PSNH

Public Service of New Hampshire

New Hampshire Yankee Division

SEABROOK STATION
Engineering Office

April 3, 1986
SBN-991
T.F. 7.1.99

United States Nuclear Regulatory Commission
Washington, DC 20555

Attention: Mr. Vincent S. Noonan, Project Director
PWR Project Directorate No. 5

References: (a) Construction Permits CPPR-135 and CPPR-136, Docket Nos. 50-443 and 50-444
(b) PSNH Letter (SBN-903), dated November 27, 1985, "Resolution of Power System Branch Confirmatory Items," J. DeVincentis to G. W. Knighton

Subject: Confirmatory Item C-21, "Routing of Off-Site Power Circuits," Additional Information on Guardrails

Dear Sir:

The information in the attached enclosure is being furnished as a result of our discussions with the Staff regarding the adequacy of the guardrails provided on the bridges crossing the 345 kV SF_6 bus work. This information augments that which was provided in Reference (b) in response to Confirmatory Item C-21, "Routing of Off-Site Power Circuits."

Since this completes our response to the above-referenced confirmatory item, we request its resolution be reflected in the next supplement to Seabrook Station's SER.

Very truly yours,

John DeVincentis, Director
Engineering and Licensing

Enclosures

cc: Atomic Safety and Licensing Board Service List

A001
1/1

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ENCLOSURE

Additional Information on Guardrails
(Confirmatory Item C-21)

ENCLOSURE

Additional Information Regarding Protection of SF_6 Bus Work from Vehicular Traffic

General Design Criterion 17 requires that the two circuits providing electric power from the transmission network to the on-site electric distribution system be designed and located so as to minimize to the extent practical the likelihood of their simultaneous failure under operating and postulated accidents.

For the Seabrook design, the connection of these circuits from the transmission line terminating structures to the switchyard is done utilizing gas insulated (SF_6) metallic bus work; refer to FSAR Figures 8.2-7 and 8.2-8 (attached). As shown on these figures, the SF_6 bus work runs under two access bridges (Bridge A and Bridge B).

We believe that the following measures taken to protect the SF_6 bus work from vehicular traffic on the access bridges satisfy the requirements of General Design Criteria 17 in that they minimize to the extent practical the likelihood of a vehicular accident causing the simultaneous failure of two off-site circuits.

(A) Vehicular traffic on these bridges is subject to strict plant-regulated speed limits: 15 miles per hour for Bridge A and five miles per hour for Bridge B. These speed limits will be posted and will be enforced by the plant's security forces located at the Gate House. Photograph A shows the proximity of the Gate House to the bridges. Because of this proximity, there is insufficient distance for a vehicle to accelerate to an unacceptable speed as it enters the site and proceeds towards Bridge A.

Vehicular access to Bridge B is controlled by the security forces in the Gate House. If there is a need for a vehicle to cross the bridge, a guard will have to walk out and remove the chain barrier which blocks access to Bridge B.

There will be no access on these bridges for Unit II construction traffic should Unit II construction resume. There is a fence line separating Unit I area from Unit II and other construction areas.

(B) Heavy guardrails are provided on the bridges. (Refer to Photographs B and C.) These guardrails are designed and constructed in accordance with AASHTO (American Association of State Highway and Transportation Officials) requirements. Guardrails designed per these requirements have been successfully tested by AASHTO to sustain a 25^{o} impact from a 4,500-pound car traveling at 60 miles per hour. For details of the design and material used for the guardrails, refer to UE&C Calculation SS-15.

(C) Each SF_6 bus work constituting a circuit (three tubular buses per circuit) which runs under the bridges is in its own concrete compartment and is separated by the adjacent one by a one-foot thick concrete wall. Refer to Photographs D and E for details.

ENCLOSURE
(Continued)

Additional Information Regarding Protection
of SF_6 Bus Work from Vehicular Traffic

(D) A galvanized steel protective grating is installed on top of the walls separating the SF_6 bus work. Refer to photographs for views of the grating. (End pieces of grating adjacent to the bridges have not yet been installed.)

(E) Additional guardrails are provided as shown in Attachment A to guide access to the bridges. The design of this type of guardrail is as shown in Attachment B.

Keeping in mind the above-described protective measures, we can now evaluate the effect of a theoretical catastrophic event which would be a vehicle traveling at the posted speed limits and veering left or right while crossing the bridge to the point where it hits the guardrail.

We believe that the vehicle will be slowed down or stopped by the impact on the guardrail depending, of course, on the size of the vehicle.

The AASHTO standard specification which was utilized for the construction of the guardrails states that the primary purpose of traffic railing is to contain the average vehicle using the structure, while taking into consideration the protection to vehicles on roadways being overcrossed; in our case, this being the SF_6 bus work.

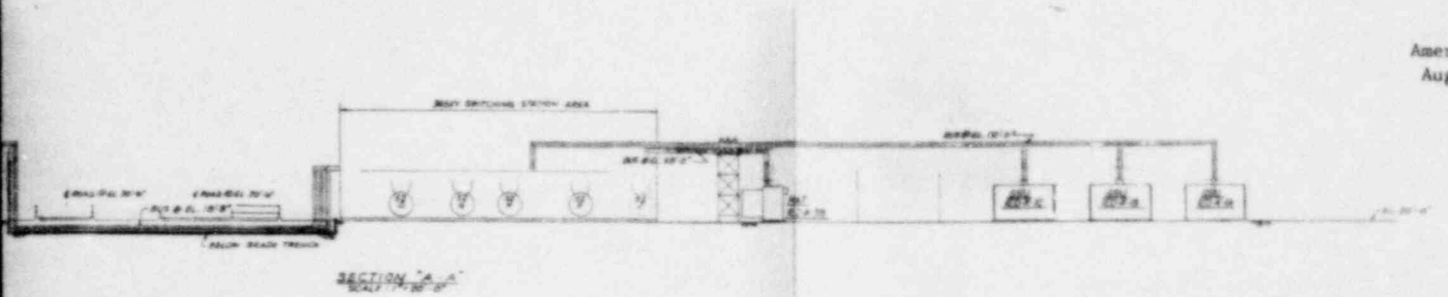
It is recognized that the AASHTO standard refers to average vehicle; in our specific situation, the vehicle in question could range from regular passenger car to a delivery oil truck or other large cargo truck. We believe though that the difference in speed (highway speeds versus plant speeds of five to 15 miles per hour) provides adequate margin since the kinetic energy available for impact at the Seabrook speed limits is far less than that present in the test performed by AASHTO (Reference (B) above)..

If the vehicle is not totally stopped by the impact on the guardrail, then the grating and the concrete walls separating the SF_6 bus work will further slow down the vehicle. As shown on Photographs D and E, the SF_6 bus work is located at the bottom of the concrete compartments, and there is at least a two-foot distance between the top of the tubular bus to the top of the concrete wall where the metal grating rests so that the vehicle cannot impact two circuits simultaneously.

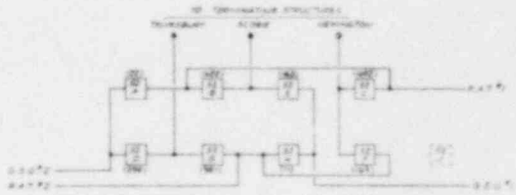
We would also like to point out that these bridges and SF_6 bus work have been in existence for at least four years, and there have been no accidents involving this equipment even considering the heavy traffic during construction of Unit I.

In conclusion, we believe that the above demonstrates that it is not credible to postulate that a vehicle could go through all these protective measures and still cause failure of two off-site circuits (i.e., damage the SF_6 bus work in two adjacent concrete compartments).

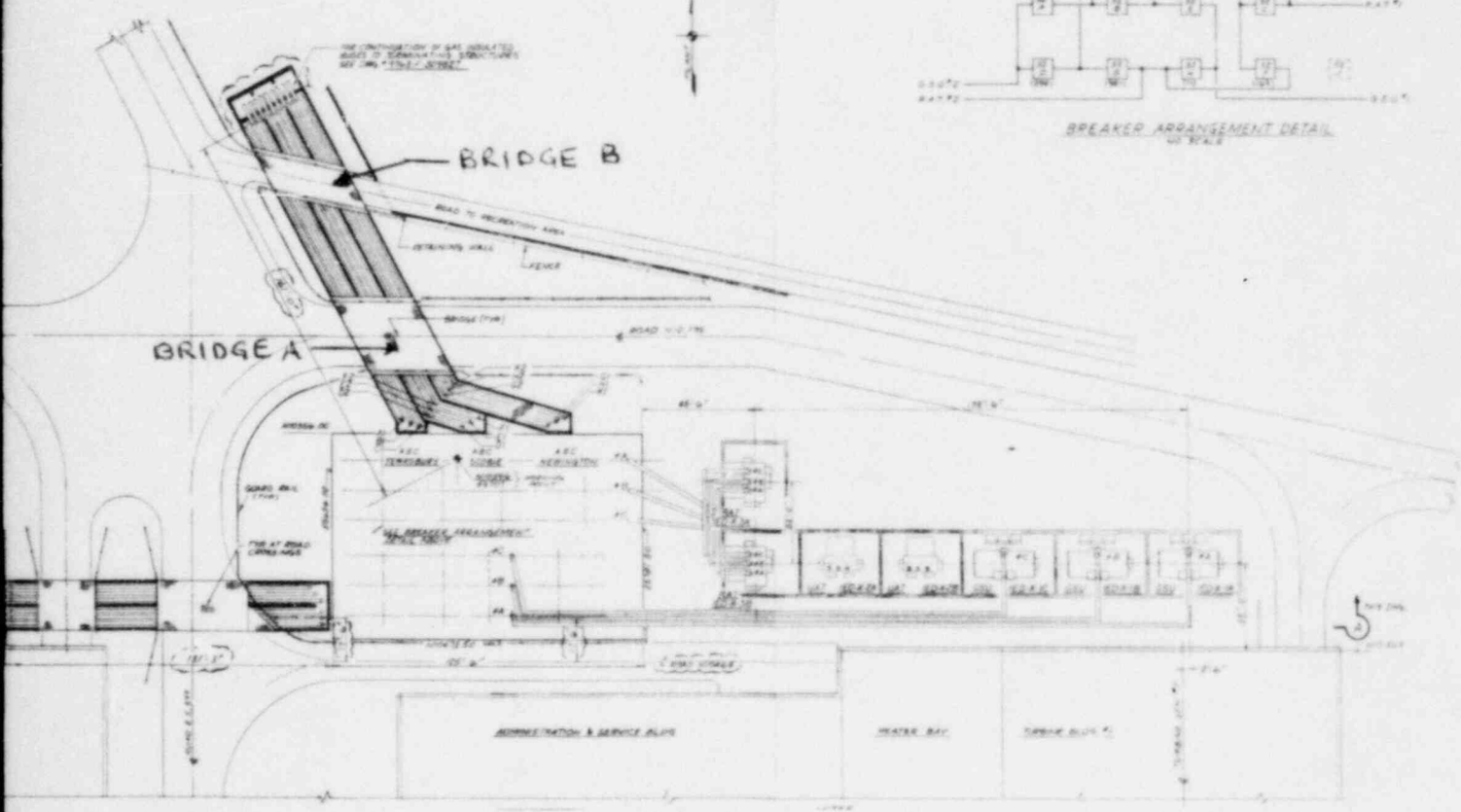
Amendment 50
August 1983



SECTION "A-A"

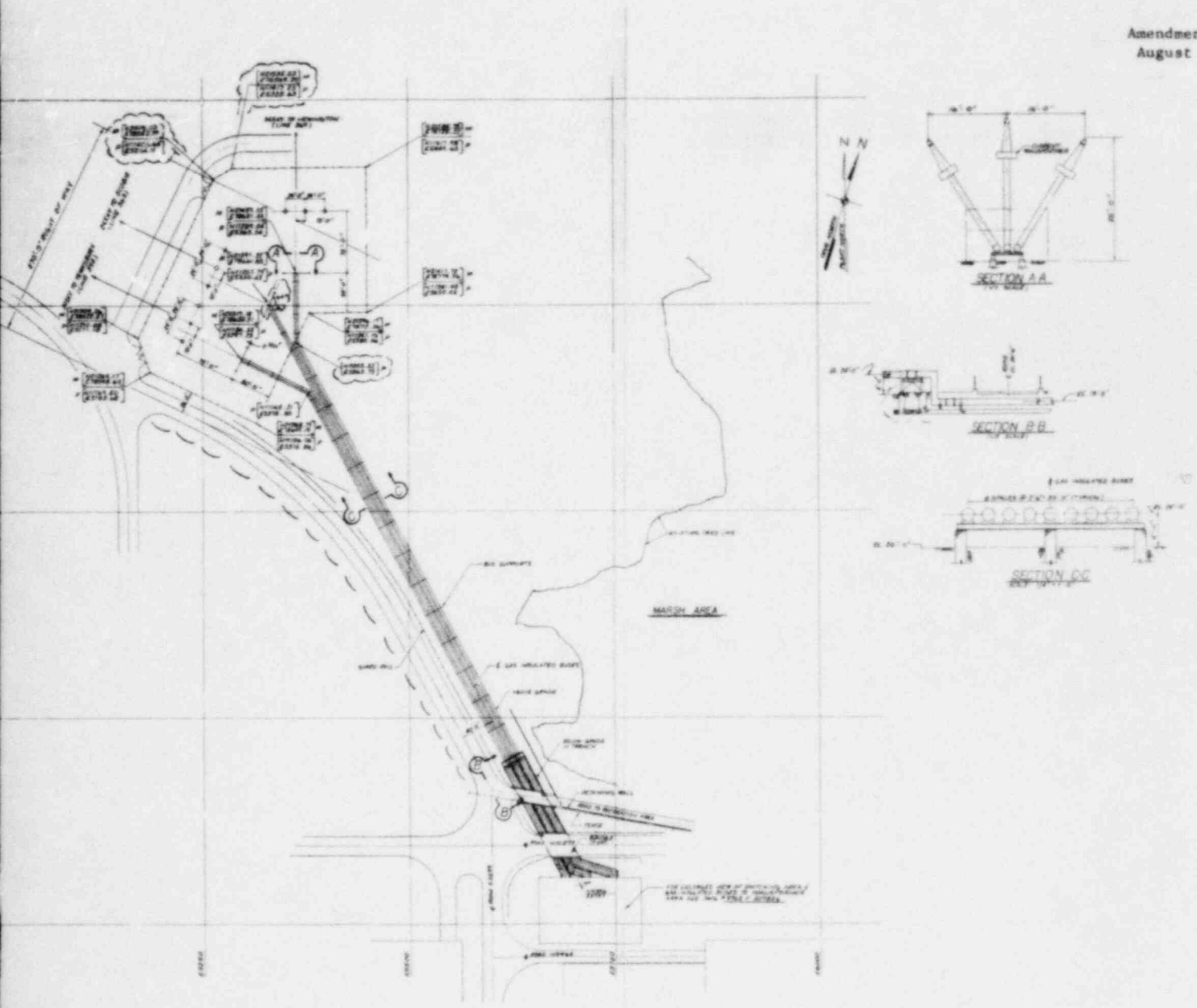


BREAKER ARRANGEMENT DETAIL



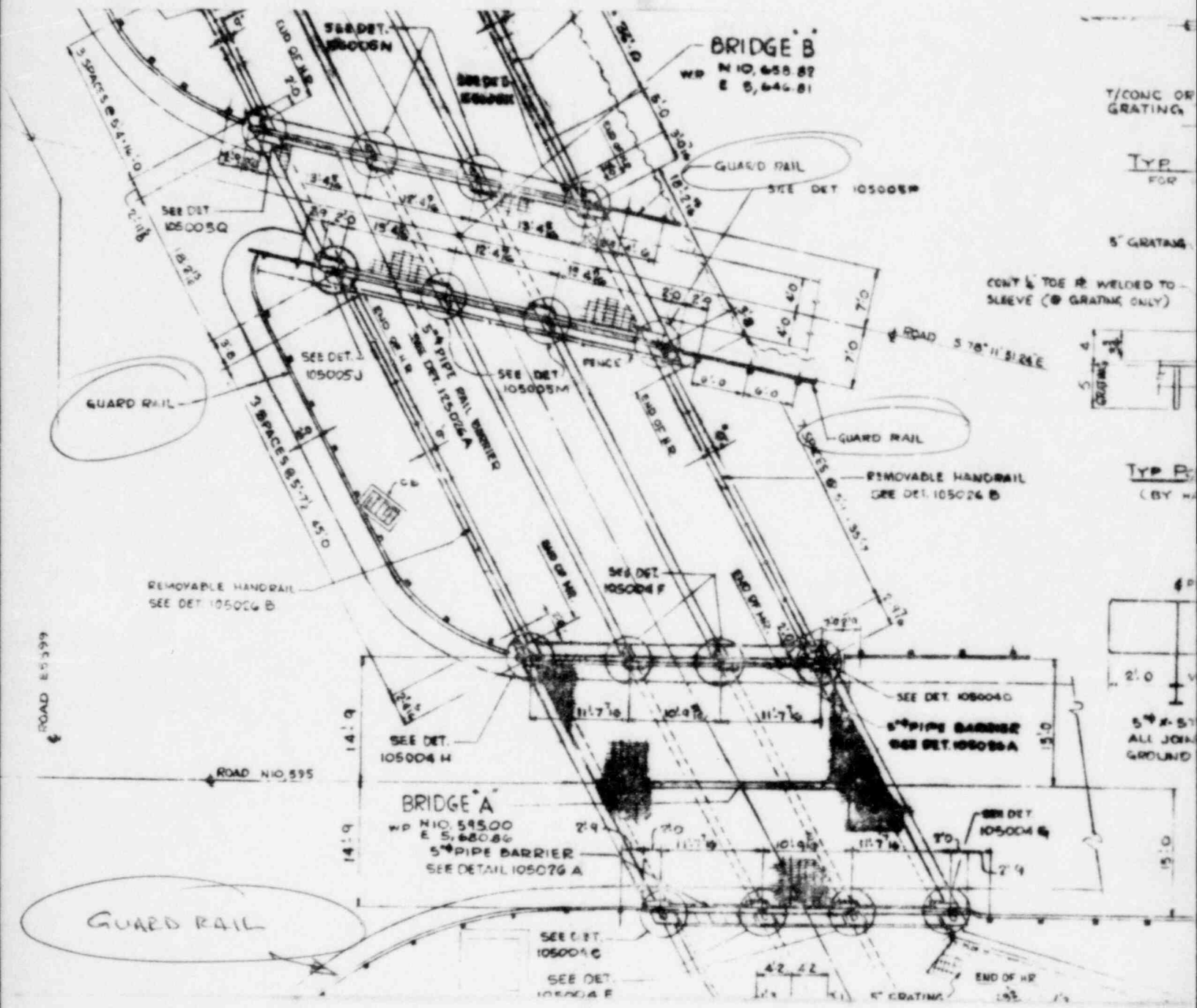
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION - UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT	345 KV SWITCHING STATION ARRANGEMENT AND INTERCONNECTIONS
	9763-F-309826 | FIGURE 8.2-7

Amendment 50
August 1983



PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION - UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT	345 KV BUS DUCT TO TERMINATING TOWERS ARRANGEMENT	
	9763-F-309827	FIGURE 8.2-8

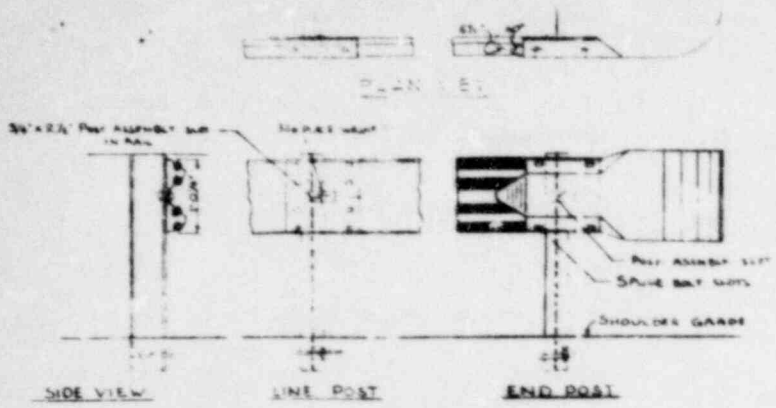
ATTACHMENT (A)



PORTION OF DRAWING # 9763-F-105026

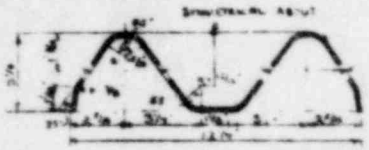
INFO ONLY

ATTACHMENT (B)



ELEVATIONS, POST AND BEAM GUARD RAIL

NOTE: SEE ADDITIONAL DETAILS TO THE LEFT AND ALSO BELOW



SECTION THRU RAIL ELEMENT

POSTS & BEAM SHOWN ABOVE ARE FOR PICTURE PURPOSES ONLY. FOR DETAILS SEE STANDARD SHEETS NO G & B, DEPT OF PUBLIC WORKS & HIGHWAYS "STATE OF NEW HAMPSHIRE STANDARD STRUCTURES"

GUARD RAIL GR-121 IS USED WITH GWB.5-A-36 POSTS.

WAS FP# 01272

SHEET REPRODUCED FROM PSNH DWG NO. R-700-3718
REV. 4 DATE 4-4-77

ENGINEER
STATE REG. NEW HAMPSHIRE NO. 5300

CIVIL
NORTH ACCESS ROAD
DETAILS

PUBLIC SERVICE CO. OF NEW HAMPSHIRE
SEABROOK STATION
ebasco services incorporated

UNITS 1+2 9763-F-103214

DISCIPLINE	CKD BY	DATE	DISCIPLINE	CKD BY	DATE
STRUCT			PIPE & CONTR		
MECH			ELECT		
CIVIL/ARCH			MECH PIPE		

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PORTION OF DRAWING # 9763-F-103214

INFO ONLY

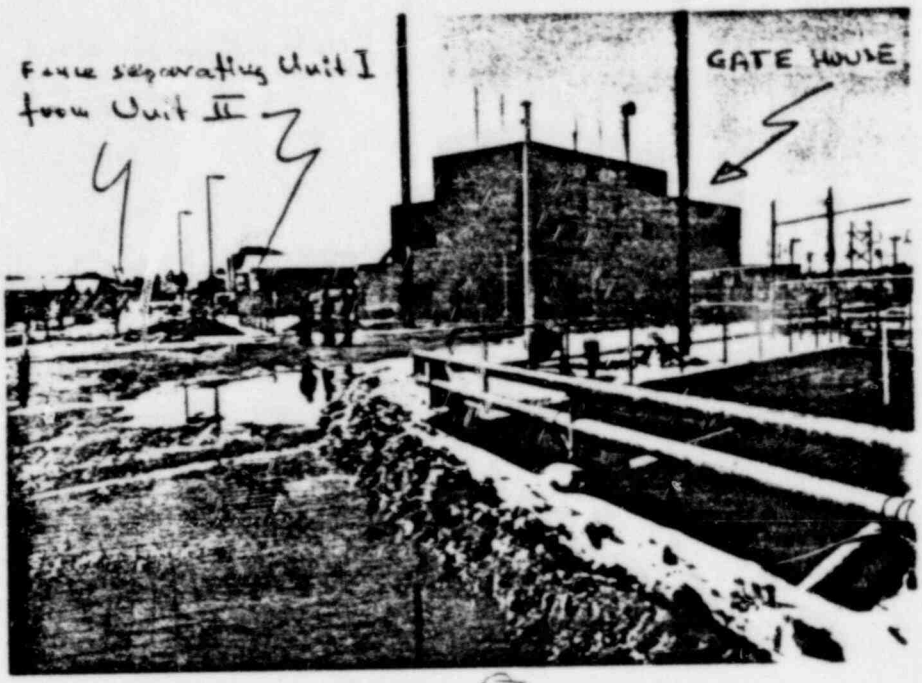

PHOTO (A)

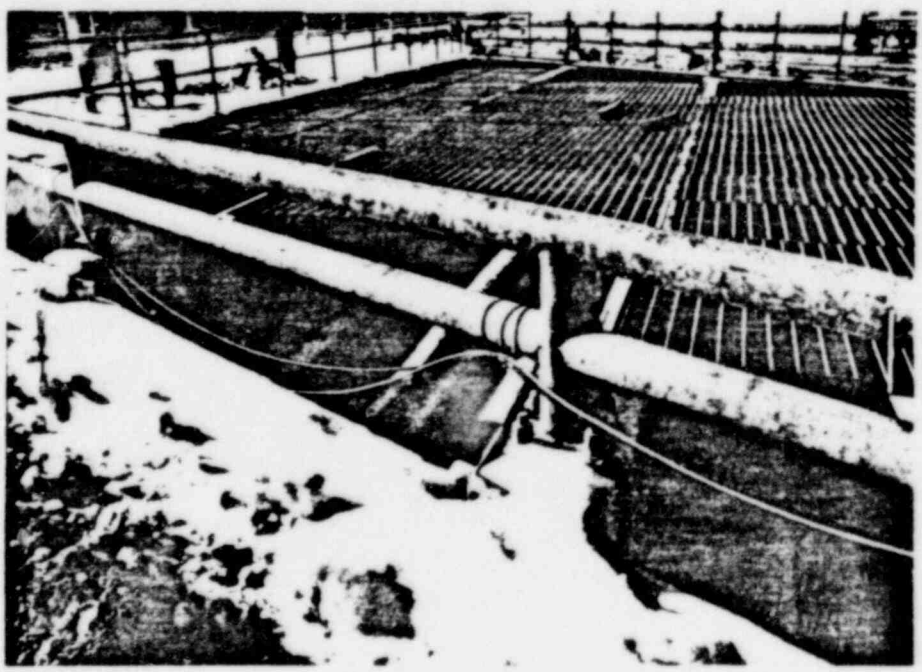

PHOTO (B)

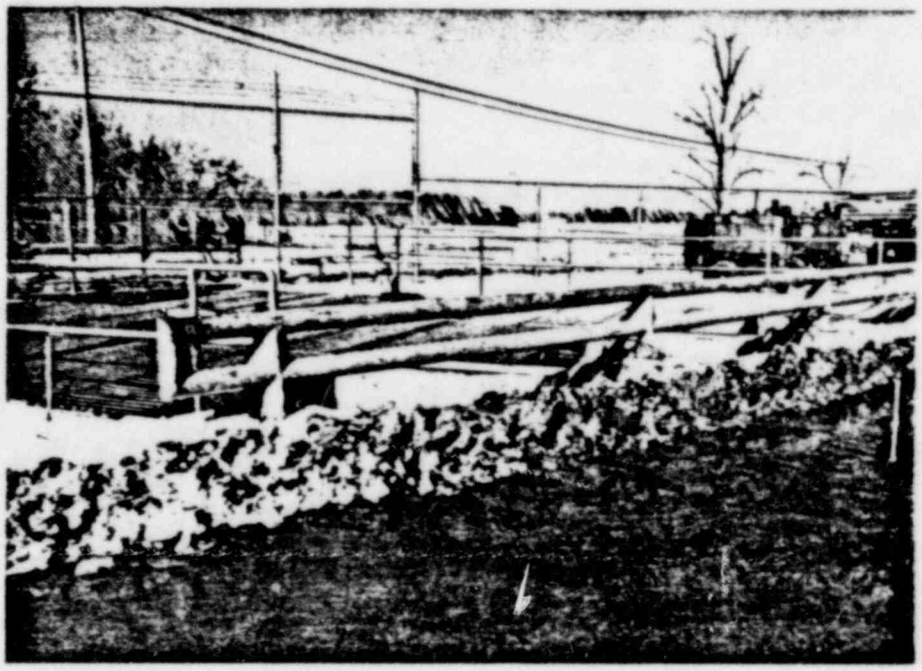

PHOTO (C)

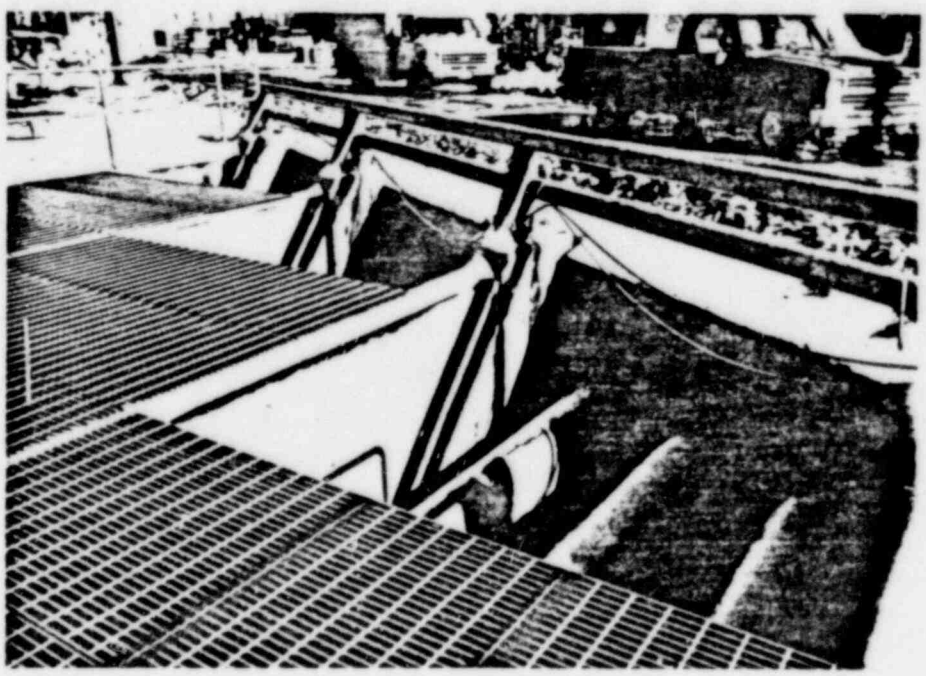

PHOTO (D)

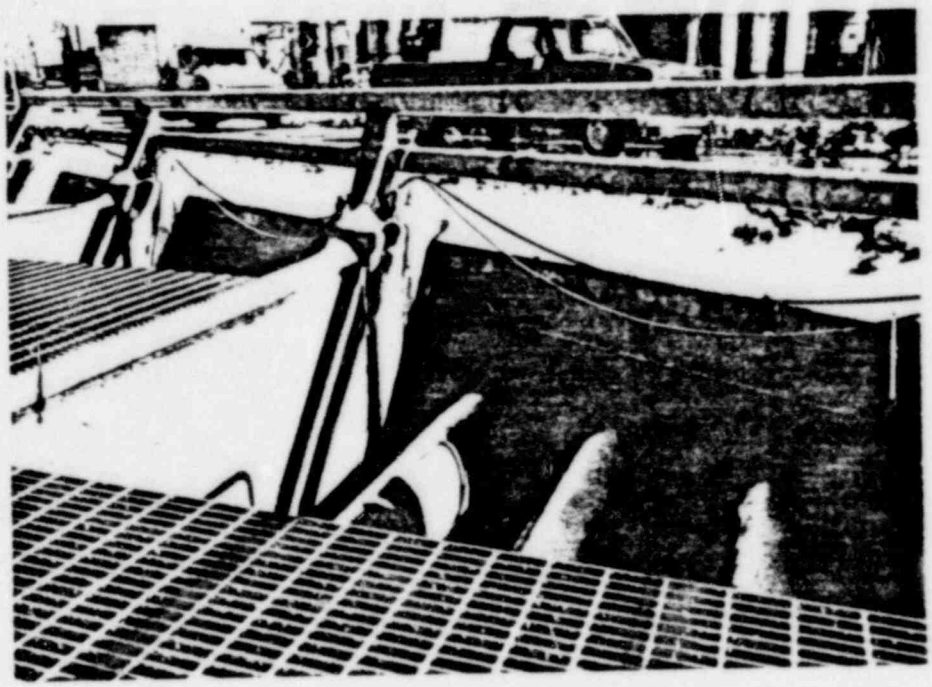

PHOTO (E)