Dated: April 29, 1988

UNITED STATES OF AMERICA
UNITED STATES NUCLFAR REGULATORY COMMISSION

before the

ATOMIC SAFETY AND LICENSING BOARD

In the matter of PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, et al. (Seabrook Station, Units 1 and 2)	Docket Nos. 50-443-OL-1 50-444-OL-1 (Onsite Emergency Planning and Safety Issue)

APPLICANTS' MOTION FOR SUMMARY
DISPOSITION OF NEW ENGLAND COALITION
ON NUCLEAR POLLUTION'S CONTENTION I.V.

Pursuant to 10 CFR 2.749, on the basis of the within Affidavits of John N. Esposito (two) and Gregory A. Kann, and for the reasons set forth below, Applicants move the Licensing Board to enter an order granting summary disposition in favor of the Applicants with respect to New England Coalition on Nuclear Pollution's ("NECNP") Contention I.V.

NECNP Contention I.V. reads as follows:

> The Applicant has not demonstrated that it meets General Design Criteria 14, 15, 31 and 32 of Appendix A to 10 CFR Part 50, as implemented by Regulatory Guide 1.83, in order adequately to reduce the probability and consequences of steam generator tube failure through periodic in-service inspection for early detection of defects and deterioration. Nor has the Applicant developed an

> adequate alternative program for in-service inspection of steam generator tubes.

In remanding this Contention, the Appeal Board noted that NECNP's reference to the steam generator tube rupture at Ginna provided a sufficiently specific basis for the admission of the contention. The Appeal Board also noted that "the Ginna incident gives rise to a possible inference that adoption of the regulatory guide's surveillance program [Regulatory Guide 1.83] at Seabrook might not prevent a tube rupture that would breach the facility's reactor coolant pressure boundary." ALAB-875 at 17.

The Affidavits of Gregory A. Kann and John N. Esposito establish that Applicants have an inspection program which meets the relevant General Design Criteria, as implemented by Regulatory Guide 1.83, and which reduces the probability and consequences of steam generator tube failure. The Affidavit of Gregory A. Kann specifically establishes that Applicants' inservice inspection program meets or exceeds the criteria proveded in Regulatory Guide 1.83. Kann Affidavit at ¶¶2-11.

As regards the Ginna incident, the Affidavit of John N. Esposito on the Ginna Tube Rupture Event and the Design of and Experience with Model F Steam Generators (Esposito Affidavit No. 1) establishes that the Ginna tube rupture was caused by a foreign object. It is highly unlikely that a tube rupture caused by a foreign object will occur at Seabrook Station because, as established in the Affidavit of Gregory A. Kann, a comprehensive inspection of all four Seabrook Station steam generators was conducted following hot functional testing and these inspections revealed no foreign objects in the Seabrook Station steam generators. In addition, a loose parts monitoring system provides additional assurance that a foreign-object-related tube rupture will not occur.

On January 25, 1982 a tube ruptured in a steam generator at the Ginna Nuclear Power Station as a result of a metal object being inadvertently left in the steam generator during a field modification in 1975. Esposito Affidavit No. 1 at ¶ 4. During operation, flow forces caused the foreign object to impact the peripheral tubes, damaging both plugged and operational tubes. Id. This process continued until a tube ruptured. Id. As a result of this event at Ginna, utilities now routinely perform visual searches of the steam generator tubesheet periphery to detect foreign objects. Id.

At Seabrook Station, in order to prevent damage to the steam generators from foreign objects, procedural controls have been developed which require a visual examination to be performed following any entry into the steam generator. Kann Afidavit at ¶12. For example, following hot functional testing, the secondary side steam generator internals were inspected. Kann Affidavit at ¶ 14. Accessible areas of the lower tubesheet were inspected by inserting a sub-miniature camera (probe) through opened hand holes in each of the four steam generators. Id. at ¶ 16. The separator area and related components were inspected during a "walk-through" examination of each generator. Id. at ¶ 19. Disposable protective clothing was worn during the walk-through examination to reduce the possibility of carrying contaminants into the internals. Id. at ¶ 20. In addition, material\equipment control was maintained by access control logs to preclude introduction of foreign objects into the internals. Id. During this walk-through the downcomer annulus areas were also viewed and no irregularities were noted. Id. at ¶ 21.

The slight amount of debris (approximately 3 to 4 ounces) located during these inspections was removed such that each of the four steam generators is considered to be free of any harmful materials in areas inspected. Id. at ¶ 23. Also, the areas viewed in each of the steam generators meet the requirements for Class "C" cleanliness under ANSI N.45.2.1-1973. Id. at ¶ 22.

In addition to the visual examination performed, a loose parts monitoring system, as described in FSAR section 4.4.6.4 is in place to detect a loose part on the steam generator tubesheet during plant operation. Id. at ¶ 3. This equipment is required to be operable during Modes 1 and 2 (as defined by the Technical Specifications) and if an alert level is exceeded, diagnostic steps will be taken within 72 hours to determine if a loose part is present. Id.

During oral argument before the Appeal Board, NECNP referred to a recent tube rupture event which had occurred at North Anna Unit 1.[1] Tr. at 27, (July 24, 1987). The Affidavit of John N. Esposito on the North Anna Tube Rupture Event (Esposito Affidavit No. 2), as seen below, establishes that the Seabrook Station Model F steam generator has a number of design features which differ from those of the North Anna steam generators. Based on these differences, a tube rupture event of the type that occurred at North Anna is not expected to occur in Model F steam generators.

On July 15, 1987, a steam generator tube rupture event occurred at North Anna Unit 1. Esposito Affidavit No. 2 at ¶ 4. The leakage location was found to be at the top tube support plate on the cold leg side and caused by high cycle fatigue. Id. at ¶ 5. The source of the loads was a

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[1] For this reason, Applicants address the North Anna incident herein. As a matter of law, however, Applicants do not believe that Contention I.V. should be read as raising any basis arising from the North Anna incident. No amended contention was ever filed. It is well established that an intervenor is bound by the literal terms of the contention and basis as filed. Texas Utilities Electric Co. (Comanche Peak Steam Electric Station), ALAB-868, 25 NRC ___, Slip Op. at 37 n. 83 (June 30, 1987).

combination of a mean stress level, produced by denting at the top tube support plate and a super-imposed alternating stress due to out-of-plane deflection of the tube above the support caused by flow induced vibration. Id. at ¶ 5. It is important to note that denting is a phenomenon which has only occurred with carbon steel support plates. Id. at ¶ 6.

The differences between carbon steel support plates, as used at North Anna, and stainless steel support material, as used at Seabrook Station, is described in Esposito Affidavit No. 1 at ¶ 5 (c). The steam generator tube support plate material of early made steam generators was carbon steel. Id. Under most conditions, this material proved to be satisfactory. Id. However, in the mid-70s corrosion of this material in the presence of chemical impurities led to a tube degradation phenomenon called denting. Id. When carbon steel corrodes, the oxide occupies a volume that is greater than that of the original material. Id. Under certain conditions which can occur in Pressurized Water Reactor steam generators formation of this oxide can fill the clearances between the support plates and the tubes producing forces sufficient to cause local tube deformation and producing high stresses which increase the potential for stress corrosion cracking of the tubes. Id. The Model F tube support material is type 405 stainless steel. Id. This material has improved corrosion resistance and with modern water AVT chemistry control, the volume of the oxide does not exceed the material loss thus eliminating the potential for denting. Id. Therefore a tube rupture event similar to that which occurred at North Anna is not expected to occur in Seabrook Station's Model F steam generators. See also, Esposito Affidavit No. 2 ¶¶ 7-8.

The NRC staff came to the same conclusion in "NRC Staff Response to New England Coalition on Nuclear Pollution's First Set of Interrogatories and Request for the Product of Documents to the NRC Staff on NECNP Contentions I.V. and IV" (December 7, 1987). In response to Interrogatory 6 (d), the NRC staff stated: "The Seabrook plant is not considered to be susceptible to the fluid flow induced vibration fatigue failure mechanism that caused the North Anna steam generator tube rupture, because it does not have carbon steel [tube] support plates with drilled holes."

In addition, the Model F steam generator incorporates a number of design features which reduce the potential for tube rupture. Esposito Affidavit No. 1 at ¶ 5. Those features include:

Thermal treatment of Alloy 600 tube material

The thermal treatment produces a microstructure that is more resistant to the various forms of stress corrosion cracking and improves corrosion resistance by as much as a factor of

10. EPRI has sponsored a number of programs which confirm this performance. Id.

Full depth hydraulic expansion tubesheet joint

The Model F tubesheet joint is formed by a full depth expansion process. This process closes the crevice between the tube and the tubesheet hole (which is a region where dryout could produce chemical concentration) while at the same time producing low residual stresses. Id.

Stainless steel tube support plate material

The Model F tube support material is type 405 stainless steel. This material has improved corrosion resistance and with modern water chemistry control, the volume of the oxide does not exceed the material loss thus eliminating the potential for denting. Id.

Quatrefoil tube support hole geometry

The Model F tube support plate holes are broached to produce a four-lobed hole which directs the flow which passes through the tube support plate to cleanse the interface with the tube. This cleansing action limits the potential for local chemical concentration and subsequent tube corrosion. This design limits the contact between the tube and the support plate to four narrow lands, also minimizing local dryout and chemical concentration. Id.

The sufficiency of the above design features can be adjudged by evaluating the operating history of the following

Model F-type steam generators using AVT chemistry operating in the United States (i.e. the equivalent to Seabrook Station). Esposito Affidavit No. 1 ¶ 6.

Plant	SG Model	Loops	Total Tubes	Operation Date
Surry 2	51F	3	10,026	9/80
Surry 1	51F	3	10,026	7/81
Turkey Point 3	44F	3	9,642	4/82
Turkey Point 4	44F	3	9,642	4/83
Point Beach 1	44F	2	6,428	4/84
Callaway 1	F	4	22,424	10/84
Robinson 2	44F	3	9,642	1/85
Wolf Creek	F	4	22,424	5/85
Millstone 3	F	4	22,504	1/86
Vogtle 1	F	4	22,504	3/87

These plants account for 33 Model F-type steam generators with nearly 150,000 tubes and represent a total of 122 equivalent steam generating operating years. Id. at ¶ 7. This operating experience is judged sufficient to confirm the reliable operating characteristics of the Model F steam generators. Id.

Of the nearly 150,000 Model F tubes in service in the United States, only 31 tubes have been plugged. Id. at ¶ 8. The reasons associated with the plugging are described in Esposito Affidavit No. 1 at ¶ 8.

Therefore, due to the use of support plate material which avoids the potential for tube denting, additional design features created to reduce the potential of a tube rupture, and the excellent operating history of the Model F steam generators, it is highly unlikely that a North Anna-type tube rupture event would occur at Seabrook Station. Id. at ¶9; Esposito Affidavit No. 2 at ¶8.

CONCLUSION

An order should enter granting summary deposition in favor of the Applicants with respect to NECNP Contention I.V.

Respectfully submitted,

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Statement of Facts Not In Dispute

1. On January 25, 1982, a tube ruptured in steam generator B at the Ginna nuclear power station. The following sequence of events was determined to have occurred:

   (a) A metal object was inadvertently left in the steam generator during a field modification in 1975. This foreign object was later found on the tubesheet at the periphery of the tube bundle.

   (b) During operation, flow forces caused the foreign object to impact the peripheral tubes resulting in damage to both plugged and operational tubes. This process continued until tube R42C55, located two rows in from the periphery of the tube bundle, ruptured.

   (c) Investigations showed that the foreign object produced an axial wear scar and local wall thinning by which the ruptured tube experienced loss in tube wall thickness over an eight month period.

   (d) As a result of this event, utilities now routinely perform visual searches of the steam generator tubesheet periphery to ensure that foreign objects are not left in the steam generators.

2. The Model F steam generator was designed in the mid-seventies. The four Seabrook Unit 1 steam generators were shipped in December 1980. The Model F incorporates

a number of design features which, together with the use of AVT water chemistry controls, reduce the potential for tube degradation. The major features of the Model F steam generators and their benefits are:

(a) Thermal treatment of Alloy 600 tube material - Years of research into the performance of Alloy 600 tube material in various steam generator operating environments led to the development of a special thermal treatment process to improve its corrosion resistance. The thermal treatment produces a microstructure that is more resistant to the various forms of stress corrosion cracking (SCC) and improves corrosion resistance by as much as a factor of 10. EPRI has sponsored a number of programs which confirm this performance and has recommended the use of thermally treated Alloy 600 for steam generator tubing.

(b) Full depth hydraulically expanded tubesheet joint - The Model F tubesheet joint is formed by full depth expansion process. After the tube is inserted into the tubesheet hole, it is expanded hydraulically in a single step. This process closes the crevice between the tube and the tubesheet hole (which is a region where dryout could otherwise produce chemical concentration if the crevice remains open) while at the same time producing low residual stresses, which reduces the potential for stress corrosion cracking.

(c) Stainless steel tube support plate material - The steam generator tube support plate material of early model steam generators was carbon steel. Under most conditions, this material proved to be satisfactory. However, in the mid-70s corrosion of this material due to the presence of chemical impurities led to a tube degradation phenomenon called denting. When carbon steel corrodes, the oxide occupies a volume that is greater than that of the original material. Under certain conditions formation of the oxide has been found to fill clearances between the support plates and the tubes producing high stresses which increase the potential for stress corrosion cracking of the tubes. The Model F tube support material is type 405 stainless steel. This material has improved corrosion resistance and with modern, AVT water chemistry control, the volume of the oxide does not exceed the material loss thus eliminating the potential for denting.

(d) Quatrefoil tube support hole geometry - The Model F tube support plate holes are broached to produce a four-lobed hole which directs the flow through the tube support plate to cleanse the interface with the tube. This cleansing action limits the potential for local chemical concentration and subsequent tube corrosion. This design limits the contact between the tube and the support plate to four narrow lands, which minimizes local dryout and chemical concentration. Tests have confirmed that the quatrefoil design produces lower local superheat at the interface with the tube than the conventional drilled tube hole. In tests which modeled sludge buildup in the crevice between the tube and the tube support plate, the buildup was limited to the width of the lands, which provides lower potential for corrosion at the interface.

3. Following a list of the Model F steam generators operating in the United States:

Plant	SG Model	Loops	Total Tubes	Operation Date
Surry 2	51F	3	10,026	9/80
Surry 1	51F	3	10,026	7/81
Turkey Point 3	44F	3	9,642	4/82
Turkey Point 4	44F	3	9,642	4/83
Point Beach 1	44F	2	6,428	4/84
Callaway 1	F	4	22,424	10/84
Robinson 2	44F	3	9,642	1/85
Wolf Creek	F	4	22,424	5/85
Millstone 3	F	4	22,504	1/86
Vogtle 1	F	4	22,504	3/87

4. These plants account for 33 Model F-type steam generators with nearly 150,000 tubes and represent a total of 122 equivalent SG operating years. This operating experience is sufficient to confirm the reliable operating characteristics of the Model F steam generators.

5. Of the nearly 150,000 Model F tubes in service in the United States, 31 tubes have been plugged. The reason associated with this plugging are as follows:

    (a) Foreign Object Interactions - Control of foreign objects is accomplished through careful inventory of materials introduced to the steam generator during maintenance and through periodic inspections in the tubesheet region. The presence of foreign objects has led to tube plugging peripheral tubes at two Model F-type plants - Surry 2 (one tube) and Turkey Point 3 (three tubes). Both of these plants began operation prior to implementation of programs to control foreign objects.

    (b) Surface Artifacts - Eddy current indications in the free length of the ruling, thought to be caused by conductive deposits on the OD surface have been observed at Surry Unit 1. Seven tubes with this type of indication were plugged at Surry. One of these was pulled and subjected to laboratory examination. Tests confirmed the absence of degradation where eddy current testing had suggested an indication of degradation. A similar condition is believed responsible for the plugging of four tubes at Turkey Point 3 and two tubes in Callaway 1.

(c) AVB Wear - Tube wall degradation at anti-vibration bar (AVB) intersections has been observed in the past, most prominently in the 51 Series steam generators but also in other models. AVB wear has been observed to occur at a rate of 5-15% per year. This mode of degradation is essentially mechanical in nature, and has been addressed in some plants with 51 Series steam generators by installation of new AVBs of a different design. AVB related wear has lead to the plugging of ten tubes at Callaway Unit 1 and two tubes at Millstone Unit 3.

(d) Other - Two additional tubes were plugged. One of these was at Surry 1 and was attributed to an internal tube restriction which prevented an eddy current inspection. The other was plugged at Callaway 1 for a variation in tube diameter not associated with the tube support plate region.

6. Experience has shown that Model F steam generators operating with modern AVT water chemistry controls are

extremely unlikely to experience tube corrosion which could lead to steam generator tube rupture, particularly in the first few years of operation.

7. Following hot functional testing the internals of the steam generators are inspected during the week of April 21-25, 1986. These inspections were performed to satisfy the Class "C" cleanliness requirements of ANSI N.45.2.1-1973, for the secondary side steam generator internals.

8. On July 15, 1987, a steam generator tube rupture occurred at North Anna Unit 1. The ruptured tube was located in Row 9, Column 51, in steam generator C. The leakage location was found to be at the top tube support plate on the cold leg side.

9. The cause of the tube rupture was high cycle fatigue. The source of the loads was a combination of mean stress level in the tube and superimposed alternating stress. The mean stress was produced by denting of the tube at the top tube support plate and the alternating stress was due to out-of-plan deflection of the tube above the top tube support caused by flow induced vibration.

10. Denting at the tube support plates is a phenomenon which experience has shown has only occurred with carbon steel material.

11. The steam generators installed in the Seabrook nuclear steam supply system are Model F steam generators which utilize stainless steel support plates, not carbon steel.

12. A steam generator tube rupture event of the type that occurred at North Anna will not occur in the Seabrook nuclear steam supply system because the requisite dented condition, will not occur because stainless steel support plates are used.

13. Regulatory Guide 1.83 describes a method acceptable to the NRC Staff for implementing the pertinent portions of General Design Criteria (GDC)-14," Reactor Coolant Pressure Boundary", GDC-15, "Reactor Coolant System Design", GDC-31, "Fracture Prevention of Reactor Coolant Pressure Boundary", and GDC-32, "Inspection of Reactor Coolant Pressure Boundary", of 10 CFR 50, Appendix A, by reducing the probability and consequences of steam generator tube failures through periodic inservice inspection of tubes for early detection of defects and deterioration. In addition to the periodic inservice inspection, Seabrook Station also performs visual searches of the steam generator tube sheet periphery to ensure that foreign objects are not left in the steam generators. Thus a steam generator tube inservice inspection program developed to meet the criteria set

forth in Regulatory Guide 1.83 complemented by a visual examination satisfies the underlying requirements of GDC 14, 15, 31 and 32, and thereby reduces the probability and consequences of steam generator tube failure.

14. The inspection program described in Regulatory Guide 1.83 at Section C, is broken down into two basic phases; (1) a preservice inspection to establish a baseline condition of the steam generator tubing and (2) periodic inservice inspections (i.e., post Operating License issuance) to assess the condition of tubing and to plug tubes as necessary (the only prescribed corrective measure).

15. In April and May, 1985, a preservice eddy current inspection was performed on the tubing in all four Seabrook Station steam generators as provided in Regulatory Guide 1.83 at C.3 and as required by the Seabrook Station Technical Specifications 3/4.4.5.

16. The preservice inspection was performed in accordance with the ASME Boiler and Pressure Vessel Code, Section XI, (hereinafter referred to as ASME Section XI) and Regulatory Guide 1.83, Revision 1, dated July, 1975.

17. Of the approximately 22,500 tubes examined during this preservice inspection, three tubes were found to have indications exceeding the plugging limit. These tubes were subsequently plugged. Several tubes were found to

have minor indications below plugging limits (i.e. 40 percent) The number, location and type of indications are typical of new steam generators. No corrective actions were required for these tubes. Additionally, six tubes exhibited indications of inadequate expansion in the tube sheet area. These tubes were subsequently re-expanded and satisfactorily re-examined in July, 1985.

18. In accordance with the Seabrook Station steam generator eddy current procedure and as required by the Seabrook Station Technical Specifications 3/4.4.5 and Surveillance Requirement 4.4.5.2b(1), any tube with preservice inspection indications greater than 20 percent will be included in the initial and subsequent inservice eddy current inspection sample.

19. Following initial criticality each inservice inspection of the steam generator tubing will be performed in accordance with the Seabrook Station eddy current inspection procedure which is consistent with the Seabrook Station Technical Specifications 3/4.4.5, Regulatory Guide 1.83, Revision 1, and ASME Section XI. The selection criteria, frequency of inspection, acceptance criteria and reporting requirements are specified in the Seabrook Station Technical Specifications.

20. In addition to inspecting to the requirements set forth in the Seabrook Station Technical Specifications and as provided in Regulatory Guide 1.83 at C.2, paragraph f, each of the tubes in the inspection sample will be examined over its entire length, from tube sheet to the tube sheet. The Technical Specifications require inspection only from the point of entry (hot-leg side) completely around the U-bend to the top support of the cold-leg. For inspection of certain inner row tubes, examination of the entire length of the tube may require entry from both the hot and cold leg sides of the steam generator. If necessary, entry into the cold leg may be rescheduled to the next subsequent inspection of that steam generator to minimize radiation exposure to personnel consistent with the ALARA objectives.

21. As provided in the Seabrook Station Technical Specifications 3/4.4.5, Surveillance Requirements 4.4.5.2, tubes are generally selected on a random basis. However, the Technical Specifications and Regulatory Guide 1.83, also provide that the sample of tubes selected for each inservice inspection of each steam generator shall include tubes in those areas where experience has indicated potential problems. Based on the Model F-type steam generator operating history information contained in the "Affidavit of John N.

Esposito on the Ginna Tube Rupture Event and the Design of and Experience with Domestic Model F Steam Generators", paragraphs 6-8, it can be concluded that the plugging of approximately 0.02% of 150,000 steam generator tubes after more than 1000 effective full power months of steam generator operation (122 equivalent steam generator calendar years since initial startup) does not identify a potential problem area. As noted in the Affidavit of John N. Esposito on the Ginna Tube Rupture Event and the Design of and Experience with Model F Steam Generators at paragraph 8(c), some tubes have been plugged as a result of indications reported at AVB locations. Although this has not been identified as a generic potential problem area for model F steam generators, these areas will be looked at in evaluating the full length tube inspection results when the Seabrook Station steam generators are inspected.

22. Based on the "Affidavit of John N. Esposito on the North Anna Tube Rupture Event", paragraph 8, it can be concluded that the particular problem that arose at North Anna is not applicable to the Seabrook Station steam generators. Therefore the Seabrook Station inspection program need not address this particular failure mechanism.

23. In order to prevent damage to the steam generators from foreign objects, procedural controls have been developed requiring accountability of objects (e.g., tools, etc.) when working in the steam generators and requiring an appropriate visual examination to be performed following any entry into the steam generator. This visual examination will include the tubesheet periphery to ensure that foreign objects have not been left in the steam generators. This visual examination is performed when an entry is made into the steam generator for whatever reason. At a minimum, steam generator secondary side visual inspections will be performed after secondary side repairs or modifications to steam generator internals or when eddy current examinations indicate potential fretting or wear indicative of potential loose parts.

24. Complementing the visual examination process is the loose parts monitoring system described in FSAR Section 4.4.6.4, which is capable of detecting a loose part on the steam generator tube sheet during plant operation. This equipment is required to be operable during Modes 1 and 2 and if an alert level is exceeded, diagnostic steps will be taken within 72 hours to determine if a loose part is present.

25. Prior to putting the unit into service and following hot functional testing the internals of the steam generators were visually inspected. These inspections were performed to satisfy the Class "C" cleanliness requirement of ANSI N.45.2.1-1973, for the secondary side steam generator internals.

26. The inspection locations were based on the areas that have historically been shown to be natural collection areas for foreign objects. The following areas were inspected: lower tube sheet area, separator area and downcomer annulus area.

27. The accessible areas of the lower tube sheet were inspected by inserting the sub-miniature camera (probe) through opened handholes in each of the four steam generators.

28. Probe positioning during inspection of tube center lane area was facilitated by the use of a guide tube; ½" electrical conduit with a 90 degree bend at the distal end. Probe articulation controls were used to steer the camera head to provide the best view.

29. The tube sheet annulus area and adjacent tube lanes were inspected by first inserting (pushing) the probe around the circumference while viewing forward. On retraction, the articulation controls were used to provide a view down the tube lanes. All inspections of the tube sheet

area were recorded on ½" VHS video tape. Pertinent data (e.g., distances or general identification) was entered onto the recordings though the use of an alpha-numeric character generator with time/data output.

30. The separator area and related components were inspected during a "walk through" examination of each generator. Entry was through a 16" manway opened for this purpose. The surface conditions of various internal components were photographed using a 35mm SLR camera equipped with a flash color print film.

31. Disposable protective clothing was worn during the walk through examinations to reduce the possibility of carrying contaminants into the generator internals. In addition, material/equipment inventory control was maintained by access control logs to preclude introduction of foreign objects into the generator internals.

32. The downcomer annulus areas were also directly viewed at this time; no irregularities were noted.

33. The areas viewed in each of the steam generators meet the requirements for Class "C" cleanliness under ANSI N.45.2.1-1973.

34. All debris located during these inspections was removed. The slight amount of material removed (estimate 3 to 4 ounces) was determined to be construction debris (e.g.,

pieces of wire). Therefore, each of the four generators is free of any and all materials in areas inspected, which might be harmful to their useful service life. No structural abnormalities were noted.

35. In addition to the above described preservice eddy current inspections and visual examination, the Seabrook Station steam generators were hydrostatically tested in accordance with the ASME Boiler & Pressure Vessel Code, Section III. This test was conducted at a test pressure equal of 1500 psi and witnessed by the Authorized Nuclear Inspector per ASME III and by the NRC.

36. In addition to the above described inservice eddy current inspections and visual examination, an inservice leak test of the Seabrook Station steam generators will be performed in accordance with ASME Section XI. This test will be conducted during each refueling shutdown.