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IN CONFIDENCE

December 9th, 1960

NI/GP/60/47

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCEGENERAL PURPOSES COMMITTEENimrod Vacuum ChamberCovering note by the Secretary

The enclosed paper PSPC/P 78 submitted to the G.P.C. by Dr. Vick on behalf of the Nimrod Project Committee, reports a large increase in the estimated cost of Marston Excelsior's contract for the main vacuum chambers.

It may be helpful to add the following details of part of the estimate in paper NI/GP/60/19, which show where the figure of £841,000 quoted in paragraph 5 of the present paper comes from:-

	Estimate £	Contingency £	Total £
Main vacuum chambers: i.e. Marston Excelsior's contract plus specified small items estimated at £26,000	683,000	158,000	841,000
Other items of the vacuum system	566,000	85,000	651,000
Totals as in paper NI/GP/60/19	1,249,500	243,000	1,492,500
These sums are now included in the approved estimate.			

The increase in the estimated total cost will be more fully detailed at the next meeting, when it is hoped to have ready a request for approval of a fixed-price contract including both development and production.

In the mean time, it is necessary to ask urgently for approval of a further increase in the limit of liability on the development contract from £498,000 to £598,000.

Will Members be kind enough to let me know whether they approve this last proposal. If there are no objections, I will ask the Chairman whether he will give approval to it on behalf of the Committee.

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J. A. V. Willis
Secretary,
Rutherford High Energy Laboratory,
Harwell.

NIMROD PROJECT COMMITTEE

Nimrod Vacuum Chamber

1. At the last meeting of the General Purposes Committee formal approval was given to increase the limit of liability of the contract with Marston Excelsior by £100,000 to £498,000. This part of the contract covers:-
 - 1.1 Design and development costs
 - 1.2 Manufacture of a prototype comprising an inner, outer and header section
 - 1.3 Plant and tools for the production chamber

The above sum did not include for the manufacture of the production sections of the vacuum chamber.

It was pointed out to the Committee that the development and manufacture of the prototype sections was proving to be very difficult and protracted, and that the development work will have to continue until satisfactory prototype sections have been achieved. The Committee appreciated that due to these conditions the estimate of the final cost would be difficult, and asked to be kept informed at each subsequent meeting of the progress of the work and the financial implications.

2. In paper NI/GP/60/45 it was stated that the final cost could not be predicted at that stage but authority to transfer £100,000 from the contingency allowance was sought to allow development work to continue. It was known that this sum would be exhausted during late 1960 and steps were taken by the Project Group, and at our request, Marston Excelsior, to re-appraise the position and make independent estimates of the total costs of development and manufacture of the complete vacuum chamber. The results were as follows:-

Marston Excelsior's estimate	£1,054,000
Project Group's estimate	£1,350,000

3. The estimate provided by Marston Excelsior was given in good faith from the present state of knowledge, but discussions showed that this could not be put forward as a final cost because of the great amount of development work still required. Both parties appreciated that it was unsatisfactory to revise periodically the anticipated final costs and that it was desirable to get the contract on a fixed price basis. Marston Excelsior would have preferred to continue on a cost plus basis until a prototype and one production section of the outer, inner and header was completed. It was considered however by the Project Group that the incentive and discipline of a fixed price contract would then be absent and the result would be a higher final cost. Marston Excelsior were requested therefore to give a fixed price or if this were not possible to provide a ceiling figure within which the whole job would be completed: the final cost would then be settled by cost investigation.
4. Marston Excelsior have now put forward a fixed price of £1.2 million for the completion of the whole chamber. This price is dependent upon early agreement of a specification; the drafting of this is now in progress and will be discussed by both parties with a view to agreement during early January 1961.

5. The fixed price of £1.2 million is in excess of the sum of £841,000 (inclusive of contingency) included in the approved NIMROD estimate, prepared during January 1960. The figure does however compare favourably with the more recent estimate prepared by the Project Group based on the present knowledge of the problem and the factory costs involved. In preparing their estimate the Project Group made some allowance for future modifications which may arise from the uncompleted development work and possible remedial work on site after the sections have been vacuum tested. It is considered therefore that a 10% contingency figure should be added to the fixed price of £1.2 million.
6. Consideration will also be given to the overall NIMROD estimate to see whether it is possible to transfer any contingency sum initially intended to cover other items. The Project Group are seeking the advice of the Chief Finance Officer of the U.K.A.E.A. as to the best ways of overcoming the financial difficulties and a complete report will be submitted to the next meeting of the General Purposes Committee.
7. In the meantime it is essential to the programme to continue work at Marston Excelsiors and an immediate increase in the limit of liability of the development part of the contract is required. It is proposed that the limit should be increased by £100,000 to £598,000. At the present rate of expenditure this would last until about mid February 1961. In Appendix I is shown the present state of the development and manufacture of the vacuum chamber.
8. The Committee is requested to:-
 - 8.1 Approve an increase in the limit of liability of the development part of the contract by a further £100,000 to £598,000; this increase being met from the overall NIMROD machine contingency allowance.
 - 8.2 Note the fixed price of £1.2 million proposed by Marston Excelsior for the completion of the NIMROD Vacuum Chamber subject to agreement of the specification.
 - 8.3 Note that a 10% contingency allowance is proposed.

P. Bowles

9th December, 1960

Progress Statement on the NIMROD Vacuum Chamber

1. Outer Chamber

All the tools required for the production of the outer chamber have been delivered and tested and a prototype section has been manufactured. It is at present being inspected on the lofting table to check the dimensions and quality of the laminate. Delivery to site is expected by the end of December 1960. The vacuum testing of this prototype will be carried out on site and if this section proves to be of the required standard it will be installed in the machine. The manufacture of two of the eight remaining sections is in progress and all the requisite materials are available. Some difficulties are being experienced in producing laminates of uniform thickness, and steps in the chamber walls are occurring due to distortion of the moulding bed. It may be necessary to partially dismantle the bed and realign the tools if the difficulties cannot be overcome by production artifices at present being tested. The first production section should be delivered to site by the end of February 1961.

2. Inner Chamber

All the tools required for the production of the inner chamber have been delivered and tested and sample sides have been produced. Development work is continuing on the stainless steel lining and on the joining of the sample sides to produce the U-shaped chamber. A large amount of development work still appears necessary. The delivery of the prototype section is programmed for mid-March 1961.

3. Header Chamber

All tools for the standard header sections with the exception of the tools for the end flanges have been delivered. Installation of these tools is taking place and the most recently delivered ones are undergoing tool room inspection. The flange tools should be delivered by mid-December 1960. The tools for the five special header sections are at present being designed at Marston Excelsiors. Samples of the walls for the header chamber have been manufactured and these are being set up in a rig to carry out further development work on the technique of splicing these together to form a section of the chamber. There is still a large amount of development work necessary on this part of the vacuum chamber project. The delivery of the prototype section is programmed for late April 1961.