

Attachment BFuel Grid Impact Loads for Salem Unit No. 2

The information presented below supplements the contents of Section 3.5 of Reference (a) and provides revised maximum fuel grid impact loads from seismic and blowdown forces. A summary of the fuel grid impact loads is provided in Table A-1. The rationale employed in developing the revised impact loads is as follows:

1. The 95 x 95 grid crush strength test value at operating temperature has increased from []^c pounds, which was used in Reference (a) to []^c pounds. This improved grid strength is justified by the results of additional grid impact tests.
2. The previously reported loss-of-coolant grid impact load of []^c pounds was for a double ended break opening area at the pump outlet nozzle. This break location is no longer considered in the evaluation for grid impact loads; the rigidity of the primary equipment supports limits the actual break opening area to a very low value and the resulting grid impact loads are low in magnitude. This conclusion was drawn from calculations for break opening area using the transient broken pipe end displacements with applied blowdown forces for a double ended pump outlet nozzle rupture. The calculations were performed for many Westinghouse plants. In no case did the maximum area exceed 40 square inches. Parametric studies for fuel grid impact loads revealed that using a reduced break opening area for the pump outlet nozzle produced low grid impact loads. Therefore, the pump outlet nozzle break location can be eliminated from consideration and the vessel inlet nozzle break location becomes the limiting break location for grid impact loads. The peak grid impact load for the vessel inlet nozzle break was []^c pounds.

7901230264

3. As shown in Figure 3-4 of Reference (a), the actual transient break opening area for a vessel inlet nozzle break has an average value of 55 square inches. The break opening area used to calculate the applied blowdown loads was 100 square inches. Parametric studies on grid impact loads for a break at the vessel inlet nozzle have shown that the grid impact loads would be reduced 30% by the effect of this reduced break area. Therefore, the grid impact loads for the worst case break location are approximately 70% of []^c pounds or []^c pounds.

4. The seismic grid impact load varies with the elevation of the grid. The peak inlet nozzle break impact loads occur at the grid which has a peak seismic impact load of []^c pounds. The pump outlet break grid impact peak load occurs at the grid which has a seismic peak load of []^c pounds.

TABLE A-1

Summary of Revised Fuel Grid Impact Loads

Impact Loads

Comments

A vertical rectangular box with a small 'C' at the top right corner and a horizontal line near the bottom.

95 x 95 Limit Used in Report

95 x 95 Limit Including Recent Test Results

Impact Loads for Double Ended Pump Outlet
Nozzle

Impact Loads for Reduced Area Pump Outlet
Nozzle Breaks are Small

100 in² RPV Inlet Nozzle Grid Load

55 in² RPV Inlet Nozzle Grid Load

Seismic Impact Peak Load at Grid for Which
Pump Outlet Nozzle Break Peak Load Occurs

Seismic Impact Peak Load at Grid for Which RPV
Inlet Nozzle Break Peak Load Occurs.