Mr. Edward M. Davis
President and Chief Executive Officer
NAC International, Inc.
655 Engineering Drive
Norcross, GA 30092

SUBJECT: ALLEGATION NMSS-2000-A-0013

Dear Mr. Davis:

By letter dated June 2, 2000, NAC International, Inc. (NAC) provided a response to a Nuclear Regulatory Commission (NRC) request for additional information, regarding concerns with NS-4-FR material supplied by NAC. NAC has also provided other information regarding NS-4-FR and Holtite-A supplied by Holtec International by correspondence and NRC inspection.

In order to continue our review of this information and resolve these concerns, the staff requires additional information that is listed in the enclosure to this letter. We request that you conduct the necessary inspections or investigations to provide a response to NRC within 30 days of the date of this letter. Your response should include the requested information. The records of your completed action should also be available for NRC inspection.

Please submit your response to ADDRESSEE ONLY: Mr. Wayne Hodges, Deputy Director, Spent Fuel Project Office. Please do not submit any other copies to NRC or the Document Control Desk. If your response contains personal privacy, proprietary, or safeguards information, such information shall be contained in a separate attachment, appropriately marked, so that it will not be subject to public disclosure. The affidavit required by 10 CFR 2.790(b) must accompany your response if proprietary information is included.

The response requested by this letter and the accompanying enclosure is not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, Pub. L. 96-511.

F-58

M

Your cooperation is appreciated. If you have any questions or need additional information concerning this request, please contact me at 301-415-2398.

Sincerely,

M. Wayne Hodges, Deputy Director
Technical Review Directorate
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Enclosure: Request for Additional Information

Your cooperation is appreciated. If you have any questions or need additional information concerning this request, please contact me at 301-415-2398.

Sincerely,

M. Wayne Hodges, Deputy Director
Technical Review Directorate
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Enclosure: Request for Additional Information

DISTRIBUTION:
NMSS-2000-A-0013

P:\ref2000a0013-nac-let2.wpd

OFC:	NMSS OAC	E	SFPO	E	SFPO	E	SFPO	E	SFPO	E	SFPO	E
NAME:	RLO'Connell		KLathrop		MWaters		KGruss		SBaggett		EEaston	
DATE:	/ /00		/ /00		/ /00		/ /00		/ /00		/ /00	
OFC:	NMSS OAC	E	SFPO	E	SFPO	E	SFPO	E	SFPO	E	SFPO	E
NAME:	JGuttman		WHodges									
DATE:	/ /00		/ /00									

OFFICIAL RECORD COPY

- Request for Additional Information -

1. (a) Identify the raw materials (e.g., resin, hardener, etc.) and the mixing ratio of the raw materials used to fabricate NS-4-FR.

   (b) Provide the exact chemical composition (including the molecular structure or chemical formula) of the NS-4-FR resin, hardener, fire retardant and other additives (i.e., hindering additives, stabilizers). Provide this information directly from the chemicals suppliers' documentation and/or data.

   (c) Provide the bases and relevant justifications for specifying the NS-4-FR formulation.

   (d) Describe the impacts that a change in this formulation would have on the NS-4-FR shielding performance. Justify the acceptable variations in the formulation (using test data) that would support the shielding performance as described in the NAC-I28 and NAC-STC Safety Analysis Reports (SARs).

2. Identify and provide supporting justifications for the following NS-4-FR characteristics:

   (a) the total gamma and neutron dose and dose rate performance limits at ambient and the NAC-I28 and NAC-STC normal operating condition temperatures;

   (b) the specific gravity for both the material that is poured during installation and for the fully cured (hardened) material. Also, indicate whether the specific gravity value of 1.68 g/cm^3 is for the material that is poured or for the fully cured (hardened) material; and

   (c) the protocol, or procedures, for measuring the viscosity of the poured material and fully cured materials.

3. Provide the quality assurance procedures and records used to ensure that the raw materials of NS-4-FR are the same materials being used during the fabrication and installation of NS-4-FR.

4. Identify the names, chemical structures, removal techniques and purposes of all solvents used in the mixing, pouring, and curing processes and all preparation phases (e.g., preparation of mixing equipment for each batch) of the NS-4-FR installation. Also, describe the effects that any residual solvents may have on the degradation or off-gassing of NS-4-FR.

5. (a) Describe, and provide associated test data on, the chemical and physical stabilities of NS-4-FR under the combined effects of moderately high temperatures and radiation levels (i.e., the same magnitude of temperature and

gamma and neutron dose and dose rate as calculated in the NAC-I28 and NAC-STC SARs.

(b) Provide the experiment protocols (or procedures) and test results showing the combined thermal and radiation effects on both the development of voids in NS-4-FR and the density of NS-4-FR as a function of time.

(c) Justify how any loss of hydrogen containing gases or vapors (e.g., water vapor, hydrogen, etc.) or a decrease in the density of the NS-4-FR over the respective license periods is accounted for in the shielding analyses of the NAC-I28 and NAC-STC casks. Describe the impacts of a loss of hydrogen containing gases or vapors or a decrease in the density of the NS-4-FR on the ability of the NAC-I28 and NAC-STC casks to provide adequate shielding in accordance with the design calculations of the respective SARs.

6. Justify how the accelerated thermal test data as described in Exhibits 2-1, 2-2 and 2-3 of the NAC letter to E. Brach dated June 15, 2000, (i.e., letter responding to Holtec's Part 21 report) demonstrate that NS-4-FR provides the level of shielding as described in the NAC-I28 and NAC-STC SARs. Additionally, provide the basis (e.g., consensus standard or specification, independent development supported by test data, etc.) for the development of the thermal testing procedures.

7. Provide data related to the demonstration of NS-4-FR shielding performance where the test temperature was reduced over time.

8. Provide data from radiation experiments that may have been conducted on NS-4-FR samples, including data obtained from thermally treated samples. Include information related to total absorbed dose and dose-rate effects on the shielding properties for these tests.

9. Provide the protocols(or procedures) and raw data from the gas chromatograph-mass spectroscopy (GC-MS) results that are reported in Figure 1-3 of Exhibit 2-1 of the NAC letter to E. Brach, dated June 15, 2000 (i.e., letter responding to Holtec's Part 21 report).

- SENSITIVE ALLEGATION MATERIAL -

ROUTING AND TRANSMITTAL SLIP

Date: September 16, 2003

NAME	INITIALS	DATE
B. O'Connel		
K. Lathrop		
M. Waters		
K. Gruss		
S. Baggett		
E. Easton		
J. Guttman		
W. Hodges		
Secretary (dispatch)		

****

ACTION: _____ APPROVAL: __X__ FOR YOUR INFO: _____
NOTE & RETURN: _____ PREPARE REPLY: _____ COORDINATION: _____

****

**********EDO/NMSS TICKET NO(s).:

DUE TO DIVISION:

DUE TO NMSS:

DUE TO EDO:

****

MEMORANDUM/LETTER TO: Ed Davis, President

FROM: M. Wayne Hodges, Deputy Director SFPO

SUBJECT: ALLEGATION NMSS-2000-A-0013

****

REMARKS:

****

ORIGINATOR: Kirke Lathrop PHONE: (301) 415-8553
SECRETARY: