

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCEGENERAL PURPOSES COMMITTEERevised 5-year financial forecast 1963/64 to 1967/68Prepared by A. Miller

1. At the request of the Treasury, the five-year forecast of expenditure considered by the Governing Board on the 9th March 1962 has been brought up to date and is submitted for approval.

The forecast is shown to correspond with the 2% p.a. rate of increase on currently approved schemes for research in nuclear physics which the Minister for Science set when approving the Electron Laboratory. Over the five year period the present figures show a small increase over the previous forecast after adjusting for changing price levels. However, this increase is very small compared with the cut accepted by the N.I.R.N.S. in September 1961.

Agreement has still not been reached with the Treasury on the meaning of "2% p.a. from the present level" referred to in the Minister's letter, but there are very strong arguments for the base figure of £6.5M (less reactor support of £80,000) used in this paper.

It must also be emphasised that we are dealing with forecasts and not with a five year budget. This is supported by the Minister's assurance that we can seek additional funds if there is a major new scientific development not foreseen when the programme was planned and also by his leaving open the question of new projects foreseen but not yet approved which are referred to below. Further, it is apparent that the cost of carrying out the approved programme in this field cannot be accurately assessed several years ahead.

2. In accordance with the Minister's letter, the programme comparisons exclude Atlas expenditure. The cost of the support of research in reactors has also been excluded since it was recognised by the Cockcroft Committee to be a separate matter from nuclear physics. The £80,000 p.a. shown in the earlier paper is now thought to be inadequate and £150,000 p.a. is proposed.

3. There are four projects in the present programme each with substantial expenditure at the end of the five-year period which are not, by Treasury standards, committed in principle. They are:-

<u>£M</u>	<u>1965/66</u>	<u>1966/67</u>	<u>1967/68</u>
Accelerator Development	.02	.30	.50
Nimrod Improvement	.01	.25	.15
Future Major Accelerator		.01	.30
Research Reactor		.01	.10
	<u>.03</u>	<u>.57</u>	<u>1.05</u>

In view of the Minister's comment in his letter of the 13th July 1962 the cost of these projects has been deducted to enable comparisons of totals to be made. It is not perfectly clear how the Minister's figure of £800,000 was arrived at, but the intention is clear and this has been followed.

4. The comparison of the forecast in paper NI/62/2 (as amended) and the present forecast is set out below together with the calculation of the likely pattern of annual grants.

<u>£M</u>	<u>1963/4</u>	<u>1964/5</u>	<u>1965/6</u>	<u>1966/7</u>	<u>1967/8</u>	<u>5-year Total</u>
(a) <u>Paper NI/62/2</u>						
R.H.E.L. and E.L.	6.64	6.80	6.90	7.17	7.86	
Deduct: Expenditure on reactor programme	.08	.08	.08	.08	.08	
Expenditure on new large projects not yet approved			.03	.57	1.05	
	6.56	6.72	6.79	6.52	6.73	
Add Increase in costs since last review based on 1961/2 prices ($4\frac{1}{2}\%$) ...	.30	.30	.31	.30	.30	
Programme at 1962/3 prices	6.86	7.02	7.10	6.82	7.03	34.83
(b) <u>Present Forecast (Schedule 1)</u>						
Deduct: Expenditure on reactor programme	.15	.15	.15	.15	.15	
Expenditure on new large projects not yet approved			.03	.57	1.05	
Current Review	6.84	7.08	6.94	7.22	7.53	35.61
(c) <u>Anticipated Grants</u>						
Base (previous year)	6.42	6.55	6.68	6.81	6.95	
Add 2%	.13	.13	.13	.14	.14	
	6.55	6.68	6.81	6.95	7.09	
Add price etc. increase 1961/62 to 1962/63 ($4\frac{1}{2}\%$)	.29	.30	.31	.31	.32	
	6.84	6.98	7.12	7.26	7.41	35.61

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCESummary of Financial Forecasts - 1963/64 to 1967/68£ Million

	1962/3	1963/4	1964/5	1965/6	1966/7	1967/8
Rutherford Laboratory Expenditure (Schedule 2)	6.22	6.51	6.18	5.70	6.12	7.03
Electron Laboratory Expenditure (Schedule 3)	.13	1.08	1.55	1.72	1.82	1.70
	6.35	7.59	7.73	7.42	7.94	8.73
Deduct shadow cut	-	.60	.50	.30	-	-
	6.35	6.99	7.23	7.12	7.94	8.73
Atlas Laboratory Expenditure (Schedule 4)	.93	1.53	1.52	1.01	.59	.71
Total NIRNS expenditure after deducting shadow cut	7.28	8.52	8.75	8.13	8.53	9.44
Deduct receipts	.11	.12	.23	.74	.74	.74
	7.17	8.40	8.52	7.39	7.79	8.70

RUTHERFORD HIGH ENERGY LABORATORY

£Million

Non-Capital Expenditure	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68
Salaries, Wages, etc.	1.00	1.27	1.39	1.41	1.43	1.45
Administration Expenses	.08	.13	.15	.16	.16	.16
Stores, Materials and Services	1.82	1.86	2.10	2.20	2.25	2.30
EMR	.07	.08	.10	.10	.10	.10
Reactor Support	.03	.11	.11	.11	.11	.11
	3.00	3.45	3.85	3.98	4.05	4.12
Less costs attributable to Atlas Laboratory	.01	.06	.08	.10	.12	.14
	2.99	3.39	3.77	3.88	3.93	3.98
Receipts	.11	.12	.08	.04	.04	.04
Summary						
Capital Expenditure (Schedule 2, sheet 2)	3.23	3.12	2.41	1.82	2.19	3.05
Non-Capital Expenditure	2.99	3.39	3.77	3.88	3.93	3.98
	6.22	6.51	6.48	5.70	6.12	7.03
Deduct Receipts - Note 1	.11	.12	.08	.04	.04	.04
Net Expenditure before Shadow Cut	6.11	6.39	6.10	5.66	6.08	6.99
Staff Numbers	1962	1963	1964	1965	1966	1967
Staff in post at 31st March	757	900	1022	1022	1022	1022

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

N.I.R.N.S.

Schedule 2
Sheet 2

Capital Expenditure	Est. Approval Date	Total Cost	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68
Nimrod	-	11.40	1.41	.67	.30	.15		
Heavy Liquid Bubble Chamber	-	.43	.10	.13	.15			
Beam Handling, Phase I	-	1.04	.26	.39	.25	.13		
Building R.2 Extension	-	.21	.07	.10	.03			
Helium Bubble Chamber	-	.44	.02	.10	.12	.18	.02	
Orion Computer	-	.40	.22	.15				
Heavy Laboratory	-	.11	.06	.05				
Extension to PLA Buildings	-	.27	.07	.03				
Didcot Housing Scheme	-	.12	.06					
Parasitic Area Extension	-	.21	.03	.13	.04			
Beam Handling, Phase II	1.10.62.	.42	-	.03	.10	.10	.18	.34
Nuclear Physics Apparatus	1. 9.63.	.73	-	.01	.15	.15	.15	.20
2nd Main Nimrod Experimental Area	1. 4.66.	.29	-		.01		.05	
Lecture Theatre	1.10.62.	.05	.02	.02	.01			
Abingdon & Chilton Housing Scheme	-	.22	.01	.10	.08	.03	.30	.50
Accelerator Development	1. 4.65.	2.10	-		.02	.02	.25	.15
Nimrod Improvement	1. 4.65.	.52	-		.01	.01	.01	.30
Future Major Accelerator	1. 4.66.	21.00	-				.01	.10
Research Reactor	1. 4.63.	3.14	-					
Extension to Building R.25 Offices	1. 4.63.	.08	-	.06	.02			
Electronics Building	1. 4.63.	.12	-	.05	.07			
Nimrod Spares	-	-	.07	.06	.04			
Roofing Hardstanding	-	.07	.04	.02			.10	.20
Track Analysis Equipment	-	-	.04	.04	.05	.07	.02	.02
Site Services and Roads	-	-	.10	.06	.04	.02		
PLA Analysing Magnets	-	.08	.01	.06	.01	.10	.25	.30
Beam Handling - misc.	-	-	-	.01	.05	.10	.20	.30
NP Apparatus - misc.	-	-	-	.07	.10	.10		
Helium Liquefier	1. 1.63.	.06	-	.02	.04	.10	.01	
PLA Improvements, including buildings	-	-	-	.03	.08			
Cooling Towers Extension	1. 4.63.	.05	-	.02	.03			
W/S and Remote Test Building	1. 1.63.	.09	-	.02	.07			
Auxiliary Building for Nimrod Physics	1. 4.63.	.10	-	.02	.07	.01		
Safety Store and First Aid Post	1. 4.63.	.03	-	.01	.02		.04	.04
Minor Works	-	-	.13	.14	.06	.05	.60	.60
Minor Plant	-	-	.51	.52	.57			
	-	-	3.23	3.12	2.41	1.82	2.19	3.05

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)		3.27	.02	.60	.80	.80	.60	.30
External Electron Beam	1.4.65.	.31			.01	.01	.14	.15
Physics Apparatus	-	-			.01	.03	.14	.20
Minor Schemes and Plant	-	-	.01	.11	.18	.18	.14	.14
			.03	.71	.99	1.02	1.02	.79
<u>Non-Capital Expenditure</u>								
Salaries, Wages, etc.			.04	.16	.24	.30	.35	.40
Administration Expenses			.01	.02	.03	.04	.05	.06
Stores, Materials and Services			.03	.16	.25	.31	.35	.40
EMR			.02	.03	.04	.05	.05	.05
			.10	.37	.56	.70	.80	.91
<u>Receipts</u>			-	-	-	-	-	-
<u>Summary</u>								
Capital Expenditure			.03	.71	.99	1.02	1.02	.79
Non-Capital Expenditure			.10	.37	.56	.70	.80	.91
Net Expenditure before Shadow Cut			.13	1.08	1.55	1.72	1.82	1.70
<u>Staff Numbers</u>								
			1963	1964	1965	1966	1967	
Staff in post at 31 March			100	143	183	204	240	

ATLAS COMPUTER LABORATORY
£ Million

	Est. Approval Date	Total Cost	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68
Capital Expenditure								
Computer (including development and buildings)		3.33	.81	.94*	1.01*	.54*	.04	.20
New Computer Store, etc.	1.4.64.	-				.06	.09	.01
Computer Replacement	1.4.64.	5.00		.02	.02	.03	.04	.04
Minor Schemes and Plant		-						
			.81	.96	1.03	.63	.17	.25
Non-Capital Expenditure								
Salaries, Wages, etc.			.01	.04	.06	.07	.08	.09
Administration Expenses			.01	.01	.01	.02	.02	.03
Stores, Materials and Services			.02	.06	.09	.14	.15	.15
EMR			.02	.05	.05	.05	.05	.05
University Computer Support			.05	.35	.20			
Rutherford Laboratory overheads			.01	.06	.08	.10	.12	.14
			.12	.57	.49	.38	.42	.46
Receipts					.15	.70	.70	.70
Summary								
Capital Expenditure			.81	.96	1.03	.63	.17	.25
Non-Capital Expenditure			.12	.57	.49	.38	.42	.46
Deduct Receipts			.93	1.53	1.52	1.01	.59	.71
					.15	.70	.70	.70
Net Expenditure			.93	1.53	1.37	.31	(.11)**	.01
Staff Numbers			1962	1963	1964	1965	1966	1967
Staff in post at 31 March			4	26	39	49	55	60

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

** Ringed figure is a net receipt.

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

<u>In Post - 31st March</u>		<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
<u>R.H.E.L.</u>	Professional	257	309	370	370	370	370
	Ancillary	300	339	400	400	400	400
	Industrial	200	252	252	252	252	252
		757	900	1022	1022	1022	1022
<u>E.L.</u>	Professional	-	40	53	65	70	80
	Ancillary	-	30	50	70	82	100
	Industrial	-	30	40	48	52	60
		-	100	143	183	204	240
<u>ATLAS</u>	Professional	2	9	13	19	23	26
	Ancillary	2	17	23	27	29	31
	Industrial	-	-	3	3	3	3
		4	26	39	49	55	60
<u>TOTAL</u>	Professional	259	358	436	454	463	476
	Ancillary	302	386	473	497	511	531
	Industrial	200	282	295	303	307	315
		761	1026	1204	1254	1281	1322