50-220

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 7, 1996

LICENSEE: Niagara Mohawk Power Corporation

FACILITY: Nine Mile Point Nuclear Station Unit No. 1

SUBJECT: SUMMARY OF TELEPHONE CONVERSATION OF MAY 22, 1996, ON REACTOR AND TURBINE BUILDING BLOWOUT PANELS (TAC NO. M94858)

On May 22, 1996, the NRC staff discussed, via telephone, the design/licensing basis questions on the Nine Mile Point Nuclear Station Unit No. 1, Reactor and Turbine Building blowout panels that were enclosed with NRC Special Inspection Report No. 50-220/96; 50-410/96-05, dated March 29, 1996. This telephone call follows a previous call on May 2, 1996 (see Summary dated May 8, 1996). Participants for the NRC staff were Messrs. M. Hartzman, D. Jeng, and D. Hood. Participants for the licensee included Messrs. C. Terry, W. Yager, and several others.

To support the discussions, the licensee faxed the enclosed information to the NRC staff. The licensee's discussion included the following items:

1. Capacity of the Inter-panel J-joints to Transfer Membrane Stresses.

   The capacity of the J-joints between panels to transfer membrane stresses has been determined to be insignificant. This was determined by calculating the carrying capacity of a joint as part of a thin metal plate subjected to transverse pressure. On this basis, the licensee concluded that the representation of the blowout panels as one-way slabs was acceptable.

2. Bolt Calculations.

   The licensee stated that the bolt calculations were based on an elliptic shear-tension interaction equation for high-strength bolts, taken from a textbook on the subject of bolted connections by Fisher. The licensee finds this equation to be conservative for low-strength bolts.

3. Blowout Panel Calculations.

   The licensee's blowout calculations have been revised, and the blowout pressures are now estimated as 65 psf for the Reactor Building, and 62 psf for the Turbine Building. (These values were previously 45 psf). The licensee also calculated the failure pressures of the superstructures in both buildings, and found them to be 145 psf and 135 psf,

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respectively. The licensee stated that the current licensing basis value of 80 psf was merely an estimate known to be conservative (i.e., low) without the need for detailed analytical modeling.

4. Protection of the Condensate Storage Tank.

In response to a question asked at the April 12, 1996, conference with the NRC staff, the licensee has calculated the consequences of a blowout panel segment impacting the roof of the building housing the condensate storage tank after an accident. The licensee finds that, in a worst-case scenario, the roof could be penetrated, but the roof would not collapse, and the tank would not be damaged.

5. As-built Data

Based upon a detailed walk-down, the licensee has found some minor differences between the design and as-built dimensions of the angle structural members to which the panels are attached. The licensee also finds that there is no connection at the top of the panels in the Turbine Building.

The licensee concluded that its calculations show ample margin to failure of the superstructure. The licensee will submit written responses to the NRC questions of March 29, 1996, on or about June 5, 1996. The licensee noted that some of the associated calculations may be included in the responses, but all calculations are available at the plant site for NRC staff audit.

Sincerely,
ORIGINAL SIGNED BY:

Darl S. Hood, Senior Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-220
and 50-410

Enclosure: As stated

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Darl S. Hood

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NRC/NM CONFERENCE CALL, MAY 22, 1996

NINE MILE POINT UNIT 1, RB/TB BLOW-OUT PANELS OPEN ISSUES RESULTING FROM NRC/NMPC TELECON DATED MAY 2, 1996

1. PROVIDE JUSTIFICATION THAT THE J-JOINT BETWEEN TWO 2' WIDE PANELS HAS NO OR INSIGNIFICANT CAPACITY TO TRANSFER MEMBRANE FORCES AND THAT THE PANELS SPAN ONE WAY ONLY.

2. DISCUSS THE USE OF AN ELLIPTICAL SHEAR/TENSION INTERACTION EQUATION FOR THE BOLT FAILURE FOR BLOWOUT PANELS.

3. HOW THE RESULTS OF BOLT TESTING WERE APPLIED FOR COMPUTING THE BLOWOUT LOADS FOR PANELS (UPPER BOUND/LOWER BOUND NUMBERS). DISCUSS ANY NEED FOR DOING ADDITIONAL TESTS TO DETERMINE SHEAR STRENGTH OF BOLTS.

4. TRACEABLE CALCULATIONS FOR ALL THE ABOVE ISSUES FOR REVIEW BY THE NRC.

5. NRC REQUESTED NM SUPPLEMENT THEIR ENGINEERING JUDGEMENT WITH A CALCULATION TO PROVE THAT CST (CONDENSATE STORAGE TANK) ROOF WILL NOT COLLAPSE IF THE BLOWOUT PANELS FALL ON IT AND THAT THE CST's WILL REMAIN OPERABLE.

6. NRC REQUESTED NM CONSIDER PERFORMING A RIGOROUS FINITE-ELEMENT MODEL ANALYSIS TO COMPUTE FORCES ON PANELS.

ENCLOSURE

(C#26) 5/22/96

AS-BUILT DATA

RESULTS OF A DETAILED WALKDOWN PERFORMED TO VERIFY THE COMPLETE CONFIGURATION OF THE BLOWOUT PANEL CONNECTION DETAILS

1. AS SHOWN ON THE DRAWING, L3x3x1/4 TO WHICH THE FKX PANELS ARE ATTACHED BY 3/8 DIA. BOLTS IS ACTUALLY L3x2x1/4 FOR BOTH REACTOR AND TURBINE BUILDINGS. THE 3" LEG ATTACHES TO THE FKX PANELS.

2. AS SHOWN ON THE DRAWING, L3-1/2x2-1/2x1/4 THAT IS WELDED TO THE COLUMNS IS ACTUALLY L2-1/2x2x1/4 FOR REACTOR BUILDING AND L3x2x1/4 FOR TURBINE BUILDING.

3. AS SHOWN ON THE DRAWING, L3x2x1/4 TO WHICH THE FKX PANELS ARE ATTACHED ARE NOT IN 12' LENGTHS BUT ACTUALLY ARE 20', 20', AND 4' LONG FOR SECTIONS IN THE REACTOR BUILDING AND ONE 20' LENGTH FOR SECTIONS IN THE TURBINE BUILDING. THE ANGLES ARE ONLY BUTTED TOGETHER, NOT CONNECTED.

4. THERE IS NO CONNECTION ON THE TOP OF THE PANELS IN TURBINE BUILDING PANELS.

PRELIMINARY

COMPARISON OF RESULTS BETWEEN WHAT WAS REPORTED DURING ENFORCEMENT CONFERENCE ON APRIL 12, 1996 AND THE CURRENT REFINED ANALYSIS (5-22-96)

A. 1/4" bolts @ 12" o.c (Pre-existing condition)

	Failure Load of Panels as reported on 4-12-96	Failure Load of Super-structure as reported on 4-12-96	Failure Load of Panels as per current refined analysis	Failure Load of Super-structure as per current refined analysis
Reactor Building	94 psf (based on a linear shear/ tension eq.)	110 psf	128 psf * (based on an elliptical shear/ten. equation)	145 psf
Turbine Building	92 psf (based on a linear shear/ tension eq.)	-	122 psf * (based on an elliptical shear/ten. equation)	135 psf **

* This failure load has been computed by using the maximum value of 1/4" dia. bolt ultimate failure strengths obtained from the tests for both the Reactor & Turbine Building bolts. (Maximum of 13 tests performed for bolts removed from TB & RB)

** Preliminary Information. Calculations have been prepared by NMPC. Checking and approval is in progress. Will also be independently verified by Sargent & Lundy Engineers.

PRELIMINARY

B. 1/4" bolts @ 24" o. c (Current configuration)

	Failure Load of Panels as reported on 4-12-96	Failure Load of Super-structure as reported on 4-12-96	Failure Load of Panels based on current refined analysis	Failure load of Super-structure based on current refined analysis
Reactor Building	45 psf (based on a linear shear/ ten. eq.)	110 psf	65 psf * (based on an elliptical shear/ten. equation)	145 psf **
Turbine Building	45 psf (based on a linear shear/ ten. eq.)	Not available	62 psf * (based on an elliptical shear/ten. equation)	135 psf

* See previous page for explanation

** See previous page for explanation

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