

27th January, 1964.

NI/GP/64/2

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GENERAL PURPOSES COMMITTEE

Five Year Forecast of Staff Numbers and Expenditure 1965/70

Note by Finance Officer

Introduction

1. The Five Year Forecast prepared in May, 1963 (NI/GP/63/10) was not endorsed by the Minister for Science but, later in the year, he accepted slightly revised figures over the four years 1964/68. The 1965/70 Forecast set out in the enclosed Tables compares with these earlier figures as follows:-

	1964/5	1965/6	1966/7	1967/8	1968/9	1969/70
	£M	£M	£M	£M	£M	£M
Current Forecast	9.85	11.19	14.00	14.23	14.05	13.66
1964/69 Forecast	9.7	9.8	10.6	10.6	13.5	-
Current Forecast (excl. Atlas)	8.20	9.92	12.86	13.23	13.25	12.78
Planning figures accepted by Minister (Atlas excluded)	8.21	8.99	9.28	9.02	-	-

2. The Directors recognise that the substantial sums by which the new forecast exceeds the Minister's planning figures make it unlikely that the new forecast will be approved in full. They do not, however, consider that this should affect the assessment of the developments needed to enable the U.K. to continue to play a leading role in nuclear and high energy physics research, or the estimation of the resulting cost.
3. The chief reasons for the difference between the Minister's planning figures and the current forecast are:-
- (a) Provision has been made for an expansion of the Rutherford programme to meet needs arising from the expected expansion of the universities following the Robbins Report (see NI/GP/64/3).
- (b) The Nuclear Structure Laboratory, housing a large electrostatic generator, has been reinstated in the forecast. The expected expenditure is significantly above earlier forecasts as a result of a report to D.S.I.R.
- (c) Provision has been made following discussions in the Physics Committee (NI/PC/63/2) for a large computer (costing £1.75M) for Nuclear Physics work. As a consequential only token provision has been made in the Atlas Computer Laboratory Forecast for extension of the N.I.R.N.S. Atlas. (The Atlas Forecast, however, has not yet been approved by the Atlas Computer Committee).
- (d) Delay in acquisition of the Daresbury site has led to a slippage of capital expenditure at D.N.P.L. Allowing for reinstatement of the 1964/65 shadow cut, the differences are a reduction of £.08M in 1965/66 and increases of £.55M and £.19M in 1966/67 and 1967/68 respectively. In addition, some increases have been made in D.N.P.L. non-capital expenditure in the light of R.H.E.L. experience.

(e) Offsetting these increases, the major extension of the P.L.A. has been dropped from the Forecast. In addition, owing to the state of discussions with European countries, no more than token provision has been made for the major new U.K. accelerator, and no provision has been made for the Research Reactor.

Shadow Cuts

4. The Director, R.H.E.L. considers that his agreed share of the 1964/65 shadow cut must be taken as a firm planning cut in view of the very small amount of new capital provided in that year. This cut (£.25M) has been therefore incorporated in the R.H.E.L. 1964/65 figure throughout the forecast. The Director emphasises that £6.25M is not a satisfactory figure within which to plan the Laboratory's work.
5. To simplify presentation, the inescapable 1964/65 shadow cut of £.21M allocated to the Daresbury Laboratory has similarly been carried into the expenditure figure for D.N.P.L. in the Expenditure Summary (Table 1) and has been reinstated in 1966/67. The other shadow cuts, applying partly to the new capital expenditure in the existing nuclear physics programme and partly to the additional programme broadly follow the pattern set in the first draft of the 1964/69 Forecast (NI/63/4), with adjustments to allow for the increased level of expenditure proposed and for the cumulative effect of shadow cuts on major projects spread over a number of years.

Rutherford Laboratory Forecast (Tables 3A - C)

6. The form of Forecast for presentation to the G.P.C. and Governing Board has been revised to reflect the setting up of the new divisional organisation at the Laboratory, which is essentially on a functional basis. The new form will facilitate comparisons of the Adams/Cassels type with other nuclear research laboratories.

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Table 1

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

Five Year Financial Forecast 1965/1970

(Expenditure Summary)

	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70
<u>Present nuclear physics programme</u>	£000	£000	£000	£000	£000	£000
Rutherford Laboratory (Table 3)	6,250	7,000	7,300	7,700	8,250	8,520
Daresbury Laboratory (Table 5)	1,950	2,333	2,685	1,855	1,733	1,831
Total (gross)	8,200	9,333	9,985	9,555	9,983	10,351
Shadow cut	-	340	200	100	100	100
Total (net)	8,200	8,993	9,785	9,455	9,883	10,251
<u>Additional programme</u>						
R.H.E.L. - programme to meet university expansion (Table 4)	-	230	500	850	920	1,020
New major projects (Table 6)	-	1,100	2,875	3,325	2,750	1,710
Total (gross)	-	1,330	3,375	4,175	3,670	2,730
Shadow cut	-	400	300	400	300	200
Total (net)	-	930	3,075	3,775	3,370	2,530
<u>Atlas Computer Laboratory</u>						
Total expenditure	1,648	1,264	1,141	998	801	877
Grand Total N.I.R.N.S. (net)	9,848	11,187	14,001	14,228	14,054	13,658

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

Five-Year Financial Forecast 1965/70

(Staff Summary)

	Staff in post at end of year					
	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70
R.H.E.L. - Present programme (Table 3)	965	1,050	1,100	1,140	1,170	1,200
R.H.E.L. - Programme to meet university expansion (Table 4)	-	23	47	71	96	121
D.N.P.L. (Table 5)	140	190	250	250	250	250
New major projects (Table 6)	-	10	100	210	270	270
Atlas Laboratory (Table 7)	60	100	105	105	105	105
Total Staff	1,165	1,373	1,602	1,776	1,891	1,946

Table 3

Rutherford Laboratory - Present Programme

	Summary					
	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
	Grant	£000	£000	£000	£000	£000
Capital Expenditure						
Major schemes in progress	1,193	330	100	120	120	120
Major new schemes	65	881	960	955	1,210	1,140
Minor capital	425	597	650	670	680	700
TOTAL CAPITAL	1,683	1,808	1,710	1,745	2,010	1,960
Non Capital Expenditure						
Salaries and general laboratory charges	2,802	3,242	3,470	3,695	3,850	4,040
Divisional budgets (less minor capital)	1,765	1,950	2,120	2,260	2,390	2,520
TOTAL NON CAPITAL	4,567	5,192	5,590	5,955	6,240	6,560
TOTAL EXPENDITURE (present programme)	6,250	7,000	7,300	7,700	8,250	8,520
Staff in post at end of year						
Professional	365	390	420	435	445	460
Ancillary	350	400	410	425	435	445
Industrial	250	260	270	280	290	295
TOTAL STAFF	965	1,050	1,100	1,140	1,170	1,200

Table 4

Rutherford Laboratory - Additional Programme to meet University Expansion

(see NI/GP/64/3)

	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
	£000	£000	£000	£000	£000	£000
<u>Expenditure</u>						
Capital	-	60	140	310	200	120
Non capital	-	170	360	540	720	900
TOTAL EXPENDITURE	-	230	500	850	920	1,020
<u>Staff</u>						
Professional	-	9	18	27	36	46
Ancillary	-	9	18	26	36	45
Industrial	-	5	11	18	24	30
TOTAL STAFF	-	23	47	71	96	121

Table 5

Daresbury Laboratory

Summary

	<u>1964-65</u> <u>Planned</u> <u>Expenditure</u> £000	<u>1965-66</u> £000	<u>1966-67</u> £000	<u>1967-68</u> £000	<u>1968-69</u> £000	<u>1969-70</u> £000
<u>Capital Expenditure</u>						
Major schemes in progress	1,600	1,366	670	-	-	-
Major new schemes	40	120	720	610	410	410
Minor capital	130	170	180	190	200	200
TOTAL CAPITAL (Gross)	1,770	1,656	1,570	800	610	610
Shadow cut	- 210	-	+ 210	-	-	-
TOTAL CAPITAL (net)	1,560	1,656	1,780	800	610	610
NON CAPITAL	390	677	905	1,055	1,123	1,221
TOTAL EXPENDITURE	1,950	2,333	2,685	1,855	1,733	1,831
<u>Staff in post at end of year</u>						
Professional	55	70	90	90	90	90
Ancillary	55	75	100	100	100	100
Industrial	30	45	60	60	60	60
TOTAL STAFF	140	190	250	250	250	250

DARESBURY LABORATORY

Table 5A

CAPITAL

	Total	1964/65 Planned Expendi- ture	1965/66	1966/67	1967/68	1968/69	1969/70
	£ 000	£ 000	£ 000	£ 000	£ 000	£ 000	£ 000
<u>PLANT</u>							
<u>Schemes in Progress</u>							
<u>Nina Project</u>							
Not yet started	1,760	770	546	450			
External Electron Beam							
Physics Apparatus	155		2	70	70	13	
Positron Facility	750	10	30	140	170	190	210
Computer	100			50	50		
Minor Plant	150		10	140	140		
Other Apparatus	790	100	120	130	140	150	150
	600			150	150		
<u>Plant Total</u>	4,395	880	708	1,130	580	503	510
<u>BUILDINGS</u>							
<u>Schemes in Progress</u>							
<u>Nina Project</u>							
Not yet started	2,120	830	820	220			
External Electron Beam							
Canteen	155		8	70	70	7	
Hostel and Flats	50	30	20				
Minor Works	150		50	50	50		
Other Buildings	280	30	50	50	50	50	50
	200			50	50		
<u>Buildings Total</u>	2,975	890	948	440	220	107	100
<u>TOTAL CAPITAL (Gross)</u>	7,370	1,770	1,656	1,570	800	610	610
Shadow Cut	-	- 210	-	+ 210	-	-	-
<u>TOTAL CAPITAL (Net)</u>	7,370	1,560	1,656	1,780	800	610	610

Table 5B

DARES BURY LABORATORYNON-CAPITAL

	1964/65 Grant	1965/66	1966/67	1967/68	1968/69	1969/70
	£ 000	£ 000	£ 000	£ 000	£ 000	£ 000
Salaries and Wages etc.	153	261	346	391	399	407
Administrative Expenses	20	30	40	45	45	50
Stores, Materials and Services	176	345	465	555	605	675
University Agreements	40	40	50	60	70	85
Rates	1	1	4	4	4	4
<u>TOTAL NON-CAPITAL</u>	390	677	905	1,055	1,123	1,221
Receipt (Canteen and Hostel Income)	-	2	8	12	17	17

New Major Projects

Table 6

(Summary)

	Total Major Capital £ 000	1964/65 £ 000	1965/66 £ 000	1966/67 £ 000	1967/68 £ 000	1968/69 £ 000	1969/70 £ 000
<u>Expenditure</u>							
Nuclear Structure Laboratory	4,500	-	650	1,800	2,450	2,000	1,200
Computer for nuclear physics	2,000	-	450	1,075	875	750	500
Major new U.K. accelerator	21,000	-	-	-	-	-	10
Total expenditure	27,500	-	1,100	2,875	3,325	2,750	1,710
<u>Staff</u>							
Nuclear Structure Laboratory	-	-	5	60	150	200	200
Computer for nuclear physics	-	-	5	40	60	70	70
Major new U.K. accelerator	-	-	-	-	-	-	-
Total staff	-	-	10	100	210	270	270

N.B. The cost, timing and rate of speed of these schemes (particularly the last two) are highly conjectural.

Table 6A

New Major Projects

	Total	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70
	£000	£000	£000	£000	£000	£000	£000
<u>Nuclear Structure Laboratory</u>							
Capital expenditure							
Double tandem electrostatic generator	2,300	*	400	700	900	300	-
Initial experimental equipment	1,000	*	100	300	300	300	-
Main building, laboratories, offices etc.	1,200	*	100	400	500	200	-
Minor capital	-	-	-	100	150	200	200
Total capital	-	-	600	1,500	1,850	1,000	200
Non capital expenditure	-	-	50	300	600	1,000	1,000
Total Expenditure	-	-	650	1,800	2,450	2,000	1,200
Staff	-	-	5	60	150	200	200
<u>Computer for Nuclear Physics</u>							
Computer	1,750	-	250	750	500	250	-
Buildings	250	-	100	125	25	-	-
Minor capital	-	-	-	-	50	100	100
Total capital	-	-	350	875	575	350	100
Non capital expenditure	-	-	100	200	300	400	400
Total Expenditure	-	-	450	1,075	875	750	500
Staff	-	-	5	40	60	70	70
<u>Major New U.K. Accelerator</u>							
Total Expenditure	21,000	-	-	-	-	-	10

ATLAS COMPUTER LABORATORY

Table 7

	1964/65 Grant	1965/66	1966/67	1967/68	1968/69	1969/70
	£ 000	£ 000	£ 000	£ 000	£ 000	£ 000
<u>Capital Expenditure</u>						
Schemes in progress	1,135	339	199	-	-	-
New Schemes	127	400	290	300	80	90
TOTAL CAPITAL	1,262	739	489	300	80	90
NON-CAPITAL	386	525	652	698	721	787
TOTAL EXPENDITURE	1,648	1,264	1,141	998	801	877
STAFF in post at end of year	60	100	105	105	105	105

N.B. This forecast has not yet been approved by the Atlas Computer Committee

Table 8

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

	<u>Receipts</u>					
	<u>1964-65</u>	<u>1965-66</u>	<u>1966-67</u>	<u>1967-68</u>	<u>1968-69</u>	<u>1969-70</u>
	£000	£000	£000	£000	£000	£000
<u>Rutherford Laboratory</u>						
Housing	16	17	17	17	17	17
Hostel	5	6	6	6	6	6
Restaurant	20	20	20	20	20	20
V.E.C. (A.E.R.E.)	50	20	-	-	-	-
Mercury Computer Team (A.E.R.E.)	5	-	-	-	-	-
Miscellaneous	5	5	5	5	5	5
	101	68	48	48	48	48
<u>Daresbury Laboratory</u>						
Canteen and Hostel	-	2	8	12	17	17
<u>Atlas Computer Laboratory</u>						
Charges for Atlas	80	200	300	300	300	300
N.I.R.N.S. TOTAL	181	270	356	360	365	365