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April 15, 1992  
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Mr. Alexander Adams, Jr.  
Non-Power Reactor, Decommissioning and  
Environmental Project Directorate  
Division of Reactor Projects - III, IV, V  
and Special Projects  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Subject: TRIGA Control Rod Drive Refurbishment Issue

Reference: Telephone Conversation, A. Adams, Jr., U.S. NRC to B. Laney, GA, (re above subject) on March 11, 1992

Dear Mr. Adams:

As indicated in our telephone conversation of 11 March, a thorough inquiry into the University of Texas control rod drive refurbishment was conducted. The inquiry included a general review of the TRIGA QA program, as well as an evaluation of the handling of the specific drives in question. In summary, it appears that an assembly error was made at the TRIGA fabrication facility in that two wires on a potentiometer on the control rod drive mechanisms were reversed. The reversal of these wires did not result in a functional change to the operation of the drives. The erroneous configuration still allowed for normal operation of the drives, but allowed the possibility of shorting out the circuit if the balancing potentiometers were not in proper adjustment for that configuration. The fault was identified after two years of normal operation when the balancing potentiometers were adjusted at the University of Texas.

In reviewing the fabrication procedures at TRIGA, there did not appear to be any deviation from the QA system as implemented by QAPD-9117, "Quality Assurance Program Document - TRIGA". The QA program requires that the work be performed in accordance with a traveler that has been approved by the project QA engineer and the project manager or their designees. The refurbishment work was performed in accordance with an approved traveler (No. PC-41317). The traveler included an operation to functionally test the control rod drives using a console and further stated that no data was required. Mr. William K. Hyde, TRIGA's chief instrumentation engineer, explained that this test was likely ordered due to the availability of a console at that time from which the test could be performed. The console test did allow for the visual verification of the functioning of the rod drives. Had a console not been available, the only means to test the rod drives

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would have been to run the approved test procedure GATR-M-73, "Mechanical and Functional Test for TRIGA Control and Regulating Rod Drives". This test procedure would have identified the problem with the crossed wires on the potentiometers. However, this is considered to be not as comprehensive as a functional test with an actual console, if one happens to be available.

The control rod drives are designated Quality Assurance Level III (QAL-III) components. This level is used for TRIGA materials, parts and components which are "not critical" to the safe operation of the facility and to the safety of plant personnel. Items designated QAL-III require less QA verification than "critical" items which are designated QAL-II. The control rod drive failure did not pose a challenge to the safe operation of the facility or to the safety of the plant personnel. Being a QAL-III component, the decision to perform the testing as indicated on the traveler was valid in accordance with the QAPD. The rod drives did pass what was judged to be an adequate functional test before being returned to the owner.

It has been determined that the control rod drive problem was an isolated incident. It has been further decided that the TRIGA QAPD will be revised to explicitly make reference to the refurbishment of TRIGA components and require that testing be conducted to the same level as current fabrication operations dictate.

Should you desire additional information concerning the above, please contact me at (619) 455-2823 or Brian J. Laney at (619) 455-4369.

Very truly yours,



Keith E. Asmussen, Director  
Licensing, Safety and Nuclear Compliance

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xc: Mr. John B. Martin, Regional Administrator, NRC Region V