

7th March, 1962

NI/GP/62/17

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GENERAL PURPOSES COMMITTEE

NIMROD BEAM TRANSPORT PLANT (PARASITIC AREA)

1. The initial provision of beam transport plant, at a cost of £1M., was approved following paper NI/GP/60/8. Paper NI/GP/61/4 presented more details of this scheme, including a breakdown of cost in terms of shielding and components. This breakdown is repeated in Appendix 1 of the present paper, together with commitments up to 1/2/62.
2. It has been pointed out frequently that requests for beam transport equipment may be expected to continue on a similar, substantial scale. A request for further equipment, primarily for use in the "parasitic area" of Nimrod, was anticipated in paper NI/GP/61/25 at a tentative cost of £334,000. The paper outlined the potential value of the parasitic area for nuclear physics experiments, and has already led to approval of building work and radiation shielding at a cost of £200,000.
3. Following recommendations of the Nimrod Study Group, detailed requirements for secondary particle beams in the parasitic area have been considered by the Nimrod Nuclear Physics Group, in consultation with prospective users of the machine. The following are typical beams which may be set up:-
 - (a) A 1.5 GeV/c separated K^- beam
 - (b) An intense 3 to 4 GeV/c π^+ (positive particle) beam
 - (c) A 1.0 GeV/c separated K^+ beam
 - (d) A 4 GeV/c π^- (negative particle) beamThe size of the parasitic area is such that a maximum of three such beams may be set up and used at any one time.
4. A list of beam transport equipment has been drawn up on the basis of the above studies, representing the minimum consistent with full exploitation of the parasitic area. The philosophy followed, as under the £1M. scheme, will be to work with the minimum number of different types of equipment, in order to obtain both economy and flexibility. Such equipment can be re-arranged to provide alternative beams, according to developments in nuclear physics requirements. (No attempt has been made to allow for "special" equipment of limited application, e.g. suited only to some specific experiment. Provision for this has been made under the headings "minor plant" and "beam handling plant - miscellaneous".)
5. An estimate of the cost of the equipment required, together with essential auxiliaries, is given in Appendix 2. The breakdown is in the same terms as in Appendix 1.

6. The cost breakdown in Appendix 2 includes a sum for power supplies. As a temporary expedient these power supplies will be housed within the parasitic area, but it is anticipated that proposals for a new power supply building will be submitted at some future time. These proposals will probably be delayed until other, wider problems of laboratory development have been clarified.
7. Approval is requested to proceed with provision of further beam transport equipment as specified in Appendix 1, at an additional cost of £400,000. Financial control would be in accordance with established procedures.

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APPENDIX I

Nimrod Beam Transport Plant: Initial Scheme

	<u>Estimate</u>	<u>Commitment</u>
Converter room extension	£5,000	-
Shielding	£125,000	£9,476
Extraction system	£45,000	£27,395
Power supplies	£175,000	£67,992
Cabling and cooling	£40,000	-
High voltage supplies	£60,000	£6,485
Quadrupole magnets	£140,000	£61,615*
Bending magnets	£60,000	£54,802
Particle separators	£130,000	£3,024
Vacuum plant and ancillaries	£80,000	-
	£860,000	£230,789
Contingencies	£140,000	-
	£1,000,000	£230,789

*Tender action for estimated £55,000 in hand

APPENDIX 2

Nimrod Beam Transport Plant: Present Scheme

	<u>Estimate</u>
Shielding	—*
Power supplies	£58,000
Cabling and cooling	£20,000
High voltage supplies	£32,000
Quadrupole magnets	£83,000
Bending magnets	£45,000
Particle separators	£60,000
Vacuum plant and ancillaries	£50,000
	£348,000
Contingencies	£52,000
	£400,000

*£125,000 for shielding is included in the parasitic
area extension scheme (NI/GP/61/25)