of the CoC and designer of the LWT packaging and HEUNL container is NAC. Although CHT is not responsible for the design of the HEUNL container assembly which will be used in existing LWT packagings, the inspection team reviewed the CHT Policy/Procedure No. E-07, Design Control revision 1, (effective date 12/6/2013) for a general background check on CHT's understanding of the importance of design control when a product is designed and fabricated by CHT. The CHT Policy/Procedure for design control was found to be well written, provided a thorough description of the design control process, and defined roles and responsibilities. The team determined that CHT understood the importance of design controls.

Since CHT is only the fabricator of the HEUNL container assembly using NAC's design, the team specifically reviewed the following CHT policy/procedures associated with design control during fabrication to verify they are being properly implemented:

- E-01, "Drawing, Specification, Procedure & Customer Contract Review and Control," Rev. 5, dated 01/13/15
- E-02, "Traveler Preparation, Verification and Control," Rev. 2, dated 1/13/15
- E-03, "Optional Sequence & Simultaneous Conduct of Traveler Operations," Rev. 0, dated 5/29/02

In addition, the team reviewed NAC's document 315-S-23, Procurement/Fabrication Specification for HEUNL Containers, revision 0, dated August 2014.

The team interviewed the CHT Project Manager (PM) for the HEUNL container assembly project to evaluate the design controls in place for handling the fabrication drawings provided by NAC to CHT, which also showed welding details and inspection criteria. The fabrication drawings provided to CHT by NAC were actually NAC's design drawings for the HEUNL container assembly. Due to the small stature of the HEUNL container and great detail provided on the NAC design drawings, CHT determined that separate fabrication drawings were not required. Using the NAC design drawings for fabrication was acceptable per the NAC specification 315-S-23.

The team was told by the CHT PM that the first official HEUNL container assembly design/fabrication drawings provided by NAC were electronically sent to CHT soon after the original Purchase Order (PO).

CHT had received one design change request (DCR 315-391-181-3A) to the original NAC drawings transmitted to CHT as of the date of the inspection. The NAC DCR drawings were also sent to CHT electronically. The CHT PM is required to provide an electronic return receipt to NAC when he receives any drawings. The CHT PM for the project receives an electronic drawing list with current revisions in addition to the electronic drawing files. The CHT PM loads the electronic drawing files he receives onto the CHT computer system. At CHT, only management employees can access the CHT computer system. Once the CHT PM has the drawings electronically, he prints a master paper copy of the drawings and stores the master in a fireproof cabinet in a Master Drawing Folder. In addition to the master paper copies of the drawings, the PM makes additional controlled copies and keeps records of which fabrication work station in the shop or individuals have the controlled copies. The PM does this by

maintaining a Drawing Control Card for every NAC design/fabrication drawing, which lists the revision, date, person/department that have a paper controlled copy of the drawing, and the control number of the drawing. When checked out drawings are returned, they are refiled and the Drawing Control Card updated reflecting the return. These records are maintained in a Controlled Drawing File.

In general, there are only about five controlled copies of design/fabrication drawings used at CHT for the HEUNL container assembly Project. CHT engineering notifies CHT Material Control (MC) to recall all outstanding controlled drawing copies when the drawings are changed by NAC revision or a DCR. MC checks the drawing control card for the drawing distribution and retrieves the drawings. All old drawing copies are destroyed by engineering except one, which is identified obsolete and maintained in the Master Work Order file for reference. The new letter or change is re-entered on the Drawing Control Card, dated, and the new revision drawings are put on file. Distribution of the revised drawings is in accordance with the names/departments recorded on the Drawing Control Card. Once the project is completed, all final quality records are to be sent to NAC. Also, the original paper copies of quality records will be stored at CHT in a climate controlled room in standard non-fireproof file cabinets. However, CHT will also make electronic copies of the project quality documents and will store these in a fireproof cabinet. Therefore, records will be stored at three places to ensure retrievability in the future.

Should any of the fabricated HEUNL container assemblies be found not in conformance with NAC design/fabrication drawings, specifications, or codes and standards, CHT shall declare them nonconforming and write a CHT Nonconformance Report (NCR). Any CHT NCRs dispositioned 'Use-As-Is' or 'Repair' shall be submitted to NAC for review and approval. Following evaluation by NAC, the CHT NCR will be returned to CHT with a disposition of approval or rejection for the proposed actions by a NAC Vendor Nonconformance Report (VNCR) Disposition Sheet. CHT NCRs with 'Use-As-Is' and 'Repair' dispositions and NAC's VNCR shall be included in the Final Documentation Package.

The team found the design controls for the HEUNL container assembly Project at CHT to be adequate with the PM responsible for controlling design revisions. Although the CHT project design control was totally concentrated with the PM, the team found the PM's process of controlling documents at CHT to be functionally adequate. Although there is no individual that verifies the PM's design/document control work in real time, the CHT Quality Control (QC) department will perform periodic audits of the design/document controls for the HEUNL container assembly project. The team found the CHT design controls in place for the HEUNL container assembly project to meet the requirements of the regulations with no concerns.

02.05 Review selected drawings, procedures and records, and observe selected activities being performed to determine that the fabrication, test, and maintenance activities meet SARP design commitments and requirements documented in the CoC.

The team reviewed work order 14061-05-01, Assembly Traveler 22946 for the Shell (drawing no. 315-391-181/part number 4). The traveler reflected the fabrication sequences including shell rolling, welding of the longitudinal seam, and visual/penetrant examinations that had been performed. The team observed the (4) Shells in storage and compared a traveler for completeness and accuracy with regards to completed work as reflected within the traveler.

The team witnessed welding in accordance with Container Assembly, drawing No. 315-391-181, Revision 3 and Design Change Request (DCR) No. 315-391-181-3A dated 3/31/2015. Specifically, the team witnessed fit-up, along with tack and component welding of (2) lid Boss' (Item 16) to a container lid (Item 24). The team noted that activities were performed in accordance with CHT work order 14061-02; traveler s/n 22937, revision 1, sequence 50; weld

procedure specification 08081-101, revision 7; and Drawing 315-391-181, Assembly 95. In addition, the team observed control of in-process materials such as top and bottom end caps and (4) shell assemblies. Overall, the team determined that the selected inspected activities met SARP design commitments and requirements documented in the CoC.

02.06 Observe activities affecting safety aspects of the packaging (such as fabrication, assembly, and testing) to verify that they are performed in accordance with approved methods, procedures, and specifications.

The team reviewed the following CHT policy/procedure associated with material control for the HEUNL container assembly project to verify it is being properly implemented:

- MC-01, "Control, Identification, and Traceability of Materials or Products," Rev. 3, dated 3/31/15

The procedure states that the Material Control Coordinator (MCC) is responsible for maintaining control of materials and paperwork for projects on the CHT shop floor. For the HEUNL container assembly project, the MCC receives travelers from the Manufacturing Engineer/Project Manager for the project. The MCC assigns serial numbers to the travelers and fills out the traveler bill of materials based on material certifications. The MCC then releases the traveler and the needed material to the shop simultaneously with the aid of a material handler.

Upon original receipt of the project materials, the MCC had assured that the materials had been placed in an area segregated from accepted, in-process, or nonconforming materials, and identifiable to accompanying documents. The MCC marks the CHT PO and Work Order numbers on the materials by a temporary marking method. Upon completion of acceptable receipt inspection by a QC inspector, a green accepted tag or label is affixed to the material. In addition, as the project progresses, the MCC maintains an itemized list of project materials and continuously updates the location and status of project materials.

Special considerations are also given for identification of project items prior to vendor operations outside CHT to assure that identification/traceability is not removed, lost, or obliterated during vendor processing. Project travelers are to specify selected identification methods, content, and location, as required, during material fabrication. Additionally, the travelers must have provisions for transferring markings to each part when an item is subdivided. Minimum traceability information is the PO, work order, and/or heat number of material appearing on the green tag or the traveler serial number.

The team discussed material control and traceability with the HEUNL container assembly Project Manufacturing Engineer/PM and the MCC on the shop floor. A sampling of identification markings were located on project components and verified against the procedure for compliance. In all cases, it was demonstrated that material control and traceability for all HEUNL container sub-assemblies and full assemblies could be maintained.

The team found the MC-01 Material Control and Traceability procedure to be properly implemented during the fabrication of the HEUNL container assembly Project with no concerns.

The July 14-16, 2015 inspection was performance based to the extent possible and consisted of witnessing various functional tests, interviews of individuals, verification of implementation of quality procedures, and records. Because of limited fabrication and testing activities at the time of the April 14-16, 2015 inspection and in order to obtain sufficient objective evidence of regulatory compliance, the team witnessed to the extent possible, pressure (hydrostatic), volumetric, helium leak, load, and component weight measurement testing.

The team witnessed hydrostatic pressure, helium leak, volumetric, siphon assembly verification, and load testing of HEUNL containers as required by NAC specification and contract requirements. The team noted each of the tests was performed in sequential order as defined by CHT's manufacturing/testing procedures. With the exception of Container Unit No. 1 hydrostatic and helium leak, test records were completed by inspection personnel and documented on test certifications.

With regard to the hydrostatic test of HENUL Container Unit No. 1, the team observed that direct visual examination of the Container bottom surface plate could not be performed in part because the container, including the base plate, was supported on blocks. NAC determined the condition to be a violation of Hydrostatic test procedure 14061-HYDRO, Revision 1, "Pressure (Hydrostatic) Test Procedure" which requires each Container to be visually examined to assure no leaks, cracks or structure deformation. The team noted CHT initiated NCR (15-116, Revision 1) and CAR (15-020) to address this issue. Further, NAC initiated VNCR No. 845226-004 in order to re-perform the hydrostatic test per the sequential requirements of section 8.1.4.4 of the NAC-LWT Cask Safety Analysis Report (Rev. 43). This issue of CHT's failure to comply with the test procedure was identified by NAC surveillance personnel witnessing the test. Subsequently, CHT re-performed the hydrostatic test satisfactorily according to the test procedure. No violation of NRC requirements occurred in part because NAC had self-identified the discrepancy and appropriate actions were taken to address and re-test the component in question.

With regard to the helium leak test of HENUL Container Unit No. 1, the team observed test setup configuration, required calibrations, and procedure qualification for response time relative to hardware configuration of the test equipment and manifolds used for testing. In addition, the team observed that acceptable lid port plug leakage rate value was not obtained. CHT QA initiated a nonconformance report and the test was suspended. Initially the cause of the failure was thought to be either the sealing surface O-ring, test fixtures, surface contamination, or a lid to Container alignment issue. To the extent possible, the team observed activities in anticipation that the condition would be resolved at the time of inspection. At that time, NAC advised the team that they would inform us of the cause and resolution along with the results of a future re-test. Subsequently, CHT identified the cause of the problem (NCR 15-121 Revision 1 and CAR 15-021) to be the initial use of an orifice type gas leak standard instead of a gas permeation type through fused glass or quartz as required by procedure. In addition, CHT noted that the leak test fixture fitting was not adequate to prevent helium leakage. CHT corrected the deficiencies by reworking the fitting to provide a welded joint instead of a threaded connection and performed testing using the proper leak standard. The team noted HEUNL Container Unit No. 1 leak test was performed on August 4, 2015 and test results were satisfactorily documented on a Helium Mass Spectrometer Leak Detection report as required by procedure. Overall, the HEUNL Container noted was satisfactorily tested leak tight in accordance with the accept criteria as required by procedure HEUNL-HMSLD, Revision 2, "HMSLD Leak testing of NAC HEUNL Containers." No violation of NRC requirements occurred in part because NAC had self-identified the discrepancy and appropriate actions were taken to address and re-test the Container in question.

The team reviewed Policy/Procedure No. Q-01, "Control of Measuring and Test Equipment," Revision 13 to determine the requirements at CHT for onsite and offsite calibration activities. The procedure discusses, in part, the requirements regarding use and control of measuring and test equipment (M&TE); that calibration occurs to national standards and that those standards have a certain accuracy when compared to the instrument being calibrated; and calibration frequency requirements. Based on shop observations and fabrication document reviews, the team assessed whether the measuring and testing devices used in activities affecting quality

were appropriately controlled and calibrated. Specifically, the team reviewed the calibration documentation for a digital thermometer, digital calipers, and a digital height gage. The team found that the M&TE was adequately controlled and calibrated for use in quality related work and the associated documentation was complete and readily retrievable in all cases except one.

For the digital thermometer, ID number CHT-566, the team reviewed the calibration documentation provided from an offsite laboratory that performed the calibration, along with the associated PO for the calibration work. The team noted that the PO required the calibration laboratory to state on the calibration documentation that the nominal accuracy of the standard used was at least four times the nominal accuracy of the instrument being calibrated, if that was the case. The team found that the calibration documentation did not contain that statement.

The team reviewed Q-01 and noted that Step 5.4 required the nominal accuracy of the standard to be at least four times the nominal accuracy of the instrument being calibrated, or have an authorized basis of acceptance. The team noted that the digital thermometer calibration documentation did not provide the four time nominal accuracy of the standard used nor an authorized basis of acceptance. This issue was entered into CHT's corrective action program as CAR No. 15-012. Afterwards, the team reviewed an amended calibration certificate which included a basis statement as well as information related to total accuracy ratios at lower test points that supported the basis statement. Overall, no issues were identified with the corrected calibration certificate. The team noted no other instances of noncompliances to Policy/Procedure No. Q-01. Further, the team noted that CHT had used its corrective action process to properly document and resolve this issue. The team considered this to be an isolated incident and of minor safety significance. This failure constitutes a violation of minor significance and is not subject to formal enforcement action in accordance with Section II of the Enforcement Policy. In addition, the team noted affixed tags showing calibration date, next calibration due date and equipment serial number on all M&TE observed in the shop. Overall, the team determined that M&TE was being adequately controlled and calibrated to ensure only calibrated equipment would be issued for use in the field.

02.07 Review selected drawings and records, and interview selected personnel, to verify that the procurement specifications for materials, equipment, and services received by the QAP holder meet the design requirements.

The team specifically reviewed the following CHT policy/procedures associated with the procurement and receipt inspection of materials/items for the HEUNL container assembly project to verify if they are being properly implemented:

- P-01, "Procurement of Materials, Items or Services," Rev. 4, dated 1/5/15
- Q-02, "Receiving Inspection of Purchased Items and Services," Rev. 5, dated 8/1/14

The CHT Manufacturing Engineer/PM (ME/PM) is responsible for the preparation of material/items POs for the HEUNL container assembly project. Exhibit P-01-1 of P-01 is the standard format for a CHT PO when purchasing materials, items, or services. In accordance with P-01, the ME/PM shall complete the body of a PO based on the bill of materials (BOM) from the design drawings and when required add a note that a qualified or approved vendor is required from the CHT Approved Vendor List (AVL). When ordering materials or items, a product description shall be provided on the PO. The ME/PM shall sign and date the PO and forward it to the QA Manager for review and approval. The QA manager reviews the PO and signs and dates the PO and returns it to the ME/PM. The ME/PM forwards the PO to the Purchasing Manager for order placement after any comment resolution with QA. The Purchasing Manager processes the PO and then signs off the PO.

The team reviewed the POs for HEUNL container assembly Important to Safety (ITS) Category A items: lid screws & threaded inserts (Heli-coil); and ITS Category B item: stainless steel nipples. The team found the PO for the Category A items to use the proper form and to have the proper ME/PM, Quality Assurance (QA), and Purchasing Manager signatures. The team found the description of the Category A items to be properly transferred from the design drawing BOM to the PO. In addition, the PO invoked the following requirements on the supplier of the Category A items:

1. Certified Material Test Reports are to be provided.
2. All items that are safety related, 10CFR 21 and 10CFR71 Subpart H apply to the order.
3. Material shall be furnished under the requirements of the vendor's QA program as audited and approved by CHT.
4. A Certificate of Compliance is required, stating compliance to items 1 through 3 above.
5. Full access to suppliers and sub tier suppliers facilities shall be granted to CHT and its customer to perform inspections surveillance or as required to assure contract requirements are being met.
6. A Qualified Vendor is required.
7. The team found the above PO requirements for ITS Category A items appropriate.

The team found the PO for the Category B items to use the proper form and to also have the proper ME/PM, QA, and Purchasing Manager signatures. The team found the description of the Category B item also to be properly transferred from the design drawing BOM to the PO. The PO invoked the following requirements on the supplier of the Category B items:

1. Material Test Reports are to be provided
2. A Certificate of Compliance is required, stating compliance to item 1 above
3. The material, items, and/or services on the PO are for application on a project invoking federal regulations 10CFR72 subparts G and 10CFR71 subpart H
4. Vendor is to notify CHT of any deficiencies on this order, for further processing under CHT's QA program
5. The team found the above PO requirements for ITS Category B items appropriate

The team reviewed the receiving inspection documents for the Category A and B items on the POs described above for compliance with Q-02. CHT personnel assigned to perform receiving inspection are to be qualified and certified in accordance with CHT policy/procedure Q-06 (Reference the Training/Qualifications section of this Report). However, the Purchasing Manager is responsible for interfacing with suppliers when required to resolve discrepancies identified as a result of the receiving inspection. Upon receipt of orders, the Material Control Supervisor shall stage the items for QC receiving inspection. Any visible damage to items and materials is noted and the Purchasing Manager notified.

Per Q-02 the QC inspector obtains a copy of the PO from the PO files and reviews the PO to assure required documents, certification, and reports are included in the package received from the vendor. The QC inspector is then required by procedure to verify the PO heading information is complete including supplier, Work Order number, necessary approvals of the PO and the supplier is either qualified or approved when noted in the body of the PO. The purchased items received are verified against the supplier documentation and the PO for identification, quantity and certification requirements. If the QC Inspector observes any of the certification/reports required by the PO are missing or incorrect, and other issues, the QC Inspector notifies the Purchasing Manager by completing a Missing and/or Corrected Certification Request (MCCR) (Exhibit Q-02-3 of Q-02). The Purchasing Manager then takes the necessary action for resolution with the vendor. Items remain in the receiving area pending resolution of the issues reported on the MCCR. After resolution, the completed MCCR is

attached to the QC copy of the PO for retention. Q-02 provides details on how a QC Inspector is to review material test reports and certified material reports against the details of material specifications and document this review. Q-02 also provides details on the minimum criteria that shall be provided on Certificate of Conformances. Q-02 provides further guidance on performing physical inspections of purchased items, such as dimensional checks.

Per Q-02, the QC Inspector signifies acceptance of items, services and accompanying documents by 1) attaching a Receiving Log (Exhibit Q-02-1 of Q-02) to the PO, stamping or signing, dating, and completing column information for each PO item, 2) stamping or signing, dating and entering the PO specified item part number and specification/standard numbers and revisions, on the certification/reports received and reviewed, 3) completing, stamping, dating and affixing a green Accepted tag to the material or items. Finally, upon acceptance of products or dispositions of discrepant products, the QC Inspector shall record results in the Supplier Quality History Record (Exhibit Q-02-2 of Q-02).

After completion of the receiving inspection, per Q-02 the supplier certifications are turned over to the ME/PM and filed in the Work Order Package. The QC copy of the PO and Receiving Log are maintained in the QC Inspection area until the project is complete. At project completion these records are turned over to the ME/PM for incorporation into the Work Order Package.

The team reviewed the Category A items' receiving inspection documentation for procedure Q-02 compliance. The team found the Receiving Log form Q-02-1 to be properly filled out for the two items and the separate Certificate of Compliance for each item to have the information written on it by the QC Inspector as required by Q-02. The team verified the vendor was on the CHT Approved/Qualified Vendor List and that the documentation provided demonstrated the quality of the ITS Category A items.

The team also reviewed the Category B item's receiving inspection documentation for procedure Q-02 compliance. The team found the Receiving Log form Q-02-1 to be properly filled out for the item and the Certificate of Compliance to have the information written on it by the QC Inspector as required by Q-02. The team verified that the documentation provided demonstrated the quality of the ITS Category B item.

The team found the P-01 and Q-02 Procurement and Receipt Inspection procedures to be properly implemented for ITS Category A and B items for the HEUNL container assembly Project with no concerns.

The team specifically reviewed the following CHT policy/procedures associated with the External Audits of material suppliers for the HEUNL container assembly Project to verify if they are being properly implemented:

- Q-16, "Q.A. Evaluation of Nuclear Industry Assessment Committee (NIAC) Assessment Reports," Rev. 0, dated 4/26/02
- Q-22, "Audits," Rev. 3, dated 11/20/13

Tioga Pipe Supply Company, Inc., Trust Manufacturing, and Chatham Steel Corporation supplied Important-to-Safety Category A materials for the fabrication of the HEUNL container assemblies and all are on CHT's Qualified Vendors List. The team reviewed the CHT external audits for each supplier.

For Tioga Pipe Supply Company, Inc., CHT provided a copy of the latest NIAC Assessment Report. In accordance with Q-16 and the NIAC Charter and Operations Procedure, the NIAC Report contained the following:

1. Assessment Plan
2. Scheduling and Assessment Concurrence Letter, as applicable
3. Assessment Report
4. Findings, as applicable
5. Completed Assessment/audit Checklist
6. Lead Auditor Qualification Records
7. Finding close out documentation, as applicable

The team reviewed a Nuclear Industry Assessment Committee (NIAC) Report dated July 2012 and found it complete and to contain the seven elements as applicable. Attachment A to Q-16 is a CHT NIAC Assessment Evaluation Form which must be filled out to document the review of the Report and its applicability to CHT's scope of work and needs by CHT QA personnel. The team found the CHT Assessment Evaluation Form for the NIAC Report to be properly filled out, to document any issues of applicability, and to have the proper CHT QA personnel signatures.

For Trust Manufacturing, CHT also provided a copy of the latest NIAC Assessment Report dated May 2013. The team reviewed the report and also found it to contain the seven elements listed above, as applicable. However, there was no CHT NIAC Assessment Evaluation form associated with the report. In this case, since CHT is a member of NIAC, CHT had provided the lead auditor from its QA department to perform the audit. The lead auditor from CHT wrote the assessment report and the report contained the CHT QA employee Qualification Records justifying lead auditor status. The team found the NIAC Report thorough and agreed that there was no need for a Q-16 NIAC Assessment Evaluation Form in this instance.

For Chatham Steel Corporation, CHT again provided a copy of the latest NIAC Assessment Report dated March 2013. The team reviewed the report and also found it to contain the seven elements listed above, as applicable. The team found the CHT Assessment Evaluation Form for the NIAC Report to be properly filled out, to document any issues of applicability, and to have the proper CHT QA personnel signatures.

Q-22 requires that a supplementary annual review of all qualified and approved suppliers be performed by CHT QA. The review is to be documented on a Vendor Audit Extension/annual Review Authorization Form (Exhibit Q-22-6 of Q-22) and is to be retained as part of the audit record. The team found the Audit records provided for each of the Qualified Vendors to contain the annual reviews.

The team found the three external audits reviewed for the HEUNL container assembly Project to be compliant with procedures Q-16 and Q-22 with no concerns

02.08 Review selected records and interview selected personnel to verify that a nonconformance control program is effectively implemented, and that corrective actions for identified deficiencies are technically sound and completed in a timely manner.

Since the fabrication activities at CHT were relatively early in the process, no nonconformance reports had been generated at the time of the April 2015 inspection for the NAC project. Therefore, the team did not review the nonconformance program further. However, at the time of the July 14-16, 2015 inspection two (2) nonconformances (NCRs 15-116, Revision 1 and 121 Revision 1) were initiated as a result of Hydrostatic and Helium leak testing, respectively (Refer to 02.06 for a description and resolution of the nonconforming conditions). Both nonconformances resulted in CHT issuance of CARs (15-020 and 021). Overall the team noted that NAC maintains sufficient records to furnish evidence that a nonconformance control

program is being effectively implemented, and that corrective actions for identified deficiencies are technically sound and completed in a timely manner.

02.09 Review selected records and procedures, interview selected personnel, and observe selected activities affecting the safety aspects of the packaging to verify that individuals performing activities affecting quality are properly trained and qualified, and to verify that management and quality assurance (QA) staff are cognizant and provide appropriate oversight.

Since the inspection was primarily a fabrication inspection, the team specifically reviewed the following CHT policy/procedures associated with inspection, test, and NDE personnel training/qualification to verify they are being properly implemented:

- Q-06, "Qualification of Inspection and Test Personnel," Rev. 1, dated 3/30/15
- Q-21, "Qualification & Certification of Nondestructive Examination Personnel," Rev. 7, dated 9/26/14

Q-06 specifies the qualification requirements for Level I, II, and III CHT QC inspectors. The capabilities/qualifications of a candidate for certification as an inspector is initially determined by an evaluation of the candidate's education, experience, training, test results, and capability demonstration. This information is then documented on a "Certification of Capability for Inspection and Test Personnel" form which is Exhibit Q-06-2 of Q-06. After initial certification, inspectors are to have their job performance reevaluated at one year intervals. Reevaluation is to be by evidence of continued satisfactory performance and documented on a "Certification of Qualification for Inspection and Test Personnel" form which is Exhibit Q-06-3 of Q-06. Vision tests shall be conducted no more than 30 days prior to qualification and every year thereafter. Vision test results are documented on Exhibit Q-21-2 of Q-21. Inspectors are recertified at least once every three years.

The team reviewed the qualification records for three Level II CHT QC inspectors working on the HEUNL container project. The team verified that there were Q-06-2, Q-06-3, and Q-21-2 forms properly filled out for each individual. The forms documented the basis for initial certification, continuing certification, and vision test records for each individual. The team determined all the forms to be in accordance with the procedure, with adequate experience documentation, proper approve signatures, and with starting dates and expiration dates.

Q-21 specifies the qualification requirements for Level I, II, and III CHT Nondestructive examination (NDE) inspectors. Q-21 states that the initial certification of all three levels of NDE inspectors shall be by examination as required by the American Society for Nondestructive Testing (ASNT)-TC-1A, American Society of Mechanical Engineers (ASME) Section III, and Q-21. Acceptable examination results are recorded on a "NDE Personnel Certification Record" form which is Exhibit Q-21-1 of Q-21. NDE inspector vision tests shall be conducted no more than 30 days prior to qualification and every year thereafter. Vision test results are documented on Exhibit Q-21-2 of Q-21. NDE inspectors are recertified at least once every three years. NDE Level I and II certifications are signed by the Level III examiner and NDE Level III certification is signed by the Vice President of Environmental, Health, Safety, and Quality.

The team reviewed the qualification records for Level II and Level III CHT NDE inspectors working on the HEUNL container project. The team verified that there were Q-21-1 and Q-21-2 forms properly filled out for each individual. The forms documented the basis for initial certification with examination grades and vision test records for each individual. The team determined all the forms to be in accordance with the procedure, with adequate examination documentation, proper approve signatures, and with starting dates and expiration dates.

The team found the Q-06 and Q-21 CHT Qualification procedures to be properly implemented for the CHT QC Inspectors and NDE inspectors involved with the HEUNL container assembly Project with no concerns.

02.10 Verify that audits of the QAP and activities affecting the safety aspects of the packaging are scheduled, have been performed as scheduled, and that identified deficiencies have been satisfactorily resolved in a timely manner.

The team reviewed the internal audit program as defined in Policy/Procedure No. Q-22, "Audits," Revision 3. This was to verify that the program was comprehensive and that audits were scheduled and conducted periodically in accordance with approved procedures by trained and qualified audit personnel who documented the audit results and followed up deficient areas via the corrective action program. The team reviewed a selection of internal audits performed in 2014 and 2015 as well as the 2014 internal audit schedule to verify that they were conducted in accordance with the program as previously defined. The team also reviewed a selection of lead auditor training and qualification records to assess whether those leading audits were trained and qualified as required by the approved procedures. For those audits performed that required corrective actions to be implemented, the team assessed whether Requests for Corrective Actions (CARs) were written as required.

The team noted that audit personnel did not have direct responsibility in the areas being audited and that the audit records were reviewed and approved by appropriate levels of management. For the lead auditor training records that were reviewed, all were trained and qualified as required by the approved procedure. During the review of an internal audit checklist that assessed nonconforming items and services and was dated September 30, 2014, the team noted that four audit elements were considered unsatisfactory. However, the team identified that the audit checklist did not state that a CAR was written for these conditions adverse to quality. After discussions with CHT personnel, it was determined that CARs were not written for those four unsatisfactory audit elements. The team noted that CHT's lead auditor documented what he/she considered to be minor items in the checklist but did not issue a corresponding CAR and that corrective actions were completed, verified and also documented in the checklist. Further, the team noted that CHT considered the findings to be below the threshold of trend analyses. The team reviewed actions taken by CHT (CAR No. 15-011) and determined adequate corrective actions were taken. Overall, the team considered this to be an isolated incident and of minor safety significance. This failure constitutes a violation of minor significance and is not subject to formal enforcement action in accordance with Section II of the Enforcement Policy. Overall, the team assessed that the Internal Audit Program was adequately implemented by performing comprehensive audits with trained and qualified personnel of all aspects of the Quality Assurance Program on an annual basis.