

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE
GOVERNING BOARD

Minutes of the meeting of the Governing Board held in the Board Room, Treasury Buildings, Whitehall, at 2.45 p.m. on Monday, April 20th, 1959.

Present:- Lord Bridges in the chair
Dr. R. Aitken
Professor P.M.S. Blackett
Sir John Cockcroft
Professor J. Diamond
Professor W. V. D. Hodge
Professor H. S. W. Massey
Sir Harry Melville
Sir James Mountford
Sir Donald Perrott
Dr. B. F. J. Schonland
Sir George Thomson
Professor D. H. Wilkinson
Dr. T. G. Pickavance
Dr. T. A. V. Willis (Secretary)

Apologies for absence were received from Mr. Gridley, Professor Mott and Professor Peierls.

1. Minutes of the last meeting

With the Board's approval, the Chairman signed the minutes of the first meeting of 1959. Several points arising from the minutes were discussed.

Minute 5 (University work at the Rutherford Laboratory)

It was agreed that the Institute and DSIR staff should consult together when there was doubt whether particular equipment should be financed by the DSIR or the Institute.

The Secretary asked for guidance on travelling and subsistence regulations for University visitors. The Board agreed that in general and where applicable, AEA regulations should be followed.

Minute 12 (Kiev Conference)

The Chairman said that there had been discussions with the Royal Society about the support of delegates to the high energy physics conference, now to be held in Kiev, not Moscow. It had been suggested that the Royal Society, helped by a grant from the Institute, should pay both travelling and subsistence allowances for all the University delegates. Professor Hodge, however, reported that the Royal Society had decided to limit their action to paying the travelling expenses of seven delegates, pending discussions of the whole question between their treasurer, Sir William Penney, and the Treasury.

The Board instructed the Secretary to keep in touch with the Royal Society and authorised the Chairman to decide on the proper action.

2. The 7 GeV proton synchrotron The Board were favourably impressed with the suggested name NIMROD, but there was a request for a little time to consider it before approval.

Dr. Pickavance summarised the progress:-

- 2.1 Magnet The machining of magnet sectors has only reached a rate of

3 per week as yet, owing to unexpected temperature effects during machining. The number of sectors delivered to date is 20 instead of 60 as planned. Vigorous action has been taken to overcome the difficulty, and it is now believed that deliveries will rise to 6 per week by the end of May and that the completion date will not be delayed.

- 2.2 Magnet Power Supply Messrs. English Electric have completed 90% of their working drawings, and are at present heat treating the heavy forgings. They are ahead of programme on all items of their contract. Messrs. Brown Boveri are not so obviously ahead, but they themselves are very confident. Several excitrons, which are the heart of their equipment, have been tested for type-approval, with complete success.
- 2.3 Vacuum vessel The contract has been placed with Marston Excelsior. Under it, the first sector will be made at cost plus a fixed fee, and the eight production sectors at a fixed price.
- 2.4 Injector The 650,000 volt generator has been delivered and is being erected. The linear accelerator vacuum vessel (Babcock and Wilcox) and the RF Liner (London Aluminium Co) are up to programme. The drift tubes are designed and ready to go out to tender.
- 2.5 Buildings The concreting of the magnet hall roof is going very well. The control building is about finished. The experimental area is nearly all roofed. In general, the accelerator buildings are still 5-6 weeks behind programme, but the laboratory and office buildings are up to time.
- 2.6 Phase II Buildings The scheme has now been approved by the Treasury, and instructions have been given to the architects to begin detailed designs.

3. Recommendations by the Physics Committee

Sir John Cockcroft introduced paper NI (59) 5, summarising the recommendations of the Physics Committee at their meeting on March 18th.

3.1 Accelerator Development Projects

Sir John said that the Physics Committee saw great importance in colliding beam techniques, and therefore recommended

- (a) that a small amount of work on a double storage ring system for electrons should be started at the Rutherford Laboratory with existing staff
- (b) that the Institute should place a contract with Vickers Research Ltd., supporting their work on the design of electron linear accelerators to the extent of £10,000 per year for two years.

These proposals were supported by several members. In reply to the question why Vickers Research should be chosen, Dr. Pickavance said that this firm had made considerable progress hitherto as a private initiative. Their board would be much more inclined to continue and extend the work if given a little support. The extra effort might be greater than that actually paid for. It was agreed that the contract should be carefully devised to have the intended effect.

ACTION 1 The Board gave general approval to the recommendations (a) and (b) in the above sub-paragraph 3.1

3.2 Technical Assistance for Accelerator Projects at Universities

Sir John recalled that the AEA had given assistance in the design of a number of University accelerators in the past. The Authority thought that these activities were now more appropriate to the Institute, and a decision in principle by the Institute was sought. As an example, the Van der Graaf group at Harwell, after completing their present task,

might go on to design an accelerator for Cambridge, If so, the 14 men involved should move to the Institute. Other AERE groups might be similarly affected: for example assistance with the Manchester heavy ion accelerator might be required.

Dr. Schonland said that he thought the group should in the first instance be seconded to the technical control of the Director, Rutherford Laboratory.

The Committee agreed that what was under discussion was assistance in the design and construction stage. The operating stage was not affected and would still be dealt with under the "Hale formula", which lays down the division of expenditure of this kind between the DSIR and the Universities general funds.

ACTION 2 The Board approved in principle the proposal that the Institute should give technical assistance to Universities in the design of accelerators.

3.3 Bubble Chamber proposals

Sir Harry Melville and other members said that the proposed propane and heavy liquid bubble chamber was a project more appropriate for the Institute to sponsor than the DSIR. Sir John Cockcroft said that the Physics Committee would be considering whether or not to recommend the proposal later, when they had full details before them.

ACTION 3 The Board agreed that the proposal for the propane and heavy liquid bubble chamber should be submitted in due course to the Institute, through the Physics Committee.

3.4 Maintenance of the large National Hydrogen bubble chamber

It was agreed that the cost of maintenance of the large hydrogen bubble chamber would fall on the Institute when the chamber has been returned from CERN to the Rutherford Laboratory. It was also realised that some expense would fall on the Institute during the initial erection of the chamber at the Rutherford Laboratory. The Secretary said that the Treasury had asked that this latter expense if it arose, should be distinguished and separately totalled, since they were troubled that there should be two routes for money going into the bubble chamber project; through the DSIR and through the Institute.

3.5 Membership of the Physics Committee

Sir John Cockcroft said that the Physics Committee recommended re-organisation of their membership and that it should be made identical to that of the DSIR Nuclear Physics Sub-Committee.

Professor Blackett said that the DSIR Committee was now going to be drastically reduced in numbers, probably to six. There was considerable discussion of the functions of the committee, with general agreement that one representative advisory body of nuclear physicists was required to advise both the DSIR and the Institute on priorities, but that each body might choose a smaller group for the purpose of recommending grants.

Sir John Cockcroft agreed to consider the matter further and to make a definite proposal at a future meeting.

4. Recommendations of the Research Reactor Committee

Sir John Cockcroft said that the Research Reactor Committee had reviewed the replies from universities to the enquiry about their present interest in using reactors. They considered that 70% of the work could be

done in low-powered reactors, while the remainder required very expensive high-flux reactors and should be done in existing AEA reactors.

The Research Reactor Committee recommended:

- (a) That the Institute should appoint a liaison officer to make arrangements with AERE on behalf of University users, and should also study with the AERE what chemical laboratory accommodation at the Rutherford Laboratory (if any) is desirable for the use of these visitors.
- (b) At least seven applications have been, or are being made by Universities for low-power reactors of a capital cost of about £125,000 each (including buildings but excluding the capital cost of the fuel) and an annual running cost of about £20,000 (including fuel hire). It is recommended that the Institute, the UGC and the DSIR should together consider what body is most suitable to deal with proposals for such reactors, to handle their finance and manage them.

Recommendation (a) was accepted by the Board. Dr. Schonland undertook to find a suitable liaison officer from AERE staff, and also to help with the consideration of laboratory space requirements.

There was a general discussion of recommendation (b), during which the following points were made as having some bearing on the important issue of responsibility:-

- (i) The capital and operating costs are in the range provided for in the scheme for support of "large machines" by the DSIR. From this point of view the DSIR machinery is perfectly appropriate. Perhaps a way can be found of meeting the safety requirements under this scheme.
- (ii) Finance is a part of management, and the more fundamental question therefore is how the reactors should be managed.
- (iii) Safety considerations may make it desirable to have the reactors on Institute sites and operated by Institute operators. However, the AEA reactor safety Committee have not yet made known their recommendations on this type of reactor.
- (iv) Experience in the technology involved is also more readily available to the Institute through their close association with the AEA than to the DSIR.
- (v) It will be necessary in most cases for two or more Universities to combine together in a reactor project. This would strengthen the case for Institute management.
- (vi) Institute management if required should extend to safety and operations only. The research and teaching programme should be a University responsibility.
- (vii) If the reactor was in a University, not on a separate site, Institute management might be an embarrassment, owing to the rates of pay being different from University rates.
- (viii) The Director, Rutherford Laboratory should not be saddled with responsibility for management of reactors about the country, unless it is really necessary. It may be that the requirements of the Nuclear Installations (Licensing and Insurance) act adequately cover the safety point without having to bring in the Institute.

The Board agreed to consider the matter again when the recommendations of the reactor safety committee on the Argonaut type reactor were known, and preferably after the recommended discussion between

representatives of the Institute, the DSIR and the UGC.

5. Staffing Policy at the Rutherford Laboratory

The Chairman introduced paper NI (59) 6 and the addendum drawing attention to the changed situation as compared with the original expectation.

Dr. Schonland said that the anticipated number at the Rutherford Laboratory had greatly increased, but he expected it to double again. He thought the proposal to employ a broadly based community of their own staff was essential, if the Institute were not to be held up by inability of the AEA to support their needs. There was general agreement on this point, and on the need for a measure of interchangeability of staff with the AEA, to improve career opportunities.

The Board reiterated their desire not to employ research physicists on a career basis and they recognised some difficulty in drawing the distinction between research physicists in this sense and some of the physicists whom they would be employing under the present proposals.

ACTION 4 The Board generally approved the proposals in paper NI (59) 6, and asked Dr. Pickavance to form a small committee with the Secretary and a representative of the AERE to prepare detailed plans, including proposals for the administrative organisation, and proposals for a pension scheme.

6. Research and Development Contract

ACTION 5 The Board considered paper NI (59) 7, and approved the recommendation that they should where possible put research and development out to Universities and Industry on agreement or contract.

7. Next Meeting

The date of the next meeting was not fixed.

April 20th, 1959.

J. A. V. Willis
Secretary

Distribution:-

Lord Bridges	Dr. R. Aitken
Sir James Mountford	Professor N.F.Mott
Professor Massey	Professor J. Diamond
Professor R. Peierls	Professor D.H.Wilkinson
Sir George Thomson	Mr. J. Gridley
Professor Hodge	Sir Harry Melville
Professor Blackett	Sir John Cockcroft
Sir Donald Perrott	Dr. B.F.J.Schonland
Dr. T.G.Pickavance	Dr. J.A.V.Willis

For information:

Mr. P.J.Searby
Sir Keith Murray (2 copies)