REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NR-260-D-101-S DATE: OCT 1 8 1983

DEVICE TYPE: X-Ray Fluorescence Analyzer

MODEL: BT-1000

DISTRIBUTOR: Dow Chemical USA
Instrument Applications Laboratory
1603 Building
Midland, MI

MANUFACTURER: Texas Nuclear
Austin, TX

SEALED SOURCE MODEL DESIGNATION: New England Nuclear Model No. NER-461A

ISOTOPE: Iron-55 MAXIMUM ACTIVITY: 100 millicuries

LEAK TEST FREQUENCY: 6 months

PRINCIPAL USE: (U) X-Ray Fluorescence

CUSTOM DEVICE: X YES ____ NO

CUSTOM USER: Dow Chemical USA
South Madison Street
Ludington, MI 49431

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NO: NR-260-D-101-S DATE: OCT 18 1993 PAGE 2 OF 4

DEVICE TYPE: X-Ray Fluorescence Analyzer

DESCRIPTION:

The device is a stainless steel out box that is seam welded. The shielding is a high density polyvinylidene chloride that has been machined to size. There is no "on-off mechanism," but rather a slide with shielding attached to protect the operator when removing the sample cup. The entire top is hinged and swings to one side to allow accessibility for maintenance purposes. This hinged top is padlocked with only the Radiation Safety Officer and Instrument Applications personnel holding keys. The source itself is attached to an aluminum mounting plate held in place by a threaded stud and a jam nut.

LABELING:

The device is labeled in accordance with Section 20.203, 10 CFR Part 20.

DIAGRAM:

See attachments 1 and 2.

CONDITIONS OF NORMAL USE:

This instrument will be used in a small production laboratory by trained, skilled laboratory personnel. The lab is equipped with a sprinkler system for fire protection. The training program at the Ludington site stresses that by-product material is to be used in strict accordance with the intended use.

PROTOTYPE TESTING:

Since this is a prototype device, no test data was submitted. However, the performance testing of the devices were done by Instrument Applications Laboratory. The source and source holder have been previously approved for licensing purposes by the NRC and the Agreement State of Texas.

EXTERNAL RADIATION LEVELS:

Dow Chemical reported the following dose rates in mr/hr for the device:

Surface	5 centimeters	30 centimeters	100 centimeters
0.1	No detectable radiations		

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QUALITY ASSURANCE AND CONTROL:

The initial device was built by Dow Chemical USA to their specifications. All subsequent devices are produced by Texas Nuclear under a contractual agreement.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- The device shall be distributed only to the specific licensee referred to in this document (Dow Chemical USA).
- The device shall be leak tested at six month intervals using techniques capable of detecting 0.005 microcurie of removable contamination.
- Handling, use, transfer, and disposal to be determined by the licensing authority.
- This registration sheet and the information contained within the references shall not be changed or transferred without the written consent of the NRC.

SAFETY ANALYSIS SUMMARY:

Based on our review of the information cited below, the device will be used by persons trained in radiation protection under Dow Chemical USA licenses. We conclude that the devices design is acceptable for licensing purposes.

Furthermore, we conclude that the devices would be expected to maintain its containment integrity for the normal conditions of use specified in this certificate. In the unlikely event an accident would occur and expose the source, Dow Chemical has a sufficiently trained staff to handle the problem.

REFERENCES:

The following supporting documents for the Model BT-1000 x-ray fluorescence unit are hereby incorporated by reference and are made a part of this registry document:

- Dow Chemical USA letters dated May 17, 1983 and August 16, 1983

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SAFETY EVALUATION OF DEVICE

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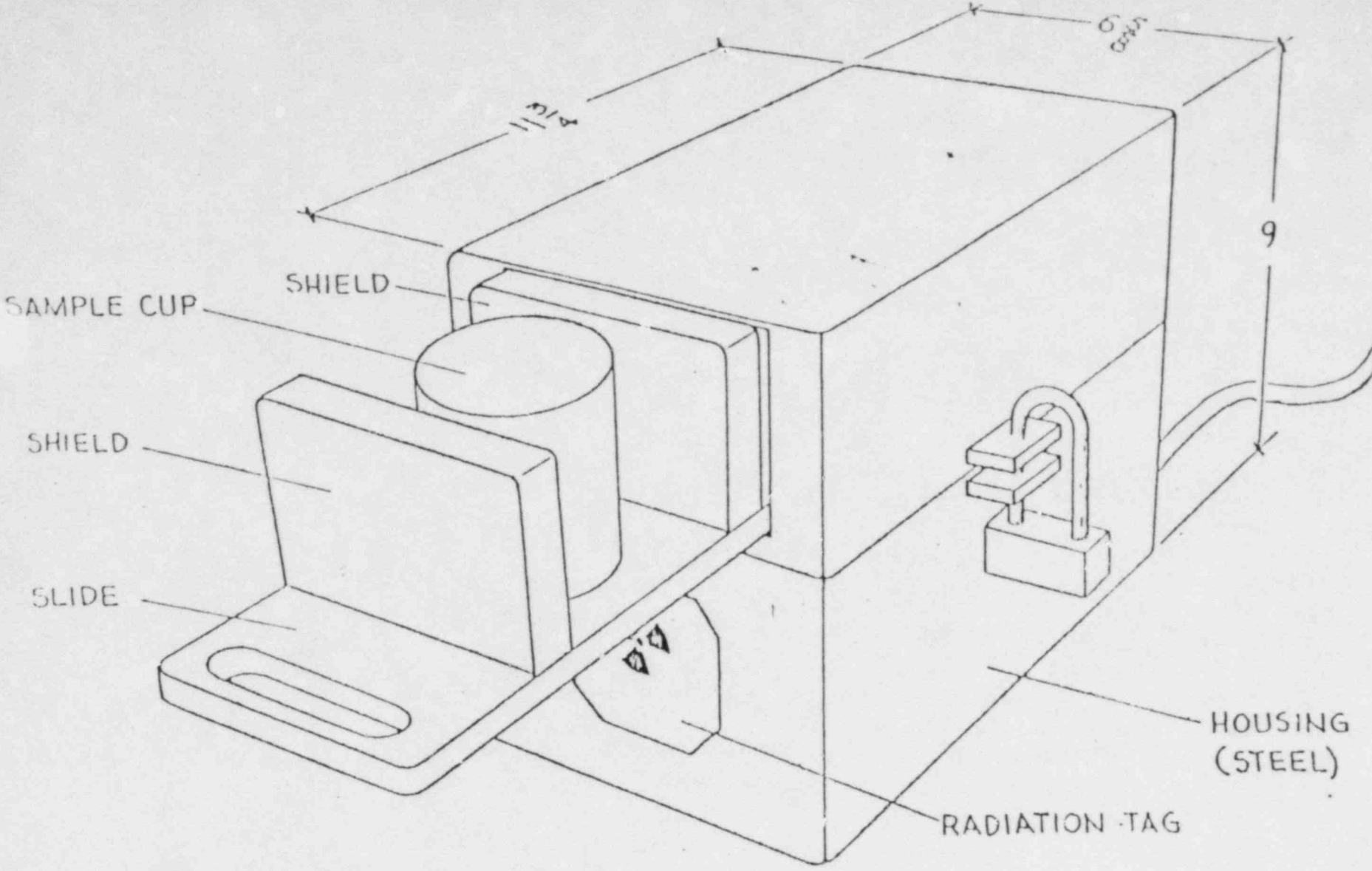
DEVICE TYPE: X-Ray Fluorescence Analyzer

ISSUING AGENY:

U.S. Nuclear Regulatory Commission

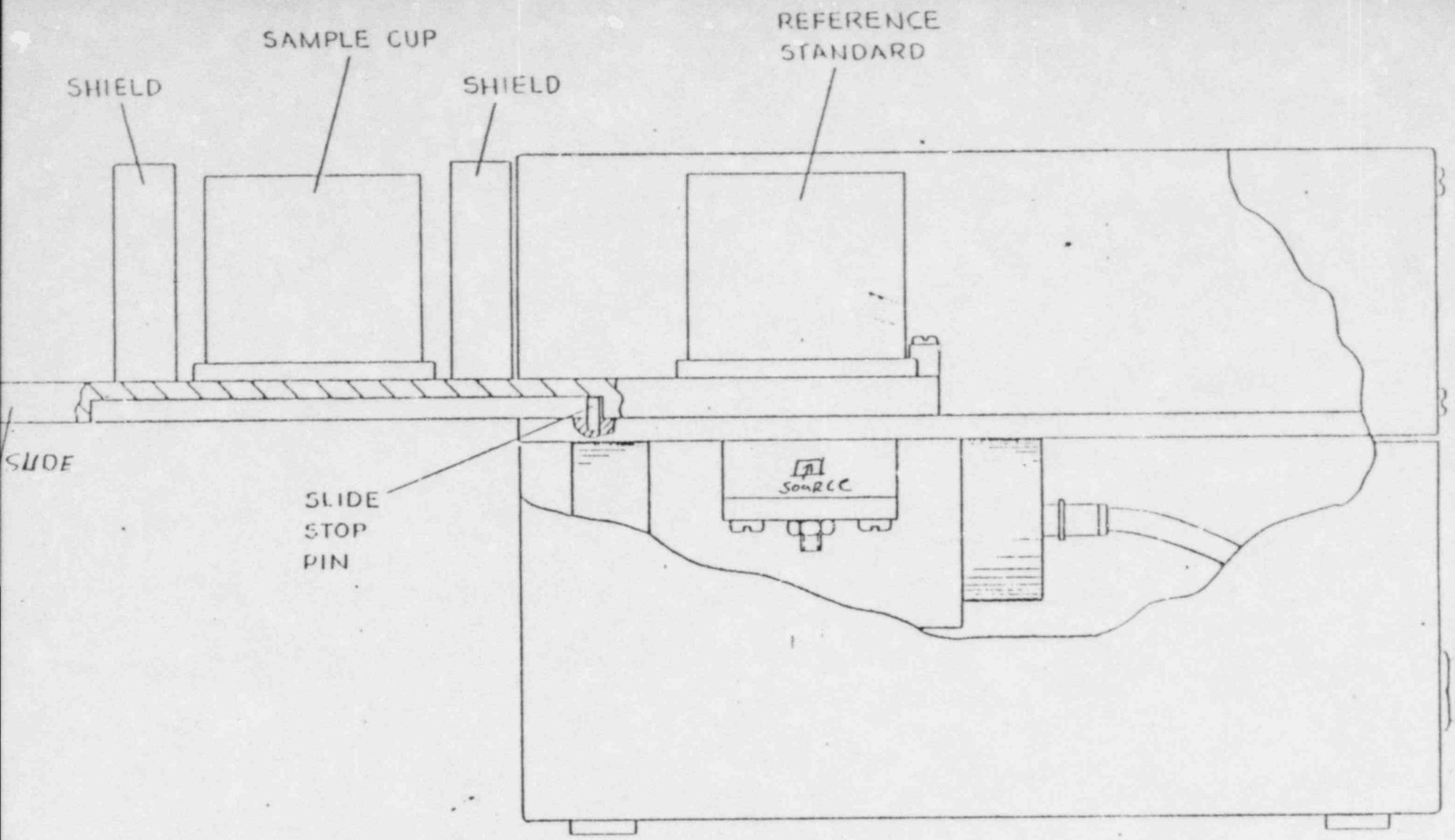
Date: 14 Oct 83 Reviewer: [signature]

Date: 18 October 1983 Concurrence: [signature]



GENERAL VIEW OF MEASURING UNIT

DRAWING NO. BT-1000



SIDE VIEW OF MEASURING UNIT
(SLIDE WITHDRAWN TO PERMIT CHANGING SAMPLE
REFERENCE STANDARD IN PLACE)

DRAWING NO. BT-1000