SAFETY EVALUATION BY THE UNITED STATES NUCLEAR REGULATORY COMMISSION FOR THE DONALD C. COOK NUCLEAR PLANT UNITS 1 AND 2

On October 25, 1984, the NRC was informed by the Indiana and Michigan Electric Power Company (IMEC) that they reduced power at both D. C. Cook Units 1 and 2. The power reduction was initiated by IMEC after uncovering an error in determining which motor driven auxiliary-feedwater (AFW) pump was assumed as the limiting single failure. Each of the two motor driven AFW pumps feed two steam generators. The FSAR analysis assumed the limiting single failure for the feedwater line break event to be the motor driven AFW pump which fed both one intact and the broken steam generators. This resulted in an AFW delivery rate of 460 gpm to the intact steam generators. However, when assuming the limiting single failure to be the AFW pump which feeds the intact steam generators, the AFW delivery rate is reduced to 375 gpm.

On October 30, 1984, IMEC submitted a reanalysis of the feedwater line break event for D. C. Cook Unit 2. This analysis was performed by Westinghouse Electric Corporation using the NRC approved LOFTRAN computer code. The methodology for analyzing feedwater line breaks was similar to that documented in WCAP-9230. WCAP-9230 is undergoing staff review. Our review to date provides us with reasonable assurance that upon completion of the review, the results submitted in support of the D. C. Cook reanalysis will remain acceptable. Should our review indicate that changes to the methodology applied to the feedwater line break event are necessary, the licensee will be required to reanalyze the event.

The analysis submitted in support of continued plant operation at rated power for D. C. Cook Unit 2 showed that for a postulated feedwater line break event, with an assumed AFW delivery rate of 375 gpm, the peak primary system pressure remained below 110% of design, in conformance with the SRP criteria, and that the minimum DNBR did not decrease below the specified acceptable fuel design limit (SAFDL). As a result, we find this analysis acceptable.

IMEC provided qualitative arguments of the acceptability of a lower AFW delivery for D. C. Cook Unit 1. These included operator actions to isolate the AFW flow to the faulted steam generator ten minutes into the event. This action would result in a delivery of 460 gpm of AFW to the intact steam generator. In addition, should two steam generators activate the low-low water level trip signal, the turbine driven feedwater pump would be initiated. However, since the main steam isolation valves require manual operator action to isolate the steam lines, delivery of AFW from the turbine driven AFW pump would not occur until the operator isolates those valves. With credit for operator action at ten minutes into the event (the design basis assumption for Unit 1), additional AFW would be delivered to the intact steam generators.

The licensing basis for D. C. Cook Unit 1 does not include an analysis of the feedwater line break event. However, the licensee reviewed the safety implications of a reduced AFW delivery for this plant and concluded that the SRP acceptance criteria for a postulated feedwater line break would be met if crediting operator action ten minutes into the event. Since the AFW is injected into the steam generator at a high elevation and the intact generators

are relieving steam throught the broken line (prior to main steam line isolation), a feedwater line break would resemble a small steam line break event. As a consequence, overpressurization of the primary system should not occur. In addition, the steam line break analysis would bound the challenge to the SAFDL.

Finally, the licensee has committed to calculate the consequences of a feedwater line break event for Unit 1 and submit the analysis in the near future. Therefore, we find the analysis acceptable.

SALP INPUT

Plant: D.C. Cook, Unit 1 and Unit 2 (Operating Reactor)

Functional Area: Licensing Activities

1. Management Involvement and Control In Assuring Quality

   Management was continuously aware of progress during the review as evident by their participation in the review process.

   Rating: Category 1

2. Approach to Resolution of Technical Issues from Safety Standpoint

   The licensee initiated plant derate when errors in their design basis calculations were uncovered. Where issues arose, immediate responses were provided to the staff's concerns. In addition, the licensee committed to assess an event which was beyond the design basis for D.C. Cook Unit 1.

   Rating: Category 1

3. Responsive to NRC Initiatives

   The licensee promptly resolved issues raised during the technical reviews.

   Rating: Category 1

4. Reporting and Analysis of Reportable Events

   Upon uncovering an error within their design basis assumption for feedwater line break events, the licensee reported the error to the NRC and derated its plants. Appropriate actions were then undertaken to assess the consequences of the error.

   Rating: Category 1

5. Overall Rating for Licensing Activity Functional Area: Category 1