

**Domestic Utilities**

American Electric Power  
Carolina Power & Light  
Commonwealth Edison  
Consolidated Edison  
Duquesne Light  
Duke Power  
Georgia Power  
Florida Power & Light

Houston Lighting & Power  
New York Power Authority  
Northeast Utilities  
Northern States Power  
Pacific Gas & Electric  
Public Service Electric & Gas  
Rochester Gas & Electric  
South Carolina Electric & Gas

Southern Nuclear  
Tennessee Valley Authority  
TU Electric  
Union Electric  
Virginia Power  
Wisconsin Electric Power  
Wisconsin Public Service  
Wolf Creek Nuclear

**International Utilities**

Electrabel  
Kansai Electric Power  
Korea Electric Power  
Nuclear Electric plc  
Nuklearna Elektrana  
Spanish Utilities  
Taiwan Power  
Vattenfall

OG-97-006

WCAP-14748-P  
WCAP-14749-NP  
Project Number 694

January 31, 1997

To: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 2055-0001

Attention: Chief, Planning, Program and Management Support Branch

Subject: Westinghouse Owners Group  
Transmittal of Reports: WCAP-14748 (Proprietary), Revision 0, and WCAP-14749, Revision 0, (Non-Proprietary), "Justification of Increasing Postulated Break Opening Times in Westinghouse Pressurized Water Reactors"

This letter transmits twenty-three copies of the report WCAP-14748 (Proprietary), twelve copies of WCAP-14749 (Non-Proprietary), all entitled "Justification of Increasing Postulated Break Opening Times in Westinghouse Pressurized Water Reactors", dated October 1996.

Also attached are:

1. One (1) copy of the Application for Withholding Proprietary Information from Public Disclosure, CAW-97-1059 (Non-Proprietary).
2. One (1) copy of Affidavit CAW-97-1059 (Non-Proprietary).
3. One (1) copy of the Copyright Notice.
4. One (1) copy of the Proprietary Information Notice.

This report (WCAP-14748) provides the Westinghouse Owners Group (WOG) technical documentation and methodology for justifying increased break opening times. WCAP-14748 is being submitted for NRC review and approval.

The use of break-opening times (BOT) on the order of 10 mSecs and higher is common practice in the nuclear industry. The Combustion Engineering practice is described in CENPD-168: "Design Basis Pipe Breaks for the Combustion Engineering Two Loop Reactor Coolant System", July, 1975. Babcock & Wilcox practice is described in BAW-10127, "LOCA Pipe Break Criteria for the Design of Babcock & Wilcox Nuclear Steam Systems", December, 1976.

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The benefits of increased BOT are derived from: a) reduced loads associated with the larger break-opening time, and b) credit for increased RCCA insertability. In the overwhelming majority of cases, a BOT increase will yield lower LOCA loads on RCS components. The components and subsystems where significant load reduction benefits may be expected are as follows:

- a) Baffle-fuel assembly grid impact loads: The baffle pressure loads and the core barrel acceleration or system loads are both reduced by increased BOT. Lowering these loads can potentially result in increased fuel grid crush margins during the LOCA event.
- b) Subcompartment/containment pressurization analysis: An increase in BOT provides benefits in calculated mass and energy releases during a LOCA. Such benefits may be realized as 1) offsets to increased releases from TAVG reductions and 2) potentially greater allowable initial pressure and/or temperature in containment.
- c) Pipe whip/jet impingement/piping support loads: A BOT increase can reduce the severity of pipe whip and jet impingement loads on neighboring components. These reductions, in turn, lead to lower piping support loads and a potential for reduced damage due to pipe whip.
- d) Steam generator loads: The important LOCA loads in steam generators are the divider plate (weld) loads, and the asymmetric loads which act to laterally displace the curved portions of steam generator tubes. Divider plate loads are high enough that, in some cases, elastic-plastic analyses have been necessary to resolve them. Likewise, the asymmetric loads acting on the curved portions of SG tubes have, in some cases, been calculated to produce support plate deformation, tube deformation, and tube flow area reduction.

Benefits derived by taking credit for increased RCCA insertability due to reduced guide tube loads include:

- a) Reduction in required RCS boron concentration.
- b) Reduced impact of the burnable absorbers on the design, e.g., no need to raise enrichment to compensate for the presence of residual absorber.
- c) Increased core design flexibility by eliminating the need to increase RWST and/or accumulator boron concentration with fuel cycle length.
- d) Reduce the need to reanalyze the containment sump pH to accommodate the increase in RWST and accumulator boron concentration.

These benefits would provide utility personnel with more time to focus on truly safety-related issues or prepare for long-term issues such as outage planning.

As this report (WCAP-14748) contains information proprietary to Westinghouse Electric Corporation, it is being transmitted with affidavits signed by Westinghouse, the owner of the information. The affidavits set forth the basis on which the information be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.790 of the Commission's regulations. Accordingly, it is respectfully requested the information be withheld from public disclosure in accordance with 10CFR Section 2.790 of the Commission's regulations.

OG-97-006

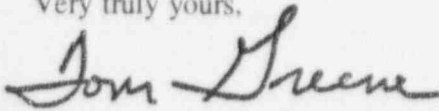
January 31, 1997

Correspondence with respect to the proprietary aspect of the Applications for Withholding or the supporting Westinghouse affidavits should reference CAW-97-1059 as appropriate and should be addressed to Mr. H. A. Sepp, Manager, Regulatory and Licensing Engineering, Westinghouse Electric Corporation, P.O. Box 355, Pittsburgh, PA 15230-0355.

Invoices associated with the review of this WCAP should be addressed to:

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Pittsburgh, PA 15230-0355.

Very truly yours,

A handwritten signature in cursive script, reading "Tom Greene".

Tom Greene, Chairman  
Westinghouse Owners Group

attachments/enclosures

OG-97-006

cc: Westinghouse Owners Group Steering Committee (1L)  
Westinghouse Owners Group Primary Representatives (1L)  
Westinghouse Owners Group Analysis Subcommittee Representatives (1L)  
A. P. Drake, ECE 5-16 (1L)  
M. DeWitt, ECE 5-36 (1L)  
Robert C. Jones, Jr, USNRC (1L)  
Claudia M. Craig, USNRC (1L)