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and Nuclear Engineering  
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Ames, Iowa 50010

IOWA STATE  
UNIVERSITY

Telephone 515-294-5840

September 27, 1973

Docket: 50-116

Mr. Angelo Giambusso  
Deputy Director for Reactor Projects  
Directorate of Licensing  
Office of Regulation  
U. S. Atomic Energy Commission  
Washington, D. C. 20545

Dear Mr. Giambusso:

This report summarizes documentation on file at the UTR-10 facility which has been reviewed and approved by the Radiation Safety Committee of Iowa State University.

Subject: Malfunction of the UTR-10 Shim-safety Rod

#### Description of the Event

At the conclusion of a Laboratory experiment on September 14, 1973, the shim-safety rod of the Iowa State University UTR-10 reactor failed to insert when a manual scram was executed. The safety rods and moderator-coolant dump functioned normally. The reactor was more than 30 percent subcritical after the scram. The reactor was secured in the fully shutdown condition. Departmental administration and the Radiation Safety Committee Chairman were notified. A verbal report was made to the Regulatory Operations office, Glen Ellyn, Illinois on September 15, 1973.

#### Investigation and Corrective Action

Inspection of the rod drive unit showed that the position potentiometer mounting nut was loose allowing the potentiometer gear to mismatch with the rod drive gear. The mismatch prevented normal spring-force insertion.

Two modifications were initiated. The potentiometer mounting hardware was changed to permit use of a lock washer. See Figures 1a and 1b. A fiducial mark was added to the nut and mounting bracket

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Mr. Angelo Giambusso  
Page 2  
September 27, 1973

to indicate during visual inspection if nut rotation has occurred. Second, the inspection interval has been reduced to six months.

Safety Evaluation and Review

The changes outlined do not involve a change in the technical specifications nor do they constitute an unreviewed safety question. The changes are effective and reduce the possibility of recurrence of the malfunction. The functions of the shim-safety control rod drive unit have not been changed. More frequent inspections can be performed without degradation in the functions of the drive unit.

Telephone conversations with Mr. John Fishbaugher, Region III, Regulatory Operations, provided guidance for and approval of actions of the licensee, during the period September 17 - 25, 1973.

Sincerely yours,

*Richard A. Hendrickson*  
Richard A. Hendrickson  
UTR-10 Reactor Supervisor

Approved:

*A. F. Voigt*  
A. F. Voigt, Chairman  
Radiation Safety Committee

RAH/jh

BEFORE

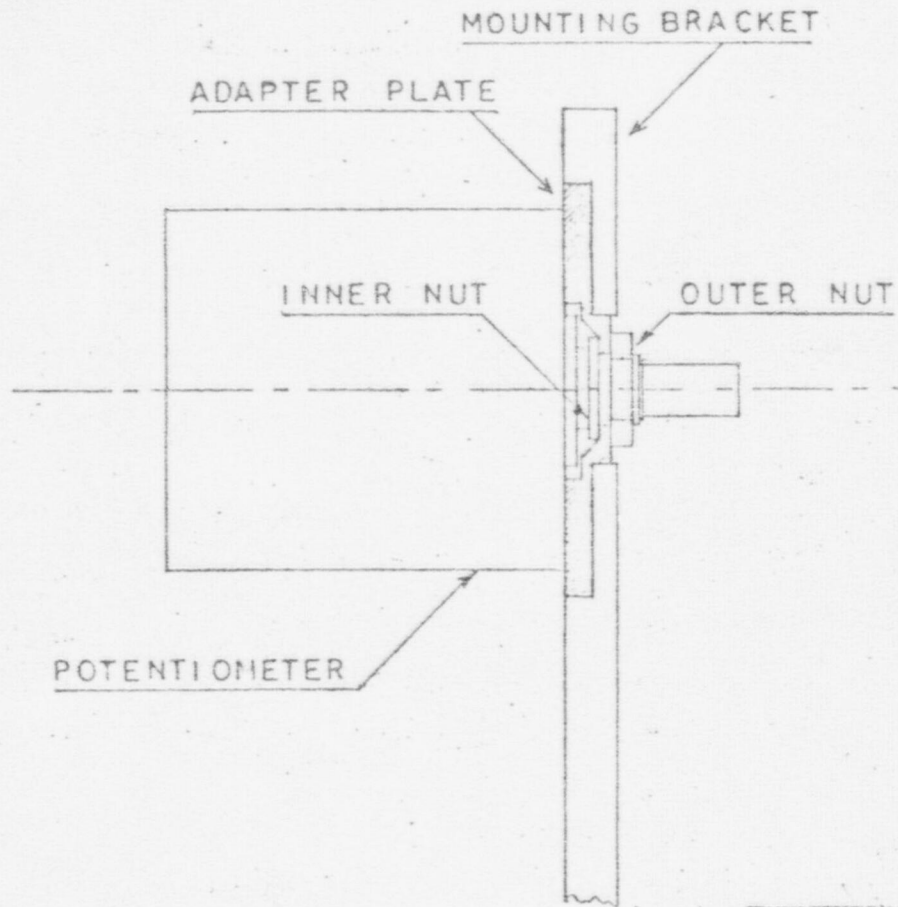


FIGURE 1a

AFTER

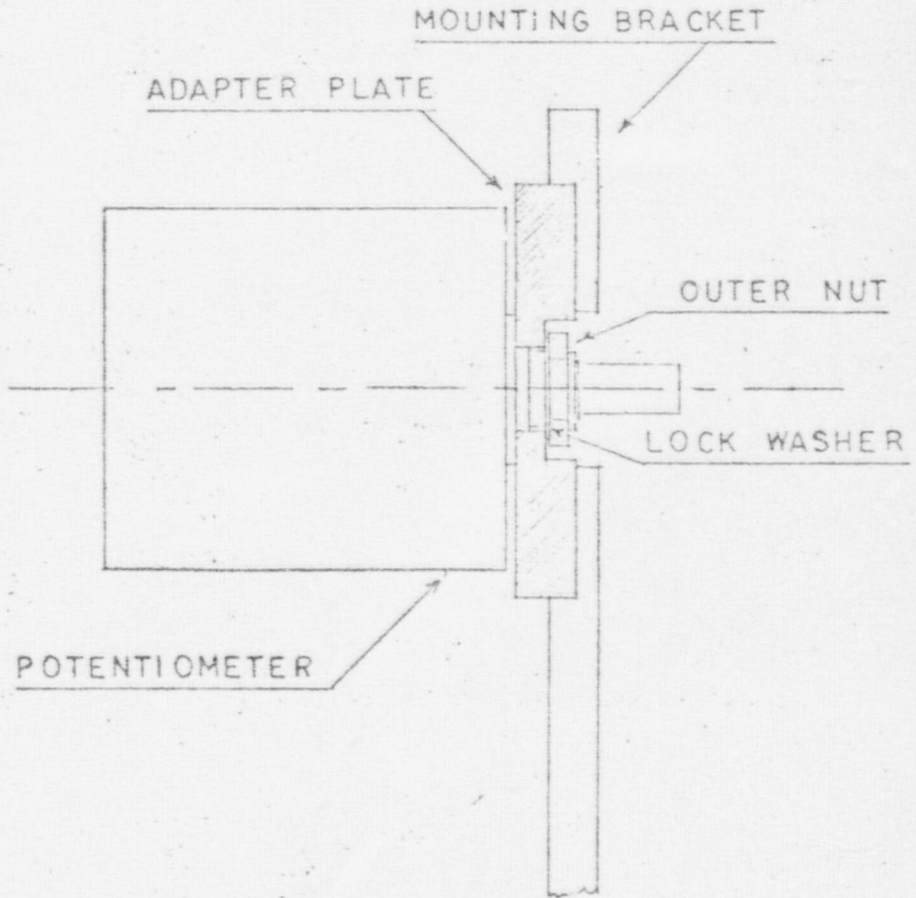


FIGURE 1b

SCALE = FULL  
DATE = 9-19-73  
DRAWN BY = Russell Anderson  
CHECKED BY = Raf