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NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GENERAL PURPOSES COMMITTEE

INCOMING ELECTRICITY SUPPLY FOR THE RUTHERFORD LABORATORY

Note by Mr. P. Bowles

INTRODUCTION

The present supply is obtained from the main grid substation on the A.E.R.E. Harwell Site. In this substation are two 15 MVA transformers which supply the whole of A.E.R.E. load and part of the Rutherford Laboratory load. There is also a 20 MVA transformer which feeds direct to the Rutherford Laboratory for the Nimrod main power supply. Anticipated increases in demand by both A.E.R.E. and N.I.R.N.S. over the next few years as set out in Appendix I indicate that a considerable extension of available capacity from the Electricity Board will be required.

PROPOSED SCHEME

Joint discussions have taken place between A.E.R.E., S.W.O., the Electricity Board and N.I.R.N.S. As a result a scheme has been agreed in principle.

This briefly involves the provision by the Electricity Board of two 30 MVA 132/11 kV transformers together with the necessary cables and switchgear. In addition A.E.R.E. and N.I.R.N.S. will require new 11 kV switchgear, substations and cables.

The factors taken into consideration in arriving at the scheme are set out in Appendix II.

ESTIMATED COST

The Electricity Board will arrange for the necessary capital for the equipment they will provide but this will increase the annual service charge by an estimated £26,250 per annum. This charge will be shared between A.E.R.E. and N.I.R.N.S. on the basis of 1/5 of the capacity being available to A.E.R.E. and 4/5 to N.I.R.N.S.

The additional capital expenditure is estimated at approximately £100,000 and of this we might expect A.E.R.E. to contribute approximately 10%.

PROVISION IN ESTIMATES

The majority of the expenditure should arise in the financial year 1962/63 and provision will be made in the estimates for that year.

RECOMMENDATION

Approval is sought for the scheme in principle so that immediate authority can be given to the Electricity Board for them to proceed with their part as it appears their work will take the longest time.

Approval for actual expenditure will be submitted later when the detailed scheme has been agreed. The scheme is also being submitted to the A.E.R.E. Management Board for approval.

APPENDIX I

FORECAST FUTURE LOADINGS

Year	Total N.I.R.N.S. Load in MVA	Reason for increase of N.I.R.N.S. Load
1961-62	12	Commissioning of plant for Nimrod Bubble Chamber and P.L.A. additional laboratories, offices and workshops.
1962-63	21	Further commissioning of plant for Nimrod and Bubble Chambers, Restaurant and additional laboratories.
1963-64	29	Extension to Nimrod and P.L.A. involving beam handling. New projects such as chemists cyclotron.
1964-65	35	Probable extensions and new projects.
1965-66	40	Probable extension and new projects.

These figures show a build up of 20 M.V.A. for N.I.R.N.S. above the present available capacity over the next 5 years and A.E.R.E. would like to reserve a further 6 M.V.A. for future growth of their load.

APPENDIX II

APPRECIATION OF PROPOSED SCHEME

1. A.E.R.E. are unable to supply additional load to N.I.R.N.S. without prejudice to existing standards of reliability.
2. Central Electricity Generating Board require that any major change in supply should be good for at least the next five years.
3. Some of the additional load must have 100% standby supply and an alternative source of supply for the present 20 MVA transformer should be available in the event of failure.
4. It is physically impracticable to further extend A.E.R.E. substation No. 1. Therefore a new main substation is required and this should be located near to the main load centre which is on or adjacent to the N.I.R.N.S. Site. This would also cater for possible A.E.R.E. developments in the Dido area.
5. Due to the pulsed nature of the load on the 20 MVA transformer other requirements for stable supply must be kept separate.

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Circulation: To Members of the G.P.C.
To Members of the Governing Board for information.