De Halford

16th May, 1961 NI/61/8

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GOVERNING BOARD

Progress at the Rutherford Laboratory

Note by T. G. Pickavance

1. Proton Linear Accelerator

The two-shift schedule, initiated at the time of the last Board meeting, has been maintained and the reliability of the machine has continued to improve.

A double-focusing magnetic spectrograph is being designed in a joint effort between A.W.R.E., King's College, London, and the Rutherford Laboratory, in consultation with other visiting teams.

Construction of the building extension has been started.

2. Nimrod

Installation of coil conductors, with end and water connections, has been completed on two octants. Significant movements of the magnet monolith were detected as the earth mounding was completed, but these can be corrected without difficulty.

Faults have occurred on both 60 MVA alternators for the magnet power supply, during tests at the factory. These are being corrected by the manufacturer. The main rectifier transformers have been installed in the transformer yard.

All the drift tubes for the injector have been delivered. The machine is being finally assembled for beam trials.

The prototype outer vacuum vessel has been evacuated to a pressure of 2.10^{-6} mm Hg, which is far below the working pressure of this part of the equipment and represents a satisfactory leak rate for the whole vessel. This, together with the progress of technology at the factory, now gives the assurance that the vessels will perform satisfactorily. However, the correlation of the many leaks which were found in the prototype with the visible defects observed has confirmed that very high standards must be maintained during all stages of manufacture. Nearly all these leaks have been cured by a simple process, but we cannot be certain that this simple procedure will be satisfactory for long service in the machine. Attention is therefore being concentrated on rigorous standards during manufacture to reduce the number of defects, and on the development of more sophisticated repair techniques which can be applied to visible defects before the vessels leave the factory. The first repair techniques tried have been very difficult to apply, thus causing delay, and have also tended to cause unacceptable distortion of the laminate. A much simpler technique advocated by the contractor is unacceptable to the project group in view of the large number of defects at present occurring. An intermediate repair technique is now proposed by the contractor, and is being tested.

Although there is now good reason to believe that the manufacturer can produce vessels with a sufficiently low incidence of defects, the first "production" outer vessel is not satisfactory and has been rejected. We have also rejected several component parts intended for the second production vessel. The manufacturer is naturally anxious to achieve a high production rate, particularly as a fixed price contract has now been negotiated, but the project group are determined to see that a sufficiently high quality is maintained and are therefore in the position of slowing down the job despite the fact that the overall time scale of the machine is suffering as a result.

Further high level discussions have been held with the vacuum vessel contractor, which have resulted in closer integration of the Institute and Authority staff with the firm's production team. More Institute technical staff have been put in permanent residence at the factory, with a 3-shift coverage. The high level discussions will be renewed every two months.

3. Auxiliary equipment

The magnet for the National Hydrogen Bubble Chamber has been assembled under the supervision of the university team, and has been satisfactorily moved on its steel bed plates.

4. Administrative matters

Members will have seen from their copies of a paper to the Personnel Committee that I have had to ask for an increased complement for 1961/2. The allocation of complement is being very carefully controlled within the Laboratory.

Other Personnel Committee papers show that such staff matters as training schemes and joint consultation are receiving attention.

Some progress has been made in providing houses but a great deal remains to be done.

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