

030-17394

Board of Municipal Utilities

Sikeston Light & Water

SIKESTON, MO 63801

AREA CODE 314-471-3326

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A. KEITH BRISQ

April 21, 1982

United States
Nuclear Regulatory Commission
Office of Public Affairs
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

ATTN: Mr. Mike McCann

Dear Sir:

This is a request of the Board of Municipal Utilities, Sikeston Power Station, Sikeston, Missouri, to change the name on our N.R.C. License Number 24-18952-01 from Johnny H. Frost to Virgil R. Strader, to allow our company to go ahead and install the nuclear devices on our various equipment to permit automatic operation of said equipment.

I have had previous experience with Texas Nuclear Model No. 5189 level detectors containing CS-137, located at Dallman Power Station CWLP, Springfield, IL. I attended and successfully completed a course sponsored by the State of Missouri on Radiological Monitoring in October, 1962. I have studied the Principles of Nuclear Reactors with ICS and was a member of the American Society of Safety Engineers for many, many years. We have another gentleman on our plant site by the name of Mike Hixon who has had experience with leak testing on FECD level detectors containing Radium 226.

Our intention at the present time is to do the leak test here on site. Any installation, relocation, maintenance or calibration will be performed by a manufacturer's representative who is fully qualified and licensed to perform such functions. At this time, I am scheduled to attend the Radiological Safety Training course sponsored by Texas Nuclear in Texas September 21-24, 1982. Attached is the curriculum for this course.

Also, attached is my complete, up-to-date, resume with copies of diplomas, certificates, etc. Mike, I hope this information will suffice. If not, please call me and I will try to furnish whatever is needed.

Sincerely,

Virgil R. Strader
Virgil R. Strader

Asst. Plant Superintendent

FEE EXEMPT

VRS/cas

cc: M. Hixon

VRS/file

Attachments

8511180811 851021

REG LIC30

24-18952-01

PDR



CITIZEN OWNED

CITIZEN OPERATED

APR 26 1982

06278

MANUFACTURER'S CALIBRATION

AND

FIELD CHECK OF RADIATION INSTRUMENTATION CALIBRATION

This procedure is applicable to the end window G.M. tube, Texas Nuclear Model 2652. This instrument is to be used by all personnel in the installation of devices containing gamma emitting isotopes.

The instrument properties, its physical construction, the effects of shock, sound, vibrations, switching transients, etc., are well known. The characteristics that need to be checked and verified in the field prior to making radiation surveys and leak tests are precision, that is, reproducibility of repeated measurements, accuracy, sensitivity and its linearity.

Tests for these items will be repeated routinely (each six months and prior to each usage), particularly because instruments in travel are subjected to such physical abuse. This precision calibration should be completed prior to or soon after going to any job for the installation of gauging devices. This periodic recalibration is distinctly different from the manufacturer calibration.

A full calibration shall be done by the manufacturer or other persons specifically authorized by the NRC only when the G.M. tube fails, the instrument has been subjected to severe abuse or the readings differ from those established by this procedure by more than 20% or at 12 month intervals.

At the time the primary instrument calibration is completed, a RA-226 check source is assigned and read on that instrument. The two widely different (e.g., 50 mRm/h side I and 1.5 mR/h side II) readings are recorded in the instrument backplate where the source is stored.

The field calibration procedure then is as follows:

1. Remove the instrument to a relatively low background area.
2. The equipment necessary would be the instrument itself, the check source supplied and a small 6" pocket steel ruler.
3. Set the instrument on a flat surface, check the battery and adjust if necessary. Remove the end cap, measure and record the background radiation.
4. Place the highest reading side of the check source on the meter probe. With the highest reading side down on the end window and positioned symmetrically with the probe, verify that the instrument is reading the same as that stamped inside the back cover $\pm 20\%$.
5. By using the pocket steel ruler as a brace, move the source approximately $\frac{1}{4}$ " above the end window and you should have a reading on the highest scale that is also verifiable on the 30 mR/h scale. A typical example would be that the check source reads 50 mR/h in contact with the meter probe and at $\frac{1}{4}$ " or so away it should drop to 25 mR/h, which is verifiable on the 30 mR/h full scale.

9/3/81

EMERGENCY PROCEDURES

VII. NUCLEAR PROCEDURES

- (1) NO ONE under any condition shall tamper with any nuclear device, in any way, without permission from and assistance by the RADIATION SAFETY OFFICER. Violation will result in termination AT ONCE, with no recourse.
- (2) Any tank, bin, hopper, etc., with a nuclear detector attached SHALL NOT be entered without permission from the Radiation Safety Officer.
- (3) All Hold Orders for entry to above devices shall be issued to the Radiation Safety Officer only.
- (4) ANYONE entering said tanks, bin, or hoppers shall have on their person a dosimeter charged, zeroed, read, and issued by the Radiation Safety Officer each day.
- (5) Anyone finding ANY damage to any nuclear device is to notify the Radiation Safety Officer AT ONCE. No loose pieces of any device are to be touched or otherwise handled and the area is to be secured at once. Retrieval, removal and disposal are to be at the direction of the Radiation Safety Officer ONLY. Violations will be considered willful and appropriate action will be taken.
- (6) No employee is to be exposed to more than 5 REM per year, or 3 REM per quarter-year, with a maximum dose to equal employee's age minus 18 times 5. Exposed time will be kept on file by the Radiation Safety Officer.
- (7) Radiation surveys will be taken at intervals as specified on licenses and per regulations or as deemed necessary and will be done ONLY by the Radiation Safety Officer.

9/3/81

LEAK TEST PROCEDURE - QT/1S

QT/1S is designed for use by individuals who have received specific hands-on training in its application. The gauge should not be dismantled or disassembled in order to leak test. Testing of the external seams, flanges and end plate is adequate.

1. Position the shutter actuator to the closed position. In the event that the shutter actuator is frozen, or appears damaged, notify the manufacturer.
2. Refer to "Calculations for Leak Testing" before proceeding. Remove the end cap from the end window of the G.M. Survey Meter, Model 2652 and with the use of the certified standard source, calibrate the unit on the proper scale. Insure that the most active side of the source faces the meter (labeled side).
3. Obtain as many cotton-tipped applicators as indicated on the applicable drawing and slightly moisten with water or alcohol.
4. With the shutter closed, wipe the areas of the source housing assembly at the locations designated on the appropriate drawings (care should be taken not to touch the Q-tips with the fingers following wiping operation).
5. Carefully place the swab end of each Q-tip in exactly the same position as the standard source and read the results. The degree of removable contamination may be readily evaluated by the method referenced above. The highest reading obtained should be used in making the calculation.
6. A leak test certificate is to be completed and filed as a permanent record of the leak test. Amounts of radioactivity found should be recorded in microcuries (μCi). However, if no radioactivity is detected it is preferable to record the results as (less than) the minimum detectable amount as opposed to zero. (e.g., 0.003 Ci).
7. We will send the wipes to a counting laboratory for additional analysis if any contamination appears on the wipes. The manufacturer will be called for instructions.
8. The certified standard source contains Cs-137.

10/16/80

CALCULATIONS FOR LEAK TESTING (QT/1S)

The following technique will be used to assess the presence of small amounts of radioactive material during leak testing of gauging devices, using a Texas Nuclear Model 2652 Portable Survey Meter that has the necessary sensitivity to detect 0.005 uCi or less of almost all gamma emitting isotopes and beta emitting isotopes with Emax greater than 80 KeV.

1. Turn on unit; check battery, verify unit operation and calibration using the supplied check source and the attached "Field Check of Radiation Instrument Calibration" procedure.
2. Place the appropriate certified standard source (Cs-137) disk on a clean flat surface and position the open end of the G.M. tube over it and as close as possible without damaging the thin window. Set the range selector to give an approximate mid-scale reading. Note and record the observed readings: M_1 (in either c/m or mR/h).
3. Remove the standard source away a few feet. With the G.M. probe in the same position, note and record the background (Bkg.) radiation in the same units as M_1 .
4. Each swab end of the cotton-tipped applicators used in wiping the gauge is in turn placed in the same geometrical position as the above-noted standard. Note and record the observed meter reading, M_2 . M_1 and M_2 must be taken in the same units.
5. To determine the degree of contamination in microcuries, a simple expression of proportionality is to be used:

$$\frac{A}{M_1} = \frac{C}{M_2} \quad \text{or} \quad C = A(\text{uci}) \times \frac{M_2 (\text{mR/h})}{M_1 (\text{mR/h})} \quad \text{Where}$$

A = activity of certified standard source in microcuries (uci);

C = amount of removable contamination in microcuries (uCi); to be calculated

M_1 = survey meter reading with calibrated source in place in either milliroentgens per hour (mR/h) or counts per minute (cpm); minus background

M_2 = survey meter reading with swab in place in either mR/h or cpm minus background

Bkg = survey meter reading with neither source nor swab near the G.M. probe in either mR/h or counts cpm. This should be subtracted as stated, however, the result can't be zero. Background will determine the lowest detectable level (conservatively taken as 2 times Bkg.).

10/16/80

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10/16/81

DENSITY GAUGE RADIATION SURVEY CERTIFICATE

NOTES:

- 1) SURVEY LETTERED POINTS AT ONE FOOT FROM THE SURFACE AND/OR AT THE SURFACE.
- 2) SOME GEIGER TUBE TYPE SURVEY METERS MAY NOT HAVE SUFFICIENT RANGE TO TAKE SURFACE READINGS ON SOME APPLICATIONS. IN SUCH CASES, USE ION CHAMBER TYPE SURVEY METER OR TAKE READINGS AT ONE FOOT.
- 3) ONCE COMPLETED, DATED AND SIGNED, THIS CERTIFICATE SHOULD BE MAINTAINED AS A PERMANENT RECORD.

DATE _____

USER _____

Gauge LOCATION _____

SOURCE HEAD MOD. NO. _____

TAG NO. _____

SOURCE HEAD SER. NO. _____

ACTIVITY _____ mCi _____ CS137, _____ COMB

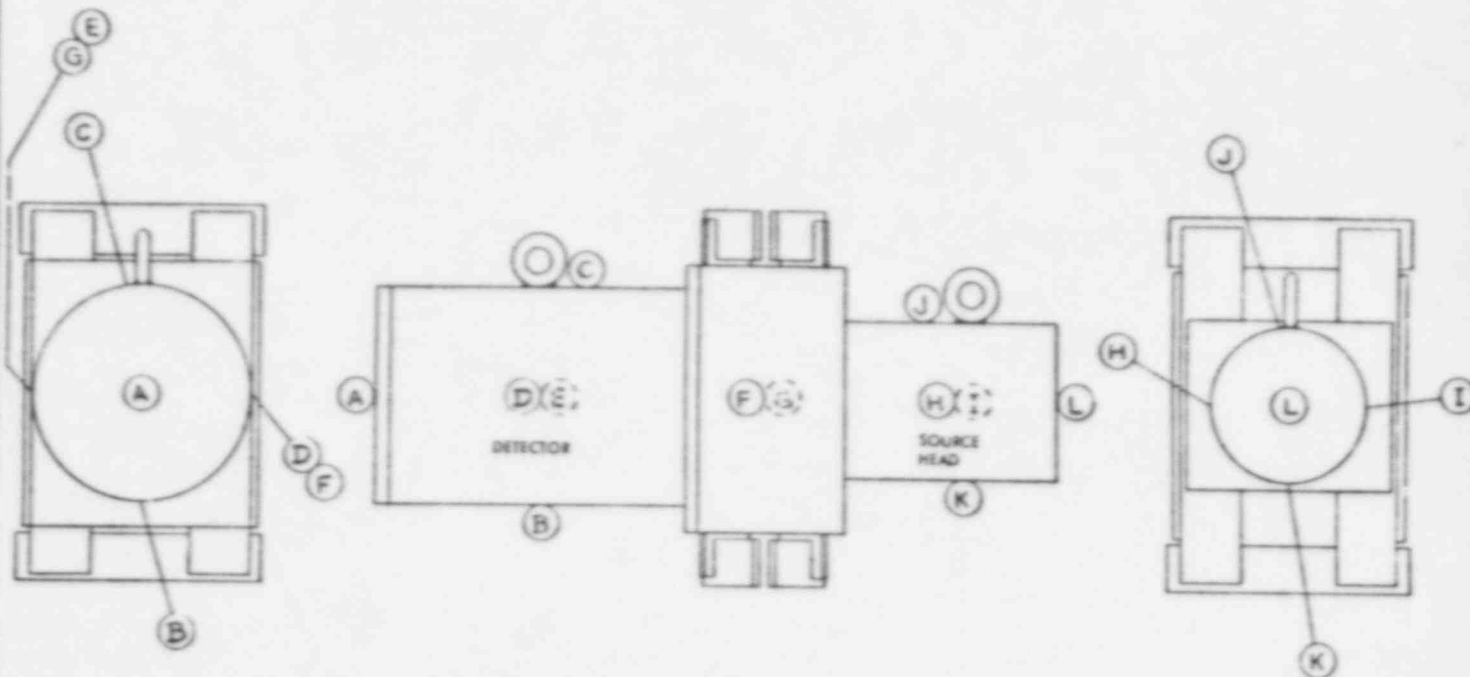
MEASURING INSTRUMENT _____

READINGS TAKEN: _____ AT SURFACE, _____ AT ONE FOOT

SIGNATURE (ONLY AFTER RESULTS RECORDED) _____ DATE _____

COMPANY NAME _____

COMPANY ADDRESS _____



mR/h												
SHUTTER	A	B	C	D	E	F	G	H	I	J	K	L
OPEN												
CLOSED												

PIPE FULL ☐ PIPE EMPTY ☐

১৪/৭/৭৭

1) SURVEY LITTERED POINTS AT ONE FOOT FROM THE SURFACE AND/OR AT THE SURFACE.

2) SOME GINGER TUNE TYPE SURVEY METERS MAY NOT HAVE SUFFICIENT RANGE TO TAKE SURFACE READINGS ON SOME APPLICATIONS. IN SUCH CASES, THE LOW CHAMBER TYPE SURVEY METER OR TAKE READINGS AT ONE FOOT.

ONCE COMPLETED, DATED AND SIGNED, THIS CERTIFICATE SHOULD BE MAINTAINED AS A PERMANENT RECORD.

DATE _____

TIME _____

Gauge Location _____

SOURCE HEAD MOD. NO. _____

TAG NO. _____

SOURCE HEAD SER. NO. _____

ACTIVITY _____ MCI _____ C1327 _____ COMB _____

MEASURING INSTRUMENT _____

READINGS TAKEN: _____ AT SURFACE _____ AT ONE FOOT _____

SIGNATURE (ONLY AFTER RESULTS RECEIVED) _____ DATE _____

COMPANY NAME _____

COMPANY ADDRESS _____



THESE JEWEL STONES ARE
STORING UP ON A TWO A YEAR

[illegible]VESSEL; EMPTY ☐ ; FULL ☐

10/16/80

LEVEL GAUGE RADIATION SURVEY CERTIFICATE

- NOTES:
- 1) SURVEY LETTERED POINTS AT ONE FOOT FROM THE SURFACE AND/OR AT THE SURFACE.
 - 2) SOME GEIGER TUBE TYPE SURVEY METERS MAY NOT HAVE SUFFICIENT RANGE TO TAKE SURFACE READINGS ON SOME APPLICATIONS. IN SUCH CASES, USE ION CHAMBER TYPE SURVEY METER OR TAKE READINGS AT ONE FOOT.
 - 3) ONCE COMPLETED, DATED AND SIGNED, THIS CERTIFICATE SHOULD BE MAINTAINED AS A PERMANENT RECORD.

DATE _____

USER _____

GAUGE LOCATION _____

SOURCE HEAD MOD. NO. _____

TAG NO. _____

SOURCE HEAD SER. NO. _____

ACTIVITY _____ HOURS _____ DAYS _____ COMB _____

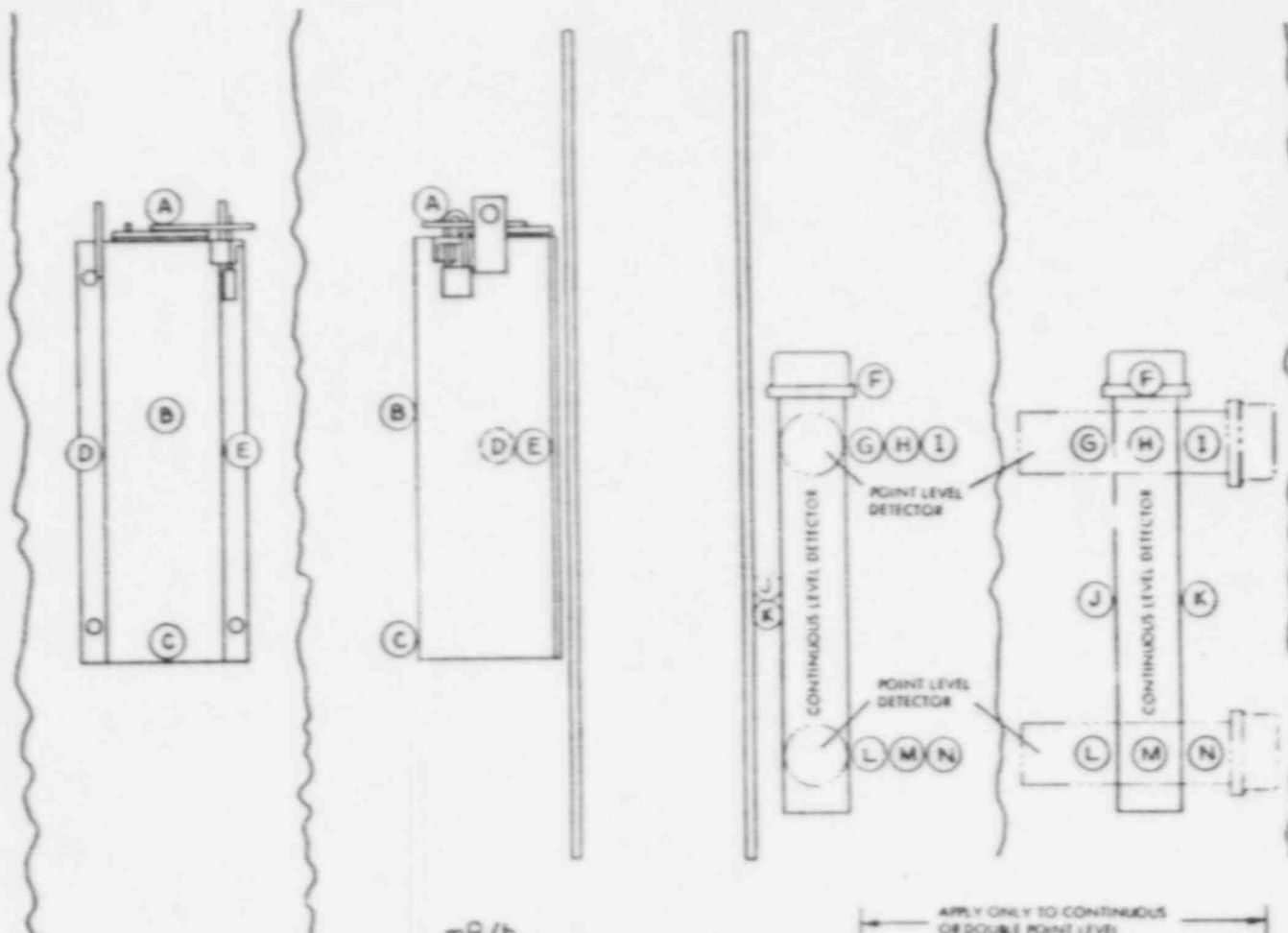
WEATHER _____ INSTRUMENT _____

READINGS TAKEN: _____ AT SURFACE _____ AT ONE FOOT

SIGNATURE (ONLY AFTER RESULTS RECORDED) _____ DATE _____

COMPANY NAME _____

COMPANY ADDRESS _____



mR/h

APPLY ONLY TO CONTINUOUS OR DOUBLE POINT LEVEL

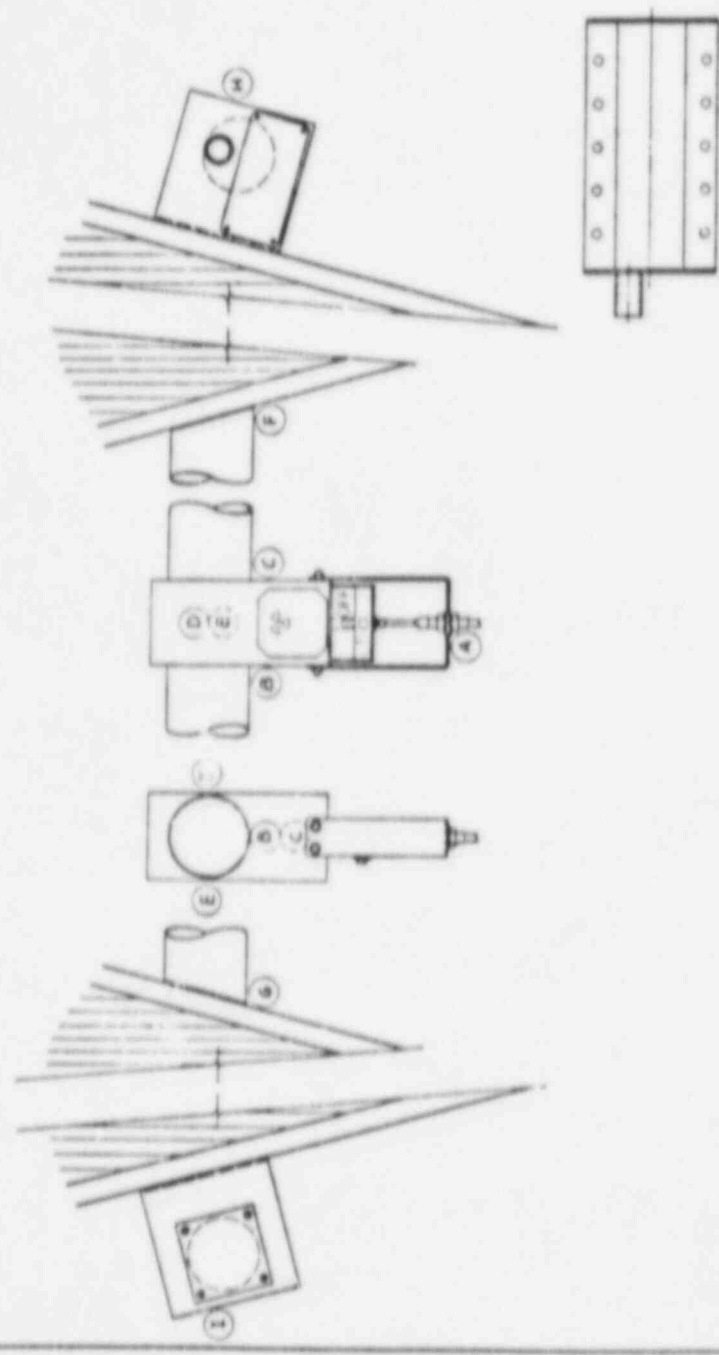
SHUTTER	A	B	C	D	E	F	G	H	I	J	K	L	M	N
OPEN														
CLOSED														

VESSEL; EMPTY ☐ ; FULL ☐

10/16/88 03996

LEVEL GAUGE RADIATION SURVEY

- NOTES:
- 1) SURVEY LETTERED POINTS AT ONE FOOT FROM THE SURFACE AND OF AT THE SURFACE.
 - 2) SOME GEIGER TUBE TYPE SURVEY METER MAY NOT HAVE SUFFICIENT RANGE TO TAKE SURFACE READINGS ON SOME APPLICATIONS. IN SUCH CASES, USE ROOM CHAMBER TYPE SURVEY METER OR TAKE READINGS AT ONE FOOT.
 - 3) ONCE COMPLETED, DATED AND SIGNED, THIS CERTIFICATE SHOULD BE MAINTAINED AS A PERMANENT RECORD.



SHUTTER	A	B	C	D	E	F	G	H	I
OPEN									
CLOSED									

VESSEL: EMPTY ☐, FULL ☐

DATE _____

USER _____

GAUGE LOCATION _____

SOURCE HEAD SER. NO. _____

TAG NO. _____

SOURCE HEAD SER. NO. _____

ACTIVITY _____ MG _____ CS/HP _____ COMB _____

WENT TAG INSTRUMENT _____

READINGS TAKEN: _____ AT SURFACE _____ AT ONE FOOT _____

SIGNATURE (ONLY AFTER RESULTS RECORDED) _____ DATE _____

COMPANY NAME _____

COMPANY ADDRESS _____

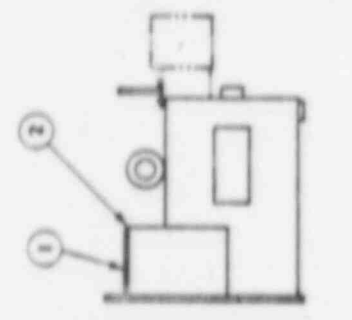
DENSITY AND LEVEL GAUGE LEAK TEST CERTIFICATE

10/16/80

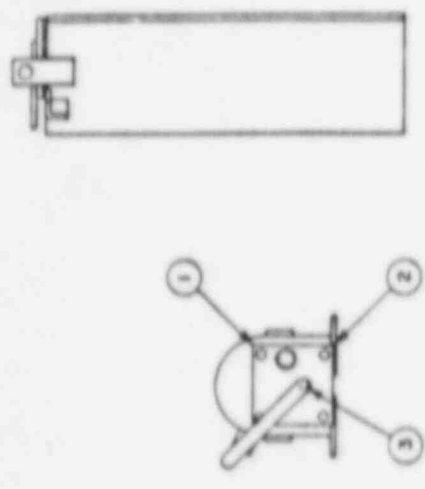
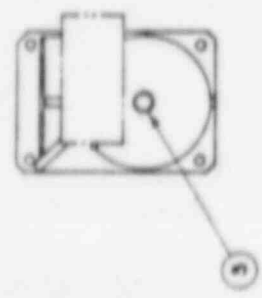
- NOTES:
- 1) NUMBERED POINTS INDICATE AREAS TO BE WIPED FOR LEAK TEST
 - 2) ONCE COMPLETED, DATED AND SIGNED, THIS CERTIFICATE SHOULD BE MAINTAINED AS A PERMANENT RECORD.
 - 3) CHECK OPERATION OF SHUTTER WHEN LEAK TEST IS PERFORMED.

USER _____
 GAUGE LOCATION _____
 SOURCE HEAD MODEL NO. _____
 INC. NO. _____
 SOURCE HEAD SER. NO. _____
 ACTIVITY _____
 MEASURING INSTRUMENT _____
 LEAK RATE TYPE _____
 SHUTTER OPERATION - _____
 _____ NEGATIVE _____ POSITIVE _____
 SIGNATURE (SIGN ONLY AFTER RESULTS ARE FILLED IN) _____ DATE _____
 COMPANY NAME _____
 COMPANY ADDRESS _____

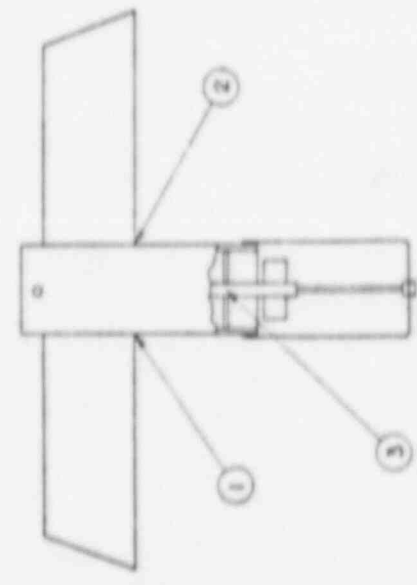
WITH AVAILABLE LEAK TEST KIT, MAIL TO:
 TEXAS NUCLEAR
 1918 W. HWY 180, AUSTIN, TEXAS 78761
 PHONE (512) 836-9885, TOLL-FREE 1-800-455-4545



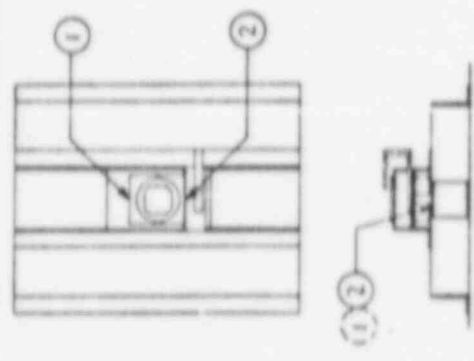
1, 2 - WIPE ALL AROUND GASKET
 3 - WIPE PLUG SEAL
 SOURCE HEAD NO. 5184



1, 2 - WIPE ALL AROUND GASKET
 3 - WIPE SHUTTER SHAFT
 SOURCE HEAD NO. 5184-95-96



1, 2 - WIPE AROUND BOTTOM OF BEAM SHROUD
 3 - WIPE AROUND SOURCE HOLDER
 SOURCE HEAD NO. 5187



1, 2 - WIPE AROUND SOURCE HEAD BASEPLATE
 SOURCE HEAD NO. 5188