



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555-0001

March 28, 1994

The Honorable Gary A. Franks  
United States House of Representatives  
Washington, D.C. 20515-0705

Dear Congressman Franks:

I am responding to your letter of February 24, 1994, to Chairman Selin concerning the use of certain equipment for identifying dimensionally nonconforming fasteners in the nuclear power industry. We are quite familiar with the controversy surrounding the use of System 21 for thread gauging as a means of identifying dimensionally nonconforming fasteners. Although System 22 verifies additional thread characteristics such as the pitch diameter, the NRC staff does not consider System 21 or the use of go-no-go gauges to be inappropriate for accepting certain fastener threads based on the following discussion.

Because of an increase in the number of bolting failures during the 1970s, the U.S. Nuclear Regulatory Commission (NRC) established a generic safety issue on bolting in the early 1980s to study the potential safety implication of these failures. The primary causes of these failures were stress corrosion cracking of overly hard fasteners, boric acid corrosion of steel fasteners, and metal fatigue. We have found no evidence to indicate that the failures were directly attributable to dimensionally nonconforming fasteners.

The Atomic Industrial Forum (AIF), the Metals Properties Council (MPC), and the Electric Power Research Institute (EPRI) also conducted major studies on bolting. As a result, EPRI issued a number of documents addressing NRC's concerns about bolting. Further, the NRC conducted two independent assessments of the probable risk of bolting failures in nuclear power plants. Both assessments indicated that the probability of a core meltdown caused by a bolting failure was low because of the highly redundant design of bolted connections, and because the bolted connection would leak and the leakage would be detected before the connection completely fails. The NRC staff published NUREG-1339, "Resolution of Generic Safety Issue 29: Bolting Degradation or Failure in Nuclear Power Plants," in June 1990, which documented the staff review of studies by AIF, MPC, and EPRI and recommended the closure of Generic Safety Issue 29. On October 17, 1991, the NRC staff officially closed Generic Safety Issue 29 by issuing Generic Letter 91-17, "Bolting Degradation or Failure in Nuclear Power Plants." In summary, the NRC staff does not consider the failures due to dimensionally nonconforming fasteners to be a significant, immediate safety concern.

Notwithstanding the closure of the generic safety issue on bolting, the NRC staff continues to be vigilant regarding any bolting problems. Through regulatory requirements in Appendix B, "Quality Assurance Criteria for Nuclear

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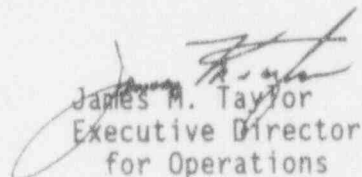
Power Plants and Fuel Reprocessing Plants," to Title 10 of the Code of Federal Regulations (10 CFR) Part 50, the NRC requires that each licensee establish a quality assurance program to ensure items, such as fasteners, used in safety-related applications, conform to applicable specifications. The NRC conducts periodic inspections of licensees to ensure that their quality assurance programs are being effectively implemented. Part 21, "Reporting of Defects and Noncompliances," of 10 CFR requires the reporting of defective items to the NRC and other nuclear facilities that may have also received the defective items. The NRC staff has reviewed the Part 21 submittals since 1990 and has not identified any bolting failures directly attributable to dimensionally nonconforming fastener threads.

In addition, nuclear power plant licensees are required to report any safety significant problems including fastener failures to the NRC in licensee event reports (LERs). The staff has reviewed LERs submitted since the mid-1980s and has not found any reports of fastener failures that could be attributed to dimensionally nonconforming fastener threads, giving additional credence to the conclusion that this is not an immediate safety concern.

The NRC staff is examining the relative merits of System 21 and System 22 for the gauging of fastener threads. Our preliminary conclusions indicate that, although System 22 may be an improvement over System 21, there is no sufficient basis to make its use a requirement for NRC licensees.

I hope this letter adequately responds to your inquiry. We appreciate having the opportunity to provide information on this matter.

Sincerely,

  
James M. Taylor  
Executive Director  
for Operations