

WASC 2202

FOLDERS ON SHELF

VARIOUS RGPE
ANNUAL REPORTS

1937-1938 Annual Report

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W324/18

ANNUAL REPORT
OF THE
SUPERINTENDENT, ROYAL GUNPOWDER FACTORY,
WALTHAM ABBEY
FOR THE YEAR 1987 - 88.

ANNUAL REPORT

of the

SUPERINTENDENT, ROYAL GUNPOWDER FACTORY,

for the year 1937 - 38.

I. PRODUCTION.

(a) Cordite.

1937 - 38 is a record of successful achievement as regards expansion of output to meet Mandate requirements.

A programme of expansion by July 1937 to 75 tons a week of Cordite of various sizes for all customers was arranged in the latter part of 1936 - 37, a total of some 8,500 tons being scheduled for production during the year.

The expansion was carried out according to plan and a total output somewhat in advance of the scheduled total obtained.

It will be appreciated that this satisfactory result could not have been achieved without the hearty co-operation of all concerned.

In the first place I must record my appreciation of the successful efforts of Headquarters officials in arranging a long dated programme of output - this has enabled me to arrange with the Director of Army Contracts a flow of manufacturing materials by means of term contracts which, despite a certain amount of anxiety as regards one or two items concerning which special mention will be made later, has never failed.

Special arrangements were made with the Labour Exchange officials as regards the necessary intake of labour and I must acknowledge to the full their services in this matter. The preference given to unemployed ex-Service men has resulted in expressions of appreciation both public and personal from the officials of the British Legion.

There have been no serious breakdowns of manufacturing facilities affecting the steady outflow of product despite the fact that an explosion occurred in December, when a cordite stove was lost involving some 5 tons of product. In this connection it is pleasing to record that the precautions taken against the effect of such an accident were thoroughly proved output was not affected in any way, material damage only being incurred.

At the inception of the expansion of output, the uncertain flow of service packages and the difficulties of the Store authorities in taking the product when made proved a handicap. These difficulties were gradually overcome and by the end of the year everything was working smoothly.

(b) Composition Exploding.

The demand for Composition Exploding has increased mainly for the Air Ministry. Some 150 tons were produced during the year by intensive methods of production involving 7 days working of the plant.

(c) R.D. Composition 202 and Picrite.

Considerable increases in manufacture of R.D. 202 and Picrite have been effected.

(d) Raw Materials.

As regards manufacturing materials the supply of Cotton Waste has caused the greatest anxiety. Co-operative purchase action with the Imperial Chemical Industries Ltd. was arranged by the Director of Army Contracts, with the result that the whole of the capacity of the two producing firms was booked for allocation between the Royal Gunpowder Factory and Imperial Chemical Industries as required.

In order to meet the combined needs it was necessary for the Director of Army Contracts to arrange for an

extension of one of the producing mills and now that this is in full operation a steady and sufficient supply has been safeguarded.

The other item referred to is Dogwood, which is required for fuse powder manufacture. War stocks only were available and when new supplies were required they could not be obtained either by me or by the Director of Army Contracts. Through the good offices of the officials at Princes Risborough, an indigenous supply (Alder Buckthorn) has been found and proved satisfactory by trial and limited supplies from the Forestry Commission are now being obtained. It is only within the last few weeks, that is, after some 18 months of research and enquiry, that a source of supply in Cambridge-shire has been discovered, which removes all anxiety for the future in respect of this particular commodity.

I attribute the happy position in regard to the supply of essential materials largely to the policy I have consistently followed of making personal contact with the Chief Executives of the supplying firms. I am particularly grateful to Mr. Clarke of British Industrial Solvents whose advice in respect of the handling of Acetone in bulk has been invaluable.

The disposal of Nitre Cake has become a troublesome business. Formerly this bye-product was sold but under present conditions the Director of Army Contracts has, despite all enquiries, only found one firm who will take it away, and it is costing some £3,000 a year for the service.

(c) Developments.

(1) Quinan Stove.

The Quinan stove for drying Gun-cotton was brought into use in the latter part of the year and the experience gained in operation has proved invaluable in the planning of the new Cordite Factory.

(11) Blending Tanks.

The construction of the foundations of the two new Blending Tanks has been completed and delivery of the steelwork is awaited.

(f) Supervision of Manufacture.

The expansion of activity has naturally thrown a great strain on the staff, which has had to be strengthened. Great difficulty has been encountered in obtaining men from outside sources who were qualified to control explosives manufacture and for a selected few of the additional posts men of the foreman class have been promoted, with gratifying results. This difficulty still exists and at the present moment I am short of four members of the Chemical Staff, and important investigational work is consequently held up.

(g) Future Prospects.

The programme for the coming year involves a further increase in production of Cordite to 4,000 tons, and 100% increases in the production of Composition Exploding, R.D. 808 and Picrite.

II. PLANNING.

(a) G.E. Factory.

An extension of the factory which, it is hoped, will be in production this Summer, has been authorised, whereby I hope to double my present output.

(b) R.D.(X).

The installation of a complete plant at an estimated cost of the order of £50,000 for making a new explosive - R.D.(X) - was put in hand. It is expected that this plant, which forms a complete factory within the Gunpowder area of the Royal Gunpowder Factory, will be in production some time during the current year. There have been delays due to lack

of information from the Chief Superintendent Research Department as to requirements, and even now there are items of plant and buildings not yet settled.

(c) Chief Engineer's Department - Planning of New Cordite Factory at Disbury.

Contracts have been let by H.M.C.W. by Sections, concentrating firstly on those sections which took the longest time to complete.

Following this principle, the following table shows the position:-

Contract No.	Description	Contract placed	Due for Completion	Remarks
1	Acid Production. Railway Sidings, Roads, Railways, Fences & Drainage.	June '37	June '38	Sidings completed
2	Cumcotton. Nitrocellulose Quinn & Solventless Cordite Sections	Jan: '38	March '39	
3	Process and Cooling Water supplies and Reservoirs.	June '38	Dec: '38	
4	Buildings in Acid Nitroglycerine, Work- shops & Stores Sections.	Will be placed in Aug: '38.	June '39	
5	Cordite Section.	Will be placed in Nov: '38	Autumn '39	
6	Administrative.	Will be placed in Dec: '38.	Autumn '39	

By March 31st 1938, the Royal Gunpowder Factory had stated complete requirements for No.5 Contract and, at that date, the outstanding requirements yet to be stated consist of a part of the Administrative Section, the Magazine Area and the Tetryl and Pierite plants.

During the year under review, machinery orders were

placed for all the more important items of plant, the priority of the work being arranged in accordance with the building programme. It is estimated that by August 1938 all these important orders will be placed, but at that date there will still remain a considerable volume of details to be handled. So far as can be seen there is no reason to suppose that the ordering of mechanical items will not keep pace with the handing over of completed buildings for mechanical erection.

The completion date of the factory is January 1940, but as it is apparent that less than 1,000 men will be employed on the site in August 1938, the number which must be employed in the last 9 months of 1939 must be over 5,000.

III. STATISTICS.

Statistical information relating to the operation of the factory during the year is attached:-

Appendix I	-	Materials
" II	-	Electricity, Steam and Water
" III	-	Property
" IV	-	Factory Expenses
" V	-	Annual Turnover
" VI	-	Personnel and Age Groups.
" VII	-	Cost of Productions.
" VIII	-	Main Productions.

APPENDIX I.

MATERIALS.

STOCKTAKING.

Value of Stock taken	...	...	...	...	£	s.	d.
					46,710.	19.	2.
" " Surpluses	...	...	...	...	178.	19.	9.
" " Deficiencies	...	...	...	...	78.	11.	0.

Value of items written off:-

Unrecoverable.

Alcohol, recovered, contaminated with H.C.	...	...	...	£	s.	d.
				178.	13.	7.
Miscellaneous items	...	...	...	1.	8.	8.

Lost.

Acetone lost in transference from Tank to Drums at Royal Gunpowder Factory	...	...	...	100.	7.	8.
				£ 274.	0.	0.

Value of Stores in Stock at 31/3/38.

Manufacturing Materials	...	...	...	£
				81,856
Other items	...	...	...	27,506
				£109,062

Value of Raw Materials received during 1937 - 38	...	...	...	£
				461,722

Value of Raw Materials received during 1936 - 37	...	...	...	£
				235,954

Price per ton of Main Items (Average prices given if more than one Contract.)

Material.	1937/38			1936/37		
	£	s.	d.	£	s.	d.
Acetone	38.	0.	0.	47.	3.	0.
Cotton Waste	71.	10.	0.	62.	0.	0.
Glycerine	117.	19.	0.	62.	5.	0.
Mineral Jelly	11.	19.	11.	10.	12.	0.

APPENDIX I (Contd.)

<u>Material</u>	<u>1937/38</u>			<u>1936/37</u>		
	<u>£</u>	<u>s.</u>	<u>d.</u>	<u>£</u>	<u>s.</u>	<u>d.</u>
Sodium Nitrate	7.	19.	0.	7.	18.	0.
Ammonium Nitrate	15.	15.	0.	11.	15.	6.
Carbonite	224.	19.	10.	224.	19.	10.
Calcium cyanamide	9.	2.	8.	9.	0.	0.
Acid Sulphuric - 80%	5.	7.	0.	5.	9.	0.
" " 65%	5.	8.	0.	5.	6.	0.
" " 96%	5.	5.	0.	5.	11.	2.
" " 98%	5.	6.	0.	5.	8.	6.
Lead chemical sheet	26.	13.	4.	27.	3.	4.
" " pipe	27.	0.	8.	29.	0.	0.
Coal Mechanical Stoker	1.	7.	6.	1.	1.	11.

Imperial Reserves.

			<u>£</u>	<u>swt.</u>	<u>gr.</u>	<u>lb.</u>
Stock of Glycerine at 31/3/38	...		577.	7.	0.	1.
	value		£53,575.	8.	9.	

APPENDIX II.

S E R V I C E S.

Electricity.

	<u>1937 - 38</u>	<u>1936 - 37</u>
Distributed	3,757,735 units	1,734,500 units
Cost per unit	1.2986d.	1.77d.

Steam.

	<u>1937 - 38</u>	<u>1936 - 37</u>
Distributed	377,582,000 lb.	323,614,000 lb.
Cost per 1,000 lb.	4s. 0.33d.	3s. 8.12d.

Water.

	<u>1937 - 38</u>	<u>1936 - 37</u>
Cost of M.W.B. water	£1,250	£251

The large difference in cost of M.W.B. water compared with 1936 - 37 is due to the silting up of the well at Guncotton Factory. Steps are being taken to have this cleared.

APPENDIX III.

PROPERTY.

		<u>1927 - 28</u>			<u>1928 - 29</u>		
		£	s.	d.	£	s.	d.
Amount expended on							
Domestic Property	...	418.	0.	0.	395.	0.	0.
Returns from Property	...	1172.	0.	0.	1155.	0.	0.

APPENDIX IV.

R.G.P.F. WALTHAM ABBEY.

FACTORY EXPENSES.

	Amount 1937-38 £	Amount 1936-37 £
Process Expenses.		
Foremen, Asst. Foremen, etc.	7,773	4,043
Miscellaneous Labour.	20,641	8,354
Consumable Stores.	3,908	1,733
Gas.	93	95
Water.	98	63
Steam (Process).	45,905	19,535
Power.	15,708	10,136
Refrigeration.	10,999	6,174
Compressed Air.	10,235	5,942
Maintenance of Plant.	50,011	23,852
Maintenance of Buildings.	6,239	3,354
Depreciation.	3,511	1,715
Rates.	304	267
Internal Transport.	12,400	4,415
Balance of Process Expenses.	10,141	4,700
Sub Total	124,800	95,393
Sectional Expenses.		
Management.	4,309	5,509
Electric Light.	1,662	911
Gas.	192	130
Steam for Heating.	8,553	3,739
Maintenance Services.	7,689	4,173
Miscellaneous Labour.	3,745	1,637
Laboratory Testing.	4,557	3,335
Care & Custody of Departmental Stores.	1,527	735
Allowances.	30,493	8,845
O.T. and N.S. Bonus.	14,807	2,756
Balance of Sectional Expenses.	13,564	7,833
Sub Total	73,493	37,453
Credit for Materials returned to Store.	2,335	1,541
Sub Total	73,257	35,113
General Expenses.		
Superintendence.	1,061	570
Registry, Pay and Order Branches.	2,273	980
Worktakers, Wages and Accounts.	3,083	2,016
Central Stores.	11,500	5,335
Police, Fire Brigade and Warders.	7,530	4,953
Maintenance of Grounds, Mains, Canal, Permanent Way, etc.	14,539	13,517
Non-effective Charges.	15,179	8,924
Balance of General Expenses.	45,273	42,733
Sub Total	99,335	79,433
Total	277,389	210,336
Less Subsidy.	-	-
Net Factory Expenses.	277,389	210,336
% to Direct Labour.	246.05	303.65
Direct Labour.	145,507	64,402

1937 - 38

ANNUAL TURNOVER.

ROYAL GUNPOWDER FACTORY, WALTHAM ABBEY.

	Parliamentary Estimate. £	Latest Forecast £
A. Establishments	7,200	7,040
B. Wages	553,000	551,060
C. Materials	453,000	442,440
D. Machinery, Contract.	30,450	18,870
E. Works, Contract.	3,800	740
F. Miscellaneous.	12,430	26,100
G. Non-effective.	9,100	8,150
	860,980	848,770
Add - Net effect of Materials on I.D.D's	5,080	9,155
	866,060	857,925
H. Productions for Army, Navy, etc.	790,880	821,200
Miscellaneous Receipts.	2,250	2,340
Sale of scrap, old stores and stores issued on repayment.	1,200	5,250
	794,330	828,790
Net effect of I.D. Services.	+ 29,800	- 2,935
	824,130	825,855
Balance shown as below	41,930	32,070

INCOMINGS	Parl'y Estimate £	Latest Forecast £	OUTGOINGS	Parl'y Estimate £	Latest Forecast £
Estimated amounts recoverable in respect of:-			Estimated expenditure on New Capital:-		
Depreciation of:-			Buildings:-		
Buildings.	3,850	3,250	Contract	400	-
Machinery.	4,800	5,870	P.R. on Contract	20	-
Mains.	400	580	Departmental	600	500
Written off:-			Machinery:-		
Buildings.	100	250	Contract	16,430	10,210
Machinery.	200	80	Departmental	4,170	2,960
Mains.	-	-	Mains:-		
			Departmental	350	430
Transfer from Supply Suspense Account	41,930	32,070	Increase of Stores in Stock.	29,000	27,000
	50,970	40,900		50,970	40,900

APPENDIX VI.

STRENGTH.

PERSONNEL (INCLUDING CHIEF ENGINEER'S DEPARTMENT)

	<u>Total</u> <u>on 31/3/38</u>	<u>Total</u> <u>on 31/3/37</u>
Supervisory, etc.	158	155
Skilled	151	148
Semi-skilled	848	194
Unskilled	1510	1808
Women & Girls	4	4
Boys	80	54
	<hr/>	<hr/>
	2091	1717
	<hr/>	<hr/>
Highest	2091	1719
Lowest	1719	835
Average	2007	1174
Entries during the year .	892	1036
Discharges " " "	459	145
Transfers In	17	55
" Out	6	48

AGE GROUPS - SHOWING PERCENTAGE OF TOTAL STRENGTH.

	<u>31/3/38</u> <u>%</u>	<u>31/3/37</u> <u>%</u>	<u>31/3/35</u> <u>%</u>
Over 50 years	10.80	11.46	63.54
40 - 50 years	16.47	16.12	14.24
30 - 40 years	55.56	55.94	12.5
21 - 30 years	37.60	36.34	7.39
Under 21 years	2.07	2.14	2.43

APPENDIX VII.

COST OF PRINCIPAL PRODUCTIONS.

		1957 - 58	1958 - 59
		Per lb.	Per lb.
		s. d.	s. d.
Cordite	W.040	2. 7½	2. 9½
	W.016	2. 6½	2. 1.
	W.037	1. 11½	2. 4.
	W.112	2. 0.	2. 1½
	W.124	1. 10½	-
	W.173	1. 11½	-
	W.T.144 - .045	2. 1½	2. 8½
	W.T.154 - .125	4. 10½	6. 3½
	W.T.206 - .100	1. 11½	-
	M.D.T. 5 - 2	2. 4½	2. 7.
	R.D.H/A.	4. 4.	4. 9.
	Picrite	4. 1½	4. 10½
	Milleake	1. 9½	1. 2½
Composition Exploding, Crystals, Grade I.		4. 10½	4. 4½
Composition Exploding, Corned, Grade I.		2. 4½	4. 9½

- Notes:- (1) Costs this year have not been relieved by some £20,000 subsidy which operated in 1956 - 57.
- (2) Increase of cost of C.E. is due to restoration of facilities, overtime and night shift rates, adjustment of stocks showing previous year's price to be low and an increased consumption of nitric acid in the new method of nitration.
- (3) The effect of loss of subsidy was more noticeable in the case of milleake than in other productions, owing to the small relation of output to plant.

APPENDIX VIII.

MAIN PRODUCTIONS - ISSUES.

Carbite.

Small Arms	M.D. .087	1b.	1b.
	M.D.T. 6 - 2	119	
	" 7 - 2	704,800	
		9,089 ⁴ / ₁₂	
		<hr/>	712,689 ⁴ / ₁₂
Mark I Flake		7	
	1/.06	8,873	
	5	800	
	20 S.C.	7,614	
		<hr/>	10,794
Gannon	M.D.C. .057		7,736
	RDH/A .089	40,620	
	.084	6,920	
	.042	61,620	
	.082	7,220	
		<hr/>	116,400
F.551/58 .010 an:		206	
	.043	10,784 ⁴ / ₁₂	
	.026	1,752	
		<hr/>	12,039 ⁴ / ₁₂
F.508/126 .010 an:			197
F.556/1 .089		618	
	.080	1,480	
		<hr/>	2,106
W.T. .134 - .136		55,400	
	.144 - .048	88,895	
	.112 - .086	1,900	
	.808 - .100	174,880	
	5 - 2	280	
W. .016		500,800	
	.040	58,898	
	.087	3,135,406	
	.112	88,250	
	.124	1,827,171	
	.145	11,280	
	.173	522,226	
		<hr/>	6,253,632
Experimental (Various)			4,510 ¹⁴ / ₁₈

Total 7,121,092 ¹²/₁₈ lb. = 3,560.5 tons.

Composition Exploding.

Crude	.25	a. tons
Corned	80.998	a. tons
Crystall	55,485	a. tons
Ground	Nil	
Total -		144.698 a. tons

APPENDIX VIII (CONT'D.)

Picrite.

For RRM/A Paste Mixing	22.768 s.tons
" RRM/A "	8.916 "
" C.S.R.D.	1.868 "
" Experimental Paste Mixing	0.016 "

Total - 33.568 s.tons

Composition R.D. 202.

Total - 2,540 lb.

Guncotton and Nitrocotton.

	No.	lb.
1 lb. Guncotton Slabs	25,556	25,556
1 lb. Guncotton Charges	8,514	8,514
1 oz. Guncotton Primers	30,912	1,932
Guncotton Pulp (to Vickers Armstrongs)		67
Guncotton Pulp (to C.S.O.F.)		100
Nitrocotton Pulp		673

Total - 51,844 lb. = 18.922 s.tons

Mill Cake for Fuse Powder.

For S.R. 227 47,400 lb. = 21.7 s.tons

Experimental from English	} 600 lb.
Alder Buckthorn and Willow	

