

Mr. Bowler
214/11/2

N.I. (G.P.) (59) 13
(Revised)

7 GeV PROTON SYNCHROTRON

QUARTERLY STATEMENT No. 7

1. This report shows in Appendix 1, the latest estimate to the end of March 1959, compared with the last Statement dated 22nd January, 1959. It is proposed that, in future, estimates will be revised quarterly at 31st March, 30th June, 30th September and 31st December.
2. The plant estimate has not been increased since the last Statement and remains at £5.43 M but some increases which cannot be accurately assessed at this stage are anticipated in the future, as explained in the Notes to Appendix 1.
3. The building estimate shows an increase since the last Statement from £2.34 M. to £2.36 M due to a number of items enumerated in the Notes to Appendix 1. The approval of the Committee to the revised estimate is sought.
4. Appendix II shows actual and predicted expenditure by years compared with the Treasury Grant.
5. Appendix III shows the expenditure and commitments up to 31st March, 1959.
6. Appendix IV shows anticipated contract action to the 30th June, 1959.
7. Appendix V shows a list of additional items on Building Estimate which are under discussion by the Project Group and for which financial approval is not yet available.
8. Appendix VI shows the financial position in graphical form.

D.W. FRY

Chairman, PROJECT COMMITTEE

9th June, 1959.

Appendix I

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Revised Cost Estimates - 31st March, 1959

Item	£ Million			
	Original Estimate approved by Treasury	Present Treasury Approval	G.P.C. Approval (Last statement dated 22.1.59)	Revised Cost Estimates at 31.3.59
1. <u>Magnet</u>	2.60	2.60	2.60	2.60
2. <u>Injector</u>	0.30	0.45	0.45	0.45
3. <u>R.F. Equipment</u>	0.15	0.15	0.15	0.15
4. <u>Vacuum System</u>	0.40	0.50	0.78	0.78
5. <u>Power Supply</u>	1.30	1.30	1.30	1.30
6. <u>Controls</u>	0.15	0.15	0.15	0.15
<u>Cooling System</u>	0.10	—	—	—
	5.00	5.15	5.43	5.43
7. <u>Buildings</u>				
Main & Ancillary Building Works	1.40	1.48	1.52	1.53
Engineering & Services	0.40	0.55	0.56	0.57
Fees	0.10	0.23	0.23	0.23
Furniture & Fittings	—	0.03	0.03	0.03
	1.90	2.29	2.34 *	2.36 *
	6.90	7.44	7.77	7.79

For explanatory notes - See next page.

*This figure for the total Building Estimate does not include the estimated effect of the cost variation clauses (C.V.C.2); the graph in Appendix VI includes this for the information of U.K.A.E.A. London Office.

7 GeV PROTON SYNCHROTRONNOTES on Revised Cost Estimate at 31. 3.59

The revised Cost Estimates include costs of additional work and re-estimated costs of the scheme initially approved.

1. PLANT :

It was reported in the last Quarterly Statement that some increase to the estimate for the Magnet might be necessary and this is now confirmed.

Increases will be necessary due to :

- (a) the effects of re-designing the Vacuum Vessel
- (b) more accurate estimating as design information becomes available

It is thought that it will be possible to include the revised estimate for the magnet in the next quarterly statement. Mean-time, the plant estimate has not been amended.

2. BUILDINGS :

There is a net increase in the Building Estimate of £21,000 made up as follows :

(a)	an increase in the estimate for the Main Buildings following issue of detail drawings	£5,000
(b)	increases in the estimated cost of drainage	4,500
(c)	special jacking system for acceptance testing of all shield blocks	2,000
(d)	increased costs of external mechanical services	6,000
(e)	Additional cabling	5,000
(f)	minor increases each of which is less than £2000	2,000
(g)	a saving on the cooling tower contract	24,000
	DEDUCT	3,000
	NET INCREASE	£21,000

In addition to the above, it is proposed to transfer £8,000 from the Contingency Fund for special measures for meeting tight programme to appropriate job headings. This sum is made up as follows :

(h)	an increase in the estimate for additional shuttering for the Magnet Room roof	3,500 ✓
(i)	additional moulds for casting shield blocks to increase the production rate	3,500 ✓
(j)	minor sums, each less than £2,000	1,000 ✓
		£8,000

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Appendix II

Actual and Predicted Rate of Expenditure as at 31.3.59, and Treasury Grant

Item	1957-58 Actual £	1958-59 Actual £	1959-60 Predicted £	1960-61 Predicted £	1961-62 Predicted £	Total Predicted £
Plant	68,586	383,549	2,300,000	2,475,000	202,865	5,430,000
Buildings	265,187	858,578	1,000,000	200,000	36,235	2,360,000
Total	£333,773	1,242,127	3,300,000	2,675,000	239,100	7,790,000

Item	Estimates for 1959-60 £	Provision in 1959-60 Estimates for 1960-61 £
Plant	2,235,000	2,220,000
Buildings	1,000,000	250,000
Total	£3,235,000	2,470,000

Appendix III(1)

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Recorded Commitments and Expenditure up to 31st March, 1959

Item	£ Value	Firm	£ Expenditure	Remarks
<u>MAGNET</u>				
Magnet Sectors	1,394,000	Joseph Sankey & Sons	169,037	Includes refining
+ Copper - Magnet Coils	53,085	British Copper Refiners	49,575	
Transporter - Magnet Sectors	1,720	Carrimore Sizzwheelers	1,720	
+ Survey Equip. & Services	15,300	H.P.L., Hilger & Watts & B.R.S.	4,214	
Magnet Coils	314,250	Metro-Vickers		
Extrusion of Copper for Magnet Coils	67,286	James Booth		
+ Miscellaneous	4,980		1,514	
<u>Total</u>	1,850,621		226,060	
<u>INJECTOR</u>				
Electro-Static Generators		S.A.M.E.S. - France		
650 K.V. <i>Phys. Lab.</i>	15,050		7,525	4.0 mc.
350 K.V. <i>Elec. Control</i>	1,989		1,989	1.5 mc.
3 x 125 K.V. <i>London</i>	7,170		3,535	
+ E.H.T. Platform	3,093	Portsmouth Aviation	2,912	
B.T.H. Modulators	15,800	B.T.H.		
+ H.P. Alternators (2)	1,179	Electro-Dynamic Constr.	582	
+ E.H.T. Platform Equipment	2,855	Portsmouth Aviation	2,005	
D.C. Gun Vacuum Equipment	6,000	Edwards High Vacuum		
+ Vacuum Vessel for Linac	11,350	Babcock & Wilcox		
+ D.C. Gun Stand & Rails	1,931	Talbot Pensonby		
Roughing Pump Units	3,096	Edwards High Vacuum		
Refrigerated Oil Traps	1,274	" " "		
+ Linac R.F. Liner Frames	5,261	Firth Vickers S. Steels		
+ Linac R.F. Liner	20,355	London Aluminium Co.		
* D.C. Gun Focussing Chamber	1,235	J.G. Meakes		
* D.C. Gun Sub-Assemblies & Components	2,330	H.E. Lintott		
* Linac Vacuum Equip.	40,333	Edwards High Vacuum		
* L.E. Drift Space Vacuum Equ.	5,338	" " "		
* H.E. Drift Space " "	7,707	" " "		
+ Miscellaneous	17,656		3,804	
<u>Total</u>	171,502		27,402	
<u>R.F. EQUIPMENT</u>				
Ferrite Frames	42,296	Phillips, Eindhoven	13,634	
Bias Supply	3,460	Hackbridge & Hewitt		
Rectifier Transformer	1,115	English Electric		
R.F. Cavity Cooling Equip.	11,256	J. & E. Hall, Ltd.		
Accelerator Unit Cavity	12,000	Marston Excelsior		
+ Miscellaneous	3,233		6,218	
<u>Total</u>	78,360		19,902	

Appendix III(2)

Item	£ Value	Firm	£ Expend- -ture	Remarks
<u>VACUUM SYSTEM</u>				
Main Pumping Equipment	154,297	Edwards High Vacuum	61,718	
Roughing Pump Units	9,286	General Eng. (Radcliffe)		
Refrigerated Oil Traps	3,823	Edwards High Vacuum		
* Combined Pumping Unit	1,418	" " "		
* Main Vacuum Vessel	325,000	Marston Excelsior		
* Demineralised Water Chilling Units	6,993	Thames Valley Refrigeration Services, Ltd.		
+ Miscellaneous	1,624			
<u>Total</u>	502,441		61,718	
<u>POWER SUPPLY</u>				
Rotating Machinery	472,250	English Electric	10,000	
+ Converter Equipment	568,760	Brown Boveri	104,400	
<u>Total</u>	1,041,010		114,400	
<u>CONTROLS</u>				
Tekronix Oscilloscopes	842	Livingstone Labs.	842	
* Control Racks	2,500	Alfred Imhoff, Ltd.		
+ Miscellaneous	2,191		1,811	
<u>Total</u>	5,533		2,653	
<u>PLANT - Grand Total</u>	3,649,467		452,135	

NOTE:- Items marked thus *, have not previously been reported.

Items marked thus +, have changed since the last report.

Appendix III(3)

Item	£ Value	Firm	£ Expend- -ture	Remarks
<u>BUILDINGS</u>				
<u>ENGINEERING & SERVICES</u>				
+ E.H.T. Switchgear	7,963	Reyrolles, Ltd.	69	
Transformers	2,934	Yorkshire Electric	2,934	
+ 25 ton Crane	9,395	Wharton Cranes	8,783	
+ Special Cranes (3)	34,346	" "	18,110	
Misc. Cranes (5)	39,759	" "	31,370	
* H.O. Cranes, Assembly & Test Building	640	Herbert Morris, Ltd.	608	
80 ton Crane-Alternator Building	18,372	Cowans Sheldon, Ltd.		
10 ton Crane - Alternator Building	5,850	John Smith (Keighley)		
+ Shielding Block Lifting & Turning over Equip.	5,904	John Barnsley & Sons		
+ Shielding Block Trolleys & Traction Unit	16,821	Robert Hudson, Ltd.		
+ Heating & Hot Water Services, Prep. Area, Control A & T. Building	6,842	Z.D. Berry & Sons	6,460	
Distribution Switchboard	5,580	English Electric	4,369	
+ Lighting & Small Power Prep. Area, Control A. & T. Building	12,803	N.G. Bailey & Co.	10,117	
+ Cables	27,392	Various	24,931	
Lift, Passenger & Goods Main Building	3,789	Evan Lifts	2,420	
415V Switchgear - Alternator Building	5,945	Reyrolles		
Water Treatment Plant	15,256	The Permutit Co.		
Lighting & Small Power - Office & Lab. Magnet & Alternator Buildings	40,444	N.G. Bailey & Co.	21,035	
Pipework Services - Heating, Hot Water & Ventilating - Main Buildings	65,181	Z.D. Berry & Sons	3,310	
Air Conditioning Equip. Magnet & Injector Rooms	45,480	Matthew Hall		
* Evaporative Cooling Units	23,170	Film Cooling Towers (1925), Ltd.		
* Magnet Cables	19,508	B.I.C.C.		
* Electrical Installations	6,520	Read & Partners	6,288	
* Steam, Gas, Air and Water Services	15,853	W. Press & Sons	13,500	
+ Miscellaneous	4,235		2,376	
* Storage Tanks	1,218	W.P. Butterfield		
<u>Total</u>	<u>441,200</u>		<u>156,680</u>	

NOTE:- Items marked thus *, have not previously been reported.

Items marked thus +, have changed since the last report.

Appendix III(4)

Item	£ Value		£ Expendi- -ture	Remarks
<u>BUILDINGS</u>				
<u>ARCHITECTS</u>				
Opening up Contract	84,645	W.E. Chivers	60,000	
Exploratory Boring	2,606	The Cementation Co.	2,606	
Trial Bore Holes	1,399	W.E. Chivers	1,399	
+ Main Civil Contract	1,104,995	W.E. Chivers	778,733	
+ Arcon Building	42,863	Taylor Woodrow	40,720	
+ Miscellaneous	1,291		924	
<u>Total</u>	<u>1,237,799</u>		<u>884,382</u>	
<u>FEES</u>				
Consultants	107,200		51,191	
+ Quantity Surveyors	40,489		11,187	
Industrial Group	85,000		18,378	
<u>Total</u>	<u>232,689</u>		<u>80,756</u>	
+ <u>FURNITURE</u>	<u>1,947</u>	A.E.R.E. Stock	<u>1,947</u>	
<u>Buildings Grand Total</u>	<u>1,913,635</u>		<u>1,123,765</u>	

NOTE:- Items marked thus *, have not previously been reported.

Items marked thus +, have changed since the last report.

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Appendix IV

Known and anticipated Contract Action during period 31.3.59 to 30.6.59

Item	Estimated Value	Firms likely to be considered	Remarks	Action sought
<u>Installation</u> (Electrical)	£			
Erection Metrology	100,000	F.H. Wheeler, Ltd.	Paper PSPC/P43 is being presented to the G.P. Committee	G.P. Committee approval is sought
- Invac Alignment	4,800	Coventry Gauge & Tool, Ltd.	Contract will be placed shortly	None
Drift tube assemblies - complete	60,000	Competitive Tender	Tenders due in 22.6.59	G.P. Committee approval will be sought
Drift tubes - Spinning Tools & Material	2,000	Lee & Wilkes, Ltd.	Contract placed on 29.5.59	None
Refrigeration Pumps and Heat Exchangers	14,037	J. & F. Hall, Ltd.	Letter of intent will be sent before 31.5.59	None
Power Supply units for drift tube quadrupole magnets	9,625	Westinghouse Brake and Signal Co.	Contract will be placed before 30.6.59	None
Intercomm. System	1,367	Communications Systems, Ltd.	Contract placed 24.4.59	None
Magnet Coil Improvements and additions	54,480	Metropolitan-Vickers, Ltd.	Paper PSPC/P44 is being presented to the G.P. Committee	Approval exists for £36,000. G.P. Committee approval is sought for an additional £18,480.
Build-up plates for magnet sectors	36,000	Joseph Sankey	Paper PSPC/P43 is being presented to the G.P. Committee	G.P. Committee approval is sought
Surveyor and Assistant in charge of Magnet Survey	4,000	Hilger & Watts, Ltd.	Contract to be placed before 30.6.59	None
Main Pole Pieces	250,000	English Electric, Ltd. Richard, Thomas & Baldwin	Tenders are being assessed and verbal report will be given to the Committee	G.P. Committee approval will be sought.
Foundation Block	10,000	English Electric	Addition to Contract for Rotating Machinery to be placed before 30.6.59.	None

F.E. 219, 554.
 R.T.B. 234, 058.
 Larky. 366, 742.
 Vickin 364, 655.
 G.E.C. 627, 595.
 D.H. Relativ.

7 GeV PROTON SYNCHROTRON.BUILDING ESTIMATES - ADDITIONS NOT YET APPROVED

Additional items which are under discussion and for which financial approval is not available or for which the financial approval given is insufficient, are listed below :

	<u>Estimated cost</u> £
1. Alterations to trenches in Magnet room and additional screen in Injector room	2,000
2. Datum level stations	500
3. Fireproof screen under shielding bridge	500
4. Modifications to Experimental Area Bubble Chamber extension for increased floor loading, deeper trench and larger tunnel exit	4,500
5. Trades waste draining to Experimental Area Bubble Chamber extension	1,000
6. Mechanical Services duct along East side of Experimental Area :	
(a) Tunnel	4,000
(b) Additional cost of pipes, pumps and heat exchangers	6,000
(PROJECT COMMITTEE Paper PSPC/P.40 refers)	*)
7. Extension of mechanical service tunnel and cable tunnel for future developments on South side of Experimental area (PROJECT COMMITTEE Paper PSPC/P.40 refers)	14,000
8. New Generator House - 2 services adjacent to Laboratory and Office building	1,500
9. Additional partitions in Laboratory and Office buildings and consequent modifications to lighting	2,000
10. Additional toilets and other minor modifications to Arcon Building	1,000
11. Additional Switchgear	18,000
	<u>£...55,000</u>

* Approval for item 6 has now been given by the Chairman of the Project Committee.

Fees

The Consulting Engineers' fees are a fixed sum of £82,500 based on a total cost of works of £1,798,000 but should this total rise by more than 5% then revision of the fees should be considered. Quantity Surveyor fees are on a percentage basis.

The estimated cost of the works including the extras above, is now £2,100,000, an increase of approximately 15% and it will be necessary to re-assess the fees. It is recommended that £10,000 should be added to the provision in the estimate for the likely increases in the engineers' and Quantity Surveyors' fees.

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PLANT ESTIMATES - ADDITIONS NOT YET APPROVED

Additional items which are under discussion and for which financial approval is not available or for which the financial approval given is insufficient, are listed below:-

		<u>Estimated cost</u>
1.	Magnet Coil improvements and additions (approval exists for £36,000)	- £54,480
2.	Build-up Plates for Magnet Sectors	- £36,000

U.K.A.E.A. (R.G.)

● TOTAL EXPENDITURE
QUARTER ENDING 31st MARCH 1959.

7 GEV. PROTON
SYNCHROTRON PROJECT.

