



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

PRC

October 16, 1984

TO ALL PRESSURIZED WATER REACTOR LICENSEES AND APPLICANTS FOR AN
OPERATING LICENSE

Gentlemen:

SUBJECT: LONG TERM LOW POWER OPERATION IN PRESSURIZED WATER REACTORS
(Generic Letter 84-21)

In June 1983, the NRC staff received a Licensee Event Report from a Pressurized Water Reactor (PWR) licensee concerning extended operation at low power followed by a return to full power operation. The licensee had not contemplated this type of plant operation in performing their safety analysis for the cycle of operation in question. Based on the results of a subsequent reanalysis, the licensee concluded that load follow operations in conjunction with this type of plant operation and with a return to full power could result in core peaking factors being greater than those resulting from the original safety analysis. This unanticipated increase in the core peaking factors was caused by a burnup distribution produced by the extended low power operation which was different than the full power burnup distribution. Upon return to full power, this burnup distribution, now representative of the low power operation and interacting with the moderator temperature coefficient and the moderator density variation, would produce this unanticipated increase in the core peaking factor. Consequently, this type of plant operation could result in a potential unreviewed safety question and would be reportable under the provisions of 10 CFR Part 50.59.

The fuel supplier for this particular licensee has performed an evaluation of extended, low power operation followed by a return to full power. They have evaluated first and reload cycle cores as a function of time in cycle. They have also evaluated, parametrically, the effect of reduced power, time at reduced power, and a control rod bank insertion strategy and worth on the core total peaking factor and radial peaking factor. The outcome of this analysis is a set of procedures that the plant, using this fuel supplier's safety analysis, should follow when extended, low power operation occurs.

All other PWR fuel suppliers have provided responses to an NRC request for information on how extended, low power operation is treated in their safety analyses. Each of these fuel suppliers has provided an adequate response in terms of either directly including extended, low power operation in their safety analysis; using incore measurements; or providing plant operation instructions for a given fuel cycle.

Accordingly, PWR licensees and applicants for an operating license are reminded that core safety analyses involve a number of assumptions concerning plant operation throughout a given fuel cycle. If, for any reason, a plant is not operated as planned (e.g., extended, low power operation as described above), the licensee should review the cycle safety analysis to verify its applicability. If parts of the safety analysis are not applicable, these should be reanalyzed and the applicability of the Technical Specifications should be confirmed.

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Darrell G. Eisenhut, Director
Division of Licensing

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GL 84-22

THE GENERIC LETTER ASSIGNED THIS NUMBER WAS NEVER ISSUED

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