

# NORTHEAST UTILITIES



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April 26, 1979

Docket No. 50-336

Director of Nuclear Reactor Regulation  
Attn: Mr. R. Reid, Chief  
Operating Reactors Branch #4  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Reference: (1) W. G. Council letter to R. Reid dated April 17, 1979.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 2  
CEA Guide Tube Inspection Program

In Reference (1), Northeast Nuclear Energy Company (NNECO) responded to verbal NRC Staff questions concerning the guide tube inspection program. Reference (1) also indicated that selected sleeves would be subjected to a pull test to the load indicated in the response to question one. Subsequently, additional pull tests have been completed; the results of these tests are summarized below.

A total of 35 sleeves in 7 discharge fuel assemblies were subjected to the pull test. Of these, 34 showed no axial movement. On one of the sleeves in Assembly B047, the pull force inadvertently exceeded the specified limit and reached approximately twice the prescribed load. This sleeve moved axially upward approximately 0.25 inches.

NNECO has evaluated these data and has concluded that the sleeves are functioning mechanically as expected and sleeved assemblies are acceptable for additional in-core use. Our NSSS vendor and fuel supplier, Combustion Engineering, has concurred in this determination. The pull force was originally established to represent a conservative upper limit on CEA drag force and on the axial force due to flow. The fact that the sleeve moved at a higher force is not considered to be a negative result. In fact, the load required for movement in the hot condition is expected to increase significantly since differential thermal expansion causes an intimate contact between the sleeve and guide tube that was not present in the test.

NNECO and CE reviewed the results of unirradiated pull test laboratory results for both "original" (i.e., not thermally cycled) and thermally cycled samples. The results of these laboratory tests indicated some slight motion of the sleeve during pull tests for both cycled and uncycled samples, approximately twice the vertical displacement at the same pull force for the thermally cycled

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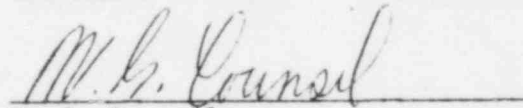
case when compared to the uncycled case. Although more motion at the same pull force level was noted for sleeve/guide tube crimp joints which had been thermally cycled, the effect of additional thermal cycles after the initial cycle is not significant. This phenomenon is attributable to the relatively rapid relaxation rate of zircaloy.

Sleeve development tests also revealed that the peak force required to remove a sleeve completely from the end fitting post was not significantly reduced by thermal cycling. This indicates that the potential for complete sleeve removal is not affected by long-term operation. Although irradiation effects were not directly incorporated into these tests, they were simulated by the use of cold worked materials. As expected, the pull to withdrawal force was higher for the cold worked material.

Because one sleeve in one assembly was displaced when subjected to the higher load, NNECO's test program was expanded to a total of 35 sleeves. No additional movement was evidenced in any other sleeve. Since both irradiation effects and thermal cycling effects saturate early (approximately 90% complete in one operating cycle), NNECO and CE have concluded that no significant loss of joint integrity will occur during further plant operation. Accordingly, NNECO has concluded that the Millstone Unit No. 2 fuel assemblies are suitable for continued plant operation. We trust the above information, coupled with previously submitted material regarding CEA guide tubes and sleeves, is sufficient for you to concur with our evaluation.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

A handwritten signature in dark ink, appearing to read "W. G. Council", is written over a horizontal line.

W. G. Council  
Vice President