

3 February 1962

A/04/2
NI/62/2

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GOVERNING BOARD

Five-Year Financial Forecast - 1963/64 to 1967/68

Note by the Secretary

1. It has recently become apparent that far more attention will be paid, in future, to the annual "forward look" and the desirability of this is strongly supported in the Plowden Report, published in July 1961. It is proposed, therefore, to submit annually, for consideration by the Governing Board, the five-year forecasts of the National Institute.
2. As stated in Paper NI/61/22, the broad pattern of expenditure approved by the Treasury for planning purposes is not regarded as immutable in all respects and "the NIRNS would be free to propose changes in order to accommodate unforeseen items". For this reason, no attempt has been made to provide "global" sums for schemes not yet envisaged. Provision has, however, been made for schemes which are confidently expected to arise but about which little information is yet available, e.g. Nimrod Improvements and Capital Accelerator Development.
3. To conform to the new layout required by the United Kingdom Atomic Energy Authority in these forecasts and future annual estimates, a slight change has been made in the non-capital headings.
4. Shadow Cuts Experience shows that the expenditure forecast, based on the totals of individual schemes, is unlikely to be achieved, although no justification can be found for reducing any particular item. In addition, the underspend in any particular year is unlikely to be known before the following year's estimates have been submitted. The shadow cuts in the expenditure summary are the sums thought to be necessary to reduce the totals of the individual items to the actual amount likely to be spent.
5. Rutherford High Energy Laboratory
 - (1) As was apparent from the first paper comparing expenditure at CERN with the RHEL forecasts (NI/61/20), the key factor is the number of staff required. The Board decided on 18 September 1961 that a determined effort must be made to keep the Rutherford Laboratory complement, excluding Atlas, to 950 in the period under consideration (up to 1967). However, it is already clear that it will be necessary, during 1962, to ask for an increase in the present approved 1962 complement. In part, this is due to the policy recently established concerning the replacement of contract labour. This particular increase, which does not represent additional expenditure, will amount to 70 when the policy has been fully implemented, in several years' time. In addition, however, it will be necessary to ask for a nett increase in 1962/63 of about 80 complement. The request will be submitted after a very careful review, but for the purpose of this paper the number of staff in post at the end of March 1963 has been estimated at 900, although the present approved complement is only 835 (plus 20 margin for certain purposes). In future years the 70 replaced contract labour have been added to the 950.

It will obviously be difficult to hold the staff numbers at the Rutherford Laboratory to approximately 1,000 but a determined effort is being made and no increase is shown in the programme.

(2) The only major departure from the approved pattern concerns the research reactor. The present tentative proposal is that it should be a joint NIRNS/UKAEA project, the cost being shared equally between the two. Brief details of the scheme are:

- (a) total cost £6,000,000;
- (b) target approval date, March 1963;
- (c) target completion date, June 1968.

The additional expenditure arising from the above proposals is mainly offset by increases in the shadow cuts.

6. Electron Laboratory It will be noted that there is a small increase in non-capital expenditure compared with the forecast in Paper NI/61/22. This is due to more detailed consideration of the financial requirements.

7. Atlas Computer Laboratory No reliable figures are yet available for the rate of payments to Ferranti Ltd. Until a contract is signed, the progress or stage payments cannot be known and the maximum possible range of expenditure in 1962/63 is nil to £1,600,000. No precise forecasts can be made of the total amount and dates of the development contributions, since this depends on the number of orders placed for Atlas computers. The Treasury is aware of this situation and should not be surprised, therefore, if an application for a supplementary grant becomes necessary.

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

Summary of Financial Forecasts - 1963/64 to 1967/68

£ Million

	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68
Rutherford Laboratory Expenditure	6.52	5.96	5.72	5.65	5.91	6.47
Electron Laboratory Expenditure	.48	1.28	1.68	1.73	1.72	1.33
	7.00	7.24	7.40	7.38	7.63	7.80
Deduct shadow cut (proportion)	.60	.60	.60	.50	.50	.50
	6.40	6.64	6.80	6.88	7.13	7.30
Atlas Laboratory Expenditure	.60	1.85	1.46	1.17	.51	.53
Deduct shadow cut (proportion)	.20	.40	.10	.10	.10	.10
	.40	1.45	1.36	1.07	.41	.43
Total NIRNS expenditure after deducting shadow cuts	6.80	8.09	8.16	7.95	7.54	7.73
Deduct receipts	.11	.12	.23	.74	.74	.74
	6.69	7.97	7.93	7.21	6.80	6.99

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

Manpower Requirements

In post at 31 March	1962	1963	1964	1965	1966	1967	1968
<u>Rutherford Laboratory</u>							
Professional	257	320	370	370	370	370	370
Ancillary	300	350	400	400	400	400	400
Industrial	200	230	250	250	250	250	250
	757	900	1020	1020	1020	1020	1020
<u>Electron Laboratory</u>							
Professional	6	40	60	70	75	80	80
Ancillary	4	30	50	80	95	110	110
Industrial	-	30	40	50	55	60	60
	10	100	150	200	225	250	250
<u>Atlas Laboratory</u>							
Professional	2	8	20	25	30	32	34
Ancillary	2	7	7	17	17	20	22
Industrial	-	-	3	3	3	4	4
	4	15	30	45	50	56	60
<u>Summary</u>							
Professional	265	368	450	465	475	482	484
Ancillary	306	387	457	497	512	530	532
Industrial	200	260	293	303	308	314	314
	771	1015	1200	1265	1295	1326	1330

RUTHERFORD HIGH ENERGY LABORATORY

£ Million

Non-Capital Expenditure	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68
Salaries, Wages, etc.	.98	1.27	1.37	1.37	1.37	1.37
Administration Expenses	.07	.09	.10	.10	.10	.10
Stores, Materials and Services	1.77	1.72	1.82	1.89	1.94	1.99
EMR and Reactor Support	.08	.14	.16	.16	.16	.16
	2.90	3.22	3.45	3.52	3.57	3.62
Receipts	.11	.12	.08	.04	.04	.04
Summary						
Capital Expenditure	3.62	2.74	2.27	2.13	2.34	2.85
Non-Capital Expenditure	2.90	3.22	3.45	3.52	3.57	3.62
	6.52	5.96	5.72	5.65	5.91	6.47
Deduct Receipts - <u>Note 1</u>	.11	.12	.08	.04	.04	.04
Net Expenditure before Shadow Cut	6.41	5.84	5.64	5.61	5.87	6.43
Staff Numbers	1962	1963	1964	1965	1966	1967
Staff in post at 31 March	757	900	1020	1020	1020	1020

Note 1 - The higher amounts for receipts in the years 1962/63 to 1964/65 are due to the charges for the low energy cyclotron design to the UKAEA.

RUTHERFORD HIGH ENERGY LABORATORY - £ Million

Capital Expenditure	Est. Approval Date	Total Cost	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68
Nimrod	-	11.20	1.71	.87	.30			
Heavy Liquid Bubble Chamber	-	.42	.12	.10	.10	.06		
Beam Handling, Ph. I	-	1.00	.15	.20	.30	.34		
Building R.2 Extension	-	.21	.08	.10	.03			
Helium Bubble Chamber	-	.42	.02	.06	.12	.20	.01	
Orion Computer	-	.40	.26	.06				
Heavy Laboratory	-	.11	.07	.01				
Extension to PLA Buildings	-	.27	.11	.02				
Didcot Housing Scheme	-	.12	.06	.01				
Parasitic Area Extension	-	.20	.05	.07				
Beam Handling, Ph. II	1.3.62	.40			.07			
Nuclear Physics Apparatus	1.5.62	.50			.10	.25	.05	.20
2nd Main Nimrod Experimental Area	1.9.63	.25			.01	.05	.15	.24
Lecture Theatre	1.4.66	.10	.02	.05	.03			
Additional Office Accommodation	1.9.62	.20		.02	.10	.08		
Peach Croft Housing Scheme	1.6.63	.32	.10	.15	.07			
Accelerator Development	1.3.62	2.00				.02	.30	.30
Nimrod Improvement	1.4.65	.50				.01	.25	.15
Future Major Accelerator	1.4.66	20.00				.75	.01	.20
Research Reactor	1.4.63	3.00			.20	.55		.60
Laboratory and Office Block	-	.09	.06	.02				
Nimrod Spares	-	-	.07	.05	.07			
Experimental Area Extension	-	.07	.03	.04				
Track Analysis Equipment	-	-	.05	.02	.02	.02	.02	.02
Site Services and Roads	-	-	.10	.10	.08	.02	.02	.02
PLA Analysing Magnets	-	.08	.06	.02				
Beam Handling - misc.	-	-					.15	.30
NP Apparatus - misc.	-	-	.05	.07	.10	.10	.10	.30
Helium Liquefier	1.9.62	.06	.02	.04				
PLA Improvements, including building	-	-	.02	.08	.06	.01		
Cooling Towers Extension	1.4.63	.05		.03	.02			
W/S and Remote Test Building	1.4.63	.08		.05	.03			
Auxiliary Building for Nimrod Physics	1.4.63	.05		.03	.02			
Model Accelerators	-	-	.01	.02	.01			
Safety Store and First Aid Post	1.4.63	.03		.02	.01			
Minor Works	-	-	.05	.06	.02	.02	.02	.02
Minor Plant	-	-	.35	.37	.40	.40	.50	.50
	-	-	3.62	2.74	2.27	2.13	2.34	2.85

ELECTRON LABORATORY

£ Million

	Est. Approval Date	Total Cost	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68
<u>Capital Expenditure</u>								
Electron Synchrotron (including Buildings)		3.12	.20	.73	.95	.75	.49	.15
External Electron Beam	1.4.65	.30					.15	.20
Physics Apparatus		-			.01	.13	.14	.08
Minor Schemes and Plant		-	.05	.10	.10	.08	.08	.08
			.25	.83	1.06	.96	.86	.43
<u>Non-Capital Expenditure</u>								
Salaries, Wages, etc.			.12	.16	.23	.29	.33	.35
Administration Expenses			.01	.03	.03	.04	.04	.04
Stores, Materials and Services			.07	.23	.32	.39	.44	.46
EMR			.03	.03	.04	.05	.05	.05
			.23	.45	.62	.77	.86	.90
<u>Receipts</u>								
			-	-	-	-	-	-
<u>Summary</u>								
Capital Expenditure			.25	.83	1.06	.96	.86	.43
Non-Capital Expenditure			.23	.45	.62	.77	.86	.90
Net Expenditure before Shadow Cut			.48	1.28	1.68	1.73	1.72	1.33
<u>Staff Numbers</u>								
			1962	1963	1964	1965	1966	1967
Staff in post at 31 March			10	100	150	200	225	250

ATLAS COMPUTER LABORATORY

£ Million

	Est. Approval Date	Total Cost	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68
<u>Capital Expenditure</u>								
Computer (including development and buildings)		3.33	.31	1.34*	.99*	.69*		
Additional Store, etc.	1.4.64	-			.10	.20	.20	.20
Computer Replacement	1.4.64	5.00						.01
Minor Schemes and Plant		-		.01	.01	.03	.04	.04
			.31	1.35	1.10	.92	.24	.25
<u>Non-Capital Expenditure</u>								
Salaries, Wages, etc.			.01	.03	.06	.07	.08	.09
Administration Expenses			-	.01	.01	.02	.02	.02
Stores, Materials and Services			.03	.06	.09	.14	.15	.15
EMR and University Support			.25	.40	.20	.02	.02	.02
			.29	.50	.36	.25	.27	.28
Receipts					.15	.70	.70	.70
<u>Summary</u>								
Capital Expenditure			.31	1.35	1.10	.92	.24	.25
Non-Capital Expenditure			.29	.50	.36	.25	.27	.28
Deduct Receipts			.60	1.85	1.46	1.17	.51	.53
					.15	.70	.70	.70
Net Expenditure before Shadow Cut			.60	1.85	1.31	.47	.19**	.17**
<u>Staff Numbers</u>								
Staff in post at 31 March			1962	1963	1964	1965	1966	1967
			4	15	30	45	50	56

* Provision has been made for an annual development payment of £140,000

** Ringed figures are net receipts

Dr. G. H. Stafford

20th March, 1962.

ADDENDUM
to NI/62/2

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GOVERNING BOARD

Five Year Forecast - 1963/⁶⁴~~67~~ to 1967/68

Note by the Secretary

As instructed by the Governing Board on 9th March, I have made certain amendments to the five-year forecast, and have also attached a note bringing out the three points which the Board wished to be made. A copy is attached.

This forecast and covering letter have now been submitted to the A.E.A. Finance Branch. If any Member has further observations to make, however, it would still be possible for me to submit a further amendment.

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

20th March, 1962.

Mr. H. J. Millen,
U.K.A.E.A.,
11, Charles II Street,
London, S.W.1.

16th March, 1962.

Dear Millen,

Five Year Forecast 1963/64 to 1967/68

I enclose the National Institute five-year forecast set out in the pattern requested. It has been approved by the Governing Board on the basis of paper NI/62/2 subject to certain amendments and subject to the following points.

1. The forecast does not take any account of unforeseen developments which may require very large sums of money. The unknown effect of a breakthrough is common to all organisations particularly when engaged on basic research and in this case the Treasury have agreed that "the NIRNS would be free to propose changes in order to accommodate unforeseen items".
2. The forecast is based on present prices and no account has been taken of the possible effects of future inflation.
3. The forecast shows that the desirable rate of progress has been retarded to conform to the restricted expenditure pattern which was virtually imposed on the NIRNS towards the end of 1961. Clearly every possible effort must be made to use the Institute facilities to the maximum extent and to achieve this, schemes must be accelerated as soon as economic conditions permit the present restrictions to be eased. The increase in expenditure in 1967/68 therefore represents the latest time at which making up the leeway should be started.

Yours sincerely,

(Signed) Ambrose Miller

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

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	6.40	6.64	6.80	6.90	7.17	7.86
Atlas Laboratory Expenditure	.60	1.85	1.46	1.17	.51	.53
Deduct shadow cut (proportion)	.20	.40	.10	.10	.10	.10
	.40	1.45	1.36	1.07	.41	.43
Total NIRNS expenditure after deducting shadow cuts	6.80	8.09	8.16	7.97	7.58	8.29
Deduct receipts	.11	.12	.23	.74	.74	.74
	6.69	7.97	7.93	7.23	6.84	7.55