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June 15, 2000

Mr. E. William Brach  
Director Spent Fuel Project Office  
Office of Nuclear Material Safety and Safeguards  
United States Nuclear Regulatory Commission  
11555 Rockville Pike  
Rockville, MD 20852

Subject: Response to Part 21 Report Regarding NS-4-FR  
Material Supplied by NAC International, Inc.

Dear Mr. Brach:

This letter responds to your June 1, 2000 letter informing NAC International, Inc. (NAC) of a notification by Holtec International (Holtec) pursuant to 10 CFR Part 21.21 regarding a potential defect in NS-4-FR shielding material supplied by NAC. NAC has thoroughly and carefully reviewed the Holtec notification and associated documentation, our records pertaining to the specific material supplied to Holtec, and our detailed records of the NS-4-FR supplied for use in storage casks. Based on the results of these administrative, technical and quality reviews, NAC has concluded that the reported conditions, to the extent such conditions exist, are limited to the unique testing samples requested by Holtec and directly result from: 1.) ambiguity regarding installation instruction as appropriate for pouring of the testing samples and, 2.) thermal testing by Holtec that exceeded the published temperature parameters established for NS-4-FR. Therefore, it is our assessment that no safety concerns exist with respect to NS-4-FR neutron shielding material installed in safety related applications. The results of our reviews are summarized below and discussed in detail in the attachments to this letter.

Holtec requested that NAC manufacture and provide unique, non-standard dimensioned NS-4-FR samples for specific tests (thermal aging and boron carbide stratification) without specification of a quality-related installation. To meet Holtec's requirements, NAC prepared NS-4-FR material test samples in accordance with our procedures, project plan and quality program controls. Installation of this quality controlled material into the "molds" required by Holtec (including a length of small diameter PVC pipe and a lasagna pan), was not similarly controlled, as no qualified process existed for such non-standard installation into non-quality related vessels (reference additional discussion in Attachment 1). As was discussed with Holtec prior to their purchase order, a formal, quality-controlled process for installing (*i.e.*, controlled delivery of) NS-4-FR into these shapes was not necessary for accurate results from the specified tests and would have added unnecessary expense without adding any value to the test results. The identification of "voids" in the sample material, therefore, was not unexpected by NAC. Indeed,

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the presence of voids under these conditions validates the extensive precautions and quality controls used by NAC when preparing NS-4-FR for use in licensed applications.

NAC has carefully analyzed the thermal testing information submitted by Holtec. To date, the Holtec report documentation has been unavailable for review by NAC. Accordingly, we have not reviewed the test procedure(s), set-up, sample size, sample preparation, temperature variations, duration, instrumentation calibration, qualification and personnel training or qualifications. Therefore, NAC's review has been limited to considering the Holtec claim of material failure during testing. Our review identified that the testing performed by Holtec was conducted at a temperature above the published specification limit of 300°F. Moreover, their noted results are inconsistent with those reported by other organizations that have performed independent thermal aging tests. The reported Holtec test conditions at 325°F for 150 to 200 days are enveloped by testing performed by: 1.) Tokyo Electric Power Company, Nuclear Fuel Transport Corporation, Mitsubishi Heavy Industries Ltd., Genden Engineering Services & Construction Company, and NOF Corporation; 2.) Hitachi Zosen Corporation and Ocean Cask Leasing Company and, 3.) Bisco Products (see Attachment 2, Exhibits 2-1, 2-2 and 2-3). Among these published results is a test by Tokyo Electric Power Company, et al., that concludes that NS-4-FR heated to 170°C (338°F) for 5000 hours (over 208 days) shows no sign of deformation or cracking that may affect shielding efficiency. Because the test temperature used by Holtec was higher than defined in the NAC published NS-4-FR specification (Attachment 4), the thermal testing information, even if confirmed as accurate, does not represent a safety concern.

The NAC Quality Assurance program was fully compliant with all applicable NRC requirements at the time of Holtec's test sample procurement and remains compliant today. NAC's Quality Assurance program is routinely and consistently applied to NS-4-FR material that is manufactured and installed in certified casks for use at licensee facilities and other applications. The unique conditions under which the Holtec test samples were poured have no applicability to NS-4-FR material manufactured and installed in licensed applications. Standard material installations are rigorously controlled by NAC approved procedures and our quality program. Extensive testing by NAC and independent laboratories has consistently determined that NS-4-FR material so manufactured fully and consistently complies with applicable federal regulations and license requirements. Further, NAC is unaware of any other information indicating unexpected performance degradation in installed NS-4-FR material, some of which has been in service for approximately ten years.

In response to the specific statements contained in the Holtec Letter of May 26, 2000, as referenced in your letter of June 1, 2000, NAC states the following.

- I. NAC has carefully reviewed the information provided in the June 1, 2000 letter along with related NAC records and information. Based on the results of our review, we have identified no safety concerns.

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II. NAC is performing (or has performed) the following actions with regard to this notification:

1. Participated in a quality surveillance by the NAC Technologies Users Group (NUTUG) on June 8-9, 2000 to independently evaluate the NAC quality program as applied to the Holtec samples.

The outcome of this surveillance resulted in no issues (*i.e.* no findings) being noted and a conclusion that NAC followed our QA program during our supply of the Holtec samples. Additionally, the included technical review concluded that NAC radiation and thermal testing fully supported the respective values contained in NAC licensing submittals.

Although the NUTUG surveillance found no issues, it resulted in two recommendations representing areas for potential enhancement of our NS-4-FR supply process. Attachment 3 details the recommendations made by the surveillance team. Any actions not yet completed will be entered into our commitment tracking database and monitored to completion.

2. Conducted a formal NAC review of all project documentation from the Holtec sample procurement to determine whether proper quality requirements and procedures were implemented and followed, and whether NAC met its obligations under the purchase order and our QA Program.

The results of our review (see Attachment 3) were that the Holtec samples met all requirements for NS-4-FR manufacturing as provided in the Bisco and NAC specifications, in full accordance with NAC's Quality Program as applies to NS-4-FR.

3. Notifying our NUTUG organization, other NAC customers for NS-4-FR, as well as the Japan Atomic Power Corporation, JAPC (NS-4-FR owner), of the Part 21 Notice and this response. We have requested assistance from JAPC in determining the proper protocol in notifying Japanese NS-4-FR users of this issue.
4. Requesting information from the longest term domestic user of installed NS-4-FR to review their available performance data and provide same to NAC to ensure that no long-term shielding material degradation is occurring in installed casks resulting in decreased shielding performance.

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5. Preparation of a "lessons learned" assessment for review by applicable NAC employees involved in purchasing and supplying materials and services under our quality program. This assessment will discuss, as a minimum, the importance of documenting all relevant terms and conditions in a purchase order.
- III. NAC has evaluated the need to notify NS-4-FR users of this matter. As described above and discussed in detail in the attachments, although NAC has concluded, based on the currently available information, that there is no potential safety issue involved, we are notifying NUTUG members and other NS-4-FR application users of the Part 21 report and this response. NAC will, of course, immediately inform applicable NS-4-FR users should any subsequent information indicate a potential safety issue.

NAC is fully committed to assisting the Staff in achieving timely resolution of this matter. If you have any additional questions or require additional information, please contact the undersigned or Mr. Howard Smith, Vice President Quality, at 770-447-1144.

Sincerely,



Edward M. Davis  
President and CEO

**Attachments**

1. Technical Analysis Report of Voiding in Holtec Sample
2. Technical Analysis Report of Temperature Effects Reported by Holtec
3. NAC Actions in Response to Holtec Part 21 Filing
4. NAC Published Product Datasheet for NS-4-FR

**AFFIDAVIT**  
IN SUPPORT OF PROPRIETARY INFORMATION  
CONTAINED IN RESPONSE TO ALLEGATION PART 21 REPORT REGARDING  
NS-4-FR MATERIAL SUPPLIED BY NAC INTERNATIONAL INC.

State of Georgia, County of Gwinnett

Willington J. Lee (Affiant), Vice President and Chief Engineer of NAC International, hereinafter referred to as NAC, at 655 Engineering Drive, Norcross, Georgia 30092, being duly sworn, deposes and says that:

1. Affiant is personally familiar with the trade secrets and privileged information contained in the information being submitted in conjunction with the response to Allegation Part 21 Report Regarding NS-4-FR Material Supplied by NAC International Inc.

In making this application for withholding of proprietary information, NAC International relies upon the exemption from disclosure set forth in the Freedom of Information Act (" FOIA"), 5 USC Sec. 552(b)(4) and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR Part 9.17(a)(4), 2.790(a)(4), and 2.790(b)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information," and some portions also qualify under the narrower definition of "trade secret," within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

2. Some examples of categories of information which fit into the definition of proprietary information are:
  - a) Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by NAC's competitors without license from NAC International constitutes a competitive economic advantage over other companies;
  - b) Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

- c) Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of NAC International, its customers, or its suppliers;
- d) Information which reveals aspects of past, present, or future NAC International customer-funded development plans and programs of potential commercial value to NAC International;
- e) Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs 4.a, 4.b, 4.d, and 4.e, above.

- 3. The information sought to be withheld is being submitted to the NRC in confidence. The information (including that compiled from many sources) is of a sort customarily held in confidence by NAC International, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by NAC International. No public disclosure has been made, and it is not available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (4) and (5) following.
- 4. Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents with NAC International is limited on a "need to know" basis.
- 5. The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his designee), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside NAC International are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

6. The information classified as proprietary was developed and compiled by NAC International at a significant cost to NAC International. This information is classified as proprietary because it contains detailed descriptions of analytical approaches, procedures, and methodologies not available elsewhere. This information would provide other parties, including competitors, with information from NAC International's technical; database and the results of evaluations performed by NAC International. Release of this information would improve a competitor's position without the competitor having to expend similar resources for the development of the database. A substantial effort has been expended by NAC International to acquire and develop this information.
7. Public disclosure of the information sought to be withheld is likely to cause substantial harm to NAC International's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of NAC International's comprehensive neutron shield technology, and knowledge base, and its commercial value extends beyond the original development and acquisition cost. The value of the technology base goes beyond the extensive physical database and analytical methodology, and includes development of the expertise to determine and apply the appropriate evaluation process.

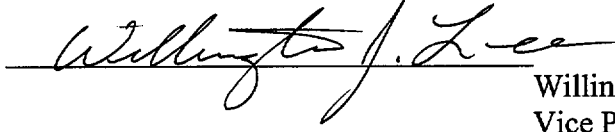
The research, development, engineering, analytical, and testing costs comprise a substantial investment of time and money by NAC International.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

NAC International's competitive advantage will be lost if its competitors are able to use the results of the NAC International experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

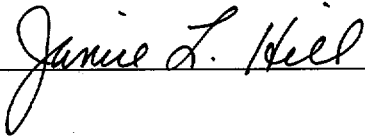
The value of this information to NAC International would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive NAC International of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools and installation procedures.

Executed at Norcross, GA this 15<sup>th</sup> day of June, 2000.



Willington J. Lee  
Vice President and Chief Engineer  
NAC International Inc.

Subscribed and sworn to before me this 15<sup>th</sup> day of June, 2000.



Notary Public in and for the  
County of Gwinnett  
State of Georgia

My commission expires the \_\_\_\_\_ day of \_\_\_\_\_

**Notary Public, Gwinnett County, Georgia**  
**My Commission Expires January 11, 2003**