

INSPECTOR NOTES COVER SHEET

Licensee/Certificate Holder (name and address)	NAC International, Inc. 3930 East Jones Bridge Road Norcross, GA 30092
Licensee/Certificate Holder contact and phone number	R. Howard Smith 678-328-1276
Docket No.	71-0018
Inspection Report No.	2005201
Inspection Date(s)	July 11-14, 2005
Inspection Location(s)	Norcross, GA
Inspectors	James Pearson, Mark Mitchell, Nancy Osgood
Background	<p>Background: NAC International is a holder of Certificate of Compliance 9225 for the Model NAC-LWT spent fuel transportation cask. This inspection was performed to verify that NAC International was implementing their current NRC-approved NAC International, Inc., Quality Assurance program. The inspection was planned and implemented due to transportation events associated with NAC-LWT shipments. On two occasions NAC-LWT transportation packages were used and upon arrival at their destinations significant quantities of free water were found inside. The Certificate of Compliance specifies that "the cask must be dry (no free water) when delivered to a carrier for transport."</p>
Summary of Findings and Actions	<p>During the period of time that the shipments were made, NAC performed Part 71 transportation activities under Certificate of Compliance (CoC) 9225, (Docket No. 71-9225) and NAC application dated January 14, 2000, as supplemented, which commits NAC to developing a quality assurance (QA) program. NAC's Quality Procedure, QP 2-4, "Order Entry and Project Planning (Revision 6) item 3.2.7, Design Verifications, states in part, ". . . identify the type(s) of design verification activities to be performed on the project and schedule.</p> <p>Contrary to the above, on August 14, 2003, NAC personnel approved project plan 14668-PM-01, Revision 0, "Exelon Corporation - LaSalle shipment to Studsvik," but failed to conduct design verification of the sealed PWR/BWR Transport canister, as part of the NAC-LWT cask to be used for transporting radioactive materials.</p>

INSPECTOR NOTES COVERS SHEET (continued)

	<p>After review of the documents associated with the project and personnel interviews, the NRC inspection team (team) determined that NAC allowed the specific review of QA program components to be overlooked. NAC personnel had an opportunity to identify this omission at various stages of the project but did not perform the required design verification. The interviews of NAC personnel by the team established that the oversights were not intentional.</p> <p>In addition to corrective actions already identified based on the findings of a NAC root cause investigation, NAC has agreed to revise Chapter 8 of the NAC-LWT application via amendment to include testing of sealed canisters intended for underwater use. NAC has agreed to require appropriate specific tests. These tests will be described in their SAR, in a subsection to Section 8.1.4 Component Testing. These tests are intended to ensure that the sealed canisters meet specified design requirements for correct operation of the LWT cask system. Acceptance criteria for the testing will be based on the "no free water" requirement of the CoC.</p>
<p>Lead Inspector Signature/Date</p>	<p>James J. Pearson <i>James J. Pearson</i> 8/17/05</p>
<p>Inspector Notes Approval Section Chief Signature/Date</p>	<p><i>[Signature]</i> 8/17/05</p>

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 QA Program (reference Regulatory Guide 7.10), and that implementing procedures are in place and effective.

The team reviewed the package operations, maintenance, and acceptance tests as specified in the Safety Analysis Report (SAR). The team reviewed the generic operating procedures for the NAC-LWT cask and the PWR/BWR Transport Canister (sealed configuration), to ensure they were consistent with the SAR. The generic operating procedures were complete, logical, clear, and unambiguous with respect to the steps for draining, purging, and dewatering both the canister and the cask. The overall procedures seemed well written and complete and proper controls were in place for revising the procedures.

With respect to the safety significance of the water in the cask, the team reviewed the NAC analysis for possible pressure increases due to water remaining during transport. The analysis appeared to be appropriate, although the team did not replicate the calculations or perform confirmatory calculations. The assumptions were appropriately conservative, for example, the analysis assumed a saturated condition (i.e., the exact volume of water remaining was not specified, it was assumed that sufficient water was available to create a saturated condition) and the maximum decay heat for five fuel rods was assumed, even though the actual decay heat of the rods from La Salle was lower than the maximum allowed. The results of the

calculations showed that the maximum pressures would be below the design pressure of the vessel. It is noted that NAC did not assess the impact of the increased pressure on the containment calculations, which are based on maximum normal operating pressure and maximum pressure in a fire accident. The calculation of maximum pressure was only performed for accident conditions, and it is unlikely that the increased pressure would have affected the conclusion that the accident release criterion in 71.51 would have been met. The team noted that the analysis NAC performed shows the safety significance of this particular event was low due to the limited number of rods shipped and the fact that there was no exposure of the cask to an actual accident or fire conditions.

The team noted that NAC, though not required, had submitted a written report to notify the NRC of the transportation events under the requirements of 10 CFR 71.95(c). NAC had issued the 71.95 report under the direction of the NAC Quality Procedure, QP 16-2, Rev. 4, Potential Significant Deficiencies and Defects and Regulatory Reporting. The team noted that the NAC 71.95 report, as supplemented was accurate. This report was reviewed by the team during the inspection and found to be adequate.

The team concluded from selective reviews that the CoC holder's activities related to transportation packagings are being conducted in accordance with the CoC, as well as the NRC-approved QA Program.

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.

The team noted acceptable application of 10 CFR Part 21 requirements in use in the procurement process. The team also noted applicable postings and reviewed selected portions of the NAC Quality Assurance Manual and associated NAC quality procedures for controlling Part 21 activities. The team concluded that provisions are in place for reporting defects as required by 10 CFR Part 21.

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

The team interviewed selected personnel and reviewed selected documentation in regard to activities associated with the transportation of radioactive materials. Specifically interviewed were the Vice President of Quality Assurance, Vice President of Operations, NAC Company President, two NAC cask operators, and a NAC Project Manager. All of the personnel were associated with shipments performed using the NAC-LWT cask which were the focus of this NRC inspection. The team reviewed design controls used in accordance with NAC's established quality assurance program.

The team determined that the actual required design controls are adequate. However design verification was not adequate for one project, in that on August 14, 2003, NAC personnel approved a project plan 14668-PM-01, Revision 0, "Exelon Corporation - LaSalle shipment to Studsvik," but failed to conduct design verification of the sealed PWR/BWR Transport canister, as part of the NAC-LWT cask to be used for transporting radioactive materials. This finding as well as the requirement violated is indicated on the cover sheet for these inspector notes.

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

Since the focus of the inspection was to determine the adequate handling of NAC-LWT transportation activities during specific shipments, no drawings, procedures or records were reviewed nor were activities observed during this inspection to determine if fabrication activities met SARP requirements. The NAC-LWT fabrication had occurred at a considerably earlier date and the NAC-LWT packagings have been in service for some time. In the discussions that the team held with NAC employees, one employee described informal testing of an inner sealed container in NAC's maintenance facility. That testing was not sufficiently prepared, overseen, and documented to support the requirements that NAC needed to ensure the safe use of the sealed inner cannister. During the inspection NAC agreed to revise Chapter 8 of the NAC-LWT application via amendment to include appropriate testing of sealed canisters intended for underwater use. NAC corrective actions are further detailed on the cover sheet for these inspector notes.

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.

No activities fabrication or assembly activities affecting packaging safety were observed during this inspection. These activities were not observed because the fabrication and assembly of the NAC-LWT had occurred a considerable time before this inspection of more recent NAC transportation activities utilizing the NAC-LWT packaging. The team did include questions about the testing of the sealed inner container during discussions with NAC staff. The team noted that some of the documents reviewed during the inspection described the lack of design verification for the use of the sealed inner container and that appropriate testing method would be required to determine the acceptability of the use of the sealed inner container in the NAC-LWT in future Part 71 shipments utilizing this specific packaging. The design verification for testing is addressed in other portions of the inspector's notes and on the inspector notes cover sheet for this inspection.

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 QA Program holder meet the design requirements.

Since the focus of this inspection was on specific NAC-LWT transportation activities and procurement for the NAC-LWT and the sealed inner container had occurred prior to these transportation activities, this area was not inspected.

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.

The team interviewed the NAC Vice President of Operations, NAC Vice President of Quality Assurance, and the NAC Director of Projects to help verify that the NAC quality program was effectively implemented.

The team reviewed the corrective actions taken and planned for the root cause analysis RCA-04-01 (Indonesian Spent Nuclear Fuel Transport, dated 9/8/04) and addenda 1 to this analysis (dated 1/5/05, Exelon LaSalle October 2000 LWT Shipment to Studsvik) and Corrective Action Report 04-01 to assure that appropriate corrective actions were identified, planned and implemented for the root cause analysis. The analyses were thorough, technically sound, and identified the program implementation problems that led to the specific failure to perform the design review. The team noted that not all corrective actions were completed at the

time of the inspection and that corrective actions were being appropriately tracked by NAC corrective action process.

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 QA staff are cognizant and provide appropriate oversight.

The team reviewed the NAC quality assurance manual, the cask operating procedures, the NAC corporate organization chart and selected quality assurance procedures. The team interviewed the NAC President, NAC Vice President of Operations, NAC Vice President of Quality Assurance, NAC Director of Projects, and the NAC Vice President of Engineering, as well as selected project managers to verify corporate understanding of activities affecting quality.

The team's reviews, interviews, and observations verify that though a weakness was identified during the root cause analysis performed by NAC, overall NAC management and NAC QA staff are cognizant and provide appropriate oversight.

02.10 Verify that audits of the QA Program 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.

Since the scope of this inspection was focused on the use of the NAC-LWT, audit process reviews were not performed. However the team recognized, during discussions with various personnel and reviews of documentation, that NAC did have a program for and was implementing quality oversight for activities affecting quality.

Documents reviewed during the inspection:

Emails, From Studsvik to NAC; dated 10/30/03, 3/18/04, 4/5/04, 11/18/05, 11/19/05, 11/22/05, and 11/24/05

Email, From NAC to Studsvik, dated 3/15/04

Letter, Exelon, PROJ20050007

Letter, LaSalle to NRC; Report per requirements of 71.95, dated 7/22/04

Letter, NAC to NRC, dated July 22, 2004, as supplemented by letters dated October 15, 2004, and February 14, 2005, "Report per Requirements of 10 CFR 71.95 - Presence of Water in Cask Cavity."

NAC Corrective Action Request, CAR-04-01, dated 2/3/05, Evaluation of the pressure due to the water in the LWT Cask

NAC Safety Analysis Report, Rev. 35, Docket 71-9225, NAC-LWT SAR, Chapters 7 and 8

NAC Proposal # 81250.135.00 Rev. 1

NAC Proposal # 81250.139.00 Rev. 2

NAC Project Plan 14666-PM-01, Rev. 0, "Framatome-ANP-LaSalle Shipment to Studsvik"

NAC Project Plan 14668-PM-01, Rev. 0, "Exelon Corporation-LaSalle Shipment to Studsvik"

NAC Project Plan 14708-PM-01, Rev. 0, "Indonesian Fuel Shipment to Studsvik"

NAC Purchase Order # 129961; from NAC to Framatome-ANP, in regard to NAC proposal # 81250.135.00 Rev. 1

NAC Quality Procedure, QP 2-4, Rev. 6 and 7; Order Entry and Project Planning
NAC Quality Procedure, QP 16-2, Rev. 4, Potential Significant Deficiencies and Defects
and Regulatory Reporting
NAC Root Cause Analysis, RCA-CAR-04-01, including attachments and addendum 1
NAC Self Identification Report, SIR-04-010
NAC Standard Practice SP-116; Self Identification Report
NAC Organizational Charts; 2002-2005
NAC Procedure, 315-P-02, Rev. 10, dated 11/2/01, NAC-LWT Cask Generic Operating
Procedure
NAC Procedure, 315-P-07, Rev. 6, dated 8/27/03, PWR/BWR Transport Cannister
Generic Loading Procedure
NAC Procedure, 315-P-07, Rev. 7, dated 6/9/05, PWR/BWR Transport Cannister
Generic Loading Procedure