New Hampshire
Yankee

Ted C. Feigenbaum
President and
Chief Executive Officer

NYN-92031

March 19, 1992

United States Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

References: (a) Facility Operating License No. NPF-86, Docket No. 50-443

(b) Station Blackout Rule (10CFR50.63)

(c) New Hampshire Yankee Letter NYN-89038 dated April 17, 1989, "Information Submittal Required by 10CFR50.63", G.S. Thomas to USNRC

(d) New Hampshire Yankee Letter NYN-90083 dated March 30, 1990, "Supplemental Information Submittal on Station Blackout Rule", T.C. Feigenbaum to USNRC

(e) USNRC Letter dated July 31, 1991, "Seabrook - Station Blackout: Request for Additional Information (TAC No. 68601)", USNRC to T.C. Feigenbaum

(f) New Hampshire Yankee Letter NYN-91141 dated September 6, 1991, "Response to Request for Information on Station Blackout Rule", T.C. Feigenbaum to USNRC

(g) USNRC Letter dated February 11, 1992, "Safety Evaluation and Request for Additional Information Concerning Station Blackout Analysis for the Seabrook Station, Unit 1, Unresolved Safety Issue A-44 (TAC No. M68601)

Subject: Response to NRC Safety Evaluation and Request for Additional Information Concerning Station Blackout Rule

Gentlemen:

New Hampshire Yankee provided responses dated April 17, 1989 and March 30, 1990 [References (c) and (d)] to the Station Blackout Rule, 10 CFR 50.63, and provided additional information on September 6, 1991 [Reference (f)] in response to the NRC's July 31, 1991 letter [Reference (e)]. This information was reviewed by the NRC staff and by Science Applications International Corporation (SAIC). The results of these reviews were transmitted to New Hampshire Yankee in an NRC letter dated February 11, 1992 [Reference (g)].



TOTAL P.02



A050
1/1

The NRC Staff review specified certain additional actions that New Hampshire Yankee needed to take to satisfy NRC requirements. These actions consisted of the following:

(1) committing to implement pre-hurricane shutdown procedures or reevaluating the plant for an 8-hour coping duration,

(2) reevaluating the Class 1E battery capacity to address concerns which prevented the Staff from concluding that battery capacity was adequate for the required coping duration,

(3) verifying heat loads in the control and switchgear rooms,

(4) confirming administrative controls exist which ensure control room temperature never exceeds 72°F,

(5) confirming a procedure exists to open the control room cabinet doors within 30 minutes of a Station Blackout (SBO),

(6) verifying MSIV's will remain operable until they have performed their required function, and

(7) confirming that all equipment required to cope with a SBO is covered by a Quality Assurance (QA) program which is consistent with the requirements of Regulatory Guide 1.155.

The following responses are presented for each of the above actions.

(1) New Hampshire Yankee has carefully reviewed the Staff concerns stated in sections 2.1 and 2.2 of Reference (g) which led to the recommendation that NHY either implement pre-hurricane shutdown procedures or reevaluate the plant for an eight hour coping duration. In Reference (d) New Hampshire Yankee stated that calculations using site-specific weather data and Table 3-5b of NUMARC 87-00 demonstrated that Seabrook Station was classified as AC Power Design Characteristic Group "P2", which requires a four hour coping duration. The Staff agreed with the plant independence of offsite power system classification of "I 1/2" and the severe weather (SW) classification of Group 3 reported in Reference (d). However, the Staff disagreed with the extremely severe weather (ESW) classification of Group 3, stating that, if the information contained in the Updated Final Safety Analysis Report (UFSAR) is utilized the appropriate ESW frequency classification for Seabrook Station is Group 4. With an ESW classification of Group 4, an SW classification of Group 3, and an independence of offsite power system grouping of "I 1/2", the offsite power design characteristic is either "P3", requiring an eight hour coping duration, or "P3*", requiring a coping duration of 4 hours with the implementation of pre-hurricane shutdown procedures.

The NRC Safety Evaluation (SER) and the Technical Evaluation Report (TER) prepared by Science Applications International Corporation (SAIC) used weather data from Table 2.3-6 of the UFSAR which presents the fastest-mile wind speeds at 30 feet above ground for selected return intervals. This data was adjusted to a 30-meter height and then extrapolated by SAIC to estimate the probability of a wind speed equal to or greater than 125 mph. The SER and TER both state that since the extrapolated value is consistent with the value given in Table 3-2 of NUMARC 87-00, Seabrook Station is considered to be in ESW Group 4. While the extrapolated data and Table 3-2 may be consistent, New Hampshire Yankee considers the site-specific data used in our analysis to be more representative of actual conditions, and the UFSAR is being updated to reflect this data.

Table 2.3-6 of the UFSAR was developed from a journal paper published in 1968 (Thom, H.C.S., "New Distributions of Extreme Winds in the United States", Journal of the Structural Division, ASCE, Volume 94, No. ST7, Proc. Paper 6038 July 1968), which is hereafter referred to as Thom (1968). The paper was submitted for publication in early 1967, which would mean that the research summarized in the paper was completed prior to 1967. As noted in the paper, the results cited were based on a wind speed data base with an average of twenty-one years of record.

Since the development of Thom (1968) the wind speed data base length of record has increased. The longer record increases the reliability of the estimated wind speed probabilities. Thom notes that a longer record increases the accuracy of the estimates. A more recently published study, NUREG/CR-2639 ("Historical Extreme Winds for the United States - Atlantic and Gulf of Mexico Coastlines", National Oceanic and Atmospheric Administration, May 1982), utilized the longer data record. In addition, since 1967, methods which utilize Monte Carlo simulations (E. Simiu, and R.H. Scanlan, Wind Effects on Structures, John Wiley & Sons, New York, 1986), have been developed to estimate hurricane wind speed probabilities. The information in these two references form the basis of the site-specific evaluation summarized in Reference (f) and documented in an engineering evaluation, Yankee Atomic Electric Company Calculation Number SBC 291, Revision 2, which is available for your review.

UFSAR Table 2.3-6 is being revised to reflect the more current information and more reliable estimates presented in NUREG/CR-2639 and in Wind Effects on Structures. Table 1, Enclosure 1 to this letter, presents this revised information. Table 1 shows the fastest-mile extreme wind speeds derived for various recurrence intervals at 10 meters and 30 meters above grade for the Seabrook site. Using Table 1, which incorporates the more recent data that was not available at the time Thom (1968) was developed, Seabrook Station is in ESW Group 3. The annual probability at the site of a fastest-mile wind $\geq$ 125 mph is approximately $2.6 \times 10^{-3}$.

Wind speed probabilities for seven weather station locations from Boston north are summarized in Table 2, Enclosure 1 to this letter. The length of record at the seven locations varies from 34 to 78 years. This information was obtained from NUREG/CR-2639 and was developed by the National Oceanic and Atmospheric Administration (NOAA). In the table, the 1000-year return period fastest-mile wind speeds are shown. The 1000-year return period fastest-mile wind speeds were adjusted, if required, to a common reference of 30 meters above grade. The adjustment factor from 10 meters to 30 meters was based on the logarithmic law, as shown in Wind Effects on Structures. The 1000-year return period event has an annual probability of exceedance of $1 \times 10^{-3}$. For all locations in the vicinity of Seabrook Station the NOAA data indicates that the annual probability of wind speeds at any location of greater than 123 mph are on the order of $1 \times 10^{-2}$. This NOAA data supports Seabrook Station's site classification as an ESW Group 3.

The wind speed probability information presented in Table 1 of this letter is documented in Calculation SBC-291, Revision 2. An excerpt of this calculation showing the wind speed probability relationship is presented in enclosure (3).

To summarize New Hampshire Yankee's reply to the recommendations in Action (1), data used to determine the ESW classification was reviewed and Seabrook Station is appropriately classified an ESW Group 3 plant. The UFSAR data used by SAIC has been superseded by more recent data and more reliable wind speed estimates. Table 2.3-6 of the UFSAR is being revised to reflect this data. Based on the more recent data the annual probability of wind speeds $\geq$ 125 mph in the vicinity of Seabrook Station is approximately $2.6 \times 10^{-3}$. Additionally, recently published NOAA data supports New Hampshire Yankee's classification of Seabrook Station as ESW Group 3. New Hampshire Yankee believes if SAIC and the Staff had the opportunity to review the data included in this letter at the time the TER was issued they would have reached the same conclusion. New Hampshire Yankee considers this information adequately resolves Action (1).

(2) Based on the information available at the time the New Hampshire Yankee submittal was reviewed, the Staff had five concerns which prevented them from concluding that Class 1E battery capacity was adequate for the required SBO duration. New Hampshire Yankee has performed a preliminary review of the battery capacity concerns listed in the SER and has concluded that the existing battery sizing calculation demonstrates adequate battery capacity is available for the four hour coping duration. No modifications are required. Detailed responses to each of the concerns are being prepared pending the completion of additional electrolyte temperature and load shedding evaluations. This information will be provided by May 31, 1992.

(3) The Staff felt that heat loads assumed in the New Hampshire Yankee SBO submittal appeared low, and recommended that we verify that these heat load values accurately reflect the loads in the control room and the switchgear rooms during an SBO event. Accordingly, area heatup in the Control Building (including the main control room and switchgear rooms) is being re-analyzed with heat loads reflecting the total battery loads as suggested by SAIC in the TER. This re-analysis will utilize a computer code suitable for compartment heatup. This code will provide a time dependent temperature profile for the main control room and the switchgear rooms. It is expected that the main control room temperature will remain below 120°F. This action will be completed by May 31, 1992.

(4) The Staff felt that assuming an initial control room temperature of 75°F was non-conservative and that if it remains as the initial temperature in the coping analysis then New Hampshire Yankee must ensure adequate administrative control exists to ensure that control room temperature does not exceed 75°F under any circumstance. New Hampshire Yankee has an existing Main Plant Computer Video Alarm System (VAS) alarm response procedure (D7011, Control Room Temperature High) which specifies appropriate corrective actions when control room temperature reaches 75°F. This procedure has been reviewed and determined to adequately provide the required administrative controls. Use of VAS alarm response procedures is directed by the NHY Operations Management Manual. New Hampshire Yankee considers this information adequately resolves Action (4).

(5) The Staff recommended that New Hampshire Yankee establish a procedure to open control room cabinet doors within 30 minutes of an SBO event. An existing procedure for coping with a Station Blackout (ECA 0.0) provides steps for opening control room cabinet doors. Operations personnel are verifying that the actions listed in this procedure can be accomplished within 30 minutes of the onset of an SBO event. This verification, and any required changes to ECA 0.0 will be completed by May 31, 1992.

(6) The Staff could not conclude that reasonable assurance of equipment operability had been provided for the Main Steam/ Feedwater Chase Electrical Room since the calculated final temperature of 132°F exceeded the EQ temperature of 130°F. The limiting EQ temperature of 130°F is associated with the MSIV Logic cabinets. It should be noted, however, that the cabinets in the MS/FW Pipe Chase Electrical Room are the Train A cabinets for all MSIV's. Redundant Train B capability is provided by an identical set of cabinets located in the Train B Switchgear Room. Because the Train B cabinets can close all the MSIV's, the redundant Train A cabinets are not required for an SBO event. Therefore, the Train A cabinets will be deleted from the SBO equipment list. The Switchgear Room temperature at four hours is well below 130°F. The only remaining components in the MS/FW Pipe Chase Electrical Room that are required for SBO have an EQ temperature of 144°F. As such, it can be concluded that reasonable assurance of equipment operability in the MS/FW Pipe Chase Electrical Room has been provided and that MSIV closure capability has been preserved. New Hampshire Yankee will revise ECA 0.0 to require the use of the B train switches by May 31, 1992.

(7) Section 2.5 of the SER recommends New Hampshire Yankee verify and confirm that equipment needed to cope with a Station Blackout is covered by an appropriate QA program consistent with RG 1.155. In response to this recommendation we reviewed each piece of required equipment and determined that it is all safety related. All safety related equipment is within the scope of the New Hampshire Yankee Operational Quality Assurance Program, which complies with the requirements of 10 CFR 50 Appendix B, which exceed those described in RG 1.155. New Hampshire Yankee considers this information adequately resolves Action (7).

New Hampshire Yankee will document completion of actions (2), (3), (5) and (6) in a separate letter by May 31, 1992. New Hampshire Yankee would be pleased to either meet or teleconference as necessary, with the NRC technical reviewers and our staff to discuss the above responses.

If you have any questions regarding the above, please contact Mr. Terry Harpster, Director of Licensing Services, at (603) 474-9521 extension 2765.

Very truly yours,

Ted C. Feigenbaum

TCF/MJM/ss

Enclosures

cc: Mr. Thomas Martin
Regional Administrator
U. S. Nuclear Regulatory Commission
Region 1
475 Allendale Road
King of Prussia, PA 19406

Mr. Gordon E. Edison, Sr. Project Manager
Project Directorate I-3
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Mr. Noel Dudley
NRC Senior Resident Inspector
P.O. Box 1149
Seabrook, NH 03874

New Hampshire Yankee
March 19, 1992

ENCLOSURE 1 TO NYN-92031

TABLE 1

FASTEST-MILE WIND SPEEDS FOR SEABROOK AREA

| Return Interval (years) | Annual Probability of Exceedance | Wind Speed (mph) 10-meters Above Grade | Wind Speed (mph) 30-meters Above Grade |
|---|---|---|---|
| 10 | 0.1 | 61 | 72 |
| 25 | 0.04 | 72 | 84 |
| 50 | 0.02 | 81 | 94 |
| 100 | 0.01 | 90 | 105 |
| 200 | 0.005 | 98 | 115 |
| 400 | 0.0025 | 107 | 125 |
| 2000 | 0.0005 | 131 | 154 |

* Note: Derived from data in NUREG/CR-2639 and Wind Effects on Structures

ENCLOSURE 2 TO NYN-92031

TABLE 2

NOAA DATA IN SEABROOK VICINITY

| Location | ID# | Record | Height | Fastest-Miles Wind Speed (mph) 1000-Year Return Period: At Measured Height | Fastest-Miles Wind Speed (mph) 1000-Year Return Period: Adj. to 30-Meters |
|---|---|---|---|---|---|
| Eastport WBO ME | 14608 | 78 | 10-meter | 98 | 115 |
| Portland WBO ME | 94734 | 68 | 30-meter | 97 | 97 |
| Portland APT ME | 14764 | 39 | 10-meter | 85 | 99 |
| Concord WBO NH | 94756 | 34 | 30-meter | 80 | 80 |
| Concord APT NH | 14745 | 38 | 10-meter | 80 | 94 |
| Boston WBO MA | 94701 | 65 | 30-meter | 80 | 80 |
| Boston APT MA | 14739 | 38 | 10-meter | 96 | 112 |

Source: NUREG/CR-2639

Note: Adjustment from 10-meters to 30-meters based on logarithmic law for open terrain (Wind Effects on Structures).

ENCLOSURE 3 TO NYN-92031

# SEABROOK STATION

## STATION BLACKOUT

## EXTREMELY SEVERE WEATHER

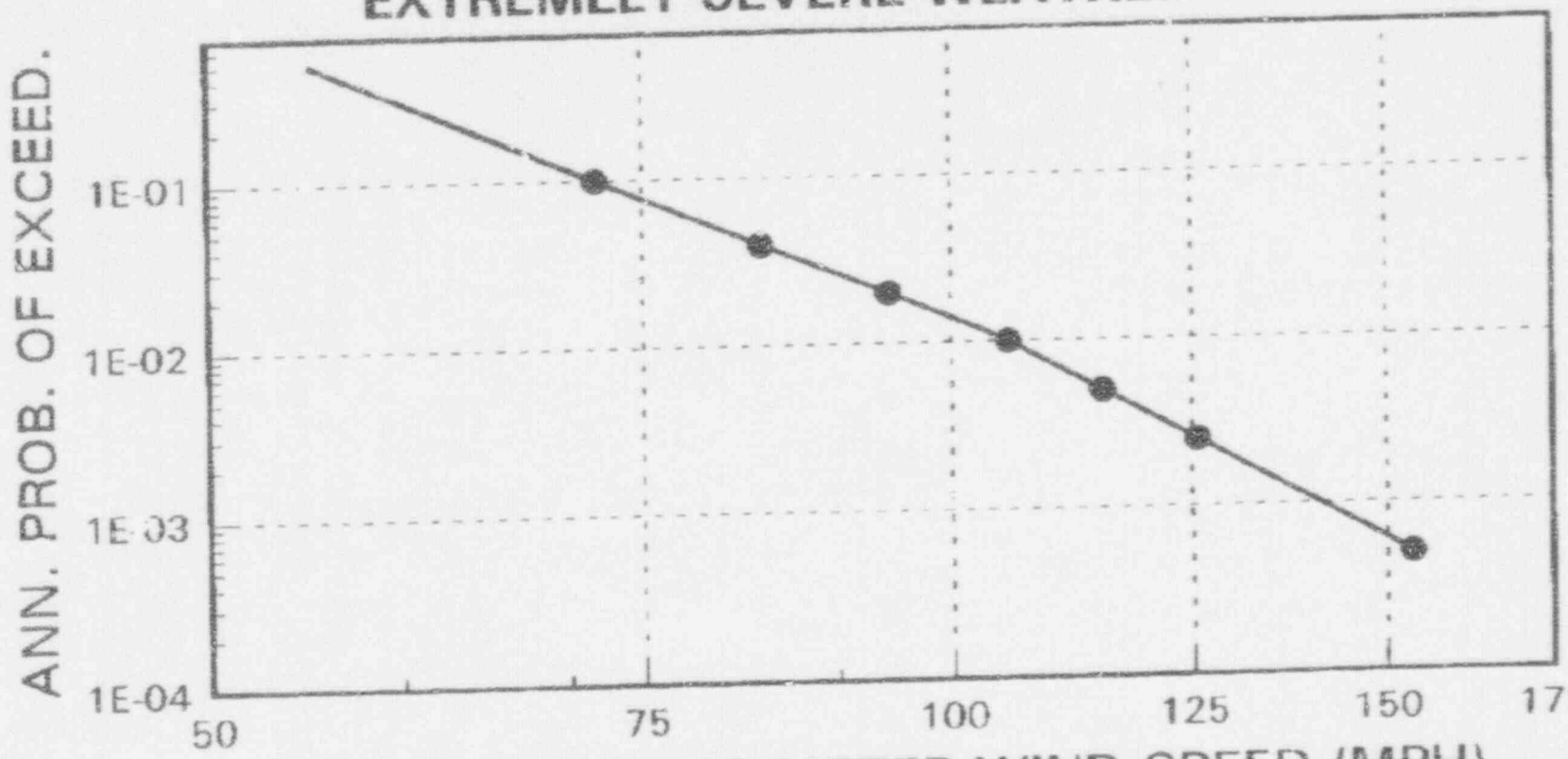


FIGURE 3