ISOMEDIX

Irradiation of Transmitters

per

Test Schedule No. 5, 12/10/72

As Modified May, 1973

provided by

The Foxboro Company

Test Date: May 14, - May 18, 1973

Foxboro Order No.: E-11812

Date: April 24, 1973

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1. Identification of Units

The 8 test transmitters were standard construction as follows:

6 Units - E13DM-ISAM2 Electronic d/p Transmitters

S/N 2595238, 239, 240, 241, 254, 255

Input Range Limits 20-205" H_2O Test Range: 0-100"H_2O

Supply Voltage Limits 24-60 Vdc

Test Supply Voltage 30 Vdc

Output Load 650Ω Output Current 4-20 mAdc

Serial Numbers 2595241, 254, 255 have standard amplifier N0143XS. The amplifier of S/N 255 was remote mounted.

Serial numbers 2595238, 239, 240 have prototype amplifier N0148TE. The amplifier of S/N240 was remote mounted.

2 Units - E13DM-HSAM2 Electronic d/p Transmitters

S/N 2630073, 093

Input Range Limits 20 -205" H_2O

Test Range: 0 - 100" H_2O

Supply Voltage Limits 63 - 100 Vdc

Test Supply Voltage 75 Vdc

Output Load 600Ω Output Current 10 - 50 mAdc

Units have standard amplifier N0143SY

2. Irradiation Test Facility

a. Description - See Attached.

b. Dosimetry was performed using a Victoreen Model 555 Integrating dose Rate Meter and Probe. The unit was calibrated on 1-15-71 by the Victoreen Instrument Company, using cobalt-60 and cesium-137 sources whose calibrations are traceable to the U.S. National Bureau of Standards. A copy of the calibration certificate is available. Backup dosimetry using Harshaw TLD devices, and also a modified Fricke chemical system, confirmed the Victoreen readings.

c. Flux distribution in Irradiation Chamber

(1) At 1×10^5 rad/hr., the flux is described as a cylinder 50" from the source centerline, over a vertical height of approximately 45". Assuming a dose rate range of 1.0 to 1.20, the cylinder becomes an annulus with inner radius of 41" and outer radius of 50", with the 1.2 factor at 41".

(2) At 1×10^6 rad per hour, the flux is described as a cylinder 15" from the source centerline extending over a vertical height of approximately 53". Assuming a dose rate range of 1.0 to 1.3, the cylinder becomes an annulus with inner radius of 9" and outer radius of 15", with the 1.3 factor at 9".

3. Test Procedure Used

a. Test performed was per Test Schedule No. 5, dated 12/10/72, previously provided by Foxboro, and revised May, 1973.

b. Irradiator operation was basically per last paragraph of Item 2a. Transmitters were positioned at pre-selected distances from the source irradiate position. The source, when raised, is then locked into its irradiate position.

4. Test Equipment Used

a. Input Equipment

(1) Power Supplies

(a) Hewlett Packard Model 60155C - 30Vdc (4-20 MA units) S/N's 01418, 01594

(b) Electronic Measurements M212A - 75Vdc (10-50 mA units) S/N's 6096, 9433

(c) One Princeton Applied Research* Model TC-100.2 S/N 157 (24Vdc for switching Circuits)

(2) Input Signal

(a) Mansfield & Green Air Deadweight Tester*
Model 650 WC-SS S/N 66614
Accuracy: 0.025% of Input Pressure

(b) Step Response Equipment

1. Capacity Tank - 1732 cu. in.

2. Air Loading Regulator - Moore Products

3. Solenoid Valve - ASCO Model 8320A25
   3-Way Valve
4. Pressure Transducer - Stathem Gold Cell
   with Interchangeable Diaphragms - 0-5 lbf//in^2
   diaphragm
5. Pressure Gauge - Wallace & Tiernan*
   Model FA-145 S/N PP11538
   Pressure Range 0-120" H_2O
   Accuracy: 0.1% of Full Scale

b. Output Equipment

(1) Resisters

(a) Load Resistors* - 400Ω ± 2Ω (4-20mA Units)
- 500Ω ± 2Ω (10-50mA Units)

(b) Readout Resistors* - 100Ω ± 0.02Ω (10-50mA Units)
- 250Ω ± 0.02Ω (4-20mA Units)

(2) Digital Voltmeter* - Data Technology Corp.
Model 350 Accuracy: ± 1 digit on Vdc ranges
S/N 18611

(3) Output Monitor - Hewlett Packard
4-Channel Recorder Model 7414A S/N 1145A

(4) Output Recorder Switching - Potter Brumfiell
8 Pole Relay - 24Vdc

(5) Output Voltage Readout Switching - 15 Pole
Multiswitch - Foxboro Company - Pt. No. V101BW
Tool Number A-171 from Dept. 383

* Asterisk denotes equipment checked by the Foxboro Company Measurement Standards Laboratory and referenced to the National Bureau of Standards.

5. Attestation of Data

An Isomedix employee (the hot cell operator) initialed test data on each run, signifying that data was taken as specified.

SERVICE IRRADIATOR DESCRIPTION

Irradiations are normally conducted in the hot cell 2-3 complex (drawing 80004). Product to be processed is placed on a series of turntables arranged in a circular configuration. The source is placed in the center of this arrangement for a preset time.

The source elements are placed in 1/2" diameter 60" long stainless tubes, held in a squirrel-cage type holder. Two or three sources are placed in each tube. In the storage position the source holder is lowered into the water filled pool-to-cell transfer chute to a depth of at least 10 feet, where the surface reading is zero.

The source is connected by a stainless steel cable to an electrically driven windup drum mounted on a jib crane in the cell. To expose the source, the operator, from the face of the cell, remotely operates the hoist until the source has cleared the storage tube. Using manipulators, he swings the crane into the irradiate position. An opposite sequence is used to lower the source. In the event of an electrical malfunction, the source can be lowered manually by turning a handle on a flywheel mounted to the drum with one of the two nearest manipulators. In any malfunction, personnel safety is maintained as long as the cell remains closed.

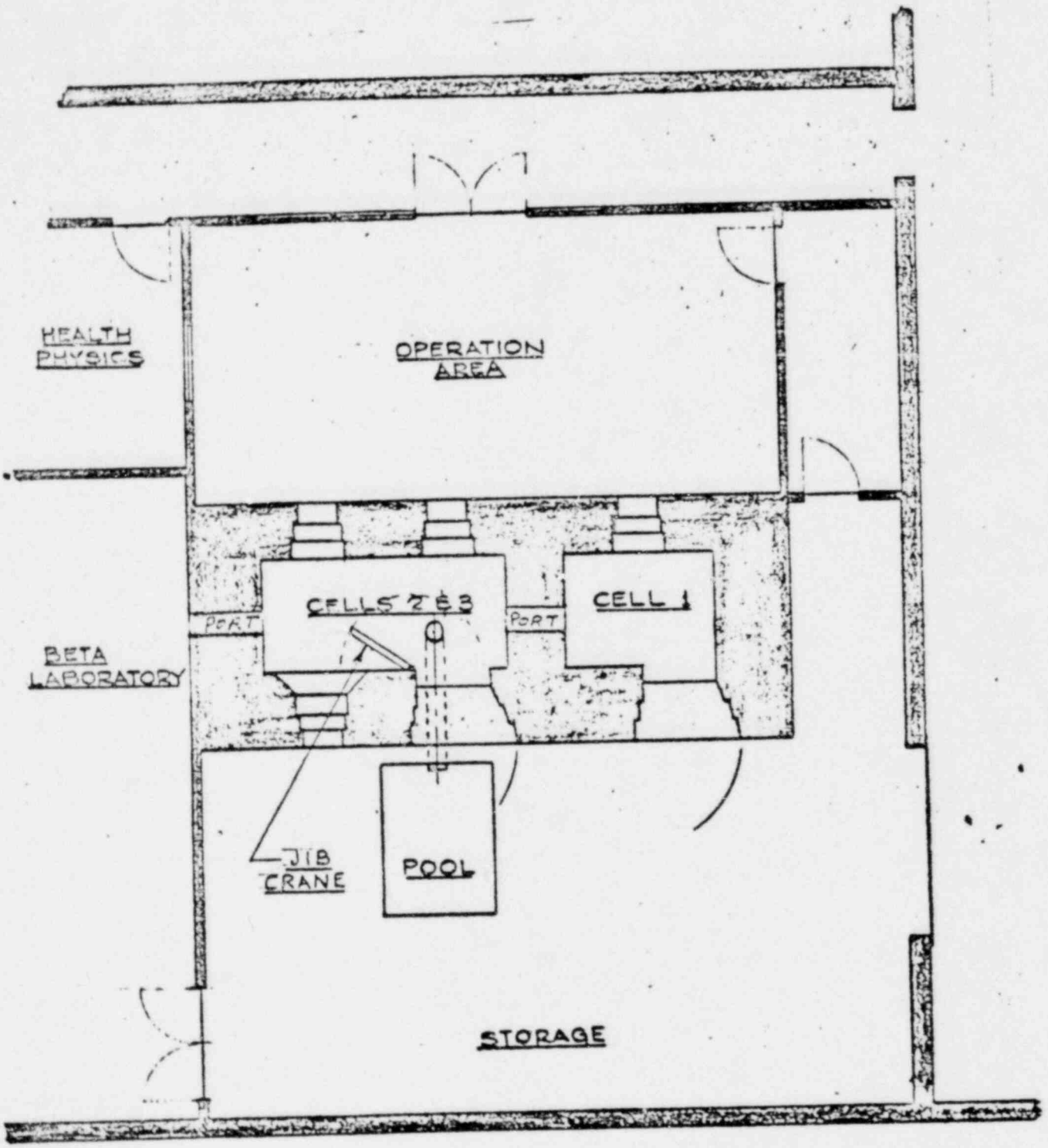

FIGURE 1
MAIN FLOOR PLAN
HOT CELL COMPLEX

Item 2a

SCALE: $\frac{1}{8}$" = 1'-0"