

NORTHEAST UTILITIES



THE CONNECTICUT LIGHT AND POWER COMPANY
THE HARTFORD ELECTRIC LIGHT COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
NEW YORK WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

P.O. BOX 270
HARTFORD, CONNECTICUT 06101
(203) 666-0011

October 1, 1980

Docket No. 50-245
B10096

Director of Nuclear Reactor Regulation
Attn: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Reference: W. G. Council letter to D. M. Crutchfield dated September 4, 1980.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 1
Additional Information in Support of Full Core Off-Load

The referenced letter proposed Technical Specification changes to facilitate off-loading and reloading of all fuel bundles without the presence of neutron sources in the core. Upon request from members of your Staff, specific calculations were performed for Millstone Unit No. 1 to demonstrate that for a loading of eight bundles of the maximum reactivity being utilized, it is not possible to form a critical array, even with control rods fully withdrawn.

A summary of this analysis, performed by General Electric Company, is attached. This demonstrates that for the most reactive conditions possible, the eight bundle (two-cell) array is approximately 5% $\Delta k/k$ subcritical.

If you have any further questions, please contact us.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

W. G. Council

W. G. Council
Senior Vice President

By:

W. F. Fee

W. F. Fee
Executive Vice President

Attachment

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GENERAL ELECTRIC

NUCLEAR FUEL
AND SERVICES
DIVISION

GENERAL ELECTRIC COMPANY, 175 CURTISS AVE., SAN JOSE, CALIFORNIA 95125

September 29, 1980
ADW:60-121

CC: J. L. Bush
K. T. Schaefer

Mr. W. C. Mihal
NORTHEAST UTILITIES SERVICE CO.
P. O. Box 270
Hartford, CT 06101

SUBJECT: MAXIMUM $K_{\text{effective}}$ of Any Eight Bundles in a 2X4 ARRAY in Millstone 1

Dear Bill:

K. T. Schaefer, of Palco Design and Management, has calculated that the $K_{\text{effective}}$ of any 2X4 array of uncontrolled fuel bundles in Millstone 1, Cycle 8 is ≤ 0.946 . This $K_{\text{effective}}$ is applicable to any core loadings that include 8D8B265-6Gd3.0, 8D8B265-6Gd2.0, 8D8B282-7Gd3.0, or less reactive bundles.

The bases for the above are the following:

- 1) The bundle array is an uncontrolled 2X4.
- 2) The bundles are the most reactive bundles in Cycle 8. All the bundle types and their respective exposures are evaluated.
 - a. At the BOC-8 all the 8XB bundles are past their peak reactivity. Each of the 8XB bundle types is based on its most reactive (lowest exposed) bundle at BOC-8.
 - b. Each of the 8XBR bundle types has bundles at their peak reactivity exposure. Therefore, each 8XBR bundle type is based on its most reactive exposure in every axial node.
- 3) The array has a full water reflector on all sides.
- 4) The water temperature is 20°C.

GENERAL ELECTRIC

Mr. W. C. Mihal

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September 29, 1980

If you have any questions on these matters, please call me or
K. T. Schaefer (408-925-6154).

Very truly yours,

Arli D. Vaughn

A. D. Vaughn
Fuel Project Manager
Millstone 1
R/C 174; (408) 925-1618

rem

Approved: *J. L. Bush*

J. L. Bush
Domestic Plant Licensing