

April 4, 2001

Mr. Edward M. Davis
President and CEO
NAC International, Incorporated
655 Engineering Drive
Norcross, GA 30092

SUBJECT: NRC INSPECTION REPORT NO. 72-1015/01-201 AND
NOTICE OF VIOLATION

Dear Mr. Davis:

This letter is in reference to the U.S. Nuclear Regulatory Commission (NRC or Commission) inspection conducted on March 12-16, 2001, of fabrication activities involving NAC spent fuel storage components at Ionics Incorporated in Bridgeville and Canonsburg, Pennsylvania. The purpose of the inspection was to examine fuel storage component fabrication and NAC's oversight of Ionic's fabrication activities. Enclosure 1 presents the results of this inspection.

This inspection was an examination of activities as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your certificate of compliance. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the NRC has determined that a Severity Level IV violation of NRC requirements occurred. The violation was evaluated in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600. The current Enforcement Policy is included on the NRC's website at <http://www.nrc.gov/OE>. The violation is cited in Enclosure 2, Notice of Violation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report. The violation is being cited in the Notice because it was identified by the NRC.

The NRC has concluded that information regarding the reason for the violation, the corrective actions, taken and planned, to correct the violation and prevent recurrence is already adequately addressed on the docket in the enclosed Inspection Report 72-1015/01-201. Therefore, you are not required to respond to this letter unless the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

E.M. Davis

-2-

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure(s) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,

/RA/ original signed by /s/

Susan M. Frant, Deputy Director
Licensing and Inspection Directorate
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Enclosures: 1. Inspection Report
No. 72-1015/01-201
2. Notice of Violation

Docket No. 72-1015

cc: Mr. David C. Jones, Chairman
NAC Technologies Users Group
Duke Power Company

E.M. Davis

-2-

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Susan M. Frant, Deputy Director
Licensing and Inspection Directorate
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NAC Technologies Users Group
Duke Power Company

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Mr. David C. Jones
Lead Engineer, Fuel Management
Chairman, NAC Technologies Users Group
Duke Power, Mail Code: EC08F
526 South Church Street
P.O. Box 1006
Charlotte, NC

**U.S. NUCLEAR REGULATORY COMMISSION
Office of Nuclear Material Safety and Safeguards
Spent Fuel Project Office**

Inspection Report

Docket No.: 72-1015

Report No.: 72-1015/01-201

Certificate Holder: NAC International, Incorporated
655 Engineering Drive
Norcross, GA 30092

Dates: March 12-16, 2001

Inspection Locations: Ionics Incorporated
Bridgeville and Canonsburg, PA

Inspection Team: Paul Narbut, SFPO, Team Leader
Rebecca Karas, SFPO, Project Manager
James Pearson, SFPO, Inspector
Edwin (Harold) Gray, Region I, Inspector

Approved by: Susan M. Frant, Deputy Director
Licensing and Inspection Directorate
Spent Fuel Project Office, NMSS

EXECUTIVE SUMMARY

NAC International
NRC Inspection Report No. 72-1015/01-201

The U.S. Nuclear Regulatory Commission (NRC) performed a team inspection at Ionics Incorporated (Ionics) in Bridgeville and Canonsburg, PA, to examine the fabrication of spent fuel storage system components. Ionics was fabricating components for NAC International Incorporated (NAC) to be used by the Maine Yankee Atomic Power Company (MYAPC). The objective of the inspection was to verify that activities were performed in accordance with 10 CFR Part 72 and NAC's NRC-approved QA program. The team also assessed NAC and MYAPC oversight of the fabrication activities.

Management Controls

The team concluded that, overall, management controls and implementation of the QA program met regulatory requirements. However, the team identified one violation for the failure to follow procedure. An Ionics quality control inspector did not comply with procedure requirements for the weld preparation configuration for a spent fuel canister shell-to-bottom-plate weld. Additionally, the team observed some management control weaknesses that were not violations of regulatory requirements. The most significant weakness was in the documentation provided for 10 CFR 72.48 evaluations.

Fabrication Controls

Overall, the team determined that procurement, fabrication, quality control and nondestructive examination activities met regulatory requirements. The team determined that, overall, NAC and MYAPC oversight controls met regulatory requirements. The team observed adequate NAC oversight presence at the fabrication shops. The team observed a strong oversight presence at the fabrication sites on the part of the licensee (MYAPC), and their contractor representatives Stone and Webster Engineers and Constructors, Incorporated (SWEC). The team observed that MYAPC had decided to build and stamp the canisters to the American Society of Mechanical Engineering (ASME) Boiler and Pressure Vessel (B&PV) Code rules. The team noted that this decision invoked an additional layer of quality controls involving both design controls and fabrication controls.

As noted above, the team identified a violation of the requirements of 10 CFR Part 72. Table 1 below summarizes information about the violation.

Table 1
Summary of Inspection Findings

Regulatory Requirement 10 CFR Section	Subject of Finding	Number of Findings	Type of Finding [Violation or Nonconformance]	Report Section
72.150	Instructions, procedures, and drawings	1	Violation	2.1.1.1

INSPECTION PROCEDURES USED

60852, "ISFSI Component Fabrication by Outside Fabricators"
60857, "Review of 10 CFR 72.48 Evaluations"

LIST OF ACRONYMS USED

ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
CoC	certificate of compliance
CR	corrective action report
Ionics	Ionics Incorporated
ISFSI	independent spent fuel storage installation
MYAPC	Maine Yankee Atomic Power Company
NAC	NAC International Incorporated
NCR	nonconformance report
NDE	nondestructive examination
NRC	Nuclear Regulatory Commission
QA	quality assurance
QC	quality control
RCA	request for corrective action report
SAR	safety analysis report
SWEC	Stone and Webster Engineers and Constructors
TSC	transportable storage cannister

PERSONS CONTACTED

The team held an entrance meeting on March 12, 2001, to present the scope and objectives of the NRC inspection. On March 16, 2001, the team held an exit meeting at Ionics to present the preliminary findings of the inspection. The people present at the meetings are listed in Table 2.

Table 2
Entrance/Exit Meeting Attendees

Name	Title	Organization	Entrance 3/12/01	Exit 3/6/01
M. Battaglia	Quality Control Manager	Ionics Inc.		x
M. Bradley	Executive Assistant	Ionics Inc.	x	
F. Cecca	Lead Quality Engineer	SWEC	x	
B. Giles	Senior Evaluator	Arizona Public Service		x
E. Gray	Inspector	USNRC Region I	x	
R. Grounder	VP Fabricated Products	Ionics, Inc		x
W. Henderson	GM Bridgeville	Ionics Inc	x	
R. Heusey	Director of Quality	Ionics Inc.	x	x
R. Karas	Project Engineer	USNRC	x	
P. Kaup	Quality Assurance Manager	Ionics Inc.	x	x
D. Kierpa	Fabrication Manager	NAC	x	x
T. Linehan	QA Representative	NAC		x
G. Milley	Engineering certifier ASME	SWEC		x
R. Milliren	GM Spent Fuel Products	Ionics Inc.	x	x
P. Narbut	Team Leader	USNRC	x	x
R. Otis	ISFSI Senior QA Engineer	MYAPC	x	x
J. Pearson	Inspector	USNRC	x	
P. Plante	ISFSI Project Manager	MYAPC		x
D. Shilbod	Procurement Representative	SWEC	x	
T. Shippee	Quality Programs Manager	MYAPC		x
R. Smith	VP Quality	NAC	x	x
R. Stevenson	Project QA Manager	SWEC	x	

REPORT DETAILS

1. Inspection Scope

The NRC team inspected activities associated with dry fuel storage equipment fabrication to determine if they were performed in accordance with the requirements of 10 CFR Parts 21 and 72, the applicable safety evaluation report, and the NRC-approved quality assurance (QA) program.

The team determined the acceptability of dry storage activities by reviewing procedures and instructions, inspecting selected documents, records, and drawings, verifying personnel training and qualifications, and interviewing personnel responsible for various activities.

The team reviewed activities related to management and fabrication controls. Within these areas, the team examined the activities involved in procurement, fabrication, welding, nondestructive examination, quality assurance, quality control, and control of design changes. Through sampling of activities the team verified that: 1) fabrication specifications were consistent with the safety analysis report (SAR) and the certificate of compliance (CoC); 2) corrective actions for deficiencies were timely and documented; 3) individuals were trained and certified for welding, nondestructive examinations (NDE), and QA; 4) personnel were familiar with requirements; 5) procured material met specifications; 6) fabrication was performed in compliance with procedures and specifications; 7) fabrication was performed under an NRC approved QA program; 8) the requirements of 10 CFR Part 21 were implemented; 9) fabrication audits were performed by the licensee and certificate holder; 10) audit findings were appropriately resolved; and 11) that there was sufficient QA and Quality Control (QC) oversight.

2. Management Controls

2.1 Quality Assurance Program

2.1.1 Observations and Findings

The team determined that overall, implementation of the QA program met regulatory requirements with one exception noted below.

2.1.1.1 QC Verification of Fabrication Activities

The team observed that QC verification of fabrication activities was adequate with one exception. The team identified one violation involving a failure to follow procedure as required by 10 CFR 72.150 and Ionics Quality Assurance Manual, Revision 6, Section 5. Specifically, a QC inspector erroneously verified that a weld joint preparation met the requirements of the fabrication traveler. The traveler, TSC3100 Revision 6, Sequence 070, required a minimum groove angle of 90 degrees with 45 degrees on each side for the outer diameter preparation of the shell-to-bottom-plate weld on the transportable storage cask (TSC), a confinement boundary weld. The weld groove angle was subsequently measured by the NRC and the QC inspector to be about 30 degrees.

At the exit interview the certificate holder, NAC, agreed with the violation and stated that nonconformance report (NCR) 2001-01-515, and Request for Corrective Action Report (RCA)

2001-028, had been written to document the problem. Subsequently, on March 20, 2001, Ionics forwarded copies of the completed NCR and RCA to the inspectors. The RCA documented the cause as a misinterpretation on the part of the QC inspector. Further, the RCA documented actions taken by Ionics which included reworking the bevel angle to be compliant with the traveler, re-instructing all QC and welding personnel about the error and the necessity for compliance with instructions, revising the traveler requirements for clarity, and evaluating the previously completed bottom welds on units 1-12 and verifying that they were satisfactory.

2.1.1.2 Evaluations of Changes in accordance with 10 CFR 72.48

The team considered that overall, the evaluations of changes performed in accordance with 10 CFR 72.48 met regulatory requirements. 10 CFR 72.48 evaluations are performed to determine if the Certificate Holder or the licensee can make a change to an independent spent fuel storage installation (ISFSI) as described in the SAR without prior NRC approval. However, the team also identified a weakness in the evaluation process that was not a violation of regulatory requirements.

The team observed that NAC's 72.48 evaluation procedures met regulatory requirements, but the use of the procedures resulted in less-than-expected technical documentation, justification, or rationale supporting the change. This was considered to be a weakness, not a violation of NRC requirements. For example, the team observed that a 72.48 evaluation performed for the proposed use of NS-3 shield plug material as a substitute for the NS-4-FR shield plug material did not identify all the necessary changes to the SAR. SAR section 3.4.1.2.7, which discusses material compatibility of NS-4-FR was not identified in the approved 72.48 evaluation as a section that was impacted by the design change, nor did the 72.48 evaluation discuss material compatibility of the NS-3 material. The team noted that no shield plugs using the NS-3 material had shipped from Ionics prior to the inspection. NAC stated that the procedure was not clear as to whether all impacted SAR sections were required to be listed in the 72.48 evaluation. NAC wrote Audit Finding Report No. 01-29 to document and track corrective actions related to this weakness.

The team observed another weakness in the 72.48 process which was not a violation of NRC requirements. The team noted that NAC had not performed a 72.48 evaluation, or other documented engineering evaluation, for the use of a mold release agent used when the shield plug material is poured. The team considered the lack of an engineering evaluation for the use of the release agent to be a weakness since chemical compatibility of ISFSI materials is addressed in the SAR in detail. During the inspection, NAC performed a 72.48 evaluation for the use of the mold release agent and documented its acceptability.

The team also observed that several 72.48 evaluations performed by NAC had been signed and accepted by MYAPC but with handwritten comments or instructions after the signature line. Although this was not considered a violation of NRC requirements, the team noted that the evaluation procedure did not provide for such comments and further noted that the inclusion of comments cast doubt on the finality of the MYAPC approval. MYAPC wrote corrective action report (CR) 01-100 to document and track corrective actions related to this observed weakness.

2.2 Nonconformance Controls, Documentation Controls, and Audit Program

2.2.1 Observations and Findings

The team determined that overall, nonconformance controls, documentation controls, and the audit program met regulatory requirements.

3. **Fabrication Controls**

3.1 Fabrication and Assembly

3.1.1 Observations and Findings

The team determined that, overall, the fabrication program met regulatory requirements. Additionally, the team determined that, NAC's QA oversight controls of Ionics fabrication met regulatory requirements. The team observed a strong oversight presence at the fabrication sites on the part of the licensee (MYAPC), and their contractor representatives Stone and Webster Engineers and Constructors, Incorporated (SWEC). MYAPC had decided to invoke the American Society of Mechanical Engineering (ASME) Boiler and Pressure Vessel (B&PV) Code stamping process for their canisters. The team noted that this decision invoked an additional layer of quality controls involving both design controls and fabrication controls.

3.2 Material Procurement, Test and Inspection Controls, and Tool and Equipment Control

3.2.1 Observations and Findings

The team determined that overall, material procurement, test and inspection, and tool and equipment controls met regulatory requirements. Purchase orders were found to be consistent with analysis requirements in the SAR, and with the fabrication specifications. Additionally, 10 CFR Part 21 controls, including postings, procedures, purchase orders and personnel familiarity with Part 21, met regulatory requirements.

4. **Exit Meeting**

On March 16, 2001, at the conclusion of the inspection, the team held an exit meeting with NAC, MYAPC, and Ionics management representatives to present the preliminary inspection findings. NAC management acknowledged the inspection findings presented by the team.

NOTICE OF VIOLATION

NAC International Incorporated
Norcross, Georgia

Docket No. 72-1015

During an NRC inspection conducted at Ionics Incorporated (Ionics) facilities in Canonsburg, Pennsylvania, on March 12-16, 2001, a violation of NRC requirements was identified. Ionics was fabricating components for NAC International Incorporated (NAC) (the NAC-UMS spent fuel storage system design) under the provisions of NAC's quality assurance (QA) program. NAC had approved the Ionics QA program for fabrication activities. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

10 CFR 72.150, "Instructions, procedures, and drawings," requires, in part, that the certificate holder prescribe activities affecting quality in documented instructions and procedures, and that these instructions be followed.

Ionics Quality Assurance Manual, Revision 6, Section 5, requires, in part, that activities affecting quality be prescribed and accomplished in accordance with appropriate documented instructions, and that a traveler shall be prepared for the systematic accomplishment of each project.

Contrary to the above, on March 13, 2001, an Ionics employee failed to accomplish an activity affecting quality as prescribed in documented instructions. Specifically, a quality control inspector erroneously signed Ionics traveler TSC3100, Revision 6, Sequence 80, for drawing number 790-082, verifying that the after-backgouging weld groove angle for the bottom-plate-to-shell weld for transportable storage container number 082-95-13 was 90 degrees minimum with 45 degrees minimum on each side when, in fact, the weld groove angles were generally 30 degrees on each side when re-measured by the QC inspector at the request of the NRC inspector.

This is a Severity Level IV violation (Supplement VI).

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence and the date when full compliance was achieved is already adequately addressed on the docket in Inspection Report No. 72 -1015/01-201. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 with a copy to Susan M. Frant, Deputy Director, Licensing and Inspection Directorate, Spent Fuel Project Office, Office of Nuclear Material Safety and Safeguards within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 4th day of April 2001