Tracor Analytic

Tracor Analytic, Inc.
1842 Brummel Drive
Elk Grove Village, Illinois 60007
(312) 364 9100

July 7, 1980

United States Nuclear
Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Attention: Mr. A. B. Davis
Chief, Fuel Facility and Materials Safety Branch

License No. 12-18379-03E
License No. 12-18379-02E
License No. 12-18379-01E

Reference: Notice of Violation, License No. 12-18379-03E, June 24, 1980

This letter is being sent in accord with Section 2.201 of the N.R.C.'s "Rules of Practice", Part 2, Title 10, Code of Federal Regulations, and will serve as the reply to the above mentioned Notice of Violation.

As explained to Dr's. C. J. Paperiello and L. W. Shatterly of the N.R.C. Region III office during the inspection of our facilities on June 17, 1980, the typical radionuclides as supplied to our customers are of transport Group III, of less than 1.0 micro-curie total activity and is shipped as part of an accessory kit for our instruments. These sources. which are sealed, are packaged in their own container, which is then packaged in a larger container along with other accessory items. The standard mode of transport is by electronic van.

This is being reported simply to define our standard method of shipping radionuclides and is not intended as an excuse for not having the survey instrument as stated in our license application of December 4, 1978.

A survey meter, ion-chamber type, with a low range of 0-10 mR/h has been on order with the Texas Nuclear Division of Ramsey Engineering Company since February 12, 1980. Delivery of this instrument has been delayed due to material shortages incurred by Texas Nuclear. Subsequent to conversations with Dr's. Paperiello and Shatterly, which indicated that this instrument may be inadequate for package surveys of limited quantities of radioactive material, I've changed our order to a Geiger tube-type of instrument with a low range of 0-0.1 milliroentgens per hour. A copy of our order and the specification sheet for this instrument is attached.

July 7, 1980

This instrument was received on July 7, 1980. We are, therefore, in full compliance with our license as of this date.

Respectfully yours,

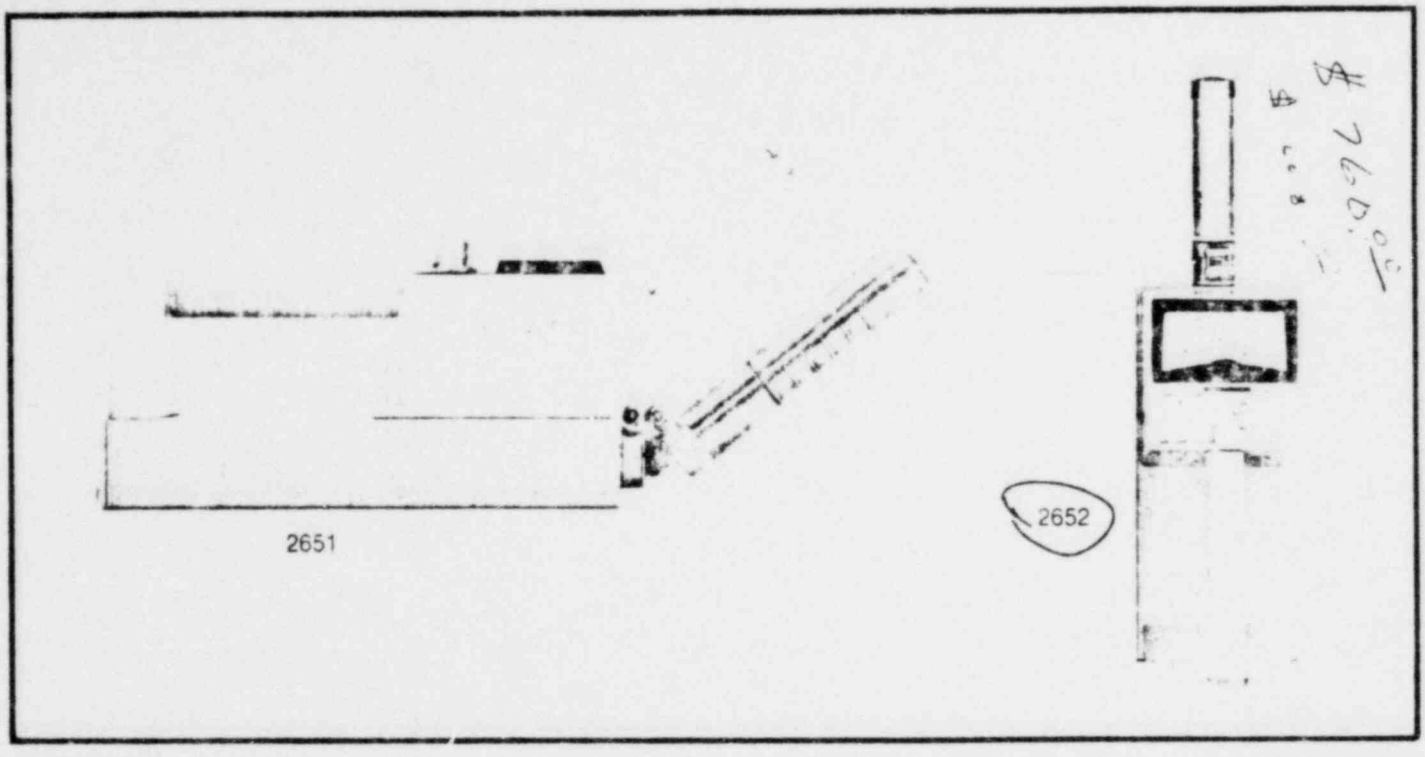
John J. Nowak

John J. Nowak
Radiation Safety Officer

JJN:jd
Att.

Alpha-Beta-Gamma Survey Meters

Technical Specifications



PORTABLE ALPHA-BETA-GAMMA SURVEY METERS

Models 2651 and 2652

- Highly sensitive and reliable.
- Solid-state circuitry.
- Seven overlapping ranges to 100 mr/hr.
- Selectable time constants.
- Powered by readily available, standard flashlight cells—300 hour operating life.
- Interchangeable probes.
- Miniature earphone for aural monitoring.
- Lightweight all-metal construction.

The Texas Nuclear Models 2651 and 2652 are portable Geiger-type survey meters for measuring alpha, beta, and gamma radiation of low and medium energies. They are exceptionally useful for general monitoring applications such as checking supposedly contaminated areas, contamination prevention, checking isotope shipments and packing material, and in other radiological and health physics applications. These survey meters are also suitable for civil defense work.

Model 2651 Survey Meter consists of a basic monitoring unit and Model 2660 side-window probe for hard beta and gamma measurements. This probe has a revolving beta shield which permits the detector tube to cover a 180° angle. When closed, the shield effectively stops beta radiation.

Model 2652 Survey Meter incorporates the basic monitoring unit and Model 2661 end-window probe for alpha, soft beta, and gamma measurements. The probe cap shields out beta radiation and permits gamma surveying only. When the cap is removed, the thin mica window of the Geiger tube is exposed, allowing measurement of alpha and beta radiation with energies as low as 40 keV.

Either probe may be purchased separately and used interchangeably with the basic monitoring unit.

The sturdy, lightweight instruments have solid-state circuitry and provide excellent operating stability. Seven overlapping ranges cover readings up to 100 milliroentgens per hour. The survey meters are powered by readily available, "D" size flashlight cells which can be replaced without tools or special procedures.

The survey meters are entirely self-contained. They use long-lived halogen quenched Geiger detector tubes, along with a five-transistor monitoring and power circuit. Radiation can be measured on seven overlapping mr/hr ranges and displayed on a 3 1/2 inch meter with color coded scales. An additional meter scale is provided for cpm readings. Selectable time constants on the most sensitive ranges allow the fastest response times consistent with good accuracy.

All operating power for the instrument is supplied by four "D" size cells that can be replaced without exposing circuitry. Printed wiring and plug-

Texas Nuclear
A Division of Ramsey Engineering Company

Box 9267
Austin, Texas 78766 USA
Telephone (512) 836-0801
Telex 77-6413

in circuit cards simplify field repairs. The detector high voltage supply is well regulated and circuits are provided for checking and adjusting the power supply voltage. Good stability and accuracy can thus be maintained over the full life of the batteries.

The hinged swivel-type probe mount permits the operator to easily manipulate the detector probe in all survey situations (i.e., surveying bench tops, spills, hands, clothing, etc.). The probe can be positioned straight out from the instrument case or folded downward for measurements of vertical or horizontal surface areas, while at the same time keeping the monitoring unit in a horizontal position for ease of manipulating the controls or reading the meter. When not in use, the probe can be folded back against the instrument case. The probe can be extended up to 40 inches away from the monitoring unit to permit measurements in confined areas. The coiled probe connecting cable retracts completely into the instrument case.

The physical construction of the survey meters assures proper balance for hand-held operation. The instruments are equipped with four plastic glide feet and the case is sturdily constructed of light-weight aluminum.

A magnetic earphone for aural monitoring of the count rate and a low activity source for checking calibration are also supplied. Both the earphone and the check source can be stored in a small compartment at the rear of the monitoring unit.

Models 2651 and 2652 are carefully calibrated at the factory in terms of gamma rays from cesium-137, which is radium equivalent for these instruments. If necessary, they can be recalibrated by the operator by means of a screwdriver adjustment and the calibration source.

SPECIFICATIONS

ranges—Seven overlapping ranges of 0.1, 0.3, 1.0, 3.0, 10, 30, and 100 milliroentgens per hour and 150, 1500, 15,000 and 150,000 counts per minute. All full scale.

time constants—Selectable, 4 or 8 seconds on the 0.1, 0.3, and 1.0 mr/hr ranges. The 3 and 10 mr/hr ranges are fixed at 4 seconds. The 30 and 100 mr/hr ranges are fixed at 2 seconds.

accuracy—±10% of full scale on all ranges. Agreement between ranges is within 5%.

zero drift—Negligible.

warm up time—None.

calibration—Factory calibrated with gamma rays from a cesium-137 source which is radium equivalent for this instrument.

display—mr/hr and cpm indicated on color coded meter scales.

electronic circuit—Four transistor monitoring circuit consists of an emitter-coupled monostable multivibrator triggered by an emitter follower amplifier, and a buffer amplifier for the magnetic earphone. The high voltage supply is a single-transistor oscillator with corona regulated output.

detector tube—Model 2660 probe uses a side-window Geiger tube. Model 2661 probe uses an end-window Geiger tube. Both detectors are halogen quenched, hermetically sealed.

operating temperature range—0° C to + 50° C.

detector operating voltage—+600 volts.

window material—Model 2660 probe, stainless steel. Model 2661 probe, mica.

window thickness—Model 2660 probe, 30 mg/cm² (cathode wall). Model 2661 probe, 1.5 to 2 mg/cm².

cathode material—Stainless steel for both probes.

dead time—Model 2660 probe: 100usec. max. Model 2661 probe: 200usec. max.

power requirements—Four 1.5 volt "D" size (standard flashlight) cells. Battery life is better than 300 hours at 8 hours per day operation.

dimensions—5 in. high x 4 in. wide x 12 in. long with probe in retracted position. Length with probe in extended position is 16 1/4 in. for Model 2651 and 15 in. for Model 2652.

weight—4 1/2 lbs. net, including probe. Shipping weight, 7 1/2 lbs.

supplied with—Probe and detector as specified, batteries, earphone, calibration source, and instruction manual.

Model 2651 is supplied with a probe containing a side-widow G-M tube for detection of gammas and hard betas. The probe has a revolving beta shield.

Tracor Analytic

1932 Brummel Drive
Elk Grove Village, Illinois 60007
Telephone (312) 364-9100

PURCHASE ORDER

CHANGE ORDER

PURCHASE ORDER NUMBER
007607-7525

THIS NUMBER MUST APPEAR ON ALL PACKING LISTS, BILLS OF LADING, ACKNOWLEDGEMENTS, INVOICES, ETC.

TRACOR PART NUMBER MUST APPEAR ON PACKING LIST FOR EACH ITEM DELIVERED

ITEMS DESIGNATED "T" ARE TAXABLE. ITEMS DESIGNATED "R" ARE FOR RESALE AND TAX EXEMPT PER I.R.O.T. #037395.

TO

Texas Nuclear Div.
Ramsey Eng. Co.
Box 9257
Austin, TX 78766

SHIP TO

John Nowak
same

CONFIRMED TO/DATE OF ORDER	VENDOR NO	TERMS	F.O.B.	SHIP VIA	DEL TO	ACCOUNT NUMBER
Jerry Petermann 6/18/80	20395	Net 30	[X] S.P. [ ] DEST	(AIR) B/W	110	21000

ITEM	PART NUMBER	REV	DESCRIPTION	ORDER QTY	DATE REQUIRED	DATE PROMISED	UNIT PRICE	UNIT MEAS	
			CHANGE QUANTITY FROM 1 TO 0 TO CANCEL ITEM						
01			Model 2595 Portable Survey Meter Low Range	0			820.00	EA	T
			ADD THE FOLLOWING ITEM TO ORIGINAL ORDER						
02			Model 2652 Portable Alpha-Beta-Gamma Survey Meter	1	6/30/80	6/30/80	600.00	EA	T

CONFIRMING

COMMENTS/SPECIAL INSTRUCTIONS

5651
6/18/80
L

ORDER VALUE 600.00

ITEM	DATE REC'D	QTY REC'D	BALANCE DUE	REC'D BY	ITEM	DATE REC'D	QTY REC'D	BALANCE DUE	REC'D BY

FORM TA 1000

REQUISITIONER COPY