



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555
JAN 31 1986

Docket No.: 50-410

MEMORANDUM FOR: R. M. Bernero, Director
Division of BWR Licensing

THRU: G. C. Lainas, Assistant Director
for BWR
Division of BWR Licenisng *JA*

FROM: B. D. Liaw, Chief
Engineering Branch
Division of BWR Licensing

SUBJECT: DOWNCOMER DESIGN FOR NINE MILE POINT
NUCLEAR STATION, UNIT 2 (NMP-2)

REFERENCE: Letter from C. V. Mangan to E. Adensam,
dated 1/23/86, regarding above subject.

On January 24, 1986, the NRC staff met with its consultants to discuss the adequacy of NMP-2 downcomer design in the context of a reanalysis performed by the applicant, Niagara Mohawk Power Corporation, and transmitted by the letter referenced above. The list of attendees is attached. The discussion focused on the acceptability of the design of the downcomers for NMP-2 and on corrective actions that might be required if the current design is found unacceptable.

On the basis of a review of the applicant's reanalysis and assuming that;

- there are no significant errors in the new calculations; and
- the way that the applicant applies the 800-series chugging loads is acceptable,

the staff and the consultants (the Group) conclude that the unbraced downcomer design at NMP-2 is marginal. The Group also concludes that the NMP-2 design meets the licensing criteria for upset and emergency conditions; however, the applicant has not adequately demonstrated the design adequacy for the faulted condition. Specifically, the downcomer may lose geometrical stability before reaching the calculated stress levels for the faulted condition.

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In reaching these conclusions, the Group discussed technical areas where excessive design conservatisms may be reduced in order to justify the adequacy of the downcomer design; e.g.,

- higher structural damping;
- load combination methodology;
- use of certified material data (yield strengths) instead of Code-specified minimum; and
- load definitions.

Other than the use of certified material data, the applicant has already taken credit for the relaxed criteria that the NRC staff has accepted. The Group was informed that the downcomer pipes are rolled-and-welded, not seamless pipes. Actual material yield strengths would be higher for the latter. For welded pipes, some geometrical imperfections (out-of-roundness, non-uniformities in seam welds, etc.) and the residual stresses are present; therefore, it may not be appropriate to provide relief in this area unless one can quantify the effect of these imperfections and residual stresses to properly allow for the use of certified material data.

In spite of the conclusions stated above, the Group recommends that the staff proceed with granting an operational license on the condition that by the first refueling, the design adequacy with respect to the faulted condition be demonstrated, e.g., out-of-plant testing which simulates the downcomer installation for NMP-2, or hardware modifications to the downcomers be made during the first refueling outage. The bases for this recommendation are as follows:

- The material used for the NMP-2 recirculation piping system is 316 NG which is considered much less susceptible to intergranular stress corrosion cracking; therefore, the probability of having a major double-ended pipe break is rather small.
- The probability of the simultaneous occurrence of a LOCA and SSE is small for the life of the plant and is even smaller during the first fuel cycle. The existing design is adequate to meet either SSE or LOCA loads in combination with other normal loads, but not both.

JAN 31 1986

Therefore, the Group concludes that the operation of the plant to the first refueling outage poses no significant risk to the public health and safety.

Original signed by
B. D. Liaw

B. D. Liaw, Chief
Engineering Branch
Division of BWR Licensing

Attachment: As stated

- cc: H. R. Denton
- D. G. Eisenhut
- R. W. Houston
- G. C. Lainas
- E. Adensam
- M. Haughey
- R. LaGrange
- W. Hazelton
- R. Hermann
- E. Rodabaugh
- G. Wilkowski
- B. Saffell
- R. Mesloh
- M. Hartzman
- K. Wichman
- C. P. Tan
- Y. Li

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*SEE PREVIOUS SHEET FOR CONCURRENCE.

OFC	: BWEB	: BWEB	: BWEB	: BWAD	: BWDO	
NAME	: R. Li:jar	: R. LaGrange	: BDLiaw	: G. Lainas	: R. Bernero	
DATE	: 1/28/86	: 1/ /86	: 1/21/86	: 1/21/86	: 1/ /86	

ATTACHMENT

LIST OF ATTENDEES

MEETING ON DOWNCOMERS NMP-2

JANUARY 24, 1986

NRC Staff:

R. Bernero - Director, DBL (part-time)
G. Lainas - Assistant Director, DBL (part-time)
B. D. Liaw - Chief, EB, DBL
Y. C. Li - Mechanical Engineer, EB, DBL
C. P. Tan - Structural Engineer, EB, DBL
M. Hartzman - Sr. Mechanical Engineer, EB, DPL-B
K. Wichman - Sr. Materials Engineer, EB, DPL-B

Consultants:

E. C. Rodabaugh (E. C. Rodabaugh & Associates)
G. Wilkowski (BCL)
B. Saffell (BCL)
R. Mesloh (BCL)