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ELECTRONICS SECTION

L. T. Heyd and P. E. Ohmart

ABSTRACT

The following construction was completed:

One (1) R. F. power supply, Model FS-[illegible] (EC No. 3). It is being [illegible] by Group 4.

One (1) log-amplifier, Model AK-1, for Seiche Laboratory, to be [illegible] by the "F" Section.

Four (4) relay control boxes for Group 1.

Installation of two (2) Standard Electric Time Company Variac [illegible] panels in Rooms E-101 and E-112.

Installation of two (2) plating controls in Room E-169 for Group 1.

The following are under construction:

One (1) scaler multiplier for Group 2[illegible] is 90 per cent complete.

One (1) scaler multiplier for Group 3[illegible] is 10 per cent complete.

Six (6) Thyratron relays for Seiche Laboratory are [illegible] per cent [illegible].

Two (2) two-input Boron-wall mixers for Seiche Laboratory are [illegible] per cent complete.

The vacuum system for refilling spent Boron-wall tubes was completed and delivered to the "F" Building.

One (1) cathode-follower probe has been delivered to Group 5.

Improper operation of the oscilloscope in the multiscaler used by Group [illegible] was due to insufficient vertical gain.

The special purity tank of methane gas recommended for use with the Nucleometer was received. A number of checks have been made of this [illegible] using both grades of methane to give comparative results. The conclusion [illegible] the Nucleometer is a satisfactory instrument for the detection of [illegible]

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particles and that a workable plateau may be obtained except in the presence of gamma.

The No. 4 parallel plate alpha counter was operating improperly. The grid wire to the first chamber tube was broken inside the wax insulation.

Another gamma counter was set up in E-107.

A Thermohm with a six-foot lead-in was placed in Fraudler No. 2 in the "WD" building.

Improper operation of the effluent flow meter in the "WD" Building has been traced to siphon action in the effluent flow line.

The electrodes and cell of the pH meter in effluent tank No. 2 in the "WD" Building were cleaned.

The pH electrodes and the cell of Clarifierculator A in the "WD" Building were cleaned with [illegible] hydrochloric acid.

Panels were assembled and installed for the cylinder temperature indicators of the two emergency power Diesels in the "T" Building.

A Firsul gauge was repaired and checked using two resistance buses instead of tubes, as normally used.

A manual planing control has been completed for Group 17.

Routine preventative maintenance checks have been made of the [illegible] controls used by Groups 17 and 20.

The scaler-multiplier (EL-250) located in T-[illegible] has defective high voltage. A fuse was blown and the rectifier tube [illegible] was gassy.

The high voltage meter on the two-input Boron-wall mixer (EL-2[illegible]) was reading full scale because the 6AG5 shunt regulator tube in channel No. 1 has a cracked base.

The overload relay of the induction heater (U.S.A. No. [illegible]) [illegible] emergenced whenever the START button was pushed. The [illegible] tube, the [illegible] (Johnson 215-G, clip type) and the [illegible] supplied screws were replaced with new ones.

The exhaust ducts that were [illegible] into the T-8 system [illegible] removed and placed in the proper outlet.

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The final [illegible] has been [illegible] in the [illegible] Beta [illegible] [illegible].

Some repairs were made to the [illegible] potential controllers [illegible] by Group [illegible].

Production gauge [illegible] made by Group [illegible] were established.

The [illegible] survey of [illegible] was [illegible] for [illegible] [illegible].

A complete reinventory is being taken of Stage [illegible] and Stage [illegible] [illegible] by Group [illegible].

Routine sampling was carried on as usual. [illegible] with the [illegible] Beta [illegible] for the [illegible].

DETAILED REPORT

Group [illegible] - G. E. [illegible], [illegible], [illegible], [illegible], [illegible], [illegible], and [illegible].

Report of Progress April 27, 1945 to June 15, 1945.

The R.F. power supply, Model [illegible] ([illegible] No. [illegible]), was completed and [illegible] to Group A for trial. First reports [illegible] operation is not [illegible] satisfactory, but better than had been expected.

The [illegible] amplifier, Model [illegible], [illegible] Beta laboratory [illegible] and is to be tested in the [illegible] Building under operating conditions.

Two Varian control panels, manufactured by the General Electric Company, were installed in Rooms [illegible] and [illegible]. [illegible] were installed under [illegible] and [illegible] pilot lights for the [illegible] were added to the [illegible] control panel.

Four small relay control boxes ([illegible]) were made and delivered to Group [illegible]. These boxes contain a double pole [illegible] relay with [illegible] by which the relay coil may be operated by a [illegible] switch.

Two plating controls, one medium current and one high current, were installed in Room [illegible] for Group [illegible]. [illegible] and [illegible] to the [illegible] being [illegible] by Group [illegible] were made [illegible] heavy [illegible] ([illegible] Section type) were installed [illegible]

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The following is being constructed:

1. One scaler-multiplier, EL-[illegible] ([illegible]) for Group 2a is complete except for modifications of the Instrument Development Laboratory Model [illegible] scaler, with which it is to be used.

2. One scaler-multiplier ([illegible]) for Group 3a is [illegible] per cent complete. This is to be used with the Model [illegible] scaler which they already have.

3. Six Thyratron relays, Model TR-[illegible], for Scioto Laboratory are [illegible] per cent complete.

4. Two two-input Boron-wall mixers, Model [illegible]-2-A, for Scioto Laboratory are [illegible] per cent complete.

Group 11 - J. E. Gregory, [illegible] Daggett, [illegible] Gregerson and [illegible]

The vacuum system to be used for refilling spent Boron-wall tubes was completed by the Glass Shop and delivered to the [illegible] Building. Of the four available spent 8-inch standard tubes, two had leaks and one had a high resistance short. The remaining tube was successfully filled in that it did [illegible] neutrons, but the tube had no plateau. It was hoped that some 12-inch [illegible] tubes could be located for refilling, but none were found which would [illegible] reworking. An inventory is being made of all Boron-wall tubes at this site because a large number of our spent tubes were sent to Chicago for reworking and apparently were not returned.

One of the cathode-follower probes built by Group [illegible] was delivered to Group 5. The neutron counter used by this group was modified for this probe but it has not been used.

The oscilloscope in the multisource used by Group [illegible] was operating improperly because it had insufficient vertical gain. This was corrected by adjusting the proper voltage divider. A few days later, it was noticed that when the D.C. arc was seeded, the maximum current available from the multisource was 1.5 amperes. A connector was burned out, causing an additional gap in the arc circuit. The connector is of special design and a replacement plus two spares were ordered.

The special parity tank of methane recommended for use with the [illegible] meter was received. A number of checks were been made of this instrument using both grades of methane to give comparative results. For all practical purposes there was no noticeable difference in the operation of the instrument with either grade of gas.

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A sample of essentially pure alpha radiation gives a voltage plateau quite flat and approximately 300 volts long. This is with the sensitivity [illegible] at 10 millivolts as recommended by the manufacturer.

A sample of radius D, E, and F in equilibrium was covered with a [illegible] of 4.12 mg./cm.^{2} aluminum and [illegible] mg./cm.^{2} mica to provide an essentially [illegible] beta source. This sample was then checked in the Nucleometer and a satisfactory voltage plateau was obtained with a slope of approximately 2 per cent per [illegible] volts.

A small gamma source was used in checking the relative gamma efficiency of the Nucleometer at various voltages. There was a difference of almost [illegible] from 4,600 volts to 4,300 volts with the source internal to the chamber. [illegible] the source external to the chamber, the difference was approximately 1.5 [illegible] for the same voltage change.

From the above data, it is concluded that the Nucleometer is a satisfactory instrument for the detection of beta particles and that a workable plateau may be obtained except in the presence of gamma. Since the gamma efficiency is so variable with voltage, it is difficult to determine quantitative data from the count if the sample does contain gamma emitting material.

This conclusion is further augmented by the fact that the [illegible] does increase when the sample received with the instrument is brought up external to the chamber. This indicates that there are some gamma present [illegible] could explain our being unable to get a voltage plateau with that sample.

The No. 4 parallel plate Kelley-Koett alpha counter is back in [illegible]tion. The grid wire to the first chamber tube was broken inside the [illegible] insulation. All counters in E-107 are now operating except the fifth [illegible] which has not had a chamber. A new chamber for this counter plus a [illegible] just received from the Machine Shop.

Another gamma counter has been set up in E-107 for use with the [illegible] Anderson tube beta counting chamber.

The tests of the Berkeley decade scaler have been started.

A Thermohm with a six-foot lead-in was placed in Pfaudler No. [illegible] [illegible] Building. The Thermohm which was removed had a three-foot lead-in [illegible] not extending far enough into the Pfaudler to give accurate temperature [illegible]. The Micromax recorder was checked with an external Thermohm which was [illegible] heated water and recorded within 1°C. between 20°C. and 99°C. If the Thermohm in Pfaudler No. 1 is a short one also, it too will have to be changed.

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The effluent flow meter in the "[illegible]" Building has been operating [illegible] perly. When the piping was filled with oil, as originally designed, a [illegible] of flow through the orifice failed to bring the meter to a reading of zero. [illegible] meter could be brought to a zero reading only by opening both crossover [illegible]. With these indications, it was theorized that while there was a flow through the orifice, some of the oil from one side of the transmission system piping [illegible] and was replaced by water. When the flow was stopped, there was a [illegible] due to the difference in specific gravity of the water and oil. The [illegible] was drained of oil and was replaced by water which should have remedied this situation. Under these conditions, the meter did return to zero when the [illegible] was stopped, but the dynamic reading was low. Further investigation [illegible] that the flow meter piping was subject to a siphon action due to the [illegible] effluent pipe immediately following the flow meter orifice. This [illegible] caused an air pocket in the flow meter piping and this air pocket [illegible] as a cushion to the pressure differential between the low pressure line and the [illegible] pressure line. Because of this cushion, the correct pressure differential [illegible] not impressed upon the transmitter and the dynamic reading was low. The [illegible] line was vented, relieving the siphon action, and the operation of the flow [illegible] is now satisfactory. The piping is still filled with water and is to be [illegible] with oil. Filling the piping with oil is only a precaution to prevent [illegible] corrosion.

The electrodes and cell of the pH meter in effluent tank No. 2 in the "[illegible]" Building were cleaned.

The pH electrodes and the cell of Clarifloculator A in the "[illegible]" Building were cleaned with .1 normal hydrochloric acid.

Panels were assembled and installed for the cylinder temperature [illegible] cators of the two emergency power Diesels in the "[illegible]" Building. The indicators used were Brown Pyrometers with a 0-800°C. scale. For this installation, a calibration chart between 200°C. and 400°C. with conversion tables to Fahrenheit is to be made with data already obtained. The indicators are used with the Iron-Constantan thermocouples mounted in the cylinder heads, and are connected to the thermocouples with No. 24 Iron-Constantan Duplex wire. One installation is completely finished, the other has yet to be tested.

A Pirani gauge was repaired and checked using two resistance boxes instead of tubes, as currently used.

Group 12 W. L. Mead, [illegible] Dean, E. C. Noelzle, and [illegible] L. Zinn

A manual plating control for Group 17 has been completed. This [illegible] consisted of an 18-inch by 18-inch bakelite panel upon which was mounted the

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