

November 17, 2003

Ms. Sandra Gavutis
Executive Director
C-10 Research and Education Foundation, Inc.
44 Merrimac Street
Newburyport, MA 01950

Dear Ms. Gavutis:

Your petition dated October 7, 2003, addressed to the Executive Director for Operations at the U.S. Nuclear Regulatory Commission (NRC or the Commission), has been referred to the Director of Licensing Project Management (DLPM) pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 2.206 of the Commission's regulations. You requested that the NRC modify the license for the Seabrook Nuclear Power Station (Seabrook) to include a thorough inspection of Seabrook's steam generators (SGs) during the plant's 2003 refueling outage. In addition, you requested that a restart only be permitted on the basis of a new license condition calling for quarterly inspections.

As the basis for your request, you stated that Seabrook's October 2003 inspection of their SGs is not technically adequate to ensure the public health and safety. In particular you stated that: 1) the NRC is not requiring Seabrook to accurately determine the extent of their SG tube degradation by means of readily available specialized rotating probes; 2) there are many uncertainties associated with the axial outside-diameter stress corrosion cracking of SG tubes fabricated from thermally treated Alloy 600 tubing; and 3) the bobbin coil is not a reliable SG tube inspection technique for detecting stress corrosion cracking.

A petition review board (PRB) has reviewed your submittal. The PRB has concluded that your submittal does not meet the acceptance criteria for consideration under 10 CFR 2.206 because it did not present sufficient facts that constitute the bases for taking the requested immediate action. In addition, the supporting information that constituted the bases for the proposed action were insufficient to warrant further inquiry. I invite you to review the acceptance criteria for a 2.206 petition in Management Directive 8.11 which is available through our Web site (<http://www.nrc.gov/what-we-do/regulatory/enforcement/petition.html>). The enclosure to this letter provides the NRC staff responses to the specific concerns in your petition.

Thank you for bringing these concerns to the attention of the NRC. I hope you find the information in this letter useful. If you have any further questions, please contact the Seabrook Project Manager, Victor Nerses, at (301) 415-1484.

Sincerely,

/RA/

Eric J. Leeds, Deputy Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure: As stated

NRC STAFF RESPONSE TO OCTOBER 7, 2003 LETTER FROM
C-10 RESEARCH & EDUCATION FOUNDATION

In your 2.206 petition, dated October 7, 2003, you indicated that the NRC failed to provide a satisfactory reply to your concerns regarding the tube degradation at Seabrook. You also indicated that the NRC reply and evaluation was incorrect and it ignored several important factors. These factors are provided below along with the NRC comments on these issues.

1. You stated that because portions of the steam lines and the refueling water storage tank are outside containment and they present large and easily recognized targets, they are vulnerable to terrorist attacks. You state that since now, for the first time, the NRC admits that tubes with circumferential cracks will fail following a steam line break; a thorough evaluation must consider that borated water will not be readily available to cool the reactor core following a steam line break.

Response: You indicated that the NRC admitted, for the first time, that tubes with circumferential cracks will fail during a steam line break. The NRC has always recognized that severe tube degradation can result in failure of the tubes, and that is why there are inspection requirements and limits on the amounts of acceptable tube wall degradation in the technical specifications. This is not new information.

Your above comments appear to stem from the response the NRC provided to your June 30, 2003, letter in which the NRC indicated that the results of a study showed that the dynamic loads associated with a steam line break will have little impact on the integrity of the steam generator tubes, unless extensive circumferential cracking is present. Although not discussed in your October 7, 2003, letter, the staff indicated in its response letter that appropriate eddy current inspection methods are used to detect the presence of circumferential cracking. Given that the licensee for Seabrook: (1) performs inspections that would detect the onset of circumferential cracking in their tubes; (2) has not found any circumferential cracking; and (3) has found limited amounts of degradation (axial, circumferential, or volumetric) thus far which would not compromise the tube from performing its intended safety function during a steam line break; it is not expected that tubes would fail (rupture) following a steam line break.

It is important to note that the goal of the inservice inspection program for steam generator tubes is to identify and repair degradation such that the tubes that remain in service will be able to withstand a main steam line break with margin for the period of time between inspections. As a result, it is not expected that tubes would fail (rupture) during a steam line break.

2. You state: "The NRC indicated that exceeding the 40% limit is not a violation of 10 CFR Part 50 because the "methodology (in Regulatory Guide 1.121) accounts for flaw growth". This rationale is flawed because the 40% limit and the 10% degradation growth rates are based on uniform wastage and not on cracks that may grow and exceed the leakage criteria. A valid methodology for degradation growth between inspections must be based on a limiting crack growth. Seabrook has not provided a credible analysis in this regard."

Response: The purpose of indicating that flaw growth was accounted for in the determination of the plugging limit (i.e., 40% limit) in our September 25, 2003, response was simply to indicate that exceeding the 40% plugging limit was not a violation of NRC requirements.

Enclosure

Your 2.206 petition indicates one of many factors (i.e., growth) that affect the determination of the tube plugging limit. Other considerations include the type of degradation and the uncertainty associated with measuring the depth of the degradation (i.e., the non-destructive examination uncertainty). Regardless of the assumptions in the plugging limit, the goal is to ensure tube integrity for the period of time between inspections. Given the inspection and repair practices at Seabrook, there has been no evidence that tube integrity has been compromised.

In general, the 40% plugging limit tends to be conservative for highly localized flaws such as pits and cracks. In fact, this has led the industry to propose relaxations to this limit (refer to NRC Generic Letter 95-05, "Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes Affected by Outside Diameter Stress Corrosion Cracking").

3. You state: "The NRC indicated that Seabrook could operate with loose parts as long as the licensee shows by analysis that the wear from loose parts will not be safety significant. We do not believe that it is possible to conduct a credible analysis of wear from loose parts of unknown size, material, and location. According to NUREG-1771, wear from loose parts is unpredictable."

The staff could not identify where in NUREG-1771, "U.S. Operating Experience with Thermally Treated Alloy 600 Steam Generator Tubes," the staff indicated that wear from loose parts is unpredictable. The staff did indicate in NUREG-1771, however, that wear from loose parts is usually unexpected. This statement was made since licensees typically take precautions to prevent the introduction of loose parts into the steam generator and take actions to prevent a loss of tube integrity from loose parts (e.g., removal of loose parts from the steam generator).