Table 3.6-1

DEFINITION OF FUEL DESIGN LIMITS

Maximum Linear Heat Generation Rate (MLHGR) The MLHGR is the maximum linear heat generation rate expressed in kW/ft for the fuel rod with the highest surface heat flux at a given nodal plane in the bundle. The MLHGR operating limit is bundle type dependent. The MLHGR is monitored to assure that all mechanical design requirements will be met.
Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) The MAPLHGR is the maximum average linear heat generation rate (expressed in kW/ft) in any plane of a fuel bundle allowed by the plant Technical Specifications for that fuel type. This parameter is obtained by averaging the linear heat generation rate over each fuel rod in the plane, and its limiting value is selected such that: (a) The peak clad temperature during the design basis loss-of-coolant accident will not exceed 2200°F in the plane of interest, and (b) All fuel design limits specified in Subsection 3.2, “Fuel Mechanical Design,” will be met if the MLHGR is not monitored for that purpose.
Minimum Critical Power Ratio (MCPR) The critical power ratio is defined as the ratio of the critical power (bundle power at which some point within the assembly experiences onset of boiling transition) to the operating bundle power. The critical power is determined at the same mass flux, inlet temperature, and pressure which exists at the specified reactor condition. Thermal margin is stated in terms of the minimum value of the critical power ratio, MCPR, which corresponds to the most limiting fuel assembly in the core.
Operating Limit MCPR The MCPR operating limit is the minimum CPR allowed by the plant Technical Specifications for a given bundle type. The minimum CPR is a function of several parameters, the most important of which are bundle power, bundle flow, and bundle R-factor. The R-factor is dependent upon the local power distribution and details of the bundle mechanical design including channel bow considerations. The limiting value of CPR is selected for each bundle type such that, during the most limiting event of moderate frequency, the calculated CPR in that bundle is not less than the safety limit CPR. The MCPR operating limit is attained when the bundle power, R-factor*, flow, and other relevant parameters combine to yield the Technical Specification value. [*Note: The R-factor is used for GE reload analyses and monitoring. For FANP reload analysis and monitoring, a similar term, F-effective, is used in place of R-Factor to account for local power distribution and details of the bundle mechanical design. Channel bow considerations are accounted for in the analysis of the Safety Limit MCPR (Reference 16).]