NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/NINE MILE POINT, P.O. BOX 63, LYCOMING, NY 13093/TELEPHONE (315) 349-2882

B. Ralph Sylvia
Executive Vice President
Nuclear

August 23, 1994
NMP2L 1488

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

RE: Nine Mile Point Unit 2
Docket No. 50-410
NPF-69

Gentlemen:

Subject: ***Proposed License Amendment - Uprated Operation, Response to Request for Additional Information***

In a letter to the NRC dated July 22, 1993 (NMP2L 1397), Niagara Mohawk Power Corporation (NMPC) proposed a license amendment to allow Nine Mile Point Unit 2 (NMP2) to operate at an uprated power of 3467 megawatts thermal. During the course of the Staff's review of this proposed license amendment, the NRC has determined that additional information, as identified in its July 26, 1994 letter to NMPC, is required to complete its review of this matter. Attached to this letter are the Staff's questions and the requested additional information.

Niagara Mohawk has provided a copy of this response to the appropriate state representative.

Very truly yours,

BR Sylvia

B. R. Sylvia
Exec. Vice President - Nuclear

BRS/KWK/ksj
Attachment

xc: Regional Administrator, Region I
Mr. B. S. Norris, Senior Resident Inspector
Mr. M. L. Boyle, Acting Director, Project Directorate I-1, NRR
Mr. D. S. Brinkman, Senior Project Manager, NRR
Ms. Donna Ross
Division of Policy Analysis and Planning
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Albany, NY 12223
Records Management

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ATTACHMENT

Question 1 - Topical Report (NEDC-31994P, revision 1) prepared by General Electric states that "the time windows established for the human factors analysis are typically the order of several minutes to hours." Please clarify the meaning of the word "time window." It is not clear whether the term "time window" refers to the window of opportunity for an operator to take action or the estimated time for the operator to perform specific required action.

The term "time window" is defined as the amount of time between when an operator is provided a cue to take a specific action and the time at which the consequence of failing to perform the action in unavoidable. As such, equating "time window" with "window of opportunity", above, is correct.

Question 2 - Please explain the method used to determine the length of the time windows, e.g., by operator walk throughs or through accident sequence analyses.

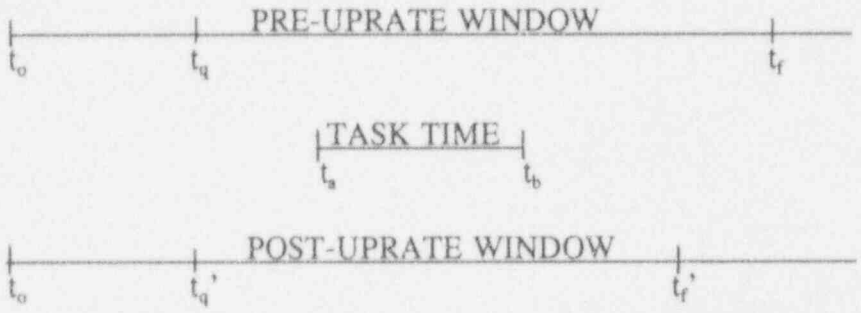
The method used to develop the "time windows" is accident sequence analysis. More specifically, accident sequences are developed to describe the progression of a severe accident including the operator and component failures that can occur as a sequence progresses. The calculation of event timing is based on calculations which simulate the response of the core, vessel, and containment.

Question 3 - Please discuss whether the power uprate will change the type, scope, or time requirements of operator actions needed for accident mitigation, including the type and scope of plant procedure changes, and any anticipated changes in the scope or nature of operator response.

Timing of events has a direct influence on the probability of successful operator actions. The impact of timing is developed by considering time windows, as above. The time for specific actions to be taken within the time window, i.e. the task time, is developed using walk throughs of procedures to direct the specific task. Generally, the greater the ratio of the time window to the task time, the greater the success probability. This occurs since the operators have a longer time to appraise, respond and correct, as necessary. In this regard, the potential for power uprate to affect accident timing has been considered relative to operator reliability.

The timeline below depicts the IPE treatment of time windows:

IPE Human Factors Modeling Timeline



In the above, t_o represents the start of the event, t_q represents the time of the cue to the operator to take a specific action, and t_f is the latest time at which the action can be successful. Similarly, the time from t_a to t_b , the task time, represent the time necessary for the operator to take the specific action. The timeline for t_a to t_b must be accomplished sometime within the period t_q to t_f, the time window. The power uprate has the potential to affect the actual times for specific accident mitigation task time windows. However, severe accident time windows are on the order of several minutes to many hours in duration and uprate related changes to event timings will be on the order of seconds to tens of seconds. In this regard, time window changes on the order of a few seconds, more or less, will have an inconsequential effect on the probability of operator success. As such, t_q' may actually occur a short time before t_q and likewise for t_f. However, in both cases the task time, i.e. the time from t_a to t_b is the same and comfortably fits either time window. For example, the task time for aligning suppression pool cooling is approximately 10 minutes and is primarily a function of the time it takes to start and stop pumps and change valve positions. In both pre and post power uprate configurations much more than 10 minutes, (i.e., approximately 15 hours in the NMP2 IPE), is available for the action to be successful.

As such, the power uprate will not significantly change the operator reliability values or overall plant safety measures as calculated by the IPE. In addition, the new uprate plant conditions will not create any new operator tasks or affect the scope of existing tasks. Minor changes to plant operating conditions will not affect the nature of plant response or create new criteria upon which to measure system or operator response. As such, uprate changes will be limited to minor changes (i.e. on the order of seconds) in severe accident timing. Where appropriate the threshold cues for operator action in the emergency operating procedures are being adjusted for uprated conditions, but in all cases the changes are small and no task scope change is involved.

In summary, the uprate will create minor changes to the timing of overall severe accident mitigation. In this regard, no changes to the type or scope of related procedures are required. In addition, no changes to the scope or nature of operator response are necessary.