NRC FORM 591M PART 1
(10-2010)
10 CFR 2.201

U.S. NUCLEAR REGULATORY COMMISSION

SAFETY INSPECTION REPORT AND COMPLIANCE INSPECTION

1. LICENSEE/LOCATION INSPECTED:	2. NRC/REGIONAL OFFICE
NAC International, Inc., 3930 East Jones Bridge Road Norcross, Georgia, 30092 (GE-Hitachi Fabrication Facility, Canonsburg, PA) REPORT NUMBER(S) 07201015/2011201	Division of Spent Fuel Storage and Transportation U. S. Nuclear Regulatory Commission Mail Stop: EBB-3-D-02M Washington, DC, 20555-0001

3. DOCKET NUMBER(S)	4. LICENSE NUMBER(S)	5. DATE(S) OF INSPECTION
72-01015	N/A	April 26-29, 2011

LICENSEE:
The inspection was an examination of the activities conducted under your ~~license~~ Certificate of Compliance as they relate to ~~radiation~~ safety and to compliance with the Nuclear Regulatory Commission (NRC) rules and regulations and the conditions of your license. 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 violations(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, NUREG-1600, to exercise discretion, were satisfied.

Non-cited violation(s) were discussed involving the following requirement(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. This form is a NOTICE OF VIOLATION, which may be subject to posting in accordance with 10 CFR 19.11.

(Violations and Corrective Actions)

10CFR72.156, "Identification and control of materials, parts, and components," states in part: the certificate holder shall establish measures for the identification and control of materials, parts, andcomponents. These measures must ensure that identification of the item is maitained by heat number, part number, serial number, or other appropriate means, either on the item or on the records traceable to the itemas required, throughout fabrication, installation, and use of the item. These identification and control measures must be designed to prevent the use of incoreect or defective materials, parts, and components.

Contrary to the above, the team compared the actual markings on the steel piece being fabricated into the VCC lift anchor, against the pieces identified in the work traveler. The team noted the lot number identification shown on the fabricated VCC lift anchor did not match the lot number in the work traveler at sequence D.

In 30 days from receipt, please provide a written response, including a description of corrective action(s).

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
LICENSEE'S REPRESENTATIVE	Howard Smith		6-13-11
NRC INSPECTOR	Jim Pearson		6/13/11
BRANCH CHIEF	Eric Benner		6/13/11

NRC FORM 591M PART 1 (10-2010)

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 678-328-1276
Docket No.	07201015
Inspection Report No.	2011201
Inspection Date(s)	April 26-29, 2011
Inspection Location(s)	GE-Hitachi Fabrication Facility, Canonsburg, PA
Inspectors	Jim Pearson, Earl Love, Jon Woodfield, Juanjo Montesinos (Observer)
Summary of Findings and Actions	This primary focus of this inspection was to review the corrective actions occurring, from an earlier inspection of activities at the GE-Hitachi (GEH) facility. One violation was identified. 10 CFR 72.156, "Identification and control of materials, parts, and components," which states in part: the certificate holder shall establish measures for the identification and control of materials, parts, and components. These measures must ensure that identification of the item is maintained by heat number, part number, serial number, or other appropriate means, either on the item or on records traceable to the item as required, throughout fabrication, installation, and use of the item. These identification and control measures must be designed to prevent the use of incorrect or defective materials, parts, and components. (See Report, Section 02.04 for details) Contrary to the above, the team compared the markings on the pieces being fabricated into the VCC lift anchor against the pieces identified in the traveler and found that the lot number identification shown on the fabricated Vertical Concrete Cask lift anchor did not match the lot number listed in the traveler at sequence 10.
Lead Inspector Signature/Date	Jim Pearson Jim Pearson 6/13/11
Inspector Notes Approval Branch Chief Signature/Date	Eric Benner 6/13/11

INSPECTION BACKGROUND

The Nuclear Regulatory Commission (NRC) performed inspections the weeks of October 29 to November 2, 2007 and January 14-17, 2008, of NAC International, Inc. (NAC) at the General Electric-Hitachi (GEH) fabrication facility in Canonsburg, PA. Based on issues identified during the first inspection week, the team elected to conduct an inspection debrief and continue the inspection at a later date. This action was taken due to the team's concern regarding the manner in which NAC's Quality Assurance (QA) program requirements were not being adequately implemented by GEH. Also, NAC had identified an issue regarding procurement of materials and initiated a stop-work order that was still in effect at the start of the inspection. Subsequently, the team informed NAC and GEH personnel of the NRC's concern over the extent of Quality Assurance (QA) programmatic issues at the GEH facility, and that the team would conduct the second week of inspection noted above.

During the second inspection week, the team reviewed NAC and GEH corrective actions to NRC findings from the first inspection week. The team also reviewed the actions that GEH had initiated to address both the NRC's and NAC's concerns in improving the implementation of GEH's QA program. In preparation for resuming fabrication activities at the GEH facility in 2007, NAC had performed an audit of GEH in April 2007 that identified a number of concerns including a decline in QA programmatic performance. In a follow-up audit in early October 2007, NAC identified additional concerns and noted that little progress had been made by GEH in addressing the April 2007 audit issues. The NRC reviewed the initiatives implemented, or planned, by GEH but was unable to make any assessment as to their effectiveness given the short period of time that most of the actions have been in place, and that others had yet to be implemented.

During the second inspection week, two (2) violations of NRC requirements were identified by the NRC, one with three examples. The first violation was against 10 CFR 72.150, "Instructions, Procedures, and Drawings." The NRC identified three examples where activities affecting quality were not prescribed in documented procedures, or where procedures for activities affecting quality were not followed. The second violation was against 10 CFR 72.158, "Control of Special Processes." The NRC identified that a welder was shown as qualified to perform two separate welding processes, yet his qualification to do so had actually lapsed.

As a result of both inspections (October 29 to November 2, 2007 and January 14-17, 2008) GEH facility was placed on an increased inspection frequency. The NRC indicated that it would conduct its next inspection at the GEH facility at such time as GEH has had sufficient time to implement its QA program improvement efforts so as to provide for a meaningful assessment. Approximately 40 months transpired since the last inspection of NAC at the GEH facility and the NRC determined that corrective actions should be well developed and GEH should have ample history to show evidence of adequate corrective action.

INSPECTOR NOTES: APPLICABLE PORTIONS OF 02.01 THROUGH 02.08 OF IP 60852 WERE PERFORMED DURING THE INSPECTION WITH RESULTS DOCUMENTED BELOW:

02.01: Determine whether the fabrication specifications are consistent with the design commitments and requirements documented in the SAR, and, as applicable, the CoC or the site-specific license and technical specifications.

The team made comparisons from fabrication documents back to the design documents for the shell plates, forgings, heat transfer disks, support disks, and fuel tubes. No concerns were noted.

02.02: Determine whether corrective actions for identified fabrication deficiencies have been implemented in a time frame commensurate with their significance, and whether nonconformance reports documenting the deficiencies have been initiated and resolved.

The team performed a second follow-up implementation review of the welder qualification tracking system corrective actions resulting from the Notice of Violation (NOV) issued at the conclusion of the NRC inspection of NAC at the GEH facility (October 29 to November 2, 2007 and January 14-17, 2008,) as documented in NRC Inspection Report (IR) 72-1015/2007-201.

The team reviewed GEH Quality Assurance Procedure, (QAP) QAP-960, Revision 7, "Welding Process Control." The team interviewed the Manager of Welding Engineering [also called the Senior Manufacturing Technologist (SMT)] and the Welding Technician to discuss the computer based welder tracking system put into place since the 2007 and 2008 NRC inspections. The electronic welder database is used to control the GEH welder qualification records and welder continuity records. The SMT demonstrated the various welder information/data that could be retrieved from the database by selecting different buttons or icons for the program on his computer screen. All the GEH corrective actions previously identified in Inspection Report 72-1015/2008-202 from the previous October 27-31, 2008, NRC NOV follow-up inspection, remained in effect. The SMT and Welding Technician further demonstrated through the electronic database system and backup hardcopy records how they maintained: 1) control over the qualification of the GEH welders, 2) what welding processes welders were qualified to perform, 3) when welder qualifications would expire, and 4) control over the weld wire that a welder could procure from the weld wire room based on their current weld qualifications. A GEH employee's access level (or security level) to the information in the welder computer database was controlled through their user name and password during log-on. The team also inspected the shop weld wire storage room which is always kept locked. Only a limited number of lead individuals have keys to the weld wire room and are authorized to distribute weld wire to welders. The weld wire room contains a network computer tied into the welder database. Although several GEH lead individuals have keys to the weld wire room and access to the welder database through the computer in the room, their access to the database is limited by their user name and password. Their database access is limited to verifying a welder is currently qualified to perform the weld process for which the welder requested weld wire and to record in the database information about the weld wire distributed to the welder. Only the SMT and the Welding Technician through their user names and passwords have total access to all the information in the welder database and the ability to change or add to it. In conclusion, the team found the computer based welder qualification tracking system implemented by GEH as a

corrective action after the 2007 and 2008 NRC inspection to be fully functional, well organized, user friendly, a current and complete welder database, and with adequate user security. No concerns were noted.

Non-conforming Materials:

The team toured the shop and found the following items tagged and segregated as Non-conforming material(s):

Item	Non-Conformance Report	status
Basket assembly	2941	Open
USM top weldment	2963	Open
USM top weldment	2964	Open
USM top weldment closed on 01/24/2011	2950	closed

Nonconformance Report Number (NRC) No. 2941 was generated as a result of GEH's disassembling of a lead basket assembly without written instructions. The process of disassembling could have compromised the traceability or other characteristics of the unit. The basket assembly required disassembly in part because the spacer disks required additional electroless nickel plating in order to meet NAC's latest specification requirements. The team reviewed the status of the NCR and determined appropriate measures were taken in order to prevent inadvertent use or installation.

The NCR Nos. 2963 and 2964, dated March 24, 2011, for the USM top weldment had several dimension parameters, included the tolerance, out of the range specified in the fabrication drawing. The disposition in both NCRs is "*accept-as-is*" and to notify the customer for concurrence. The notification to the customer, NAC, was shown in transmittal form dated March 24, 2011. The team examined the NRC No. 2950 from another USM top weldment, closed on January 24, 2011 with dimension deviations and the corresponding NAC's Supplier Documentation Review Report (SDRR) accepting the deviations with a 72.48 evaluation.

The inspection verified these Non-conformance items were appropriately tagged and segregated from the other acceptable components, documented on an NCR form (No. 1063), and processed according to the Quality Assurance Manual dated July 17, 2009 Revision 1, Chapter 15, Control of Non-conformances and Quality Assurance Procedure 1500 Non-conforming Material Control, QAP-1500, Revision 15, January 25, 2011. No issues were identified.

02.03: Determine whether individuals performing quality-related activities are trained and certified where required.

The team performed a second follow-up implementation review of individual welder qualification corrective actions resulting from the Notice of Violation (NOV) issued at the conclusion of the

NRC inspection of NAC at the GEH facility (October 29 to November 2, 2007, and January 14-17, 2008) as documented in NRC Inspection Report (IR) 72-1015/2007-201.

To verify the continued effectiveness of GEH's corrective actions for welder qualifications, the team reviewed the welder qualifications of four (4) welders to determine if they were qualified for the welding that they were performing while the inspection team was on-site. The welder's qualification records and continuity records were easily and quickly found in the computer database and the welders were found to be qualified for the weld processes they were performing. All the records for these welders were also found to be in good order. No concerns were identified.

The team reviewed the certification records of the personnel performing the radiographic testing RT in the shop to ascertain that they were certified in accordance with Quality Assurance Procedure, QAP 900, "Qualification and Certification of NDE Personnel." The team reviewed qualification records of a RT Level II Inspector and determined he was qualified and certified in accordance with QAP 900.

The team reviewed GEH's QA Manager's record of lead auditor qualification as well as a NDE personnel certification record of a UT Level II inspector to ascertain that he was certified in accordance with ASNT-TC-1a -1992 editions and GEH's procedure. The team determined that both were appropriately qualified and certified.

02.04: Determine whether the offsite fabricator's personnel are familiar with the specified design, designated fabrication techniques, testing requirements, and quality controls associated with the construction of the DCSS.

The team witnessed the fabrication welding of the vertical concrete cask (VCC) lift anchors for the NAC Palo Verde Spent Fuel Storage Contract. The fabrication traveler to perform this work was 172518-600, Revision 1, with the associated fabrication drawing 407-262, Revision 5. The work was being performed at Sequence 70 of the traveler. The team observed the welder and discussed with him the work he was performing and concluded that he was familiar with the design under fabrication, and with the associated fabrication techniques, testing requirements, and quality controls. The team verified the weld map, weld procedure specification, quality assurance procedure, weld wire heat number, weld wire size documented on the traveler and later the welder's qualifications. The team also compared the actual markings on the steel pieces being fabricated into the VCC lift anchor against the piece parts identified in the traveler. The team found that the lot number identification shown on the fabricated VCC lift anchor did not match the lot number listed in the traveler at sequence 10. By not having the same lot identification number shown on the fabricated VCC lift anchor and in the traveler, NAC's fabricator GEH is in violation of 10 CFR 72.156, "Identification and Control of Materials, Parts, and Components," which states: The licensee, applicant for a license, certificate holder, and applicant for a CoC shall establish measures for the identification and control of materials, parts, and components. These measures must ensure that identification of the item is maintained by heat number, part number, serial number, or other appropriate means, either on the item or on records traceable to the item as required, throughout fabrication, installation, and use of the item. These identification and control measures must be designed to prevent the use of incorrect or defective materials, parts, and components.

The discrepancy between the fabricated lift anchor lot number markings and the lot number shown in the traveler was brought to the attention of both NAC and GEH personnel. The GEH Quality Manager initiated GEH Corrective Action Report 54875 to resolve the issue, determine the cause of the discrepancy, and determine why it was not discovered by reviewers of the traveler. During the review of the discovery, GEH personnel also noted that the traveler had been improperly prepared. The traveler had been prepared, reviewed and signed by several individuals. Production staff and quality assurance personnel had also signed the traveler during fabrication verifying that the lot numbers between the traveler and fabricated VCC lift lug were the same. Other than the lot number discrepancy, the team found no other concerns.

02.05.a: Determine whether materials, components, and other equipment received by the fabricator meet DCSS design procurement specifications.

The team reviewed procurement procedures, reviewed various approved vendor audits and traced the procurement history of components undergoing fabrication to verify that they were procured from qualified suppliers and met specifications by obtaining samples of materials in use on the shop floor. Components observed included but were not limited to shell ASTM plates, forgings, heat transfer disks, support disks, fuel tubes, and weld wire. GEH staff demonstrated traceability for each of the materials selected back to the applicable purchase order and the associated heat/lot numbers. The team also noted that 10 CFR Part 21 requirements were included, when required, on the purchase orders reviewed.

The team examined a sample of manufacturing drawings, work control procedures, and job travelers to determine that fabrication of cask storage systems met the requirements of the Certificate of Compliance (CoC). The team observed fabrication activities, special processes, and applicable personnel qualification and certification records to determine that fabrication satisfied requirements and was accomplished by qualified personnel. Further, the team reviewed a sample of in-process job travelers and examination reports to assess work that had been completed, as required. The team noted that in all cases manufacturing drawings job travelers and inspection and welding procedures were adequately identified and at various work locations and the documents reflected the correct revisions, as applicable.

As noted above, the team reviewed a sample of in-process job travelers and examination reports to assess work that had been completed. As a result, the team noted the welding of a temporary holding lug on a Bottom Plate. Based on a review of that traveler, as applied to a Transportable Storage Canister (TSC) for use at Palo Verde, the team noted that the traveler did not contain sequences for subsequent removal and inspection even though the inspection records contained evidence that the lug was removed and inspected. The team reviewed other travelers for similar occurrences and noted in all cases that the lug was in fact removed and the removal area was inspected. As a result, GEH initiated Corrective Action Request No. 54864 to provide consistent instructions and traveler sequences for welding of the lug, subsequent removal, and inspection of the removal area.

The team verified, for those items that had been received by GEH for fabrication, that appropriate tags associated with the status of incoming items either awaiting receipt (red tag) or for those items that had been inspected (green tag) were affixed to the materials. The team verified by observation assurance that identification of incoming items was maintained by heat and job order number on the items and on records traceable to the item.

The team reviewed a sample of vendor audits performed by or for GEH for procured materials. All materials sampled were verified to have been procured from companies listed on GEH's Approved Vendor List (AVL), also used by GEH and audit reports were within their required periodicity for maintaining the subject companies on the AVL. Audit findings were documented in the reports along with corrective actions taken by those audited. No concerns were identified in this review.

Overall, the team concluded that GEH's procurement activities were being performed in accordance with their controlling procedures. Methods used to approve addition of suppliers to the AVL were appropriate and the audits used to qualify and maintain suppliers on the AVL were adequate. Where issues identified in the audits required response by the supplier, documentation of supplier corrective action was included in the audit files.

02.05.b: Determine whether the procurement specifications conform to the design commitments and requirements contained in the SAR and, as applicable, the CoC or the site-specific license and technical specifications.

The team reviewed NAC International Fabrication Specification 790-S-05, Revision 16, "Procurement/Fabrication Specification, NAC Transportable Storage Canisters, Basket Assemblies and Fuel Cans." The team found the specification to have the adequate signatures and approvals and all fabrication activities observed during the inspection to be in compliance with the specification, with no concerns.

02.06: Determine whether DCSS components are being fabricated per approved QA and 10 CFR Part 21 implementing procedures and fabrication specifications.

The team reviewed all the GEH Quality Assurance Procedures (QAPs) at overall Revision 53 provided in GEH controlled copy number 8. The team found all the DCSS components were being fabricated in accordance with approved QA procedures. Forty five QAPs were reviewed and all were found to be signed and approved. The final signature of approval on the individual QAPs was by the Quality Manager, or equivalent on procedures which had not been revised for several years. However, the team noted that QAP 1200, "Measuring, Test & Inspection Equipment Calibration Procedure," was shown as Revision 15 in the QAP manual table of contents while the actual procedure copy in GEH QAP controlled copy number 8 was at Revision 14. The discrepancy was discussed with the GEH Quality Manager and he acknowledged that the revision shown in the table of contents for QAP 1200 did not agree with the actual revision provided in controlled copy number 8. The GEH Quality Manager stated that Revision 15 was correct and the copy of the QAP in controlled copy number 8 was not current. The Quality Manager initiated GEH Corrective Action Report 54865 to resolve the issue and determine the extent of the issue throughout the QAP controlled copies. Other than the item just noted, the team found no other concerns with QA implementing procedures.

The team observed a GE-Hitachi, Level II, radiographic testing inspector performing RT on UMS circumferential welds in the radiography area, using traveler No. 282-99-92 and Radiography Examinations Procedure No. 172504 Revision 1, dated: June 29, 2010. The team observed the location of the x-ray source, image quality indicators, markers and films onto the canister. No concerns were identified.

Based on shop observations the team verified that measuring and testing devices used in activities affecting quality were appropriately controlled and calibrated. The team noted affixed tags showing calibration date, next calibration due date and equipment serial number. The team reviewed calibration reports of the following of Measuring and Test Equipment (M&TE):

Serial	Item
B-0190	torque wrench (dynamometer)
C-0207	Functional gage (fuel tube)
C-0860	digital depth gage
C-0693	Pressure gage
C-0856	Digital cell read-out (digital indicator)
C-0857	Load cell
C-0996	Hastalloy UT calibration block

The team verified that the equipment calibrations were performed by Exelon Powerlabs and that they were appropriately maintained on the Approved Vendor's List for such services. Further, the team noted appropriate labeling and identification of M&TE, including the person who performed calibration, calibration of M&TE at periodic intervals, use of reference standards traceable to a national standard, and documented "As-Found"/"As-Left" information. No concerns were identified.

02.07: With regard to fabrication activities, determine whether:

a. They are conducted under an NRC-approved QA program (10 CFR 72.140).

The team reviewed the NAC's NRC approved, and GEH's QA programs to ensure the latest versions were in use and controlled. The team verified that implementing procedures are developed based on the QA program requirements, as applicable. No concerns were noted.

b. The provisions of 10 CFR Part 21, "Reporting of Defects and Noncompliance," for reporting defects that could cause a substantial safety hazard have been implemented.

The team reviewed a reference to Part 21 compliance in GEH's Statement of Policy and Authority, Revision 1, found in GEH's QAP. In addition, the GEH QAP (Section 15) was verified to address the responsibilities for Part 21 reporting. The team also reviewed GEH procedure QAP-1610, Revision 2, "Procedure for Compliance with 10 CFR 21" and verified specific guidance for control and reporting of Part 21 activities. No concerns were noted.

c. The fabricator's personnel are familiar with the reporting requirements of 10 CFR Part 21.

The team held discussions with both NAC and GEH personnel in regard to the control of Part 21 activities. The discussion provided a basis for determining the familiarity of the 10 CFR Part 21 reporting requirements. No concerns were noted.

d. The fabricator has complied with 10 CFR 21.6, "Posting requirements."

The team verified complete Part 21 postings at multiple locations throughout the GEH fabrication facility. All posting were found to be acceptable.

02.08: With regard to quality assurance activities, determine whether:

a. The fabricator has been audited by either the licensee or CoC holder.

The team has previously verified audits by the CoC holder at the Canonsburg facility and found them to be acceptable. The team reviewed a more recent audit by a prospective licensee. The team determined that the audit (SA-10-001) performed by Zion Solutions, verified the appropriate attributes to determine GEH to be a capable fabricator and identified to NAC that GEH could be used as one of NAC's prime fabricators for the Magnastor Dry Cask Storage system fabrication. No concerns were noted.

b: With regard to quality assurance activities, determine whether for selected audits and inspection findings from (as applicable) QA audit or surveillance and/or inspection reports issued in the previous 2 years, the findings were appropriately handled with corrective actions implemented in a time frame commensurate with their safety significance.

In addition to the corrective actions verified from audit SA-10-001, noted above, this inspection focus was on the corrective action performed by NAC and GEH in regard to the previous NRC inspection findings of October 29 to November 2, 2007 and January 14-17, 2008. The team's review included verification of each item listed in the NRC Inspection Report 72-1015/2007-201. No concerns were noted.

c: With regard to quality assurance activities, determine whether supervision and quality control/quality assurance personnel perform appropriate oversight during fabrication activities.

The team observed a fit test for a shield plug (284-99-88) into its companion UMS canister (UMS-TSC-407-088). In addition, the team observed the drain tube insertion length and end angle cut QC checks for the same unit. The team further observed the fit checks for the drain and vent plugs and the structural lid fit-up test for the same UMS canister. All these verification checks were identified sequences on a traveler for the unit with hold points for GEH QC and NAC personnel to witness and sign off verification. Later during the inspection the team observed a transfer adapter operational test which required QC and NAC personnel to witness and sign-off. The team determined that supervision and quality control/quality assurance personnel performed appropriate oversight during the fabrication activities. No concerns were identified.