ENTERGY

Entergy Operations, Inc.
P.O. Box 31
Killona, LA 70066
Tel 504 739-6374

R. F. Burski
Director
Nuclear Safety
Waterford 3

W3F191-0676
A1.05
QA

December 11, 1991

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
Comments on Preliminary "Accident Sequence Precursor Program Cold Shutdown Analysis" for Waterford 3

Gentlemen:

In response to the November 29, 1991 letter from David L. Wigginton to Ross P. Barkhurst, the Attachment provides our comments on the subject preliminary report, which addresses the July 14, 1986 loss of shutdown cooling event that occurred at Waterford 3.

We wish to express our appreciation for the opportunity given to provide our comments on this preliminary report. Should you have any questions on our comments or need additional information, please contact Roy Prados at (504) 739-6632.

Very truly yours,

R. F. Burski

RFB/RWP/ssf
Attachment
cc: R.D. Martin, NRC Region IV
D.L. Wigginton, NRC-NRR
N.S. Reynolds
R.B. McGehee
NRC Resident Inspectors Office

A001
1/1

Comments On Preliminary "Accident Sequence Precursor Program Cold Shutdown Event Analysis" For Waterford 3

1. Page A-232, Event Description, Par. 1 - The elevation of the centerline of the hot legs is 13' 4 1/2", not 107'.

2. Page A-232, Event Description, Par. 1 and elsewhere as applicable - Refueling water storage tank (RWST) should be refueling water storage pool (RWSP).

3. Page A-235, Par. 3 - The charging pumps are characterized as providing unborated water injection. Although the charging pumps can inject unborated water, they are normally aligned to take suction from a borated source of water.

4. Page A-235, Item b - The assumption was made that only one LPSI pump was available since the other LPSI pump cavitated while taking suction from the RCS hot leg. However, it is highly likely that this LPSI pump could also have been recovered by switching suction to the RWSP. In addition the charging pumps could inject borated water which would as a minimum delay the time for core uncovery (if not prevent core uncovery).

5. Page A-235, Analysis Approach - The analysis does not credit continued makeup for core cooling success because the RCS was closed. However, with no decay heat removal, RCS pressure would increase due to boiling in the core until the low temperature overpressure protection (LTOP) relief valves would open at approximately 430 psia. Operators would respond to this loss of inventory according to their procedures by injecting with the HPSI pump. Thus, a once through cooling path would be established with feed by HPSI injection and bleed by the LTOP relief valves. The LTOP relief valves discharge to the containment sump which would allow recirculation using the HPSI pump if the refueling water storage pool empties. Although flow might be intermittent as cool water injected to the core would stop the boiling and would reduce RCS pressure causing the relief valve to reseat, adequate core cooling would be provided. Thus, an additional system failure would be necessary, given failure of RHR recovery and steam generator heat removal, to reach core damage. This could reduce the conditional core damage probability by at least an order of magnitude or two.

6. Page A-236, Item c - The failure probability given to RHR recovery does not seem to reflect the considerable amount of time available to recover RHR before core damage would occur. Filling the RCS to a higher level than mid-loop using the HPSI or LPSI pumps would considerably delay core uncovery by increasing liquid heat capacity and aid recovery efforts by compressing the vapor bubble in the LPSI pump suction line. These potential actions do not appear to have been considered.

7. Page A-236, Item d - In addition to the Emergency Feedwater pumps, Waterford 3 has a motor driven Auxiliary Feedwater pump that is also capable of providing water to the steam generators for makeup. It is not clear if this alternate and diverse makeup path is considered in the failure probability for steam generator cooling.

8. Page A-238 - The centerline elevation of the loop seal in the shutdown cooling suction piping is 23', not 22'. The bottom of the RWSP is at elevation -4'.

9. Page A-236, Analysis Results - The first sentence should read "The estimated conditional core damage probability associated with the loss of RCS level and RHR cooling for the July 14, 1986, Waterford 3 event is (new number as a result of comments)."