GOVERNMENT OF INDIA
TARIFF COMMISSION

REPORT

ON

The Continuance of Protection to the Caustic Soda Industry

BOMBAY 1961

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Report on the Continuance of Protection to the Caustic Soda Industry 1961.

GOVERNMENT OF INDIA

MINISTRY OF COMMERCE AND INDUSTRY

New Delhi the 24th November, 1961.

RESOLUTION

Tariffs

No. 32(2)-T.R./61.—The Tariff Commission has submitted its Report on the continuance of protection to the Caustic Soda Industry on the basis of an inquiry undertaken by it under Sections 11(e) and 13 of the Tariff Commission Act, 1951. Its recommendations are as follows:—

(1) Protection to the caustic soda industry should be continued for a further period of three years that is up to 31st December 1964, at the existing rates of duty, namely, 30 per cent *ad valorem* (preferential) and 40 per cent *ad valorem* (standard). A countervailing duty equal to excise duty is also leviable, on this item, in addition to import duty.

(2) While licensing additional capacity for caustic soda existing units should be encouraged to expand their capacity to an economic size. In licensing new units also due attention should be paid to the importance of setting up plants of large capacity in areas advantageously situated with regard to power and common salt.

(3) Caustic soda is a basic raw material for a large number of industries. It is, therefore, of paramount importance that it should be made cheaper. This aspect should be borne in mind while licensing further capacity for chemical caustic soda.

(4) The Railways should take necessary steps to increase the allotment of tank wagons (broad guage and meter guage) for movement of liquid caustic soda and also consider the question of adjusting railway freight in such a way that movement of liquid caustic soda over long distances is encouraged.

(5) The higher freight rate for bulk movement of salt under class 37.5-A of Goods Tariff need not be enforced if a consumer undertakes to carry out protective measures for wagons as required by the railways. The Railways should, in consultation with the manufacturers of caustic soda, evolve a workable arrangement for bulk movement of salt in wagons and extend the facilities to cover long distance movement of salt.

(6) The State Electricity Boards should be requested not to effect increases in the existing electricity rates during the present Plan period.

2. Government accept recommendation (1). The necessary legislation in Parliament will be introduced in due course.

3. Government have taken note of recommendations (2) to (5) and steps will be taken to implement them as far as possible.

4. The attention of the State Governments is invited to recommendation (6).

ORDER

ORDERED that a copy of the Resolution be communicated to all concerned and that it be published in the *Gazette of India*.

B. N. ADARKAR,
Joint Secretary to the Government of India.

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APPENDICES

REPORT ON THE CONTINUANCE OF PROTECTION TO THE CAUSTIC SODA INDUSTRY

1. The claim of the caustic soda and bleaching powder industry to protection was the subject of four tariff inquiries held in 1946, 1950, 1954 and 1958. Details of the first three inquiries are given in our last Report on the continuance of protection to the industry (1958). In that Report we recommended that (a) the protective duties on caustic soda, both solid and other sorts, should be continued at the existing rates of 30 per cent *ad valorem* (preferential) and 40 per cent *ad valorem* (standard) as long as the tariff values of Rs. 28 per cwt. on solid caustic soda and Rs. 45 per cwt. on caustic soda of other sorts are retained, (b) if a change in tariff values is effected in future, the protective duties should be correspondingly altered, and (c) protection to the caustic soda industry should be continued for a further period of three years, that is, till 31st December 1961. We also recommended that protection to the bleaching powder industry, including bleaching paste, should be discontinued after 31st December 1958. The Government of India accepted these recommendations and extended protection to the caustic soda industry up to 31st December 1961 by the Indian Tariff (Amendment) Act, 1958. From 1st January 1959 a revenue duty of 15 per cent *ad valorem*, which was the level of protective duty, was imposed on bleaching powder and bleaching paste. By a Notification issued on 28th September 1960 tariff values were fixed, with effect from 1st October 1960, on the basis of metric units at Rs. 55.10 per quintal on caustic soda, solid and Rs. 88.50 per quintal on caustic soda of other sorts. With effect from 1st September 1961 these tariff values were revised to Rs. 56.00 and Rs. 70.00 per quintal, respectively, but the rates of protective duty were maintained at the existing levels. Under the Finance Act, 1961 an excise duty of Rs. 4 per quintal was levied on caustic soda, solid, and caustic lye on the basis of 100 per cent strength of caustic soda and simultaneously a countervailing import duty of an equivalent amount was imposed on the corresponding imported products.

Previous tariff inquiries

2.1. As the current term of protection to the caustic soda industry is due to expire on 31st December 1961, we have undertaken the present inquiry under section 11(e) read with section 13 of the Tariff Commission Act, 1951 under which we are empowered to enquire into and report on any further action required in relation to protection granted to an industry with a view to its increase, decrease modification or abolition according to the circumstances of the case.

Present inquiry and its scope

2.2. Besides examining the question of continuance of protection to the caustic soda industry we are required to determine ceiling prices for caustic soda and chlorine in all forms, including bleaching powder In this connection it may be mentioned that on the basis of recommendations in our last Report on the Fair Selling Prices of Caustic Soda

Chlorine, Hydrochloric Acid and Bleaching Powder (1958), Government fixed ceiling prices of caustic soda in all forms and its allied products in October 1959. The prices of bleaching powder were fixed in May 1960. These prices, which were valid up to 31st December 1960, were raised in January 1961 and the revised prices are to remain in force up to 31st January 1962 for caustic soda and up to 31st December 1961 for bleaching powder. While fixing the prices of bleaching powder in May 1960 Government observed that the prices would be subject to review by us as and when due. The scope of our present inquiry therefore covers two aspects, namely (a) continuance of protection to the caustic soda industry and (b) determination of ceiling prices of caustic soda and chlorine in all forms, including bleaching powder.

2.3. As in 1958, we deal with the two aspects of the inquiry in separate Reports. In this Report we confine ourselves to the question of continuance or otherwise of protection to the caustic soda industry. The second Report on the question of prices will follow shortly.

Method of inquiry

3.1. Questionnaires to producers, consumers and associations of consumers of caustic soda were issued in the last week of March 1961. The Indian Chemical Manufacturers' Association, Calcutta and the Alkali Manufacturers' Association of India, Bombay were asked to submit memoranda covering various aspects of the industry. A press note was also issued inviting firms, persons or associations interested in the inquiry to obtain copies of the relevant questionnaires prepared by us and furnish their replies. The Development Wing was requested to send a detailed memorandum on the progress made by the industry since the last inquiry, its present position and schemes for future expansion. In formation regarding caustic soda manufacturing units located in their respective States was sought from the State Directors of Industries. The Ministry of Railways (Railway Board), the Textile Commissioner, the Salt Commissioner, the Hindusthan Salt Co. Ltd., and the Chemical and Allied Products Export Promotion Council were addressed for information on certain specific issues relating to the inquiry. All the State Governments were invited to forward their views regarding the question of continuance of protection to the industry and other related matters. The Collectors of Customs at principal ports and the State Trading Corporation of India Ltd. were addressed for information relating to c i.f. prices, landed costs etc. A list of those to whom questionnaires or letters were issued and those who replied is given in Appendix I.

3.2. We visited some of the factories manufacturing caustic soda located in differents parts of the country. We deputed our Cost Accounts Officers to examine the costs of production of caustic soda and chlorine in all forms at six units, namely, Tata Chemicals Ltd., Mithapur, Saurashtra Chemicals Ltd., Porbandar, Calico Mills (Chemical Division), Bombay, Mettur Chemical and Industrial Corporation Ltd., Mettur Dam, Dhrangadhra Chemical Works Ltd., Sahupuram and Alkali and Chemical Corporation of India Ltd., Calcutta. The Chief Cost Accounts Officer, Ministry of Finance, Government of India, made available to us the

services of one of his Cost Accounts Officers to examine the cost of production of caustic soda at D. C. M. Chemical Works, Delhi. The names of the factories visited by us and by our Officers, together with the dates of visits, are given in Appendix II.

3.3. A public inquiry into the industry was held on 15th September 1961. A list of persons who attended the enquiry is given in Appendix III.

Implementation of the recommendations in our last Report (1958)

4.1. In Paragraph 1 we have indicated the latest position regarding tariff protection to the industry. We set out below the ancillary recommendations in our last Report (1958) and the extent to which they have been implemented.

4.2. "An examination of the question relating to open wagon movement of salt, after taking into account the steps adopted in other countries for the purpose, should be undertaken by the Railway Administration in consultation with the representatives of the industries concerned."

The Railway Board has informed us that our suggestion was examined and it was decided in November 1959 to permit as an experimental measure for a period of three months the bulk loading of salt, subject to the indentors undertaking to cover the walls and floors (up to the required height) of wagons with kraft paper of suitable quality before loading salt and also to wash the wagons at the destination within the usual free time. According to the Board even though wide publicity was given no booking was made under this arrangement. The manufacturers on the other hand, have generally contended that no uniform policy is adopted by the several Railway Administrations to allow bulk movement of salt in open wagons. D. C. M. Chemical Works, which tried to move salt in bulk from Sambhar Lake, has expressed the view that it is not feasible because of (a) difficulties in complying with the stringent conditions stipulated by the Railways, (b) absence of bulk weighing arrangements at Sambhar Lake for loading salt into wagons, and (c) heavy shortage occurring when salt is moved in bulk. The matter is discussed further in paragraph 9.1.2.

4.3. "The Railway Administration may take steps to provide an increasing number of tank wagons for the transport of caustic soda in liquid form."

The Railway Board has informed us that the existing fleet of 59 broad gauge liquid caustic soda tanks is adequate to meet the demand for such wagons on broad gauge lines. As regards transport over metre gauge lines, the Railways are utilising four sulphuric acid tank wagons. They consider this to be adequate as there are no outstanding demands. Manufacturers of caustic soda, however, have pleaded that the Railways should take note of steadily increasing production of caustic soda and arrange to provide more wagons. This is discussed further in paragraph 16.2.

4.4. "The Railway Administration may consider the question of providing a few tank wagons on experimental basis for the transport of liquid chlorine."

We are informed by the Railway Board that its rolling stock now consists of ten liquid chlorine tank wagons but that they are not being utilised for lack of traffic offering. Travancore-Cochin Chemicals Ltd., has, however, stated that the Railway Administration has not so far placed liquid chlorine tank wagons even on an experimental basis. Other manufacturers have stated that as there are at present no large consumers of liquid chlorine, the tank wagons are not indented.

4.5. "The question of developing the manufacture of dicalcium phosphate fertiliser should be kept in view when any fresh licence is issued for augmenting the production of electrolytic Caustic soda."

The Ministry of Commerce and Industry has informed us that this recommendation is kept in view while licensing additional capacity for electrolytic caustic soda.

4.6. "The large-scale salt works (both among existing units and those to be established in future) which propose to supply salt to industrial users should undertake production of salt of the grade acceptable to the chemical industry."

This recommendation was brought to the notice of large-scale salt works by Government. Instructions were also issued by the Salt Commissioner to salt manufacturers to undertake production of high grade salt for use by the chemical industry and also for export. We understand that steps are being taken by Government to ensure that new factories to be established in future produce high grade salt to the extent of 75 per cent of their output. Most salt works are now operated manually and we are advised that with mechanisation the purity of salt can be improved. The Third Five Year Plan also provides for the establishment of three new mechanised salt works in the public sector at Contai (West Bengal), Vedaranyam (Madras) and Bombay. Each of these works is expected to produce 2,00,000 tonnes a year of high grade salt suitable for chemical industries. In addition, a scheme for the establishment of a salt washery-*cum*-sodium sulphate plant in the public sector at Sambhar Lake has been approved and details are being worked out.

5.1. *Caustic-soda*

Present position of the Industry, rated capacity and Production

5.1.1. *Number of units.*—The caustic soda industry has made significant progress under the stimulus of protection. In 1955 when protection was first granted, there were twelve units engaged in the manufacture of caustic soda of which seven produced for sale and five for self-consumption. The number rose to fifteen in 1958 and now there are eighteen units in the industry of which eleven produce for sale and seven mainly for self-consumption.

Particulars of the three new units which commenced production subsequent to the last inquiry in 1958 are given below:—

Sl. No.	Name of the unit	Location of the factory	Annual licensed capacity (Tonnes)	Date of commencement of production
1.	J. K. Chemicals Ltd.	Thana (Bombay)	1,000 (Rayon Grade).	August, 1959.
2.	Dhrangadhra Chemical Works Ltd.	Sahupuram (Madras).	26,400 (Rayon Grade).	October, 1959.
3.	Saurashtra Chemicals (Props. Jiyajeerao Cotton Mills Ltd., Gwalior).	Porbandar (Gujarat).	20,400	March, 1960.

Out of the eighteen units, one unit employs the chemical process, another both chemical and electrolytic processes while the rest have adopted electrolytic process for the manufacture of caustic soda. Among the units which have adopted electrolytic process, six have mercury cells only, ten diaphragm cells and one has installed both mercury and diaphragm cells. Details of the process employed and the forms of caustic soda produced by each unit are given in the statement in paragraph 5.1.2.

5.1.2. *Capacity.*—During the last inquiry in 1958, the total capacity of the fifteen units in the industry was assessed at 68,270 tonnes. During the present investigations information relating to capacity was collected from the manufacturers and the Development Wing, but the sets of figures differed in some cases. The matter was discussed at the public inquiry and it was agreed that in a chemical industry where the process of manufacture is continuous, the annual installed capacity should be calculated on the basis of daily capacity. Accordingly, the daily capacity of each unit was assessed in consultation with technical experts and the annual installed capacity determined. The statement below shows the present daily capacity of every unit in production, its annual installed and achievable capacity as worked out by us. It also gives the figures of capacity adopted in 1958 and other particulars, such as process of manufacture adopted by each unit and the forms of caustic soda produced:

(A) *Capacities of units producing caustic soda for sale*

(In tonnes)

Sl. No.	Name of the unit	Type of process employed	Forms of caustic soda produced	Annual capacity in 1958	Present capacity			Remarks
					Daily capacity	Annual installed capacity	Annual achievable capacity	
1	2	3	4	5	6	7	8	9
			(i) *Units producing caustic soda by chemical process*					
1.	Tata Chemicals Ltd., Mithapur.	Chemical	Solid, flakes and liquid.	6,710	20·32	7,400	6,300	
2.	Saurashtra Chemicals, Porbandar.	Do.	Solid	..	73·66	26,900	22,900	
				6,710	93·98	34,300	29,200	
			(ii) *Units producing caustic soda by electrolytic process*					
1.	Tata Chemicals Ltd., Mithapur.	Electrolytic Diaphragm.	Solid, flakes and Liquid.	3,350	10·16	3,700	3,100	
2.	Alkali & Chemical Corporation of India Ltd., Calcutta.	Do.	Liquid	5,370	21·40	7,800	6,600	

3. Calico Mills, Chemical Division, Ahmedabad.	Do.	Do.	2,350	7·07	2,600	2,200	
4. Calico Mills, Chemical Division, Bombay.	Electrolytic Mercury Amalgam.	Do.	3,660	10·16	3,700	13,100	
5. D. C. M. Chemical Works, Delhi.	Electrolytic Diaphragm.	Solid, flakes and Liquid.	9,390	35·56	13,000	11,100	
6. Hindusthan Heavy Chemicals Ltd., Calcutta.	Do.	Liquid . .	2,080	6·10	2,200	1,900	
7. Mettur Chemical and Industrial Corporation Ltd., Mettur Dam.	Do.	Solid, flakes and Liquid.	5,260	20·32	7,400	6,300	
8. Travancore-Cochin Chemicals Ltd., Alwaye.	Electrolytic Mercury Amalgam.	Do.	6,710	27·43*	10,000	8,500	*Exclusive of capacity for manufacture of Sodium Hydrosulphite.
9. J. K. Chemicals Ltd., Bombay.	Do.	Liquid . .	..	3·00*	1,100	900	
10, Dhrangadhra Chemical Works Ltd., Sahupuram.	Do.	Solid and flakes	..	80·00	29,200	24,800	
			38,170	221·20	80,700	68,500	
		TOTAL OF (i) AND (ii) .	44,880	315·18	115,000	97,700	

(B) *Capacities of units producing caustic soda mainly for self-consumption*

(In tonnes)

Sl. No.	Name of the unit	Type of process employed	Forms of caustic soda produced	Capacity in 1958	Present capacity			Remarks
					Annual rated capacity as furnished by the units	Annual installed capacity now assessed	Annual achievable capacity	
1	2	3	4	5	6	7	8	9
1.	National Rayon Corporation Ltd., Bombay.	Elecrtolytic Mercury Amalgam.	Liquid	7,110	8,500	9,400	8,000	Sells a part of its production.
2.	Orient Paper Mills Ltd., Brajrajnagar.	Do.	Do.	3,290	3,290	3,600	3,100	
3.	Rohtas Industries Ltd., Dalmianagar.	Electrolytic Mercury Amalgam and Electrolytic Diaphragm.	Do.	5,370	5,590*	6,800	5,800	*Based on 300 working days.
4.	Mysore Paper Mills Ltd., Bhadravati.	Electrolytic Diaphragm.	Do.	580	620	700	600	
5.	Shri Gopal Paper Mills Ltd., Yamunanagar.	Do.	Do.	670	780	900	800	
6.	Sirpur Paper Mills Ltd., Sirpur.	Do.	Do.	3,020	3,020	3,300	2,800	
7.	Titaghur Paper Mills Ltd., Titaghur.	Do.	Do.	3,350	3,830	4,200	3,600	
			TOTAL (B)	23,390	25,630	28,900	24,700	
			GRAND TOTAL (A & B)	68,270	..	143,900	122,400	

The present annual installed capacity of the industry works out to 143,900 tonnes and the annual achievable capacity 122,400 tonnes (of which 97,700 tonnes represent the capacity of 11 units which manufacture for sale), as against the capacity of 68,270 tonnes for fifteen units in 1958. Thus, there has been a substantial increase in capacity, which was due partly to the expansion of existing units and partly to establishment of three new units.

5.1.3. *Production.*—The statement in Appendix IV gives the figures of production of caustic soda in all forms (solid, liquid and flakes) during the years 1958, 1959, 1960 and 1961 (Jan.-June). The following table gives a summary of the aggregate production, together with percentages of production of each form of caustic soda to total production in each year:—

	Technical Grade (Tonnes)	Rayon Grade (Tonnes)	Total (Tonnes)	%
	1	2	3	4
1958				
Fused solid caustic soda . .	9,744	1,557	11,301	19
Liquid caustic soda . . .	32,222	11,503	43,725	75
Caustic soda flakes . . .	2,263	1,022	3,285	6
TOTAL .	44,229 (76%)	14,082 (24%)	58,311	100
1959				
Fused solid caustic soda . .	7,941	5,465	13,406	19
Liquid caustic soda . . .	34,456	17,715	52,171	74
Caustic soda flakes . . .	3,118	1,788	4,906	7
TOTAL .	45,515 (65%)	24,968 35%)	70,483	100
1960				
Fused solid caustic soda . .	14,009	22,344	36,353	37
Liquid caustic soda . . .	35,401	20,140	55,541	57
Caustic soda flakes . . .	3,330	2,176	5,506	6
TOTAL .	52,740 (54%)	44,660 (46%)	97,400	100

	1	2	3	4
1961 (January-June)				
Fused solid caustic soda . .	11,153	12,092	23,245	40
Liquid caustic soda . . .	20,394	11,464	31,858	55
Caustic soda flakes . . .	1,774	954	2,728	5
TOTAL .	33,321 (58%)	24,510 (42%)	57,831	100

Thus production rose by about 67 per cent from 58,311 tonnes in 1958 to 97,400 tonnes in 1960 and during the first half of 1961, the output was running at the rate of 116,000 tonnes approximately. Production of the rayon grade has registered an upward trend and its share in the total production rose from 24 per cent in 1958 to 42 per cent during January-June 1961; there was a corresponding decline in the share of the technical grade. In 1958 and 1959 the relative proportions of output of caustic soda in different forms remained practically unchanged, with liquid caustic soda accounting for about 75 per cent of the aggregate output. There was a significant change from 1960 when the proportion of liquid caustic soda declined to 57 per cent and dropped further to 55 per cent during January-June 1961.

The decline in the share of liquid caustic soda and the progressive rise in production of fused caustic soda are due to the coming in of Dhrangadhra Chemical Works, the largest unit in the industry, which produces mainly fused caustic soda and does not market liquid caustic soda.

5.1.4. A break-down of the figures of total production of caustic soda for self-consumption and for sale is given below:

(Tonnes)

	1958	1959	1960	1961(Jan.-June)
For self consumption	18,853(32%)	22,743(32%)	25,236(26%)	13,440(23%)
For sale . . .	39,458(68%)	47,740(68%)	72,164(74%)	44,391(77%)
	58,311(100%)	70,483(100%)	97,400(100%)	57,831(100%)

5.2. *Liquid chlorine.*—At the time of our last inquiry there were ten units producing liquid chlorine and their aggregate annual capacity was 30,670 tonnes. Since then two more units, namely, J. K. Chemicals Ltd. and Orient Paper Mills Ltd. have commenced production of chlorine. The former has liquid chlorine for sale and the latter produces

chlorine gas for its own use. The following table shows the names of the units, their annual capacity and production of liquid chlorine since 1958:—

(Tonnes)

Sl. No.	Name of the unit	Present annual capacity	Production			
			1958	1959	1960	1961 (Jan.-June)
1	Tata Chemicals Ltd.	2,520	1,467	1,530	1,866	1,063
2	Alkali Chemicals and Industrial Corpn. Ltd.	5,810	4,769	4,851	5,741	2,898
3	Calico Mills (Chemical Division), Ahmedabad.	1,540	972	1,091	1,099	538
4	Calico Mills (Chemical Division), Bombay.	2,680	1,226	2,135	1,677	1,043
5	D.C.M. Chemical Works.	10,230	6,102	6,752	7,566	4,603
6	Hindusthan Heavy Chemicals Ltd.	1,490	1,011	874	974	314
7	Mettur Chemical and Industrial Corpn. Ltd.	4,000	2,362	2,679	2,504	1,502
8	National Rayon Corpn. Ltd.	3,600	335	1,187	2,762	1,848
9	Travancore-Cochin Chemicals Ltd.	3,300	1,141	1,983	2,511	1,193
10	J. K. Chemicals Ltd.	990	..	492	877	458
11	Rohtas Industries Ltd.	1,650	39	80	113	27
12	Orient Paper Mills Ltd.	2,880	..	N.A.	N.A.	N.A.
	TOTAL	40,690	19,424	23,654	27,690	15,487

(NOTE.— Sl. No. 11 produces mostly and Sl. No. 12 entirely for self-consumption.)

5.3. *Hydrochloric Acid.*—In 1958 there were ten units producing hydrochloric acid with a total annual capacity (in terms of 100 per cent acid) of 14,310 tonnes. Since then, another unit, J. K. Chemicals Ltd., Bombay, has commenced production. Dhrangadhra Chemical Works

Ltd., Sahupuram, at present converts its chlorine into weak hydrochloric acid to facilitate discharge as waste effluent. Its production has not, therefore, been taken into account. The following table shows the present capacity and production of eleven units since 1958:—

(Tonnes)

Sl. No.	Name of the unit	Present capacity in terms of 100% hydro-chloric acid	Production			
			1958	1959	1960	1961 (Jan.-June)
1	Tata Chemicals Ltd.	890	581	739	801	411
2	Alkali & Chemical Corporation of India Ltd.	820	555	681	811	389
3	Calico Mills, Chemical Division, Ahmedabad.	600	442	428	458	243
4	Calico Mills, Chemical Division, Bombay.	1,010	153	397	480	236
5	D.C.M. Chemical Works.	5,610	396	602	805	284
6	Hindustan Heavy Chemicals Ltd.	380	183	139	276	87
7	Mettur Chemical and Industrial Corporation Ltd.	1,000	451	574	660	299
8	National Rayon Corpn. Ltd.	4,000	432	753	746	1,152
9	Travancore-Cochin Chemicals Ltd.	5,940	6,774	5,033	5,716	3,125
10	J. K. Chemicals Ltd.	990		47	306	239
11	Rohtas Industries Ltd.	110	129	215	203	78
	TOTAL	21,350	10,096	9,608	11,262	6,543

All the units except National Rayon Corporation and Travancore-Cochin Chemicals sell their acid. National Rayon Corporation sells a part of the acid and drains out the rest if chlorine is surplus. Travancore-Cochin Chemicals produces the acid in the form of gas for conversion into ammonium chloride in the adjoining factory of Fertilizers and Chemicals Ltd.

Future expansion

6.1. The Planning Commission has laid down for caustic soda a target of 400,000 tons for annual capacity and of 340,000 tons for annual production to be attained by the end of the Third Plan period. The present annual capacity is 143,900 tonnes only and additional capacity required for reaching the target is expected to be achieved partly by expansion in the existing factories and partly by establishment of new factories. Ten of the existing factories, (seven from the group that produces caustic soda for sale and three from the group producing the chemical mainly for self-consumption) have been licensed for expanding their capacities for manufacture of caustic soda. The additional capacity so licensed and likely to be installed in the course of the next three years, that is, by the end of 1964 is of the order of 60,000 tonnes. As regards newcomers, licences were issued to fourteen companies to establish the manufacture of caustic soda (thirteen by electrolytic process and one by chemical process) but the licence of one company has since been revoked. The aggregate capacity licensed to these thirteen new units is of the order of 130,000 tonnes but the capacity expected to be established by the end of 1964 is about 95,000 tonnes. We understand, however, that a few applications for expansion of capacity are pending before the Licensing Committee.

6.2. Particulars of additional capacity sanctioned to the existing units and of licences granted to new comers, together with the dates by which such capacity is expected to be installed, are given in the following statements:—

Statement showing additional capacity licensed

(A) *For existing units.*

(Tonnes per annum

Sl. No.	Name of the unit	Additional capacity licensed	Likely date by which additional capacity will be commissioned
1	2	3	4
1	Tata Chemicals Ltd. . .	3,190 Chemical Caustic Soda 2,220 Electrolytic Caustic Soda	End of 1962.
2	Calico Mills, Chemical Division, Bombay.	6,710	June, 1963.

1	2	3	4
3	Travancore-Cochin Chemicals Ltd.	22,500*	700 tonnes—1962. 3,300 tonnes—June, 1963. 18,500 tonnes—After 1964. *Exclusive of capacity licensed for sodium sulphide.
4	D.C.M. Chemical Works . .	5,210	1964.
5	Hindusthan Heavy Chemicals Ltd.	2,150	April, 1962.
6	Mettur Chemical & Industrial Corporation Ltd.	26,830	6,710 tonnes—March, 1962. 20,120 tonnes—After 1964.
7	Dhrangadhra Chemical Works Ltd.	19,800	16,500 tonnes—March, 1963. 3,300 tonnes—1964.
8	National Rayon Corporation Ltd.	4,710	Beginning of 1963.
9	Sirpur Paper Mills Ltd. . .	3,020	1963.
10	Titaghur Paper Mills Ltd. .	1,680	1963.
		98,020	

(B) *For new units.*

(Tonnes)

Sl. No.	Name of the unit	Date of issue of licence	Annual capacity licensed	Date by which the capacity is likely to be established
1	2	3	4	5
	(i) *Chemical Caustic Soda*			
1	H.M.D.H. Bhiwandiwalla & Co., Bombay.	29-3-57	16,760	After 1964.
	(ii) *Electrolytic Caustic Soda*			
2	Andhra Sugars Ltd., Thanuku .	9-12-59 & 3-5-60	10,060	3,300 tonnes.—End of 1962. 6,760 tonnes—1963.
3	National Organic & Chemical Industries Ltd., Bombay. (Standard Mills Ltd.)	1-5-61	11,710	1964—Exclusive of capacity licensed for caustic potash.

1	2	3	4	5
4	National Newsprint and Paper Mills Ltd., Nepanagar.	10-2-61	4,130	1964.
5	Century Rayon, Bombay . .	11-11-60	10,060	1964.
6	Rajasthan Vinyl & Chemical Industries Ltd., Kotah.	27-12-60	10,060	1962.
7	Kanoria Chemicals & Industries Ltd., Faizabad. (Purtabpore Co. Ltd.)	20-8-60	16,760	1964.
8	Bangur Bros. Ltd., Calcutta	6-2-61	16,760	1964.
9	Atul Products Ltd., Bulsar	7-10-58 & 12-9-59	6,710	1962.
10	West Coast Paper Mills Ltd., Dandeli.	2-2-61	9,140	1964.
11	Orient Paper Mills Ltd., Amlai	2-2-61	6,710	After, 1964.
12	Nepa Chemicals Ltd., Nagpur	1957	4,020	After 1964.
13	Durgapur Industries Board, Durgapur.	5-5-61	6,710	After 1964.
	TOTAL (B) .		129,590	
	GRAND TOTAL (A) & (B).		227,610	

If the expansion schemes referred to above are implemented as scheduled, the installed and the achievable capacity during the next three years will be as under :—

(In tonnes)

	At Present	1962	1963	1964
Annual installed capacity . .	143,900	179,000	221,800	298,900
Annual achievable capacity .	122,400	152,300	188,700	254,100

7.1. *Caustic soda:*

Domestic demand

7.1.1. In 1958 we estimated the demand for caustic soda at 124,000 tons for that year and at 159,000 tons for 1961. The break-down of these estimates was as follows:

(In tonnes)

Consuming industry	Estimated demand in 1958	Estimated demand in 1961
Soap	23,000	28,000
Textile	34,000	38,000
Paper	26,500	30,000
Rayon	28,000	46,000
Vanaspati	1,800	2,500
Petroleum refining	3,000	2,700
Chemicals & dyestuffs	2,000	4,000
Aluminium	1,600	3,500
Rare earths and miscellaneous	4,100	4,300
TOTAL	124,000	159,000

According to the Development Wing consumption of caustic soda during the last three years was 135,000 tonnes in 1958, 155,000 tonnes in 1959 and 170,000 tonnes in 1960. The total availability made up of indigenous production and imports during those years was 121,000 tonnes, 220,000 tonnes and 151,000 tonnes respectively.

7.1.2. The estimates of demand received by us in connection with the present inquiry from the Development Wing, the producers and other interests are tabulated in the following statement:—

Statement showing estimates of current and future demand for caustic soda by consuming industries

(In tonnes)

Sl. No.	Source of information	Year	Soap industry	Textile industry	Paper industry	Rayon industry	Vanaspati industry	Alumi-nium industry	Miscella-neous industries	Total
1	2	3	4	5	6	7	8	9	10	11
1	Development Wing . .	1961	28,000	45,000	52,000	50,000	2,500	4,000	13,500	195,000
		1962	30,000	46,500	62,000	60,000	3,000	8,000	17,500	227,000
		1963	33,000	48,000	75,000	70,000	3,500	12,000	22,500	264,000
		1964	36,000	49,000	90,000	77,000	4,000	15,000	29,000	300,000
2	*Producers* (Calico Mills, Bombay & Ahmedabad, Dhrangadhra Chemical Works, Travancore-Cochin Chemicals, Saurashtra Chemicals and Tata Chemicals) and *Producers' Associations* (Indian Chemical Manufacturers' Association and Alkali Manufacturers' Association of India).	1961	28,000	38,000	30,000	46,000	3,700	3,400	13,000	162,100
		1962	31,000	39,500	38,000	65,000	4,000	5,000	15,000	197,500
		1963	34,000	41,000	46,000	100,000	4,230	7,600	18,000	250,830
		1964	37,000	42,500	54,000	125,000	4,500	11,000	22,000	296,000
3	Hindusthan Heavy Chemicals Ltd.	1961	25,000	26,000	30,000	44,000	2,000	4,000	9,000	140,000

7.1.3.1. The various estimates of demand and the trends of consumption and supply in the past referred to above were discussed in the public inquiry and it was agreed to assess the requirements as under:

7.1.3.2. *Soap industry:*

Production of soap in 1961 is estimated as 150,000 tonnes in the organised sector and 350,000 tonnes in the small scale sector. By 1964 their output is expected to rise to 190,000 tonnes and 440,000 tonnes respectively. On the basis of the consumption factors which we adopted in our 1958 Report, namely, 13 per cent in the large scale sector and 6 per cent in the small scale sector, the total demand of this industry for caustic soda is assessed at 40,500 tonnes in 1961 and 51,100 tonnes in 1964.

7.1.3.3. *Textile industry:*

The present demand for caustic soda by the textile industry is assessed at 45,000 tonnes and the demand in 1964 at 50,000 tonnes. These figures are based on the total estimated cloth production of 8,200 million yards in 1961 and 9,026 million yards in 1964 as furnished by the Textile Commissioner.

7.1.3.4. *Paper and paper boards industry:*

The total production of paper pulp and paper boards is envisaged to be 445,500 tonnes in 1961 and 735,000 tonnes in 1964. Based on the consumption factor of 10 per cent, which was accepted in 1958, we have assessed the demand for caustic soda by this industry at 44,600 tonnes in 1961 and 73,500 tonnes in 1964.

7.1.3.5. *Rayon industry:*

Production of viscose rayon is estimated at 50,000 tonnes in 1961 and 90,000 tonnes in 1964. On the basis of an average consumption of one ton of caustic soda per ton of rayon, the requirements of caustic soda for all types of rayon, namely, filament, staple, film and cord and other types were assessed at 50,000 tonnes in 1961 and 90,000 tonnes in 1964.

7.1.3.6. *Vegetable oils and vanaspati industry:*

Production of vanaspati is estimated to be of the order of 400,000 tonnes and 550,000 tonnes during 1961 and 1964 respectively. The industry's requirements of caustic soda have, therefore, been estimated at 3,200 tonnes in 1961 and 4,400 tonnes in 1964. We have assumed that the consumption of caustic soda would be about 0.8 per cent of the finished product.

7.1.3.7. *Aluminium industry:*

The demand of the aluminium industry is estimated at 5,000 tonnes for 1961 and 20,000 tonnes for 1964. This has been calculated on the basis of an estimated annual production of 20,000 tonnes and 75,000 tonnes of aluminium during those two years.

7.1.3.8. *Miscellaneous group of industries:*

The demand for caustic soda by the group of industries listed below is assessed at 13,500 tonnes for 1961 and at 30,000 tonnes for 1964:—

(i) Rare earths,

(ii) Dyestuffs and intermediates,

(iii) Petroleum products,

(iv) Drugs and pharmaceuticals,

(v) Plastic raw materials, and

(vi) Other organic chemicals.

7.1.4. The estimates of demand arrived at on the above basis are given below:—

(In tonnes)

Consuming industry	1961	1964
Soap	40,500	51,100
Textiles	45,000	50,000
Paper	44,600	73,500
Rayon	50,000	90,000
Vanaspati	3,200	4,400
Aluminium	5,000	20,000
Miscellaneous industries	13,500	30,000
TOTAL	201,800	319,000

Against the estimated demand of 319,000 tonnes in 1964 the maximum production likely to be realised in that year will be about 254,000 tonnes. Thus there will be a wide gap of 65,000 tonnes which has to be covered. Domestic demand has been increasing at a fast rate. Unless additional capacities are sanctioned the demand will continue to outstrip production.

7.2. *Chlorine.*—In our last Report (1958) we estimated the annual demand for chlorine by various chlorine consuming industries at 40,000 tons for 1958 and expected it to increase to 95,000 tons in 1961. These estimates were arrived at after adopting a conservative assessment of chlorine utilisation by Dhrangadhra Chemical Works at Tuticorin for recovery of pure salt. In connection with the present inquiry the Development Wing has observed that it would be difficult to make a forecast

of future demand for chlorine in the absence of information regarding progress made in the establishment of several licensed projects for the manufacture of chlorine-based products. The estimates furnished by it as well as by other interests are given below:—

(In tonnes)

	Current 1961	Future 1964
1. Development Wing.	68,000	132,000
2. Producers (Calico Mills—Chemical Division, Bombay and Ahmedabad; Dhrangadhra Chemical Works, Travancore-Cochin Chemicals and Tata Chemicals).	66,500	130,000
3. Mettur Chemical and Industrial Corporation . .	56,900	161,500 (For 1965-66)
4. Producers' Associations (Alkali and Chemical Manufacturers' Association and Indian Chemical Manufacturers' Association).	66,500	130,000

These figures were discussed at the public inquiry and it was agreed to accept the estimates furnished by the Development Wing. Accordingly, we have assessed the domestic demand for chlorine at 68,000 tonnes for 1961 and 132,000 tonnes for 1964.

Utilisation of chlorine

8.1. In our 1954 Report we dealt with the situation then confronting the indigenous producers of caustic soda about the disposal of chlorine which is a joint product in the manufacture of caustic soda by the electrolytic process. We recommended that Government should take special measures to encourage the development of industries which required large quantities of chlorine. We stressed that manufacturers should also intensify their efforts to develop the use of chlorine. Reviewing the progress in this regard we observed in paragraph 7.1 of our last Report (1958) that there was evidence of greater awareness on the part of producers of the need for increasing utilisation of chlorine.

8.2. At present producers of caustic soda in general (barring Dhrangadhra Chemical Works), are in a position to find a useful outlet for their output of chlorine either by sale as liquid chlorine or by manufacture of chlorine-based products. The rapid expansion of the paper industry in the country provided an important outlet for chlorine. Manufacture of polyvinyl chloride and polyethylene chloride has also helped in greater utilisation of chlorine. Other large-scale chlorine consumers are industries for manufacture of insecticides and pesticides (D.D.T., benzene hexachloride, etc.), fertilisers like ammonium chloride and products like

stable bleaching powder. Liquid chlorine is also used on an increasing scale for water purification and sanitation. A few units like Tata Chemicals have plans to manufacture benzyl chloride, ethylene dichloride and fertilisers like dicalcium phosphate which will result in increased utilisation of chlorine. Calico Mills, Bombay which has put up a plant for the manufacture of P.V.C., has plans to undertake the manufacture of trichlorethylene. Dhrangadhra Chemical Works, which disposes off as effluent practically all its chlorine in the form of weak hydrochloric acid, also contemplates manufacture of P.V.C., trichlorethylene, perchlorethylene and liquid chlorine. Some manufacturers also convert chlorine into bleach liquor which is sold to nearby textile mills. As regards captive units (*i.e.* those producing for self-consumption), the chlorine produced in the caustic soda plants installed by paper mills is mainly used for producing bleach liquor. Rohtas Industries produces liquid chlorine, hydrochloirc acid and bleaching powder. Orient Paper Mills has a liquefaction plant for the manufacture of liquid chlorine but there was no production during the last three years. National Rayon Corporation Ltd. produces liquid chlorine and hydrochloric acid for sale and is installing a plant for making carbon tetrachloride. The following statement gives particulars of producers of caustic soda who manufacture diverse products utilising chlorine:—

Name of the producer	Name of chlorine products produced	REMARKS
1	2	3
1. Tata Chemicals Ltd.	Liquid chlorine, hydrochloric acid, benzene hexachloride, copper oxychloride, zinc chloride, bromine and ferric chloride.	The Company has discontinued production of bleaching powder from this year but it has plans to produce benzyl chloride and ethylene dichloride. It has also applied for a licence to manufacture dicalcium phosphate along with ossein from bones by digestion with hydrochloric acid.
2. Alkali and Chemical Corporation of India Ltd.	Liquid chlorine, hydrochloric acid and benzene hexachloride.	
3. Calico Mills, Chemical Division, Ahmedabad,	Bleach liquor, liquid chlorine and hydrochloric acid.	

1	2	3
4. Calico Mills, Chemical Division, Bombay.	Bleach liquor, liquid chlorine and hydrochloric acid.	The company has put up a plant for the manufacture of P.V.C. and will also take up the manufacture of trichlorethylene.
5. D.C.M. Chemical Works . .	Liquid chlorine, hydrochloric acid, active earth, ferric chloride, ossein and dicalcium phosphate.	D.D.T. is produced in an adjacent factory. The company is planning to set up a bleaching powder plant for which it has received licence.
6. Hindusthan Heavy Chemicals, Ltd.	Liquid chlorine and hydrochloric acid.	
7. Mettur Chemicals & Industrial Corporation Ltd.	Liquid chlorine, hydrochloric acid, bleach liquor, calcium chloride and bleaching powder.	
8. Travancore-Cochin Chemicals, Ltd.	Liquid chlorine, bleach liquor, hydrochloric acid, rare earth chloride, ammonium chloride and D.D.T.	Rare earth chloride, ammonium chloride and D.D.T. are produced in adjacent factories.
9. J. K. Chemicals, Ltd. . .	Liquid chlorine and hydrochloric acid.	
10. Dhrangadhra Chemical Works, Ltd.	Hydrochloric acid .	The company has plans to undertake the manufacture of P.V.C., trichlorethylene, perchlorethylene and liquid chlorine.
11. National Rayon Corporation, Ltd.	Liquid chlorine and hydrochloric acid.	The company is installing a semi-commercial plant for making cabontetrachloride.

8.3. From the data furnished to us by the above producers it appears that the utilisation of chlorine (weighted average) was about 84 per cent in 1958, 73 per cent in 1959 and 61 per cent in 1960. The progressive decline in utilisation during 1959 and 1960 was mainly due to the largest among the producers having had to waste practically its

entire output of chlorine. If we omit to take into account its figures from our calculation, the weighted average of percentage utilisation works to 83 in 1959 and 85 in 1960. In other words, the remaining units were able to find useful outlets for their chlorine. We were informed at the public inquiry that the demand for chlorine improved further in 1961 and at present there is no problem of chlorine utilisation. This position will not, however, continue for long. From the data given in paragraph 6 it would appear that by the end of 1964, the output of electrolytic caustic soda will increase to about 222,200 tonnes. The corresponding production of chlorine (on the basis of 85 tonnes of chlorine to 100 tonnes of caustic soda) will be about 189,000 tonnes. As against this, the overall requirements of chlorine in 1964 are expected to be of the order of 132,000 tonnes (*vide* paragraph 7.2). There will, therefore, be an excess of chlorine production to the extent of 57,000 tonnes and accordingly the problem of profitable utilisation of chlorine will pose itself before the industry. The remedy for this situation may be sought from larger production of chemical caustic soda, but having regard to its high cost of production we do not recommend such a step. We must, therefore, reconcile ourselves to the fact that at least for a few years to come there will be surplus chlorine which will have to be wasted. This has become unavoidable as the demand for caustic soda is rising much faster than that for chlorine.

9.1. *Electrolytic caustic soda:*

Raw materials, power and fuel

9.1.1. The principal raw material required for the manufacture of caustic soda by the electrolytic process is common salt. Besides, a few other materials such as mercury, graphite, soda ash, barium carbonate (also barium chloride), sodium sulphite and asbestos paper are also required. Common salt is used for making saturated brine solution and barium carbonate, soda ash and lime are required for purification of brine before feeding it into electrolytic cells. Graphite and mercury form respectively, anode and cathode of the mercury cell. In the diaphragm cell, iron-grate lined with asbestos serves as cathode and graphite as anode. Coal and furnace oil are used for generating steam and power and for fusion of caustic soda solid. In some cases dowtherm (a liquid organic compound) serves as a heat transfer material in the process. The consumption of asbestos lining is linked with that of electrodes. Barring coal, furnace oil, common salt, soda ash, sodium sulphite and barium carbonate, the other raw materials are imported.

9.1.2. *Common salt:*

The main sources of salt supply are located in Saurashtra, Kutch, Rajasthan (Sambhar) and Madras. Tata Chemicals, Saurashtra Chemicals, Mettur Chemical and Industrial Corporation and Dhrangadhra Chemical Works, Sahupuram, obtain salt from their own or associate works while D. C. M. Chemical Works and Rohtas Industries purchase salt from Hindusthan Salt Co. Ltd., Sambhar. All other units get their requirements of salt from Gujarat and to a limited extent from Bombay region. Most of the units are able to obtain salt of the required quality,

which can be used without much processing in the factory. The industry's main problem about salt is the cost of transport. In this connection we invite attention to paragraphs 7.1.1.2 and 7.1.1.3 of our latest Report (1961) on the continuance of protection to the Soda Ash industry. We have recommended therein that the higher freight rate for bulk movement of salt under class 37.5-A need not be enforced if a consumer undertakes to carry out protective measures for wagons as required by the railways. We have also recommended that the Railway Administrations should, in consultation with the manufacturers of soda ash, evolve a workable arrangement for bulk movement of salt in wagons and extend the facilities to cover long distance movement of salt. Both the recommendations are essential for development of the caustic soda industry and we reiterate them for sympathetic consideration by Government.

9.2. *Chemical caustic soda:*

The basic raw materials required for chemical caustic sod are soda ash and limestone. Coal, coke and fuel oil/furnace oil constitute the main fuel, while mild steel sheets for fabricating drums form important packing material. Lime required in the process is produced by burning lime-stone and coke in a kiln. Coal and fuel oil are used for generating power and steam. Barring mild steel sheets, which are partly met by imports, all other raw materials are available in the country.

9.2.1. *Soda ash:*

Tata Chemicals and Saurashtra Chemicals are the only two producers at present manufacturing caustic soda by lime-soda process. They use their own soda ash.

9.2.2. *Limestone:*

Tata Chemicals obtains the bulk of its requirements of limestone from quarries at Ranavav near Porbander. Saurashtra Chemicals gets its supply from Kajiawadri and Adityana quarries.

9.2.3. *Coke:*

Both the manufacturers mentioned above obtain supplies of this raw material from cokeries in Bihar area.

9.3. *Packing material:*

Mild steel sheets form the only packing material for solid caustic soda. The following units require steel sheets for packing while others have been selling caustic soda in liquid form:—

1. Tata Chemicals Ltd.,
2. Dhrangadhra Chemical Works Ltd.,
3. Saurashtra Chemicals,
4. Mettur Chemical and Industrial Corporation Ltd.,
5. D. C. M. Chemical Works, and
6. Travancore-Cochin Chemicals Ltd.

They have installed their own drum plants and obtain their supplies of sheets from either indigenous sources or abroad as users/fabricators.

9.4. *Power:*

9.4.1. Among the producers of caustic soda, Tata Chemicals generates its own electric energy and D. C. M. Chemical Works produces a part of its requirements in its own power house and purchases the balance from the Delhi State Electricity Board. Other producers obtain their requirements of electricity through their respective State Electricity Boards.

9.4.2. The current rates per Kwh. of energy in the case of seven units, whose costs of production have been examined by us, are as under:

	Rate (nP.)	
1. Alkali & Chemical Corporation . .	4·09	
2. D. C. M. Chemical Works . . .	7·03	(Weighted average of purchase rate and cost of own generation).
3. Mettur Chemical & Industrial Corpn. Ltd. .	2·01	
4. Tata Chemicals	9·80	(Own generation).
5. Dhrangadhra Chemical Works, Sahupuram	2·53	
6. Saurashtra Chemicals	9·84	
7. Calico Mills—Chemical Divn., Bombay .	4·02	

N.B. Cost of power generated by a unit does not include depreciation and return on power block.

The above rates include electricity duty or surcharge amounting in certain cases to 0.8 nP. per unit.

9.4.3. In our 1958 Report we had suggested that Government should take suitable steps to relieve industries of uncertainties regarding rates for the supply of electrical energy. In this connection we are informed by the Ministry of Commerce and Industry that our suggestion had been brought to the notice of all State Governments. The Governments of Assam and Madras are in agreement with our views and no duty or surcharge on consumption of electricity is charged by them. The Government of Uttar Pradesh has exempted with effect from 1st April 1959 the industries engaged in the manufacture, processing or repairs of goods from payment of electricity duty. The Government of Orissa has stated that it would be prepared to consider, in appropriate cases, the fixing of special rates depending upon the importance of power as a factor in the cost of production. The States of Maharashtra, Mysore,

Kerala and Madhya Pradesh, which by 1964 will account for about one-third of the manufacturing capacity for caustic soda are, however, not in favour of exempting electro-chemical industries from payment of electricity duties on the electric power consumed by them. The Government of Gujarat is reported to have decided to exempt all new industries from payment of electricity duty for specified periods and to extend this concession to electro-chemical and other power-intensive industries also. It is disappointing that some of the States are not agreeable to exempt caustic soda units from payment of electricity duty. Further, while a few States would be willing to charge concessional rates for electricity, none has agreed to maintain the current rates for the entire Third Five Year Plan period. Considering that about 4,000 units of power are required to produce one tonne of caustic soda, a rise of 1 nP. in the electricity rate will raise the cost of production of caustic soda by Rs. 40 per tonne. We realise that there may be practical difficulties in securing uniform concessional rate throughout the country for electro-chemical industries from the diverse agencies producing electrical energy (both thermal and hydro-electric). But we consider that the caustic soda industry requires for its sound development stable rates of electricity for a fairly long period and we reiterate the recommendation made in our last Report (1958) that State Electricity Boards should be requested not to effect increases in existing rates during the present Plan period.

9.5. *Fuel:*

As stated in paragraphs 9.1 and 9.2 coal, coke and furnace oil constitute the main fuel for this industry. Coke is mainly required for chemical caustic soda in the lime kiln.

9.5.1. *Coal:*

Among the producers of electrolytic caustic soda, only two producers, namely, D. C. M. Chemicals Works and J. K. Chemicals use coal for producing solid caustic soda, while Alkali and Chemical Corporation uses it for generating steam.

9.5.2. *Furnace oil:*

The following five units use furnace oil for fusing caustic soda (either electrolytic or chemicals):

1. Dhrangadhra Chemical Works Ltd.,
2. Travancore-Cochin Chemicals Ltd.,
3. Mettur Chemical and Industrial Corporation,
4. Tata Chemicals Ltd.,
5. Saurashtra Chemicals.

None of the above units has complained of any difficulty in obtaining its requirements of furnace oil.

10.1. *Standard specifications.*—Caustic soda is available in two grades, technical and rayon. There are two Indian Standard Specifications—one for caustic soda (technical), IS:252-1950 and the other for pure caustic soda, IS: 1021-1956. The former specification was amended in June 1956 and again in May 1959. Further revision of the specification is now under consideration. The following table indicates the requirements for technical caustic soda and pure caustic soda:

Standard specifications and quality of indigenous products

Characteristics	Requirements		
	As per specification IS: 252-1950 as amended upto 1959	As per draft Indian Standrad Specification for caustic soda technical DOC: CDC 25 (1231)	As per IS.: 1021-1956
	(Technical caustic soda)	(Technical caustic soda)	(Pure caustic soda)
(i) Sodium hyroxide (NaOH) content per cent by weight, minimum.	95·0	95·0	99·5
(ii) Sodium carbonate (as Na_2CO_3) per cent by weight, maximum.	2·0	2·0	0·40
(iii) Total chlorides and sulphates as sodium chloride (NaCl) and sodium sulphate (Na_2SO_4), per cent by weight, maximum.	3·0	3·0 (as Cl) (as Na_2SO_4).	0·10 0·16
(iv) Matter insoluble in water, per cent by weight, maximum.	0·2	0·2	..
(v) Silicates (as SiO_2) per cent by weight, maximum.	..	..	0·04
(vi) Iron (as Fe_2O_3), p.p.m. maximum . .	..	0·05% by Wt.	15·0
(vii) Copper (as Cu) p.p.m. maximum . .	..	..	2·0
(viii) Manganese (as Mn) p.p.m. maximum .	..	..	2·0

As regards caustic soda solution (technical grade), the material should also comply, on dry basis, with the requirements given in the table above except that chloride and sulphate contents of the material, on dry basis, should be not more than 3.5 per cent, both taken together and expressed as sodium chloride (NaCl) and sodium sulphate (Na_2SO_4) respectively and for pure caustic soda solution, the material should be free from dirt, foreign matter and other visible impurities.

10.2. *Quality.*—At the time of the 1958 inquiry the general opinion of consumers and trade associations was that the quality of indigenous caustic soda was satisfactory. The defects then pointed out mostly related to comparatively low content of NaOH in caustic soda and high proportion of impurities in the products of certain manufacturers and defective packing. The evidence now placed before us indicates that the manufacturers have since taken several measures to rectify the above defects. The consensus of opinion expressed at the public inquiry on this occasion was that indigenous manufacturers are producing technical grade caustic soda conforming to IS specification. As regards rayon grade caustic soda, certain consumers complained about high iron content in the product manufactured during trial runs by Dhrangadhra Chemical Works. This was admitted by the manufacturer who now claims to have rectified the defects and to produce rayon grade caustic soda acceptable to the rayon industry.

11.1. *Import control policy:*

11.1.1. Caustic soda is classified under Serial No. 22(a) of Part V of the Import Trade Control Schedule. The import policy in respect of this product is that since the licensing period July-December 1956, imports of caustic soda are generally channelled through the State Trading Corporation. Applications from actual users for rayon grade caustic soda were also considered on an *ad hoc* basis on the recommendations of the Development Wing till October 1959—March 1960 period. The issue of such *ad hoc* licences was discontinued thereafter. Mills exporting cotton textiles or yarn were, however, granted actual user licences for import of caustic soda (along with other textile chemicals) from the licensing period October 1958—March 1959 on the following basis:—

Import control policy and imports

"(i) Against exports of grey cloth or yarn up to 4 per cent of the f.o.b. value of the exports. This percentage will be increased to 8 per cent if the exports are made to U.S.A., West Germany or Scandinavian countries.

(ii) Against exports of dyed or processed cloth, up to 6 per cent of the f.o.b. value of the exports. This percentage will be increased to 8 per cent if the exports are made to U.S.A., West Germany or Scandinavian countries."

11.1.2. The bulk of imports was effected through S.T.C., which undertakes a periodical review of the supply and demand position of this chemical in consultation with its Port Committees and releases imported caustic soda to consumers to the extent required. Caustic soda manufacturers have expressed general satisfaction with the current policy of regulated imports.

11.2. *Imports.*—Data relating to imports of caustic soda from 1958 to 1961 (up to April) as recorded in the 'Monthly Statistics of the

Foreign Trade of India', are given in Appendix V. The following table gives the total imports during the period.

(In tonnes)

Period	Caustic soda flakes	Caustic soda solid	Casutic soda others	Total
1958	22·70	61,657·06	1,044·74	62,724·50
1959	446·35	148,656·20	419·67	149,522·22
1960	44·93	53,596·46	399·43	54,040·82
1961 (Jan.-April) . .	37·87	56·96	14·80	109·63

The principal sources of supplies were the U.K. and China in 1958 and 1959 and the U.K. and Japan in 1960. Imports rose from about 63,000 tonnes in 1958 to about 150,000 tonnes in 1959, but fell in 1960 to 54,000 tonnes. Even allowing for the planned expansion of the industry, our dependence on imports will not, as observed in paragraph 7.1.4., diminish in the near future.

Existing rates of duty

12.1. *Import duty.*—Caustic soda is assessed to customs duty (protective) under item No. 28(34) of the First Schedule to the Indian Tariff Act, 1934. The relevant extracts are reproduced below:—

Item No.	Name of article	Nature of duty	Standard rate of duty	Preferential rate of duty if the article is the produce or manufacture of			Duration of protective rates of duty
				The United Kingdom	A British Colony	Burma	
1	2	3	4	5	6	7	8
28(34)	(a) Caustic soda of British Manufacture.	Protective.	30 per cent *ad valorem plus* the Excise duty for the time being leviable on like articles if produced or manufactured in India, and where such duty is leviable at different rates the highest duty.	..	..	10 per cent *ad valorem*	December 31st, 1961.

1	2	3	4	5	6	7	8
	(b) not of British manufacture.	Protective.	40 per cent *ad valorem plus* the excise duty for the time being leviable on like articles if produced or manufactured in India and where such duty is leviable at different rates the highest duty.	..	..	..	December 31st, 1961.

NOTE—Caustic soda manufactured in a British Colony shall be deemed to be of British manufacture.

Tariff Values:

	Rs. nP. per quintal.
Soda, caustic commercial quality (including rayon grade).	
(a) Fused Solid	56·00
(b) Other forms, including flakes, pellets, rods and sticks.	70·00

N.B.—The tariff values apply to articles packed in containers of not less than 6·36 kg.

12.2. *Excise duty.*—Under the Finance Act, 1961 an excise duty of Rs. 4 per quintal was levied with effect from 1st March 1961 on caustic soda solid and caustic lye on the basis of 100 per cent strength of caustic soda.

C. i. f. prices and landed costs

13. Data collected by us from Collectors of Customs, S.T.C. and other sources regarding c.i.f. prices and landed costs of imported caustic soda (fused solid, the form in which import occurs) are given in Appendix VI. They relate to imports made in 1959 and 1960. The representatives of S.T.C., however, informed us at the public inquiry that his organisation had contracted for import of technical grade caustic soda from the U.K., Japan, Hungary and Russia at the following c.i.f. prices:

(Per Tonne)

U.K.	£ 22-13-0	(Rs. 302·00)
Japan	£ 19-11-9	(c.i.f. landed) (Rs. 261·17)
Hungary	Rs. 302·20	(c.i.f. landed).
Russia	,, 295	

The representatives of Chemical & Alkali Distributors, Bombay stated that a consignment of technical grade caustic soda was being imported from West Germany by a cotton textile mill at a c.i.f. price of £ 19 per tonne (Rs. 253.33). The bulk of imports has been coming from U.K. and it was only in 1959 and 1960 that significant imports were made

from Japan. We are by no means certain that Japan will supply in future the major portion of our requirements. On the last occasion also we were guided by the landed cost without duty of imported caustic soda from U.K. although there were cheaper imports from China. We have, therefore, decided to adopt the c.i.f. price for import from U.K. as contracted by S. T. C. for determining the quantum of protection required by the industry. Adding clearing charges of Rs. 10.00 per tonne, the landed cost without duty comes to Rs. 312.00 per tonne.

Costs of production and fair ex-works prices of indigenous caustic soda

14.1. As stated in paragraph 3.2, the costs of production of caustic soda (solid fused and in flakes), caustic liquor, liquid chlorine, hydrochloric acid and bleaching powder were examined by our Cost Accounts Officers at seven units. Since data relating to Saurashtra Chemicals, which went into production only in March 1960, were inadequate for purposes of framing a reliable estimate of its future cost of production, we have not taken them for consideration in this Report. On the basis of data collected and after discussions with the manufacturers, we have framed estimates of future costs. The reports of the Cost Accounts Officers furnishing details of costs will be forwarded to Government as confidential enclosures to our second Report on this industry which will deal with the revision of ceiling prices of the above products. For purposes of determining the measure of disadvantage suffered by the indigenous caustic soda industry, *vis-a-vis* imports, we are considering the fair ex-works price determined by us for fused solid caustic soda only as it is in this form that the bulk of imports takes place.

14.2. Of the six units whose costs of production have been examined, Alkali and Chemical Corporation of India Ltd., Calcutta and Calico Mills (Chemical Division), Bombay did not produce fused solid caustic soda during the periods costed nor have they any plans to manufacture it in the near future. In the circumstances we have not used data relating to them in projecting our estimates of costs. Our estimates of the fair ex-works prices of the remaining four units which produce solid caustic soda, are as follows:—

(Per Tonne)

	Estimated annual production	Fair ex-works price	Weighted average
	Tonnes	Rs.	Rs.
1. D.C.M.	7,167	671·01	
2. Mettur	7,600	616·80	
3. Tata (Electrolytic)	4,210	734·50	
(A) TOTAL	18,977		663·38
Tata (Chemical)	6,540	921·85	
(B) TOTAL	25,517		729·63
4. Dhrangadhra	38,000	576·99	
(C) TOTAL	63,517		638·31

14.3. For the purpose of arriving at the representative fair ex-works price of fused solid caustic soda for the industry, we decided in 1958 to adopt the weighted average of the fair ex-works prices of only electrolytic fused solid caustic soda. The ex-works price of chemical caustic soda produced by Tata Chemicals was not considered as neither the volume nor the cost of production justified its inclusion for the calculation of a representative cost for the industry. Another unit manufacturing exclusively chemical caustic soda has now commenced production, but adequate cost data were not available owing to its recent inception. In view of recent developments in the industry we consider that the representative cost should be determined by taking the weighted average of the fair ex-works prices of electrolytic caustic soda of D.C.M., Mettur and Tatas. We have decided to omit for our present purpose the fair ex-works price of chemical caustic soda manufactured by Tatas which is as high as Rs. 921.85 per tonne. Further since the majority of units have capacity of less than 30 tonnes per day, Dhrangadhra Chemicals with 80 tonnes daily capacity cannot be deemed to be representative of the industry and has been left out.

15.1. The following table gives a comparison of representative fair ex-works price of indigenous fused solid caustic soda with the ex-duty landed cost of caustic soda imported from U.K. as mentioned in paragraph 13:—

Measure of Protection

	Rs. per tonne
(i) Fair ex-works price (*vide* paragraph 14·3 *ante*)—Weighted average	663·38
(ii) C.i.f. price	302·00
(iii) Clearing charges	10·00
(iv) Landed cost ex-duty	312·00
(v) Difference between (i) and (iv)	351·38
(vi) Difference as a percentage on tariff value of Rs. 56 per quintal or Rs. 560 per tonne *i.e.* preferential rate of protective duty needed by the industry.	62·7
(vii) Existing rate of duty (preferential)	30%

15.2. It would appear from the above table that on the basis of the existing tariff value a preferential rate of duty of 62.7 per cent *ad valorem* is required to provide adequate protection to the industry. We do not, however, recommend that the existing rates of duty should be raised. Units like Dhrangadhra Chemicals with large capacity will not need this scale of protection and the trend for expansion of capacities, (*vide* paragraph 16.1), which could be stimulated by internal competition, should not be curbed. Enhancement of the rates of duty

to the level indicated by the bare comparison of ex-works price of indigenous caustic soda with landed cost ex-duty of the imported product will have little influence on the growth of the industry or internal prices in the present context of regulated imports and releases by S. T. C. It will, on the other hand, handicap the industries which are permitted at present to import this chemical by way of incentives under the Export Promotion Scheme. We are, therefore, of the view that the existing rates of protective duty, namely 30 per cent *ad valorem* (preferential) and 40 per cent *ad valorem* (standard) need not be revised.

15.3. We consider that the present difference of Rs. 14.00 per quintal between the tariff values of fused caustic soda commercial quality (including rayon grade) and caustic soda in other forms would afford adequate protection to the domestic caustic soda produced in the form of flakes. It is seen that on the basis of the fair ex-works price estimated by us, the difference between the fused solid caustic soda and flakes is of the order of Rs. 10.32 per quintal. The manufacture of caustic soda in flakes accounts for a very small proportion (about 5 to 7 per cent) of the total production and there is almost self-sufficiency in production of caustic soda in this form. Further, there have been no imports of any substantial quantities in the recent past. (Imports were about 45 tonnes in 1960 and 38 tonnes in January-April 1961). We are, therefore, of the view that the rates of protective duty recommended by us for caustic soda solid will afford adequate protection to the indigenous caustic soda in flakes on the basis of the present tariff values.

15.4. We have also considered the question whether continuance of tariff protection in the prevailing conditions of restricted imports is necessary. Our conclusion is that tariff protection is justified firstly as it has a psychological influence on industries which require a stimulus or assurance for large-scale development and secondly, as it provides for a continuous watch over the performance of the protected industry. Since the caustic soda industry needs to be developed in a big way not only to meet the growing needs of the country but also to find new outlets in development of allied industries based on use of chlorine, we have come to the conclusion that withdrawal of protection at this stage would be harmful to the industry. We, therefore, recommend that protection to the caustic soda industry should be continued for a further period of three years from 1st January 1962 and that protective duties at the existing rates should hold good during the period, that is, up to 31st December 1964.

16.1. *Economic size of caustic soda unit.*

Ancillary recommendations

16.1.1. It will be seen from the tables in paragraph 5.1.2. that the industry is at present dispersed in eleven States namely, Andhra Pradesh, Bihar, Delhi, Gujarat, Kerala, Madras, Maharashtra, Mysore, Orissa, Punjab and West Bengal. The sizes of units vary from 2 tonnes per day (Mysore Paper Mills—1.88 tonnes a day and Shri Gopal Paper Mills—2.37 tonnes a day) to 80 tonnes a day (Dhrangadhra Chemical Works).

If the expansion envisaged materialises according to plan, caustic soda units will also be established by 1964 in Madhya Pradesh and Rajasthan where there are none at present. Only two States, namely, Assam and Jammu and Kashmir will not have any caustic soda unit even then. As regards size-wise distribution, there will be then three units with a daily capacity of about 100 tonnes or more; two units with a capacity of about 50 tonnes each, and the rest having capacities of 40 tonnes or less per day. The following table shows the frequency distribution of daily capacities of various caustic soda units as at present and as it is likely to be in 1964:

Range of daily capacities in tonnes	No. of units in 1961	No. of units in 1964
0— 9·9	7	5
10—19·9	3	5
20—29·9	3	3
30—39·9	3	5
40—49·9	nil	2
50—74·9	1	4
75—99·9	1	1
100 and above	nil	2
TOTAL	18	27

16.1.2. We were informed by the representative of the Development Wing that the present policy was to build up in each State one caustic soda unit of at least 50 tonnes per day capacity and that in pursuance of this policy the twin aspects of zonal distribution of the industry and fuller utilisation of chlorine which is a joint product in the electrolytic process were taken into consideration in licensing additional capacity. We find from our cost investigation that raw materials (mainly salt) account for about 13 per cent and power 42 per cent of the total cost of manufacture of fused solid caustic soda. While we recognise the importance of zonal distribution of the industry we cannot ignore the fact that the fair ex-works price of our caustic soda is more than double the landed cost ex-duty of the imported product. Even though the export price of the foreign product is much lower than the domestic price of caustic soda in the exporting countries, we notice that the weighted average of the fair ex-works price (Rs. 663.38 per tonne) is about 36 per cent higher

than the domestic price *(£ 35-6-6 per ton in 750 lbs. drums or Rs. 489 per ton) of solid caustic soda (98-99%) in the U.K. Caustic soda being a basic industrial raw material its cost of production must be reduced. For this purpose proximity to sources of cheap power and salt should receive greater importance than the need for establishing one unit in each State. Further, conversion charges account for about 24 per cent of the final cost of manufacture and we expect their incidence to diminish as units grow bigger up to their technical optimum. We were told at the public inquiry that under the conditions prevailing in this country at present the technical optimum or the economic size of a caustic soda unit is 100 tonnes per day. This view finds support from the costing of Dhrangadhra Chemical Works, a unit at present of daily capacity of 80 tonnes to be raised to 140 tonnes. This unit is also advantageously placed in regard to salt and power. Its fair ex-works price of Rs. 577 per tonne will, when it is able to make fuller utilisation of chlorine, fall further and compare favourably with domestic prices in exporting countries like the United Kingdom. From the table given in the preceding paragraph it will be observed that even in 1964 only three of the existing units will expand to economic level while the remaining twenty-four units will continue to fall short of the technical optimum. In view of this, we recommend that while licensing additional capacity, existing units should be encouraged to expand their capacity to an economic size and that in licensing new units also, due attention should be paid to the importance of setting up plants of large size capacity in areas advantageously situated with regard to power and common salt.

16.1.3. From our analysis of the cost of manufacture of caustic soda by electrolytic and chemical processes it is evident that chemical caustic soda is more expensive. As against 2 tonnes of common salt required for 1 tonne of electrolytic caustic soda, chemical caustic soda, which is produced from soda ash, involves in all about 3 tonnes of salt and 6 tonnes of limestone. In addition, in the process of manufacture of soda ash from brine, the entire chlorine is wasted in the form of calcium chloride, which has little sale value. With the establishment of more and more chlorine-based industries the disadvantages of the electrolytic process have ceased to be formidable. In our view the question of reducing the cost of caustic soda should, in the present stage of our development, receive priority over the issue of complete utilisation of chlorine. We were informed during the public inquiry that even in highly industrialised countries of Europe the chemical process is being discarded in favour of electrolytic process. As caustic soda is a basic raw material for a large number of industries with planned programmes of development, it is of paramount importance that it should be made cheaper and, we recommend that this aspect should be borne in mind while licensing further capacity for chemical caustic soda.

16.2. *Tank wagons for transport of liquid caustic soda and railway freight.*—We have stated in paragraph 4.3. that while the Railway Board considers that the existing stock of tank wagons (59 B. G. tank wagons

*Chemical Trade Journal and Chemical Engineer, dated 4th August, 1961.

and 4 M. G. sulphuric acid tank wagons currently diverted to the transport of liquid caustic soda) is adequate, manufacturers have urged that Railways should take note of the steady increase in production of caustic soda and arrange to provide more wagons. In fact, the representative of Tata Chemicals pointed out that his quota of tank wagons has been reduced from 5 to 2. Another point urged by the industry is that at present both liquid and solid caustic soda are treated alike for purposes of freight and charged under class 37.5-A and that since the concentration of liquid caustic soda is about 50 per cent NaOH, consumers have to pay more than double the freight for the same quantity of caustic soda (100 per cent basis) if obtained in the form of lye (liquid). This acts as an inhibiting factor in the growth of demand for liquid caustic soda especially from distant customers. We consider that in the overall interests of our economy the sale of liquid caustic soda should be encouraged because it leads to saving in fuel for fusion and steel sheets for packing. We recommend, therefore, that the Railway Administrations should take necessary steps to increase the allotment of tank wagons (broad gauge and metre gauge) for movement of liquid caustic soda and also to consider the question of adjusting railway freight in such a way that movement of liquid caustic soda over long distances is encouraged.

17. Our conclusions and recommendations are summarised below:—

Summary of conclusions and recommendations

17.1. The current annual domestic demand for caustic soda is estimated at 201,800 tonnes and the demand is expected to increase to 319,000 tonnes in 1964.

[Paragraph 7.1.4.]

17.2. The domestic demand for caustic soda has been increasing at a fast rate. Unless additional capacities are sanctioned the demand will continue to outstrip production.

[Paragraph 7.1.4.]

17.3. The annual domestic demand for chlorine is assessed at 68,000 tonnes for 1961 and 132,000 tonnes for 1964.

[Paragraph 7.2.]

17.4. The higher freight rate for bulk movement of salt under class 37.5-A of Goods Tariff need not be enforced if a consumer undertakes to carry out protective measures for wagons as required by the railways. The Railway Administrations should, in consultation with the manufacturers of caustic soda, evolve a workable arrangement for bulk movement of salt in wagons and extend the facilities to cover long distance movement of salt.

[Paragraph 9.1.2.]

17.5. The State Electricity Boards should be requested not to effect increases in the existing electricity rates during the present Plan period.

[Paragraph 9.4.3.]

17.6. Protection to the caustic soda industry should be continued for a further period of three years, that is, up to 31st December 1964 at the existing rates of duty, namely, 30 per cent *ad valorem* (preferential) and 40 per cent *ad valorem* (standard).

[Paragraph 15.4.]

17.7. While licensing additional capacity for caustic soda, existing units should be encouraged to expand their capacity to an economic size. In licensing new units also due attention should be paid to the importance of setting up plants of large size capacity in areas advantageously situated with regard to power and common salt.

[Paragraph 16.1.2.]

17.8. Caustic soda is a basic raw material for a large number of industries. It is, therefore, of paramount importance that it should be made cheaper. This aspect should be borne in mind while licensing further capacity for chemical caustic soda.

[Paragraph 16.1.3.]

17.9. Railway Administrations should take necessary steps to increase the allotment of tank wagons (broad gauge and meter gauge) for movement of liquid caustic soda and also consider the question of adjusting railway freight in such a way that movement of liquid caustic soda over long distances is encouraged.

[Paragraph 16.2.]

Acknowledgements

18. We wish to convey our thanks to the manufacturers, importers, consumers and the various associations who furnished us with detailed information in connection with this inquiry and their representatives who tendered evidence before us.

K. R. P. AIYANGAR,
Chairman.

J. N. DUTTA,
Member.

J. N. SEN GUPTA,
Member.

R. BALAKRISHNA,
Member.

PRAMOD SINGH,
Secretary

BOMBAY;
Dated 9th October, 1961.


सत्यमेव जयते

APPENDIX I

[*Vide* Paragraph 3.1.]

List of Firms, Bodies, Associations and Government Departments to whom the Commission's Questionnaires and Letters were issued and from whom Replies or Memoranda were Received.

* Indicates those who replied to the questionnaires or letters.

@ Indicates those who are not interested.

A. UNITS PRODUCING CAUSTIC SODA FOR SALE

*1. Mettur Chemical & Industrial Corporation Ltd., Mettur Dam, R. S., Salem District, Madras State.
*2. Tata Chemicals Ltd., Bombay House, Bruce Street, Fort, Bombay-1.
*3. D.C.M. Chemical Works, P. B. No. 1211, Bara Hindu Rao, Delhi.
*4. Calico Mills, Chemical Division, P. O. Box No. 12, Ahmedabad.
*5. Calico Mills, Chemical Division, Anik, Chembur, Bombay-71.
*6. The Alkali and Chemical Corporation of India Ltd., 34, Chowringhee, Calcutta.
*7. The Travancore-Cochin Chemicals Ltd., Udyogamandal P. O., (Via) Alwaye, Kerala State.
*8. Hindustan Heavy Chemicals Ltd., Hindusthan Buildings, 4, Chittaranjan Avenue, Calcutta-13.
*9. Dhrangadhra Chemical Works Ltd., 15-A, Horniman Circle, Fort, Bombay-1.
*10. Saurashtra Chemicals, Porbandar.
*11. J. K. Chemicals Ltd., J. K. Buildings, Dougall Road, Ballard Estate, Bombay-1.

B. UNITS PRODUCING CAUSTIC SODA FOR SELF-CONSUMPTION

*1. National Rayon Corporation Ltd., Ewart House, Bruce Street, Fort, Bombay-1.
*2. Shri Gopal Paper Mills Ltd., "Thapar House", 25, Brabourne Road, Calcutta-1.
*3. The Sirpur Paper Mills Ltd., Sirpur Kaghaznagar (C. Rly.), Hyderabad (Andhra Pradesh).
*4. Titaghur Paper Mills Co. Ltd., P. B. No. 185, Chartered Bank Buildings, Calcutta.
*5. The Mysore Paper Mills Ltd., Bhadravati Paper Town P. O., Mysore State.
*6. Orient Paper Mills Ltd., 8, India Exchange Place, Calcutta-1.
*7. Rohtas Industries Ltd., 11, Clive Road, Calcutta-1.

C. PROSPECTIVE PRODUCERS

*1. H.M.D.H. Bhiwandiwalla & Co., 583, Chira Bazar, Bombay-2.
*2. Nepa Chemicals Ltd., Pratibha Press Building, Wardha Road, Nagpur.
3. Heavy Chemicals Ltd., 22, Broach Road, Tuticorin-1, Madras State.

*4. Bangur Brothers Ltd., 14, Netaji Subhas Road, Calcutta-1.

*5. Century Rayon, Industry House, 159, Churchgate Reclamation, Bombay-1.

*6. Rajasthan Vinyl & Chemical Industries, Prop: The Delhi Cloth & General Mills Co. Ltd., Caxton House, Rani Jhansi Road, New Delhi.

*7. The Andhra Sugars Ltd., Venkataraypuram, Post Box No. 2, Tanuku (S. Rly), Andhra Pradesh.

*8. Kanoria Chemicals Industries Ltd., 9, Brabourne Road, Calcutta-1.

*9. National Organic Chemical Industries Ltd., Mafatlal House, Backbay Reclamation, Bombay-1.

*10. The National Newsprint & Paper Mills Ltd., Nepanagar (M. P.).

*11. The Atul Products Ltd., Post Atul, Dist. Surat (W. Rly.).

*12. The West Coast Paper Mills Ltd., Shreeniwas House, Waudby Road, Fort Bombay-1.

D. PRODUCERS' ASSOCIATIONS

*1. Indian Chemical Manufacturers' Association, India Exchange, India Exchange Place, Calcutta 1.

*2. Alkali Manufacturers' Association of India, 15-A, Horniman Circle, Fort, Bombay-1.

E. IMPORTERS/DISTRIBUTORS

*1. The State Trading Corporation of India Ltd., Express Building, 9 & 10, Mathura Road, New Delhi.

*2. Imperial Chemical Industries (India) Private Ltd., I. C. I. House, 34, Chowringhee, P. O. Box No. 182, Calcutta-2.

*3. Tata Oil Mills Co. Ltd., Bombay House, 24, Bruce Street, Fort, Bombay-1.

@4. The Chemical Importers & Distributors Ltd., P-21/22, Radhabazar Street, Calcutta-1.

*5. Chemical & Alkali Distributors Ltd., Himalaya House, Palton Road, Bombay-1.

*6. India United Chemical Distributons Ltd., 25, Swallow Lane, Calcutta-1.

F. CONSUMERS

*1. The Bengal Paper Mills Co. Ltd., 14, Netaji Subhas Road. Calcutta-1.

*2. India Paper Pulp Co. Ltd., 8, Clive Row, Post Box No. 150, Calcutta-1.

3. National Newsprint and Paper Mills Ltd., Nepanagar (M. P.).

*4. Orient Paper Mills Ltd., 8, India Exchange Place, Calcutta-1.

*5. Hindustan Insecticides Ltd., Udoygmandal P. O., Kerala State.

*6. Indian Aluminium Co. Ltd., 31, Chowringhee Road, Calcutta-16.

*7. Aluminium Corporation of India Ltd., 7, Council House Street, Calcutta.

*8. Standard Vaccum Refining Company of India Ltd., Post Box No. 355, Bombay-1.

*9. Burmah-Shell Refineries Ltd., Post Box No. 1725, Bombay-1.

*10. Caltex Oil Refining (India) Ltd., Post Box No. 145, Visakhapatnam-1.

*11. Hindustan Lever Ltd., Scindia House, Ballard Estate, Bombay-1.

*12. Godrej Soaps Private Ltd., 316, Delisle Road, P. O. Jacob Circle, Bombay-11.

*13. Tata Oil Mills Co. Ltd., Bombay House, Bruce Street, Fort, Bombay-1.

*14. National Rayon Corporation Ltd., Ewart House, Bruce Street, Fort, Bombay-1.

*15. Travancore Rayons Ltd., Rayonpuram P. O., Kerala State.
*16. Indian Oxygen Ltd., 48/1, Diamond Harbour Road, Calcutta-27.
*17. The Atul Products Ltd., P. O. Atul, Bulsar (W. Rly.).
*18. Dunlop Rubber Co. (India) Ltd., Dunlop House, 57-B, Free School Street, Calcutta-1.
@19. Indian Plastics Ltd., Poisar Bridge, Kandivlee, Bombay-67.
*20. Amar Dye Chemical Ltd., Post Box No. 6471, Rang Udyan, Sitaldevi Temple Road, Mahim, Bombay-16.
*21. Shambu Nath and Sons Ltd., Post Box No. 12, G. T. Road, Amritsar.
22. The Deccan Paper Mills Company Ltd., Commonwealth Building, Laxmi Road, Poona-2.
*23. Punalur Paper Mills Ltd., Punalur, Kerala State.
*24. Gwalior Rayon Silk Mfg. (Wvg.) Co. Ltd., Birlagram, Nagda (W. Rly.).
*25. The Sirsilk Ltd., Sirpur-Kaghaznagar (C. Rly.), Andhra Pradesh.
*26. Century Rayon, Industry House, 159, Churchgate Reclamation, Bombay-1.
*27. Mahalakshmi Colour Company, Pudupet, Gudiyattam.
28. P. V. Varkey & Co., Soap Makers, Thukalasery.
*29. The Buckingham & Carnatic Co. Ltd., Post Box No. 1966, Madras.
*30. The Empress Mills Ltd., Nagpur.
*31. The Tata Mills Ltd., Bombay House, Bruce Street, Bombay-1.
32. Shri Sairam Colour Co., 12, West Hanumanthrayan Kovil St., Erode (S. Rly.)
33. Shri Sohan Singh Jaswant Singh, Mandi Fenton Ganj, Jullunder City.
34. Shri Lota Singh Harnam Singh, Naya Bazar, Delhi-6.
35. Shri Mahavir Glass & Silicate Works, Jumuna Road, Agra.
36. Sardar Soap Products, Wankaner (Saurashtra).
37. The Amritsar Textile Finishing Mills Co., Outside Ghee Mandi Gate, Amritsar.
38. Lakshmi Printing Co., Outside Ghee Mandi Gate, Amritsar.
*39. The Universal Textile & Dyeing Mills Co., Outside Ghee Mandi Gate, Amritsar.
40. Swastika Supply Co., 13, Portuguese Church Street, Calcutta-1.
*41. Dholpur Glass Works Ltd., Dholpur.

G. CONSUMERS' ASSOCIATIONS

*1. Indian Soap and Toiletries Makers' Association, P-11, Mission Row Extension, Calcutta-1.
*2. The Millowners' Association, Post Box No. 95, Elphinstone Building, Veer Nariman Road, Bombay-1.
3. Indian Paper Mills Association, India Exchange Place, Calcutta.
*4. The Ahmedabad Millowners' Association, Post Box No. 7, Navarangpura, Ahmedabad-9.
*5. Indian Paper Makers' Association, Royal Exchange, Post Box No. 280, Calcutta-1.
*6. The Vanaspati Manufacturers' Association of India, 5th Floor, India House, Fort Street, Bombay-1.
*7. The Karur Weaving and Knitting Factory Owners' Association, Ltd., Karur (S. I.).
*8. The Madhya Pradesh Millowners' Association, 11, South Tukoganj, Indore (U. P.).

H. GOVERNMENT DEPARTMENTS

(*i*) *Central Government* :

*1. The Secretary to the Govt. of India, Ministry of Commerce & Industry, Udyog Bhavan, Maulana Azad Road, New Delhi.

*2. The Senior Industrial Adviser (Chemicals), Development Wing, Ministry of Commerce & Industry, Udyog Bhavan, Maulana Azad Road, New Delhi.

*3. The Textile Commissioner, Govt. of India, Wittet Road, Ballard Estate, Bombay-1.

*4. The Secretary, Railway Board, Ministry of Railways, New Delhi.

*5. The Salt Commissioner, Geejgardha House, Civil Lines, Post Box No. 139, Jaipur.

*6. The Coal Controller, 1, Council House, Street, Calcutta.

*7. The Collector of Customs, New Custom House, Bombay-1.

*8. The Collector of Customs, Mysore Bank Buildings, Madras-1.

*9. The Collector of Customs, Calcutta.

*10. The Collector of Customs, Custom House, Cochin.

*11. The Director of Co-ordination & Statistics, Directorate General of Supplies & Disposals, National Insurance Building, Parliament Street, New Delhi-1.

*12. Hindustan Salt Company Ltd., Plot 13, Vivekanand Marg, 'C' Scheme, Post Box No. 146, Jaipur.

*13. The Secretary Chemicals & Allied Products, Export Promotion Council, India Exchange (8th Floor), India Exchange Place, Calcutta-1.

*14. The Director, Indian Standards Institution, Manak Bhuvan, 9. Mathura Road, New Delhi.

@15. The Development Commissioner, Small Scale Industries, Udyog Bhuvan, Maulana Azad Road, New Delhi.

(*ii*) *State Governments* :

1. The Chief Secretary to the Government of Andhra Pradesh, Hyderabad.
2. The Chief Secretary to the Government of Assam, Shillong.
3. The Chief Secretary to the Government of Bihar, Patna.
4. The Chief Secretary to the Government of West Bengal, Calcutta.
5. The Chief Secretary to the Government of Gujarat, Ahmedabad.
6. The Chief Secretary to the Government of Jammu & Kashmir, Shrinagar.
7. The Chief Secretary to the Government of Kerala, Trivandrum.

@8. The Chief Secretary to the Government of Madhaya Pradesh, Bhopal.

9. The Chief Secretary to the Government of Madras, Madras.
10. The Chief Secretary to the Government of Maharashtra, Bombay.

@11. The Chief Secretary to the Government of Orissa, Bhuvaneshwar.

@12. The Chief Secretary to the Government of Mysore, Bangalore.

13. The Chief Secretary to the Government of Punjab, Chandigarh.
14. The Chief Secretary to the Government of Rajasthan, Jaipur.
15. The Chief Secretary to the Government of Uttar Pradesh, Lucknow.
16. The Chief Commissioner, Delhi Administration, Delhi.

@17. The Chief Commissioner, Himachal Pradesh Administration, Simla.

@18. The Director of Industries & Commerce, Government of Andhra Pradesh, Hyderabad.

@19. The Director of Industries Government of Assam, Shillong.

20. The Director of Industries, Government of Bihar, Patna.

*21. The Director of Industries, Government of West Bengal, New Secretariat Buildings, (9th Floor), 1, Hastings Street, Calcutta 1.

*22. The Director of Industries, Government of Gujarat, Ahmedabad.

@23. The Director of Industries & Commerce, Government of Jammu and Kashmir, Shrinagar.

@24. The Director of Industries & Commerce, Government of Kerala, Trivandrum.

25. The Director of Industries Government of Madhya Pradesh, Indore.

26. The Director of Industries, Government of Madras, Madras.

*27. The Director of Industries, Government of Maharashtra, Bombay.

@28. The Director of Industries, Government of Mysore, Bangalore.

29. The Director of Industries, Government of Orissa, Cuttack.

@30. The Director of Industries, Government of Punjab, Chandigarh.

*31. The Director of Industries and Supplies, Government of Rajasthan, Jaipur.

*32. The Director of Industries, Government of Uttar Pradesh, Kanpur.

33. The Director of Industries, Delhi Administration, Delhi.

34. The Director of Industries, Government of Himachal Pradesh, Simla.

APPENDIX II

[*Vide* Paragraph 3.2]

Statement showing the Caustic Soda factories visited by the Commission and its Officers

Sl. No.	Name of the factory	By whom visited	Date(s) of visit
1	2	3	4
(A)	*Factories visited by the Commission :*		
1	Tata Chemicals Ltd., Mithapur . .	Shri K. R. P. Aiyangar, Chairman	15th June, 1961.
2	Saurashtra Chemicals, Porbandar .	,, K. R. P. Aiyangar, Chairman	16th June, 1961.
3	Hindusthan Heavy Chemicals Ltd., Calcutta.	,, J. N. Dutta, Member	17th August, 1961.
4	Alkali & Chemical Corporation of India Ltd., Calcutta.	,, J. N. Dutta and Shri J. N. Sen Gupta, Members	18th August, 1961.
5	D. C. M. Chemical Works, Delhi . .	,, J. N. Dutta, Member	23rd August, 1961.
6	Calico Mills, Chemical Division, Bombay	,, J. N. Dutta, Member	2nd September, 1961.
7	Mettur Chemical & Industrial Corporation Ltd., Mettur Dam.	,, K.R.P. Aiyangar, Chairman and Shri J. N. Dutta, Member.	7th September, 1961.
8	Dhrangadhra Chemical Works Ltd., Sahupuram, Arumuganeri.	,, K. R. P. Aiyangar, Chairman and Shri J. N. Dutta, Member.	8th September, 1961.
9	Travancore-Cochin Chemicals Ltd., Udyogamandal P.O., (Via) Alwaye.	Dr. R. Balakrishna, Member	20th September, 1961.

(B) *Factories visited by the Commission's Officers :*

1	Mettur Chemical & Industrial Corporation Ltd., Mettur Dam.	Shri S. Saha, Technical Director (Chemicals)	18th December, 1960.
		,, S. R. Mallya, Asstt. Cost Accounts Officer	9th to 14th June, 1961.
2	Travancore-Cochin Chemicals Ltd., Udyogamandal P.O. (Via) Alwaye.	,, S. Saha, Technical Director (Chemicals)	19th December, 1960.
3	Dhrangadhra Chemical Works Ltd., Sahupuram, Arumuganeri.	,, S. Saha, Technical Director (Chemicals)	25th December, 1960.
		,, S. R. Mallya, Asstt. Cost Accounts Officer	30th May, 1961 to 5th June 1961.
4	Alkali & Chemical Corporation of India Ltd. Calcutta.	,, S. Saha, Technical Director (Chemicals)	5th to 9th June, 1961.
		,, A. K. Banerji, Asstt. Cost Accounts Officer	5th to 15th June, 1961.
		,, M. S. Marballi, Research Officer (Chemicals)	17th December, 1960.
5	D. C. M. Chemical Works, Delhi	,, S. Saha, Technical Director (Chemicals)	12th to 15th June 1961.
		,, P. S. Kailasam, Cost Accounts Officer, Ministry of Finance (Cost Accounts Branch), New Delhi.	6th to 9th June, 1961.
6	Saurashtra Chemicals, Porbandar	,, P. M. Menon, Cost Accounts Officer	19th to 21st June, 1961.
		,, M. S. Marballi, Research Officer (Chemicals)	8th & 9th June, 1961.
7	Calico Mills, Chemical Division, Bombay	,, S. Saha, Technical Director (Chemicals)	29th June, 1961.
		Dr. P. V. Gunishastri, Director (Reviews & Research)	
		,, A. K. Banerji, Assistant Director (Reviews) and	
		Shri M. S. Marballi, Research Officer (Chemicals)	
		,, A. K. Banerji, Asstt. Cost Accounts Officer	17th & 29th to 31st August, 1961.
8	Tata Chemicals Ltd., Mithapur	,, S. Saha, Technical Director (Chemicals)	17th to 19th August, 1961.
		,, U. R. Padmanabhan, Cost Accounts Officer	16th to 22nd June 1961.
9	Calico Mills, Chemical Division, Ahmedabad.	,, S. Saha, Technical Director (Chemicals)	20th and 21st August, 1961.
10	Hindusthan Heavy Chemicals Ltd., Calcutta.	,, M. S. Marballi, Research Officer (Chemicals)	19th December, 1960.

APPENDIX III

[*Vide* Paragraph 3.3]

List of persons who attended the Commission's public inquiry on 15th September 1961

A. PRODUCERS

1.	Shri P. A. Narielwala	Representing	Tata Chemicals Ltd., Bombay House, Bruce Street, Fort, Bombay-1.
2.	,, C. R. Rao		
3.	,, M. B. Bhagwat		
4.	,, D. G. Pujari.		
5.	,, T. S. Natarajan		
6.	,, H. Ramachandran		
7.	,, P. C. Jain	,,	Dhrangadhra Chemical Works Ltd., 15-A, Horiman Circle, Fort, Bombay-1.
8.	,, Shashi Chand		
9.	,, A. R. Narasimhan		
10.	,, S. Rajagopalan		
11.	,, M. Nilakantan		
12.	,, K. K. Raman	,,	The Mettur Chemical & Industrial Corporation Ltd., Mettur Dam R.S., Salem District.
13.	,, R. V. Ramani		
14.	,, S. Ramaswami		
15.	,, R. Natarajan		
16.	,, T. M. Krishna Rao		
17.	,, M. L. Seth	,,	The D.C.M. Chemical Works, Post Box No. 1211, Bara Hindu Rao, Delhi.
18.	,, T. R. Pareek		
19.	,, D. C. Mittal.		
20.	,, M. L. Vashist		
21.	,, K. N. Sharma		
22.	,, H. T. Bhavnani	,,	Calico Mills, Chemical Division, Anik-Chembur, Bombay-71.
23.	,, V. S. Mankikar		
24.	,, G. V. Krishnarao		
25.	,, C. A. Ghare Khan	,,	Calico Mills, Chemical Division, Post Box No. 12, Ahmedabad.
26.	,, A. P. Vasa		
27.	,, V. S. Bhatia	,,	The Alkali & Chemical Corporation of India Ltd., 34, Chowringhee, Calcutta-16.
28.	,, G. Subramaniam		
29.	,, S. K. Vakil	,,	Saurashtra Chemicals, Porbandar.
30.	,, D. P. Patkar		
31.	,, L. R. Krishnamurthy	,,	The Travancore-Cochin Chemicals Ltd., Udyogmandal P.O., (Via) Alwaye, Kerala State.

32.	Shri S. P. Sen . . .	Representing	Hindusthan Heavy Chemicals Ltd., Hindusthan Bldgs., 4, Chittranjan Avenue, Calcutta-13.
33.	,, M. K. Krishnan . .		
34.	,, P. C. Jain . . .	,,	J. K. Chemicals Ltd., J. K. Buildings, Dougall Road, Ballard Estate, Bombay-1.
35.	Dr. M. D. Parekh . .	,,	The National Rayon Corporation Ltd., Ewart House, Bruce Street, Fort, Bombay-1.
36.	Shri M. M. Uppal . .	,,	Rohtas Industries Ltd., 11, Clive Row, Calcutta-1.
37.	,, P. R. Biyani . .	,,	Bangur Brother Ltd., 14, Netaji Subhas Road, Calcutta-1.
38.	,, M. N. Bhagwati . .	,,	Century Rayon, Industry House, 159, Churchgate Reclamation, Bombay-1.
39.	,, P. M. Jhaveri . .		
40.	,, R. K. Raman . .	,,	Kanoria Chemicals & Industries Ltd., 9, Brabourne Road, Calcutta-1.
41.	,, P. A. Porecha . .	,,	National Organic Chemical Industries Ltd., Mafatlal House, Backbay Reclamation, Bombay-1.
42.	,, B. D. Somani . .	,,	The West Coast Paper Mills Ltd., Shriniwas House, Waudby Road, Fort, Bombay-1.

B. PRODUCERS' ASSOCIATIONS

43.	Shri V. N. Shah . . .	Representing	Indian Chemical Manufacturers' Association, India Exchange, India Exchange Place, Calcutta-1.
44.	,, B. M. L. Moorthy .	,,	Alkali Manufacturers' Association of India, 15-A, Horiman Circle, Fort, Bombay-1.

C. IMPORTERS/DISTRIBUTORS

45.	Shri M. M. Saklani . .	Representing	The State Trading Corporation of India Ltd., Express Bldg., 9 & 10, Mathura Road, New Delhi.

46.	Shri S. C. Puri . . .	Representing	Imperial Chemical Industries (India) Private Ltd., I.C.I. House, 34, Chowringhee, Post Box No. 182, Calcutta-1.
47.	Dr. M. B. Ichaporia . .	,,	The Tata Oil Mills Co. Ltd., Bombay House, Bruce St., Fort, Bombay-1.
48.	Shri R. F. Vakharia . .		
49.	,, N. Ramamoorthy .	,,	Chemicals & Alkali Distributors Ltd., Himalaya House, Palton Road, Bombay-1.

D. CONSUMERS

50.	Shri R. A. Taraporewalla .	Representing	Hindusthan Lever Ltd., India House, Fort Street, Bombay.-1.
51.	,, K. R. Gokulam . .	,,	Godrej Soaps Pvt. Ltd., 316, Delisle Road, P.O. Jacob Circle, Bombay-11.
52.	,, D. K. Beheti . .	,,	Indian Aluminium Co. Ltd., 31, Chowringhee Rd., Calcutta-16.

E. CONSUMERS' ASSOCIATIONS

53.	Shri S. J. Bhatt . . .	Representing	Indian Soap and Toiletries Makers' Association, P-11 Mission Row Extension, Calcutta-1.
54.	,, G. R. Thatte . .	,,	The Millowners' Association, Post Box No. 95, Elphinstone Bldg., Veer Nariman Rd., Bombay-1.
55.	,, A. D. Moddie . .	,,	The Vanaspati Manufacturers' Association of India, 5th Floor, India House, Fort Street, Bombay-1.
56.	,, C. D. Shah . . .	,,	The Non-Power Soap Manufacturers' Association, 380 Shanker Sett Bungalow Compound, Girgaum Road, Bombay-2.

F. MERCHANTS' ASSOCIATION

57.	Shri P. C. Mehta . . .	Representing	The Chemical & Alkali Merchants' Association, 5th Floor, Himalaya House, Palton Rd., Bombay-1.

G. GOVERNMENT DEPARTMENTS

58.	Shri P. K. Seshan . .	Representing	Ministry of Commerce & Industry, Development Wing, Udyog Bhavan, Maulana Azad Road, New Delhi.
59.	,, S. B. Sarkar . .	,,	The Coal Controller, Govt. of India, 1, Council House Street, Calcutta.
60.	Dr. K. I. Narasimhan . .	,,	The Textile Commissioner, Govt. of India, Wittet Rd., Ballard Estate, Bombay-1.
61.	Shri Gulam Anwar . .	,,	The Salt Commissioner, Geejgardha House, Civil Line, P.B. No. 139, Jaipur.
62.	,, G. F. Velloze . .	,,	Ministry of Railways (Railway Board), New Delhi.
63.	,, M. M. Mistry . .	,,	The Director General of Supplies & Disposals, National Insurance Building, Parliament Street, New Delhi-1.
64.	,, K. P. Revankar . .	,,	The Collector of Customs, New Custom House, Bombay-1.
65.	,, A. B. Rao . . .	,,	Indian Standards Institution, Manak Bhuvan, 9, Mathura Road, New Delhi-1.
66.	,, U. Chatterji . .	,,	The Director of Industries, Govt. of West Bengal, New Secretariat Bldgs. (9th Floor), 1, Hastings Street, Calcutta-1.
67.	Dr. J. D. Parikh . .	,,	The Director of Industries, Govt. of Gujarat, New Mental Hospital Building, Ahmedabad.
68.	,, P. A. Sabnis . .	,,	The Director of Industries, Govt. of Maharashtra, Sachivalaya Annexe, Bombay-1.

H. OBSERVER

69. Shri J. P. De Sousa, Editor, Chemical Age of India, Technical Press Publications, Prem-Kutir, 177-Marine Drive Reclamation, Bombay-1.

APPENDIX IV

(*Vide* Paragraph 5.1.3)

Statement showing grade-wise (Technical and Rayon) and form-wise (Solid, Liquid and Flakes) production of Caustic Soda

(In tonnes)

Sl. No.	Name of the Unit	Grade (Technical /Rayon)	1958				1959				Remarks
			Solid	Liquid	Flakes	Total	Solid	Liquid	Flakes	Total	
1	2	3	4	5	6	7	8	9	10	11	12
(A) *Units producing for sale :*											
1	Saurashtra Chemicals, Porbandar.	Technical	..	..	..	..	..	..	..	..	Started production from March, 1960.
2	Tata Chemicals Ltd., Mithapur	,,	6,195	..	513	6,708	4,707	139	1,032	5,878	
3	Alkali & Chemical Corporation of India Ltd., Calcutta.	,, ,,	1	5,687	39	5,727	..	5,912	..	5,912	
4	Calico Mills, Chemical Division, Ahmedabad.	,,	..	2,598	..	2,598	..	2,687	..	2,687	
5	D. C. M. Chemical Works, Delhi.	,,	1,992	5,277	1,453	8,722	1,553	6,152	1,501	9,206	
6	Hindusthan Heavy Chemicals Ltd., Calcutta.	,,	..	1,490	..	1,490	..	1,364	..	1,364	
7	Mettur Chemical & Industrial Corpn. Ltd., Mettur Dam.	,,	1,556	2,169	258	3,983	1,681	2,472	585	4,738	
8	Calico Mills, Chemical Division, Bombay.	Rayon	..	1,835	..	1,835	..	3,496	..	3,496	
9	Travancore-Cochin Chemicals Ltd., Alwaye.	,,	1,557	5,816	1,022	8,395	1,312	6,354	995	8,661	

10	J. K. Chemicals Ltd., Bombay	Rayon	..	..	..	..	..	852	..	852	Started production from August, 1959.
11	Dharangadhra Chemical Works Ltd., Sahupuram.	„	..	..	..	..	4,153	..	793	4,946	Started production from October, 1959.
	TOTAL	.	11,301	24,872	3,285	39,458	13,406	29,428	4,906	47,740	

(B) *Units producing for self consumption :*

12	National Rayon Corporation Ltd., Bombay.	Rayon	..	3,852	..	3,852	..	7,013	..	7,013	
13	Mysore Paper Mills Ltd., Bhadravati.	Technical	..	554	..	554	..	598	..	598	
14	Orient Paper Mills Ltd., Drajrajnagar.	„	..	2,922	..	2,922	..	2,545	..	2,545	
15	Rohtas Industries Ltd., Dalmianagar.	„	..	4,365	..	4,365	..	5,522	..	5,522	
16	Shri Gopal Paper Mills Ltd., Yamunanagar.	„	..	692	..	692	..	679	..	679	
17	Sirpur Paper Mills Ltd., Sirpur	„	..	3,180	..	3,180	..	2,780	..	2,780	
18	Titaghur Paper Mills Ltd., Titaghur.	„	..	3,288	..	3,288	..	3,606	..	3,606	
	TOTAL	.	..	18,853	..	18,853	..	22,743	..	22,743	
	GRAND TOTAL (A+B)	.	11,301	43,725	3,285	58,311	13,406	52,171	4,906	70,483	

APPENDIX-IV (*Contd.*)

(In tonnes)

Sl. No.	Name of the Unit	Grade (Technical /Rayon)	1960				1961 (January-June)				Remarks
			Solid	Liquid	Flakes	Total	Solid	Liquid	Flakes	Total	
1	2	3	4	5	6	7	8	9	10	11	12
(A) *Units producing for sale* :											
1	Saurashtra Chemicals, Porbandar.*	Technical	2,102	..	..	2,102	5,143	..	..	5,143	
2	Tata Chemicals Ltd., Mithapur.	,,	5,125	312	1,338	6,775	2,940	346	627	3,913	
3	Alkali & Chemical Corporation of India Ltd., Calcutta.	,,	..	6,860	..	6,860	..	5,257	..	5,257	
4	Calico Mills, Chemical Division, Ahmedabad.	,,	..	2,670	..	2,670	..	1,300	..	1,300	
5	D.C.M. Chemical Works, Delhi.	,,	4,303	4,656	1,573	10,532	1,982	3,050	879	5,911	
6	Hindusthan Heavy Chemicals Ltd., Calcutta.	,,	..	1,411	..	1,411	..	484	..	484	
7	Mettur Chemical & Industrial Corporation Ltd., Mettur Dam.	,,	2,479	2,788	419	5,686	1,088	1,584	268	2,940	
8	Calico Mills, Chemical Division, Bombay.	Rayon	..	3,240	..	3,240	..	1,817	..	1,817	
9	Travancore Cochin Chemicals Ltd., Alwaye.	,,	1,086	6,579	1,159	8,824	739	3,568	677	4,984	

10	J. K. Chemicals Ltd., Bombay	,,	..	1,789	..	1,789	..	1,012	..	1,012
11	Dharangadhra Chemical Works Ltd., Sahupuram.	,,	21,258	..	1,017	22,275	11,353	..	277	11,630
	TOTAL . .		36,353	30,305	5,506	72,164	23,245	18,418	2,728	44,391

(B) *Units producing for self-consumption :*

12	National Rayon Corporation Ltd., Bombay.	Rayon	..	8,532	..	8,532	..	5,067	..	5,067
13	Mysore Paper Mills Ltd., Bhadravati.	Technical	..	610	..	610	..	276	..	276
14	Orient Paper Mills Ltd., Brajrajnagar.	,,	..	3,250	..	3,250	..	1,638	..	1,638
15	Rohtas Industries Ltd., Dalmianagar.	,,	..	5,495	..	5,495	..	2,878	..	2,878
16	Shri Gopal Paper Mills Ltd., Yamunanagar.	,,	..	651	..	651	..	343	..	343
17	Sirpur Paper Mills Ltd., Sirpur	,,	..	2 990	..	2 990	..	1,430	..	1,430
18	Titaghur Paper Mills Ltd., Titaghur.	,,	..	3,708	..	3,708	..	1,808	..	1,808
	TOTAL . .		..	25,236	..	25,236	..	13,440	..	13,440
	GRAND TOTAL (A+B) . .		36,353	55,541	5,506	97,400	23,245	31,858	2,728	57,831

*Started production from March, 1960.

APPENDIX V

(*Vide* Paragraph 11.2)

Statement showing imports of Caustic Soda for the period 1st January 1958 to 30th April 1961.

Name of product and country of origin	1958		1959		1960		1961 (January-April)	
	Quantity (Tonnes)	Value (Rs.)	Quantity (Tonnes)	Value (Rs.)	Quantity (Tonnes)	Value (Rs.)	Quantity (Tonnes)	Value (Rs.)
1	2	3	4	5	6	7	8	9
Caustic Soda in :								
(i) *Flakes:*								
U. K.	22·40	44,099	435·73	6,58,307	38·69	44,190	37·85	28,790
Germany, West	0·25	925	0·66	3,001	1·53	1,356	..	..
U. S. A.	0·05	114	..	..	..	..	..	..
France	..	..	9·96	11,774	4·71	6,152	..	..
Switzerland	..	..	..	143	..	..	..	..
SM VAL TRNS	..	..	..	..	..	..	0·02	133
TOTAL	22·70	45,138	446·35	6,73,225	44·93	51,698	37·87	28,923

(ii) *Solid :*

U. K.	29065·55	2,15,25,514	84,748·76	5,94,94,990	29,592·30	1,57,72,038	47·41	50,857
U.S.S.R.	2386·93	26,84,930	8,644·21	42,82,977	4,499·75	22,03,470	5·46	3,931
Germany, West . . .	1188·67	7,09,417	5,485·40	50,04,319	..	..	3·73	3,611
Singapore	0·46	300	..	..	..	..	..	..
Hong Kong	0·25	312	..	..	..	..	..	..
China	29,007·43	1,40,86,088	23,680·03	1,39,62,405	4,096·42	24,15,682	..	..
U.S.A.	7·77	7,254	..	196	..	..	..	..
Japan	..	..	12,947·04	65,29,450	12,695·22	59,16,756	..	..
Rumania	..	..	4,401·74	25,63,284	2,712·77	14,51,965	..	..
Italy	..	..	4,584·83	25,60,882	..	..	..	..
Netherlands	..	..	4164·19	31,14,179	..	..	..	..
SM VAL TRNS . . .	..	..	..	..	..	..	0·36	688
TOTAL .	61,657·06	3,90,13,815	148,656·20	9,75,12,682	53,596·46	2,77,59,911	56·96	59,087

APPENDIX V—(*Contd.*)

1	2	3	4	5	6	7	8	9
(iii) *Others*:	15·39	18,775	412·00	2,40,164	2·08	9,407	0·62	1,408
Sweden	3·45	4,723	0·36	1,561	1·58	2,793	..	..
Germany, West . . .	9·55	37,195	7·21	34,526	13·05	51,072	10·10	21,235
Netherlands	0·41	1,563	0·10	99	..	..	..	..
China	1,015·94	3,67,606	..	..	372·63	2,11,238	..	..
U.S.A.	..	..	..	299	..	..	..	..
Czechoslovakia . . .	..	..	..	..	10·09	16,652	..	..
Belgium	..	..	..	..	..	..	1·55	4,770
France	..	..	..	..	..	..	0·77	2,922
SM VAL TRNS . . .	..	..	..	..	..	..	1·76	5,336
TOTAL .	1,044·74	4,29,862	419·67	2,76,649	399·43	2,91,162	14·80	35,671
GRAND TOTAL OF (i), (ii) AND (iii)	62,724·50	3,94,88,815	149,522·22	9,84,62,556	54,040·82	2,81,02,771	109·63	1,23,681

APPENDIX VI

(*Vide* Paragraph 13)

Statement showing c. i. f. prices, customs duty, clearing charges and landed costs of imported Caustic Soda—Fused Solid.

(per tonne)

Sl. No.	Source of information	Origin of import	Date of import	Specification	C.i.f. price	Customs duty*	Clearing charges	Landed cost	Remarks
1	2	3	4	5	6	7	8	9	10
						Rs.	Rs.	Rs.	
1	Collector of Customs, Madras.	China . .	19-2-59	98-99% in drums	200·00	220·40	5%	441·34	*Customs duty is calculated at the rate of 30 per cent *ad valorem* preferential and 40 per cent *ad valorem* standard on tariff values which were as follows before 1st September, 1961:—
		Do.	3-9-59	In drums .	378·15	220·40	5%	628·54	
		U.K. . .	8-4-59	98-99% In drums .	553·93	165·30	5%	755·31	
		Do.	20-6-59	In drums .	399·81	165·30	5%	593·50	
		Do.	15-9-59	Do.	458·26	165·30	5%	654·72	
2	Collector of Customs, Bombay.	U.K. .	28-11-59	98-99% in drums "Cresent" Brand.	351·03	165·30	..	581·07	
		Do.	27-11-59	Do.	524·91	165·30	..	716·50	
		Do.	16-12-59	98/100% "Seekey" Brand Rayon Grade.	451·75	165·30	..	640·32	(a) Caustic Soda, fused solid. Rs. 55·10 per quintal. (b) Other forms including flakes pellets rods & sticks. Rs. 88·50 per quintal.
		Do.	23-12-59	Do.	538·03	165·30	..	730·28	
		Do.	29-1-60	Do.	522·45	165·30	..	693·66	
		China .	30-12-59	Rayon Grade .	367·43	220·40	..	645·24	
		U.S.S.R. .	3-2-60	..	346·67	220·40	..	584·42	
		Rumania .	11-2-60	..	371·00	220·40	..	610·20	

APPENDIX VI—(*Contd.*)

(Per tonne)

1	2	3	4	5	6	7	8	9	10
					Rs.	Rs.	Rs.	Rs.	
3	Collector of Customs, Calcutta.	U.K. . .	30-12-59	Solid in drums.	400·37	165·30	6·15	571·82	
		Do.	1-3-60	Do.	472·81	165·30	6·54	644·65	
		Do.	14-5-60	Do.	549·38	165·30	6·94	721·62	
		Do.	31-5-60	Do.	708·62	165·30	6·94	880·86	
		Do.	2-6-60	Do.	391·12	165·30	6·94	563·36	
		Do.	10-6-60	Do.	391·51	165·30	6·94	563·75	
		Do.	13-6-60	Do.	404·11	165·30	6·94	576·35	
		Do.	12-2-60	Do.	470·05	165·30	6·94	642·29	
		Do.	22-6-60	Do.	394·07	165·30	6·94	566·31	
		Do.	7-7-60	Do.	549·77	165·30	8·32	723·39	
		Do.	6-7-60	Do.	551·15	165·30	6·94	723·39	
		Do.	13-7-60	Do.	391·12	165·30	9·50	565·92	
		Do.	28-7-60	Do.	398·68	165·30	3·00	561·98	
		Japan .	20-1-60	Do.	551·15	220·40	6·95	778·50	
		Do.	14-1-60	Do.	547·02	220·40	6·95	774·37	
		Do.	25-6-60	Do.	332·07	220·40	6·95	559·42	
		Do.	2-8-60	Do.	334·63	220·40	6·95	561·98	
		Do.	27-8-60	Do.	334·63	220·40	6·95	561·98	
		Rumania	23-2-60	Do.	367·11	220·40	6·95	594·46	
		Do.	22-2-60	Do.	371·04	220·40	6·95	598·39	
		Do.	6-4-60	Do.	708·62	220·40	6·95	935·97	
		Do.	7-4-60	Do.	688·94	220·40	6·95	916·29	

	U.S.S.R.	26-2-60	Do.	346·64	220·40	6·94	573·98
	Do.	20-4-60	Do.	551·15	220·40	6·95	778·50
	Do.	25-6-60	Do.	334·63	220·40	6·95	561·98
	Do.	30-7-60	Do.	334·63	220·40	6·95	561·98
	Do.	2-2-61	Do.	346·60	..	..	..
	U.S.A. .	31-5-60	Do.	551·16	220·40	6·95	778·50
4 State Trading Corporation of India Ltd., New Delhi.	U.K. . .	May-August, '60.	98% minimum packed in drums.	390·63	..	..	..
	Japan . .	Jan. '60' July-Sept., '60.	Do.	335·33	..	..	..
	U.S.S.R. .	Feb.-Aug., '60	96/97% min. packed in drums.	348·42	..	..	..
	China . .	Jan., '60.	98% minimum packed in drums.	349·91	..	..	..
	Rumania .	Feb.-April, '60.	Do.	369·23	..	..	..
	. . .	Feb.-April, '60.	94/96%	342·56	..	..	..
5 Chemical and Alkali Distributors Ltd., Bombay.	China . .	6-1-60	98/99% Solid .	348·38	220·40	6·24	575·02
	U.K. . .	31-5-60	Do.	390·39	165·30	9·31	565·00
	Do.	7-6-60	Do.	391·69	165·30	9·09	566·08
	Do.	1-7-60	Do.	390·36	165·30	9·13	564·79
	Do.	18-7-60	Do.	390·35	165·30	9·47	565·12
	Do.	25-7-60	Do.	390·38	165·30	9·37	565·05

APPENDIX VI—(*Contd.*)

1	2	3	4	5	6	7	8	9	10
					Rs.	Rs.	Rs.	Rs.	
6	Tata Oil Mills Co. Ltd., Bombay.	China	2-1-60	..	347·95	220·40	4·13	572·48	
		U.K.	3-1-60	..	395·28	165·30	4·07	564·65	
		Do.	7-1-60	..	394·91	165·30	3·97	564·18	
		Do.	13-5-60	..	386·51	165·30	2·41	554·22	
		Do.	2-6-60	..	390·28	165·30	4·04	559·62	
		Do.	1-7-60	..	390·42	165·30	4·09	559·81	
		Do.	20-7-60	..	390·38	165·30	4·08	559·76	
		Do.	23-7-60	..	390·30	165·30	4·06	559·66	
		Do.	26-7-60	..	390·26	165·30	4·07	559·63	
		Do.	15-7-60	..	393·37	165·30	9·48	568·15	
		Do.	4-8-60	..	390·39	165·30	9·45	565·14	
		Do.	16-8-60	..	389·91	165·30	4·09	559·30	
		Do.	10-9-60	..	390·35	165·30	9·43	565·08	
		Do.	3-6-60	..	390·59	165·30	4·07	559·96	
		Do.	15-3-60	..	390·31	165·30	9·43	565·04	
		Japan	27-1-60	..	345·15	220·40	9·45	575·00	
		Do.	8-8-60	..	335·33	220·40	9·44	565·17	
		Do.	11-8-60	..	335·44	220·40	9·44	565·28	
		Rumania	26-2-60	..	369·24	220·40	8·97	598·61	
		Do.	13-4-60	..	345·42	220·40	9·42	575·24	
		U.S.S.R.	22-2-60	..	346·61	220·40	4·09	571·10	

7	Imperial Chemical Industries (India) Pvt. Ltd., Calcutta.	U.K.	Jan. '60	98/99% Solid	423·52	165·30	8·17	596·99	Highest.
				in drums.	394·80	165·30	4·08	564·18	Lowest.
		Do.	May/	Do.	390·57	165·30	9·41	565·28	Highest.
			July '60.		389·76	165·30	4·04	559·10	Lowest.
		China . .	Jan. '60	Do.	346·20	220·40	8·46	575·06	Highest.
					349·83	220·40	4·19	574·42	Lowest.
		Japan . .	Jan./Feb.	Do.	345·22	220·40	9·37	574·99	Highest.
			'60.		345·08	220·40	7·97	573·45	Lowest.
		Do.	Sep./	Do.	335·52	220·40	9·49	565·41	Highest.
			Oct. '60		335·34	220·40	9·37	565·11	Lowest.
		U.S.S.R. .	Mar.-	Do.	346·69	220·40	9·42	576·51	Highest.
			June '60.		346·70	220·40	4·24	571·34	Lowest.
		Rumania .	Mar./	94/96% Solid	369·33	220·40	9·61	599·34	Highest.
			April '60.	in drums.	345·47	220·40	4·24	570·11	Lowest.

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