



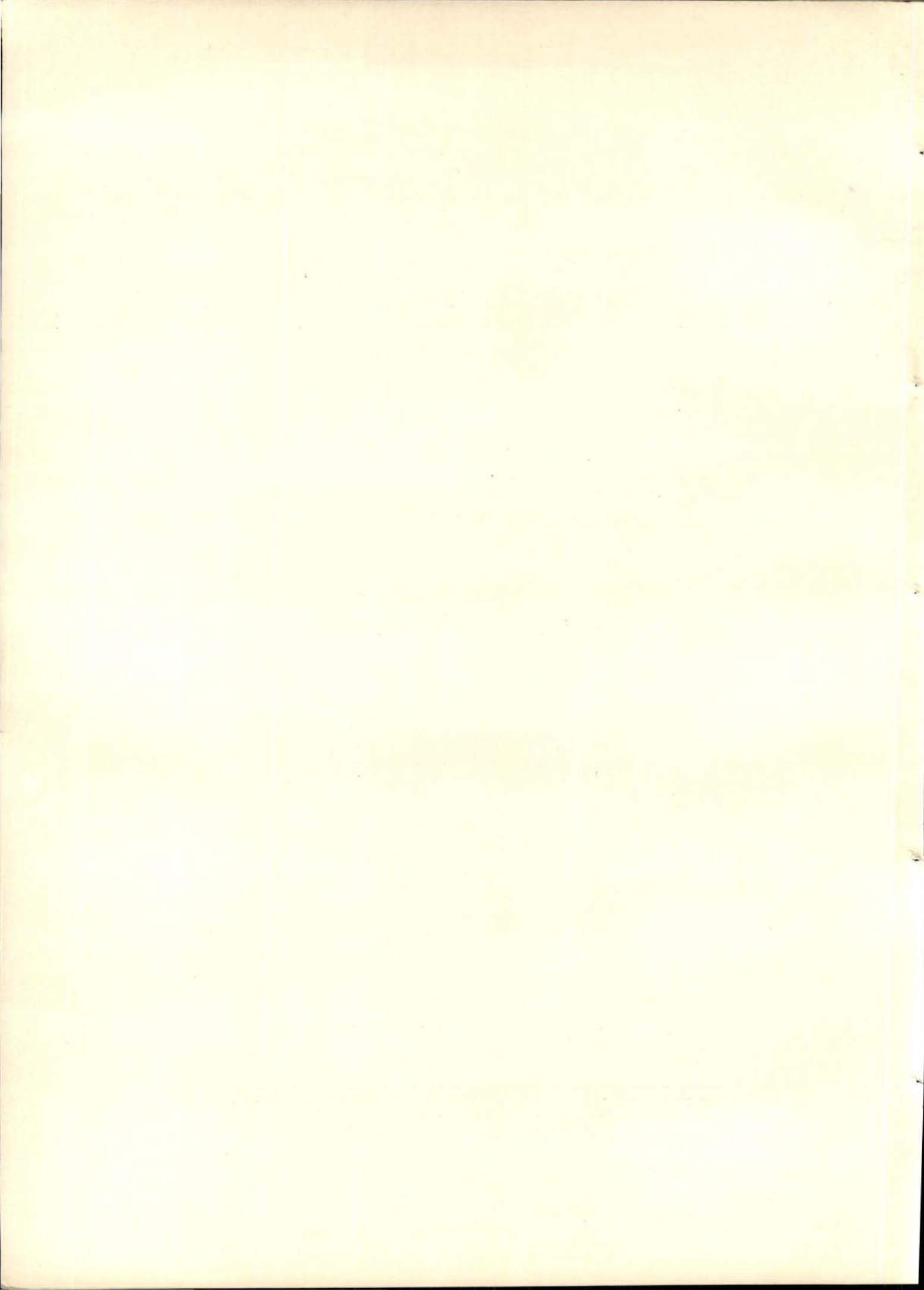
**REPORT OF THE
COMPTROLLER & AUDITOR GENERAL
OF INDIA**

UNION GOVERNMENT

No. 8 (COMMERCIAL) OF 1990

**HINDUSTAN FERTILIZER CORPORATION LIMITED
HALDIA FERTILIZER PROJECT**

CAG
351-7232R
NO.8



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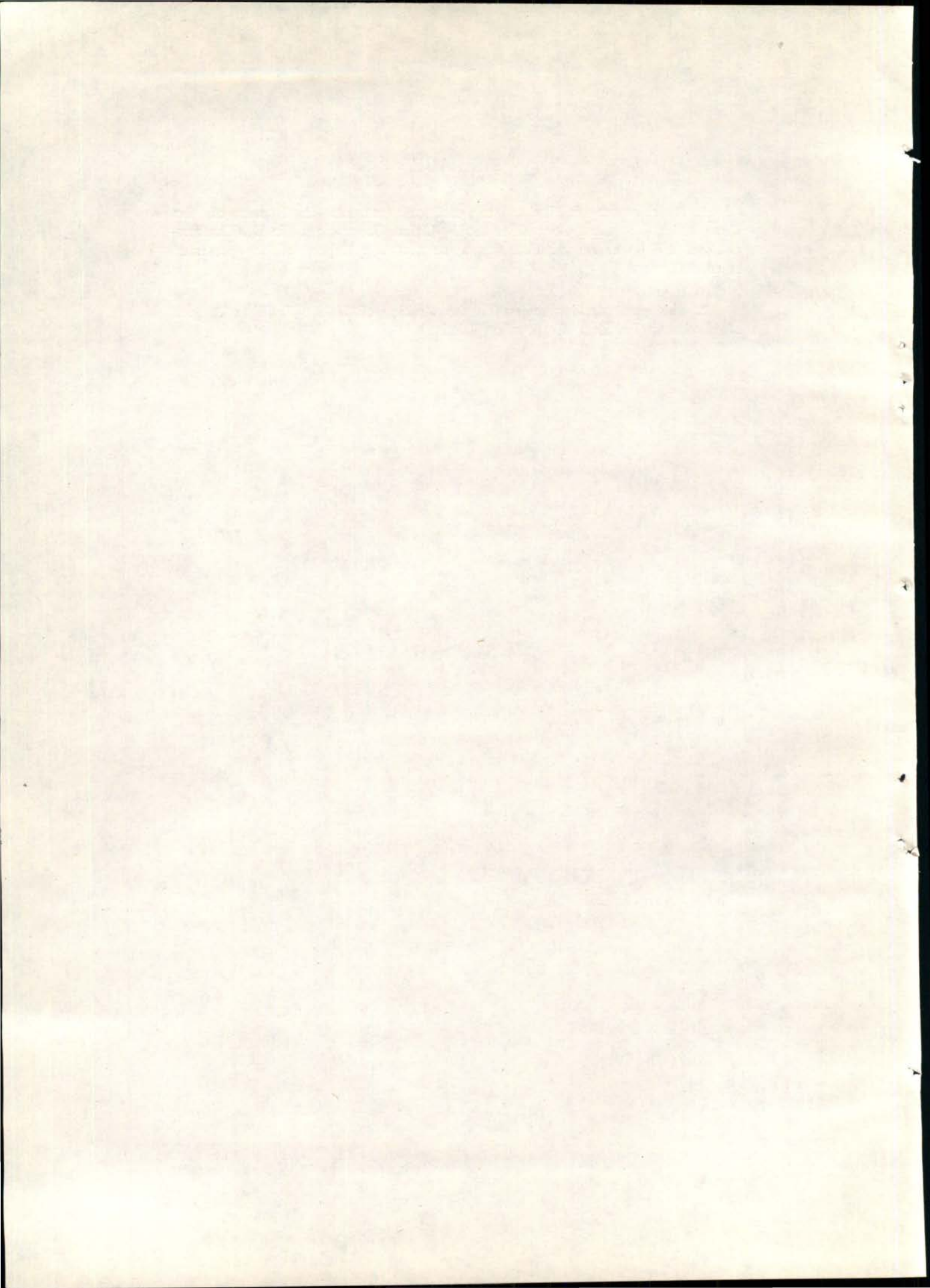
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PREFACE

1. A reference is invited to prefatory remarks in Report of the Comptroller & Auditor General of India—Union Government No. 1 (Commercial) of 1990 wherein mention was made that this Report will be presented in several parts.

2. This part contains review on the working of Haldia Fertilizer Project of Hindustan Fertilizer Corporation Limited.



HINDUSTAN FERTILIZER CORPORATION LIMITED HALDIA FERTILIZER PROJECT

OVERVIEW

The Haldia Fertilizer Project was started by the erstwhile The Fertilizer Corporation of India Limited (FCI) and came under the control of Hindustan Fertilizer Corporation (HFC) Limited in March, 1978. The Government of India sanctioned the Project in November, 1971 with a total capital investment of Rs. 88.03 crores, including foreign exchange component of Rs. 29.04 crores, for production of Urea, Nitrophosphate, Methanol and Soda Ash. It was stipulated in the original Techno-Economic Feasibility Report (TEFR) that the Project would be completed within 34 months from the date of obtaining foreign exchange clearance. Subsequently, in October, 1972 it was envisaged that the Project would be commissioned in 42 months from the zero date of 1-9-1972 i.e. by 1st March, 1976.

The mechanical completion of the Project could, however, be achieved only in January, 1979 and the commissioning activities started from early 1980. But till September, 1986 commercial production could not be started and from October, 1986 the commissioning activities were suspended under the orders of the Government. (Paras 1.01, 5.01 and 6.01).

II. Even though the commissioning activities were suspended in October, 1986, the Company decided to operate Air Separation Unit (ASU) to make high pressure nitrogen available for preservation of catalyst and equipments at a cost of Rs. 1 crore per month. Since the Ministry did not sanction this, the operation of ASU was stopped from 17th April, 1987 and the Company started purchasing nitrogen from outside for preservation of catalyst and equipments. The operation cost of ASU was more than the cost of purchase of nitrogen from outside and this resulted in extra expenditure of Rs. 5.42 crores from the operation of ASU from November, 1986 to 16th April, 1987. (Paras 7.01 and 7.02).

III. As a result of delay in the completion of the Project, Project cost estimate had to be revised 13 times from October, 1972 to September, 1986. The Project cost estimate of September, 1986 (yet to be approved by the Board and sanctioned by the Government) envisaged a total expenditure of Rs. 624.19 crores (including FE component of Rs. 42.96 crores) against the original sanctioned estimate of Rs. 88.03 crores. The overall increase of Rs. 536.16 crores was

attributed to change in the scope of work, increase in financing and departmental charges, inadequate initial provisions, price escalation etc. The actual expenditure incurred upto March, 1990 was Rs. 596.26 crores. (Paras 4.01 to 4.04).

- IV. (a) There was abnormal delay in commissioning of the Project. This was due to locational handicap of site and delays in : (i) approving the agreements by the Government with foreign collaborators (3 to 17 months), (ii) foreign exchange clearance from Government (2 to 28 months), (iii) supply of completed drawings by Planning and Development Division (P&D) (12 to 75 months), (iv) supply of equipments by indigenous firms (26 to 48 months) and, (v) diversion of orders from indigenous suppliers to foreign firms (15 to 27 months). (Para 5.03).
- (b) Due to locational handicap of the site, pre-consolidation by sand wicking and pre-loading work had to be carried out at a cost of Rs. 5.74 crores on account of poor load bearing capacity of the soil. (Para 2.00).
- (c) The engineering and drawing done by P&D had various deficiencies whose rectification resulted in extra cost of Rs. 2.98 crores. (Para 5.03).
- (d) The completion of project was further delayed by 25 months due to damage to Oxygen Gas Holder and fire in Oxygen Compressors. The Company had to incur Rs. 2.19 crores for repair of the Oxygen Gas Holder and Oxygen Compressors. (Para 5.04).

V. As a result of delay in the completion of the Project, the performance guarantee period of critical equipments expired. In view of this the Management had to cover the performance guarantee of some critical equipments and machinery under breakdown policy with manufacturing guarantee at a cost of Rs. 56 lakhs as insurance premium. (Para 5.05).

VI. Before the suspension of commissioning activities in October, 1986 a scheme was drawn up (September, 1986) by the Company for debottlenecking of the Plants at a capital cost of Rs. 135.30

crores at the instance of Ratan Tata Committee appointed by the Government to examine the operational possibilities of the Project. The debottlenecking scheme envisaged rectification of major constraints in respect of certain critical equipments. In January, 1987, the Company submitted a proposal to the Government to restart the Plant after successful trial run of N. P. K. Plant on Sulphate Recycle Process. The Government, however, decided in February, 1987 for an end-to-end survey of the entire Project with a view to identifying the design deficiencies and production bottlenecks with the assistance of foreign consultants.

Accordingly, on 29th October, 1987 agreements were entered into with two foreign firms viz. M/s. Toyo Engineering Corporation (TEC) Japan and M/s. UHDE, (West Germany). M/s. TEC were to study complete revamping and rehabilitation of Ammonia, Urea and Methanol Plants at a fee of Rs. 1.16 crores and M/s. UHDE were to study Sulphuric Acid, Nitric Acid, Phosphoric Acid, Ammonia Sulphate, and NPK Plants alongwith off site facilities at a fee of Rs. 1.53 crores. Both M/s. TEC and M/s. UHDE submitted their reports in July, 1988 envisaging an expenditure of Rs. 299 crores and Rs. 203 crores respectively for revamping and rehabilitation of the Plants as covered in the agreements. (Paras 6.01 to 6.04).

VII. M/s. TEC brought out many deficiencies particularly in the Ammonia Plant and anticipated the completion of revamping work in 36 months. M/s. UHDE suggested that the Nitrophosphate Plant, which was the central theme for making the downstream plants commercially viable, can be brought back to its rated capacity with Direct Neutralisation Route/Mixed Dissolving Route. They also pointed out many other serious deficiencies, and recommended not to revamp the Ammonium Sulphate Plant as there was no commercially viable process route for Ammonium Sulphate recycle with Gypsum conversion. The firm, however, anticipated the completion of revamping of downstream plant in 32 months and recommended that the revamping work be taken in two phases. (Paras 6.04 and 6.07).

VIII. In view of resource constraints and non-viability of the Project without capital write off, the Government approved (July, 1989) in principle, the UHDE's revamping proposal for phase I pertaining to NP & Nitric Acid Plant involving an outlay of Rs. 123.88 crores and asked for detailed proposal exploring the possibilities of operating the Ammonia, Urea and Methanol Plants at a modest capacity with minor investment.

The detailed proposal for phase I revamping of Nitrophosphate Group of Plants involving an updated cost of Rs. 156.74 crores was submitted to the Government in October, 1989. In March, 1990 a detailed Report of PDIL in respect of Ammonia, Urea and Methanol Plants which envisaged the capital expenditure of Rs. 237.00 crores mainly for replacement and modification of equipments and machinery which had failed and got damaged was also submitted to the Government.

The cost of revamping of Phase-I as mentioned above was later revised from Rs. 156.74 crores to Rs. 200.95 crores in August, 1990. (Paras 6.07 to 6.10).

IX. Final decision of the Government on the proposal for revamping of phase I and on the report of PDIL was still awaited (November, 1990). Exclusion of Soda Ash Plant from the scope of study by M/s. TEC and M/s. UHDE and recommendation of M/s. UHDE not to revamp Ammonium Sulphate Plant made the future of capital investment on the Soda Ash Plant (Rs. 13.68 crores) and Ammonium Sulphate Plant (Rs. 2.66 crores) uncertain. (Paras 6.08 and 6.10).

X. The last revised date of commercial production was October, 1986. Since commercial production could not be started, there was production loss of 4,95,000 tonnes of Urea, 15,00,000 tonnes of NPK, 1,80,000 tonnes of Soda Ash and 1,23,750 tonnes of Methanol during the years from 1987-88 to 1989-90. On the other hand, to meet the domestic demand of fertilizers the Government had to import 114.15 lakh tonnes of nutrients (NPK) during the years 1985-86 to 1989-90 at a total cost of Rs. 6511.25 crores. Import of 8.367 lakh tonnes of nutrients valued at Rs. 275.99 crores could have been avoided if the Plants of this project had gone into commercial production in 1986. (Para 8.04).

XI. Thus due to various design deficiencies, technical problems, mismatching of equipments, time and cost-over-runs, the project cost shot up from Rs. 88.03 crores to over Rs. 596 crores by March, 1990. Even after this vastly increased investment, the project failed to achieve commercial production. Therefore, the very purpose for which the project was set up i.e. to meet the increased demand in Eastern Region in India for phosphatic and nitrogenous fertilizer remained unfulfilled. Besides, a massive investment of over Rs. 596 crores has remained unproductive so far. On the other hand, standing charges of over Rs. 1.50 crores per month are being separately incurred. (Para 8.05).

1. INTRODUCTION

1.01 In August, 1964 the Government of India approved in principle, Haldia as a possible location for a fertilizer plant in conjunction with the oil refinery located there. Demand for Phosphatic and Nitrogenous fertilizer was considered to be very high in the Eastern Region and accordingly production capacities of these were planned to be augmented in that area. The Fertilizer Corporation of India Limited at the instance of Government of India prepared the final Techno-Economic Feasibility Report (TEFR)

in December, 1970 for establishment of a fertilizer plant at Haldia. Government approved in November, 1971 the Haldia Fertilizer Project at a total capital investment of Rs. 88.03 crores including foreign exchange component (FE component) of Rs. 29.04 crores.

1.02 The various units of the plant, their capacities and main products together with the feed stock are as follows :—

Sl. No.	Name of the Unit	Intermediate Product/ end Product	Capacity- Original/ Revised (M.T. per day)	Revised Annual Capacity (M.T.)	Main feed stock
1	2	3	4	5	6
A. Intermediate Product Plants					
1.	Ammonia Plant	Ammonia	600	198000	Fuel Oil from IOC.
2.	Nitric Acid Plant	Nitric Acid (100 percent)	475	159000	Ammonia
3.	Sulphuric Acid Plant	Sulphuric Acid (100 percent)	200/(250)	82500	Sulphur to be imported
4.	Phosphoric Acid Plant	Phosphoric Acid (P ₂ O ₅)	77/(100)	33000	(a) Rock Phosphate to be imported. (b) Sulphuric Acid.
5.	Ammonium Sulphate Plant	Ammonium Sulphate	353/(400)	132000	(a) Ammonia (b) Carbondioxide (c) Chalk.
B. End Product Plants					
6.	Urea Plant	Urea	500	165000	(a) Ammonia (b) Carbondioxide.
7.	Nitrophosphate Plant	Nitrophosphate	1263/(1667)	500000	(a) Nitric Acid (b) Phosphoric Acid (c) Ammonium Sulphate (d) Rock Phosphate (e) Ammonia.
8.	Methanol Plant	Methanol	125	41250	Ammonia Feed Gas.
9.	Soda Ash Plant	Soda Ash	200	60000	(a) Salt (b) Potash

Note: The figures within brackets indicate revised capacities.

Pursuant to a Government decision (January, 1978) reorganising The Fertilizer Corporation of India Limited and the National Fertilizers Limited, the Haldia
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Project was transferred to the control of the newly created Company viz. Hindustan Fertilizer Corporation Limited (HFC); incorporated on 14th March, 1978.

2. POOR LOAD BEARING CAPACITY OF THE SOIL

In 1972-73 when the soil data of the factory site was received from erstwhile Planning and Development Division [now known as Projects and Development India Limited (PDIL)] the soil bearing capacity was found to be very poor. This necessitated providing 7068 piles, and pre-loading and sand wicking at a total cost of Rs. 5.74 crores, which was not envisaged in the Techno-Economic Feasibility Report (TEFR).

3. DIVISION OF RESPONSIBILITY FOR THE EXECUTION OF THE PROJECT

3.01 The execution of the Haldia Project was the joint responsibility of the P&D Division (now PDIL) and Haldia Division of the Company. P&D Division's scope of work was design, engineering and supply of major plants and that of Haldia Division to receive and store all equipments and materials received at site, execute civil and structural works and erect all plants and equipments as per design and drawings supplied by P&D Division.

3.02 The names of the units for which P&D Division with its own know-how or with the help of imported know-how/technology and other agencies provided the design and detailed engineering are detailed in Annexure 'A'.

3.03 It may be seen from Annexure-A that out of nine plants, three complete plants viz. Sulphuric Acid Plant, Nitric Acid Plant and Ammonium Sulphate Plant and certain sections of other plants viz. Shift

Conversion Section of Ammonia Plant and Refining, Storage and Filling Section of Methanol Plant were designed and engineered on the basis of erstwhile P&D's own knowhow without any foreign collaboration. The other Group of Plants was engineered by the erstwhile P&D on the basis of imported know-how and technology whereas for NPK and Soda Ash Plant detailed engineering was also developed by foreign companies.

4. PROJECT COST ESTIMATES

4.01 Revision of Project Cost Estimates

The Project Cost Estimate of Rs. 88.03 crores (including foreign exchange component of Rs. 29.04 crores) approved by the Government in November, 1971 was stated to be a broad estimate as many of the details were not available when TEFR was prepared.

4.02 The detailed cost estimates for the Project were, however, subsequently revised 13 times after September, 1972—fixed as zero date, till September 1986. But the Government sanctioned only two of the revised Project Cost Estimates viz. that of April, 1976 in February, 1979 at Rs. 228.51 crores (including FE component of Rs. 42.96 crores) and that of January, 1980 in July, 1981 at Rs. 281.96 crores (including FE component of Rs. 42.96 crores).

4.03 The table below indicates the total project cost sanctioned by the Government from time to time and the reasons for increase in the project cost.

(Rupees in crores)

(a)	1. Date of sanction of original/revised estimate	November 1971	February 1979	July 1981	September 1986 (yet to be approved by the Board & sanctioned by the Govt.)
	2. Amount sanctioned	88.03	228.51	281.96	624.19
	3. Amount of foreign exchange included in sanctioned amount	29.04	42.96	42.96	42.96
	4. Difference (Increase over previous estimate)	—	140.48	53.45	342.23
(b)	Reasons for increase and amount involved ;				Total
	1. Change in scope	10.59	—	—	10.59
	2. New scope	—	1.51	64.56	66.07
	3. Inadequate provisions	31.48	5.65	110.69	147.82
	4. Effect on account of rupee value parity	9.95	—	—	9.95
	5. Shifting of supplies from foreign currency to Indian currency and vice-versa.	8.11	—	—	8.11
	6. Price escalation	49.54	7.54	25.73	82.81
	7. Rise in contract price	—	1.48	—	1.48
	8. Increase in financing charges	7.38	—	76.81	84.19
	9. Increase in departmental charges	2.49	—	24.87*	27.36
	10. Modifications	—	—	6.22	6.22
	11. Others	20.94	37.27	33.35	91.56
	Total increase				536.16

*Net of receipt of Rs. 42.70 crores on account of sale of products.

4.04 Government of India's last sanction for revised cost estimate given in July, 1981 was only for Rs. 281.96 crores. Against this sanction, the Company had incurred an expenditure of Rs. 596.26 crores till the end of March, 1990; resulting in excess expenditure of Rs. 314.30 crores i.e. 111.5 per cent over the last sanctioned estimate. The sanctioned estimate was inclusive of Rs. 42.96 crores for foreign exchange component; out of which foreign supplies of equipment, engineering, know-how amounting to Rs. 28.29 crores were provided by foreign agencies on credit.

4.05 After July, 1981, the Government did not accord sanction for any other revised cost estimates and the approval to the latest revised estimate of Rs. 624.19 crores (including foreign exchange component of Rs. 42.96 crores) was awaited (March, 1990).

4.06 It would be observed that a major part of the increase in project cost was due to price escalation (Rs. 82.81 crores), increase in financing charges (Rs. 84.19 crores) and increase in departmental charges (Rs. 27.36 crores); which were all attributable to delay in completion and commissioning of the project. It would also be noticed that 40% of the increase in project cost was attributable to inadequate provisions and new scope of work suggesting lack of proper estimation.

5. COMMISSIONING OF THE PROJECT

5.01 *Project completion schedule and delays*

The TEFRR submitted to the Government in February, 1970 tentatively stipulated a time schedule of 34 months from the date of obtaining foreign exchange clearance for completion of the Project.

The detailed 'Revised Project Cost Estimates' which were prepared in October, 1972 after detailed engineering envisaged the commissioning of the Project plants in 42 months from the zero date of 01-9-1972 i.e. in March, 1976 and commercial production after three months i.e. from June, 1976. Though mechanical erection was completed in January, 1979 and the commissioning activities started from early 1980, production never stabilised due to a host of design defects, other deficiencies and defects in various machines. Consequently the Government suspended all the activities of the Plant in October, 1986.

5.02 The scheduled dates of commissioning as per project cost estimates of October, 1972, dates of trial run and the extent of delay in commissioning of different intermediate product plants and end-product plants are indicated below :

A. *Intermediate Product Plants*

(1) *Ammonia Plant* : This plant was to be commissioned by March, 1976, but trial run was conducted

on 4-7-1983 and though some production was achieved, commercial production could not be started. The extent of delay from the scheduled date of commissioning was 87 months approximately.

(2) *Nitric Acid Plant* : This plant was to be commissioned by March, 1976 but trial run could be conducted only on 4-10-1983; resulting in delay of about 90 months (approx.) from the scheduled date of commissioning. Like Ammonia Plant, although some production was achieved, commercial production could not be started in this plant also.

(3) *Sulphuric Acid Plant* : This plant was to be commissioned by March, 1976 but trial run was conducted on 22-8-1984; resulting in delay of about 101 months from the scheduled date of commissioning. As in the case of preceding two plants, commercial production could not be started; although the plant did produce some quantities.

(4) *Phosphoric Acid Plant* : This plant was scheduled to be commissioned by March, 1976 but trial run was conducted on 18-4-1985; resulting in delay of about 109 months from the scheduled date of commissioning. Besides some production, no commercial production could be started in this plant as well.

(5) *Ammonium Sulphate Plant* : This plant was scheduled to be commissioned by March, 1976 but was not yet commissioned (November, 1990).

B. *End Product Plants*

(1) *Urea Plant* : It was scheduled to be commissioned by March, 1976; but trial run was conducted on 11-8-1983 resulting in delay of about 88 months from the scheduled date of commissioning. Commercial production could not be started, even though some production was achieved.

(2) *Methanol Plant* : Against the scheduled date of commissioning of this plant by March, 1976 the trial run could be conducted on 9-4-1982 resulting in delay of about 72 months. This plant also gave some production but commercial production could not be undertaken.

(3) *NPK Plant* : This plant was to be commissioned by March, 1976 but trial run was conducted on 28-1-1984; involving a delay of about 94 months from the scheduled date of commissioning. Even though some production was achieved, commercial production could not be started.

(4) *Soda Ash Plant* : This plant was to be commissioned by March, 1976 but it was yet to be commissioned (November, 1990).

5.03 The delay by different agencies at various stages as revealed by a test check in audit is given below :—

- (i) Approval of Project Licence Agreement by the Government of India—3 to 17 months from the dates of signing agreements with 5 foreign agencies for licence and know-how.
- (ii) Release of foreign exchange by Government of India—2 to 28 months inspite of identification of maximum credit sources.
- (iii) Delay in project schedule by foreign collaborators as mentioned below :—
 - (a) Supply of basic engineering documents for Gassification and Rectisol Section of the Ammonia Plant by M/s. Lurgi/Shell—10 months and subsequent revision of specifications—5 to 9 months.
 - (b) M/s. Ensa and Polimex could not supply various equipments in time in accordance with firm specification as per agreement due to non receipt of firm technical documents from the various process licensors which had adverse impact on the project schedule.
- (iv) There was overall delay of about four years in mechanical erection work. Sand-wicking, preloading and piling work was delayed by 6 to 10 months. Civil construction was delayed by 19 to 27 months. For delay in mechanical erection and civil work, the Company had to pay escalation charges amounting to Rs. 83.65 lakhs. Delay in supply of engineering drawings by PDIL was also a contributory factor. The PDIL took 12 to 75 months to supply the drawings. Supply of equipments by the suppliers for mechanical erection work also contributed to the overall delay.

Delay by PDIL in supply of drawings was stated to be on account of change in scope, belated receipt of the process packages from various licensors/sub-vendors and changes/modifications based on feed back from similar plants. No action could, however, be taken against PDIL for delayed supply of drawings as there was no formal contract with the then P&D which was a part of FCI Limited.

- (v) Supply of equipments by indigenous suppliers was also delayed by 26 to 48 months due to technical problems faced by them; as most

of the indigenous suppliers were manufacturing the equipments for the first time. Besides delay in supply, many of the critical indigenous equipments failed to perform satisfactorily.

As M/s. BHPV could not supply Urea Reactor in time, the Company placed another order on M/s. Thyssen Industries (West Germany) in January, 1977 for supply of one Urea Reactor at a cost of Rs. 41.67 lakhs which was received in January 1978. The decision for import of Urea Reactor was taken in a meeting held in October, 1976 at Ministry's level in view of the uncertainty of delivery and performance of M/s. BHPV reactor. As a result of import of Urea Reactor, the Urea Reactor supplied belatedly by M/s. BHPV at a cost of Rs. 23.06 lakhs remained idle since November, 1977.

- (vi) Due to inability of indigenous suppliers orders were diverted to foreign firms; causing fresh delay of 15 to 27 months in placement of orders on foreign firms.
- (vii) Numerous changes were made by PDIL in the drawings of Gassification and Rectisol Sections for rectification of design deficiencies and carrying out other modifications necessitating procurement of additional imported and indigenous items. The cost of modifications and design changes amounted to Rs. 2.98 crores.
- (viii) In addition to the above delays, it has also been noted in audit that there were incidence of mismatching of equipments in certain sections like LNW, Refrigeration compressor, Nitrogen compressor etc.

5.04 *Damage to Oxygen Gas Holder and Oxygen Compressors*

Damage to Oxygen Gas Holder and Oxygen Compressors proved another major obstacle in commencement of commercial production. On 15th September, 1983 there was an implosion in the Oxygen (O₂) Gas Holder.

The Air Separation Unit supplying oxygen to Oxygen Gas Holder had suddenly tripped due to failure of fuel oil pump to the boilers necessitating manual tripping of all the boilers.

While all the plants tripped for want of steam supply, the Oxygen Compressor continued to run drawing oxygen from the Gas Holder and causing vacuum inside. This resulted in collapse of the Gas Holder.

A Committee constituted (September, 1983) by the General Manager to go into details of the accident and reasons for collapse of Oxygen Gas Holder indicated (November, 1983) that the collapse of Oxygen Gas Holder was due to abandonment of duty spot by all the operators of the Ammonia and the Steam Generation Plants and failure of the Management to take timely action to counter the threat of the operators leaving the work spots enblock.

The Oxygen Compressor No. 3 was seriously damaged on 18-10-1983 due to fire and the Compressor No. 2 was burnt down in November, 1983. M/s. Linde, the designers of the Oxygen Compressor, who investigated the causes of fire, in their report (February, 1984), *inter-alia*, stated that Oxygen Compressor No. 2 was restarted on the same day without having investigated the causes of fire in Oxygen Compressor No. 3. However, the Management stated (August/November, 1988) that the Oxygen Compressor No. 2 was checked thoroughly and restarted on 5-11-1983 and continuous running of the compressor was cleared by M/s. Linde's representatives on 6-11-1983. The commissioning activities had, however, to be suspended due to damage to Oxygen Compressor. The repair and painting job of Oxygen Gas Holder was completed on 10-2-1985 at a cost of Rs. 11.45 lakhs and the repair of Oxygen Compressors work was completed on 30-11-1985 by incurring an expenditure of Rs. 2.08 crores.

The General Manager of the Division requested a Safety Consultant on 3-5-1984 to conduct a survey on the failure of Oxygen Compressors No. 2 and 3. Though his report (12-5-1984) did not specifically identify the causes of failure of the Oxygen Compressor, it indicated that safety system in the Compressors was not adequate.

5.05 Impact of delay in the commissioning of the plants

(1) Ammonia, produced by the Ammonia Plant, is required for production of all the four end-products viz. Urea, Nitrophosphate, Methanol and Soda Ash of Haldia Division. Therefore, functioning of the Ammonia Plant is the key factor for the complex as a whole. This plant was unable to run on sustained basis due to several equipment failures, as detailed in preceding paras.

(2) Guarantee period of different process licences expired during the period from November, 1975 to June, 1977 after five years from the respective effective dates. Similarly the performance guarantee period of most of the critical equipments also expired during the period from March, 1977 to April, 1980. In view

of the expiry of performance guarantee periods of critical equipments, the Management covered the performance of some critical equipments and machinery under breakdown insurance policy with manufacturing guarantee endorsement upto March, 1984 and on this account the Company had to pay Rs. 56.00 lakhs towards insurance premia.

(3) Due to delay in the commissioning of the Plants, the process performance guarantee of certain sections of the plants also expired and the management consequently entered into a commissioning agreement on 7th January, 1981 with PDIL.

The period of agreement which was extended upto 31st March, 1985 was finally terminated with effect from 1st April, 1985 as the PDIL left the site unilaterally inspite of requests from G.M., Haldia. As a result, the performance of all the plants could not be proved as per the guarantees.

6. PRESENT STATUS OF THE PLANTS

6.01 The commissioning activities commenced in early 1980. In spite of various efforts, the plants could not be run on a sustained basis. In view of the dismal performance of the project, a Committee (Ratan Tata Committee) was appointed by the Government under Project Implementation Programme to examine the operational possibilities of the project. Based on the recommendations of the Committee a scheme was drawn up (September, 1986) by the Company for debottlenecking of the plants at a capital cost of Rs. 135.30 crores.

The debottlenecking scheme envisaged rectification of major constraints in respect of critical equipments such as (a) Oxygen Compressor, (b) Nitrogen Compressor, (c) Air Separation Unit. Besides the scheme also envisaged (a) procurement of molecular sieve for dehydrating oxygen, (b) replacement of existing compressor by centrifugal compressor, (c) installation of 30 MW Gas Turbine.

In October, 1986 the Ministry, however, advised the Company not to incur any expenditure on the commissioning of Haldia Project except meeting expenses on wages and standing expenses until further advice; as Government's approval for further release of funds was awaited and firm date of commencing production (which was earlier anticipated as October, 1986) was not informed to the Ministry.

6.02 After successful trial run (January, 1987) of N.P.K. Plant on Sulphate Recycle Process, a proposal to restart the plant was submitted by the Company (15-1-1987) to the Government. The Government

on the other hand decided in February, 1987 for an end-to-end survey of the Haldia project with a view to identifying design deficiencies and production bottlenecks with the assistance of foreign consultants, if necessary, and to incur standing charges of Rs. 1.25 crores per month on Haldia Project. The standing charges of Rs. 1.25 crores increased to Rs. 1.52 crores w.e.f. 1988-89.

6.03 In July, 1987 Government released Rs. 3.00 crores as free foreign exchange to the Company to meet the expenditure on the appointment of consultants for preparation of cost estimates. Pursuant to this, the Company entered into agreements on 29th October, 1987 with two foreign consultants viz. M/s. Toyo Engineering Corporation (TEC), Japan and M/s. UHDE, West Germany for complete revamping and rehabilitation study and preparation of final report. M/s. TEC were responsible for Ammonia, Urea and Methanol Plants with a fee of Rs. 1.16 crores and M/s. UHDE for Sulphuric Acid, Nitric Acid, Phosphoric Acid, Ammonium Sulphate and NPK plants and off site facilities/utilities and services at a fee of Rs. 1.53 crores.

6.04 Both M/s. TEC and M/s. UHDE submitted their reports in July, 1988 envisaging an expenditure of Rs. 299 crores for revamping and rehabilitation of Ammonia, Methanol and Urea Plants with completion period of 36 months and of Rs. 203 crores for revamping and rehabilitation of NPK Plant, Nitric Acid Plant, Phosphoric Acid Plant, Ammonium Sulphate Plant and Sulphuric Acid Plant and off site facilities with completion period of 32 months.

6.05 The report of M/s. TEC *inter-alia* brought out the following deficiencies :

- (1) Wrong location of Ammonia Plant relative to that of Steam Generation Plant which resulted in troubles in Air Separation Unit, Air Compressor, Oxygen Compressor and Water-cooled heat exchangers.
- (2) Many kinds of deficiencies in the entire area of Ammonia Plant design. These pertained to :
 - (a) Oxygen Compressor,
 - (b) Carbon Recovery Section,
 - (c) Liquid Nitrogen Washing Unit,
 - (d) Surface Condensor for steam turbines,
 - (e) Condensor for Refrigeration Compressor.

In regard to Urea and Methanol Plants similar design defects were also pointed out by them though the extent of deficiencies was less than that of the Ammonia Plant.

- (3) Many troubles were traced to manufacturers bad workmanship in Oxygen Compressor and Nitrogen Compressor.

6.06 M/s. UHDE carried out detailed inspection at site and made a thorough investigation of the design of various plants within the scope of their contract. They observed that Nitrophosphate Plant was the central theme for making the downstream plants commercially viable and after analysing various process alternatives they reported that Nitrophosphate Plant could be brought back to its rated capacity with Direct Neutralisation Route/Mixed Dissolving Route. In regard to other downstream plants like Nitric Acid Plant, Phosphoric Acid Plant and Sulphuric Acid Plant, they observed that these plants could also be brought to their rated capacity by incorporating certain new equipments and doing modifications without changing the basic process.

They also pointed out the following deficiencies :

- (a) High degree of interdependence of process plants and limited storage facilities for intermediate products.
- (b) Direct use of river water with high suspended and dissolved solids without treatment.
- (c) Inadequate and poor design of the coal handling system.
- (d) Insufficiency of the design of instrument and electrical distribution system.
- (e) Bad shape of material handling system for raw materials and products.
- (f) Low level of workmanship for erection and maintenance of plants.

This report, however, recommended not to revamp the Ammonium Sulphate Plant as there was no known commercially viable process route for Ammonium Sulphate Recycle with Gypsum conversion.

6.07 M/s. UHDE recommended taking up the revamping work in two phases. In the first phase they recommended revamping of Nitric Acid and N.P. Plants and for erection of handling and storage facilities for imported phosphoric acid and ammonia to be used in the new route i.e. direct neutralisation process which could be operated alternatively as a mixed dissolving process, instead of Sulphate Recycle Process as originally designed involving an investment of Rs. 123.88 crores. The Sulphate Recycle Process was recommended to be abandoned on the ground that this process was not known to have been operating anywhere in the world.

6.08 Soda Ash Plant was excluded from the study altogether and M/s. UHDE had recommended non-revamping of the Ammonium Sulphate Plant.

Thus the future of capital investment of Rs. 13.68 crores in Soda Ash Plant and Rs. 2.66 crores in Ammonium Sulphate Plant has remained uncertain.

6.09 Based on the above two reports and proposals, the cost of complete revamping was estimated at Rs. 502 crores. But in view of resource constraints and non-viability without capital write-off of substantial magnitude, the Government approved (July, 1989) in principle, the UHDE's revamping proposals for Phase-I pertaining to N.P. and Nitric Acid Plants involving an outlay of Rs. 123.88 crores and accordingly asked for (July, 1989) detailed proposal for revamping of these plants. The Government also asked for detailed proposal exploring the possibility of operating the Ammonia, Urea and Methanol Plants of Haldia Project at a modest capacity utilisation with minor investments and a financial analysis alongwith a proposal for financial restructuring of the project cost so that the project after revamping became economically viable.

6.10 The detailed proposal for Phase-I revamping of Nitro Phosphate group of plants of Haldia involving an updated cost of Rs. 156.74 crores was submitted to the Government in October, 1989. The cost of Rs. 156.74 crores was further updated to Rs. 200.95 crores in August, 1990. M/s. PDIL (Projects and Development India Limited) prepared a detailed project report on rehabilitation of Ammonia, Urea and Methanol Plants of Haldia Division estimating capital outlay of Rs. 237.00 crores, including foreign exchange component of Rs. 48.90 crores. This Report was submitted to the Government in March, 1990.

Final decision of the Government in regard to revamping of Nitrophosphate group of plants as well as Ammonia, Urea and Methanol Plants was still awaited (November, 1990).

7. POOR PLANNING AND CONSEQUENTIAL LOSS OF RS. 5.42 CRORES

7.01 In pursuance of Government of India's directive dated 16th October, 1986, the Company stopped all activities in connection with the commissioning of the Haldia Project. However, it was decided to operate the Air-Separation Unit (ASU) to make high pressure Nitrogen available for the purpose of preservation of catalyst and equipment. The Company accordingly

approached the Ministry in October, 1986 for sanction of Rs. 2.80 crores per month (Rs. 1.25 crores for meeting expenses on wages and similar standing expenses plus Rs. 1.55 crores for running of ASU with one boiler). The Cabinet Committee on Economic Affairs, however, approved in the meeting held on 27th February, 1987 only Rs. 1.25 crores per month for incurring standing charges. But in the meanwhile the ASU was operated till 16th April, 1987 incurring Rs. 1.00 crore per month.

After the ASU's operation was stopped (from 17th April, 1987), the Company started purchasing Nitrogen from outside incurring only Rs. 1.40 lakhs per month for preservation of catalyst and equipment as against Rs. 1.00 crore per month for operating the ASU.

Thus an extra expenditure of Rs. 5.42 crores was incurred for the period of 5½ months from November, 1986 to 16th April, 1987 at the rate of Rs. 98.60 lakhs per month (Rs. 1.00 crore—Rs. 1.40 lakhs) for operating ASU for preserving catalyst and equipment.

7.02 The Ministry stated (December, 1989) that since running of the ASU was necessary for trial run of the Oxygen compressors after these were modified as per supplier's instruction, this opportunity was taken to supply nitrogen for proper preservation of equipment during the period of running ASU. This opportunity was also utilised for successful trial of N.P. Plant on Sulphate Recycle Route. Hence the expenditure incurred in running of ASU cannot be treated as infructuous.

7.03 The above stand does not justify incurring of huge extra expenditure in running of ASU on account of the following :

- (a) Due to chronic technical problems, Haldia Plant could not reach the desired stage of commercial production whereupon Ministry itself had advised the management to stop all commissioning activities of the project. Hence trial run of oxygen compressor as also of N.P. Plant in sulphate recycle route, when the sulphate recycle route was considered to be an unproven process, was not justified.
- (b) The cost benefit comparison of running the ASU with one boiler and protecting the plants with Nitrogen purchased from outside was not intimated to the Ministry in October, 1986.

8. IMPORTANT FEATURES OF THE PROJECT

8.01 The important features of the project emerging out of the detailed analysis given in the preceding paragraphs are summed up below.

The Haldia Fertilizer Project was approved by the Government in November, 1971 with total capital investment of Rs. 88.03 crores for production of Urea, Nitro Phosphate, Soda Ash and Methanol. In the original TEFR it was stipulated that the project would be completed within 34 months from the date of obtaining foreign exchange clearance. Subsequently in October, 1972, it was envisaged that the project would be commissioned in 42 months from the zero date of 1-9-1972, i.e. by March 1976. But even after 18 years from the zero date (1-9-1972) the project could not be commissioned due to delays at various stages and various technical as well as design deficiencies as indicated below :

- (a) Delay of 3 to 17 months in the approval of project licence agreements by the Government.
- (b) Delay of 2 to 28 months in the release of foreign exchange by the Government.
- (c) Delay in the supply of basic engineering documents and various equipments by the foreign collaborators.
- (d) Delay in the supply of drawings by P&D (now PDIL) which took 12 to 75 months to supply the drawings.
- (e) Delay of 26 to 48 months in the supply of equipment by the indigenous suppliers. The Company purchased Urea Reactor from indigenous as well as from foreign supplier resulting in Urea Reactor supplied by the indigenous supplier at a cost of Rs. 23.06 lakhs and received in November, 1977 being rendered surplus.
- (f) Switch over from indigenous supply of equipments to imported supply caused delay of 15 to 27 months in placing orders on foreign firms.
- (g) Modification in the drawings by PDIL also caused considerable delay; exact impact of which could not be calculated.
- (h) Sand-wicking, preloading and piling works had to be carried out at a cost of Rs. 5.74 crores due to poor load bearing capacity of soil.
- (i) There was overall delay of about four years in mechanical erection work. For delay in

Completion of civil and mechanical works the company had to pay escalation charges aggregating Rs. 83.65 lakhs.

- (j) Delay due to a number of modifications/rectifications for design defects and deficiencies, and inexperience of the indigenous suppliers. The cost of modification for removal of design deficiencies amounted to Rs. 2.98 crores.
- (k) Damage to Oxygen Gas Holder as a result of leaving of the work spots by the operators en-block and subsequent fire in the Oxygen Compressor after use of tail gas holder. The repairing cost of Oxygen Gas Holder and Oxygen Compressors amounted to Rs. 2.19 crores.
- (l) Due to expiry of performance guarantee period of critical equipments, the Management paid Rs. 56.00 lakhs towards insurance premia for covering some critical equipments under breakdown policy with manufacturing guarantee endorsement.
- (m) Mismatching of the equipments in certain Sections.

8.02 For this delay/failure in the commissioning of the project no responsibility was fixed either on PDIL, which were responsible for design and engineering of major plants, or on the site management of Haldia Division, who were responsible for civil and structural work.

8.03 The commissioning activities were suspended by the Government in October, 1986. The delay in the commissioning of the project increased the project cost. Till March, 1990 the total expenditure incurred on the project was Rs. 596.26 crores as against Rs. 88.03 crores originally approved (November, 1971) by the Government for the project. Apart from un-productive investment, the project has been incurring recurring expenditure of Rs. 1.25 crores per month as standing charges since February, 1987 towards wage bill of the employees and preservation of plant and machinery. The standing charges of Rs. 1.25 crores increased to Rs. 1.52 crores w.e.f. 1988-89.

8.04 The last revised date of commercial production as anticipated was October, 1986. Since commercial production could not be started there was production loss of 4,95,000 tonnes of Urea, 15,00,000 tonnes of NPK, 1,80,000 tonnes of Soda Ash and 1,23,750 tonnes of Methanol during the years from

1987-88 to 1989-90. To meet the shortage, the Government had to import 114.15 lakh tonnes of the nutrients (NPK) during the years 1985-86 to 1989-90 at a total cost of about Rs. 6511.25 crores. Out of this, import of 8.367 lakh tonnes of nutrients valued approximately at Rs. 275.99 crores could have been avoided had the Haldia Plant been commissioned and operated on the basis of installed capacity during the years 1987-88 to 1989-90.

8.05 Thus due to various design deficiencies, technical problems, mismatching of equipments, time and

cost-over-runs, the project cost shot up from Rs. 88.03 crores to over Rs. 596 crores. Even after this vastly increased investment, the project has failed to achieve commercial production. Therefore, the very purpose for which the project was set up i.e. to meet the increased demand in Eastern Region in India for phosphatic and nitrogenous fertilizer has remained unfulfilled. Besides, a massive investment of over Rs. 596 crores has remained unproductive so far. On the other hand standing charges of over Rs. 1.50 crores per month are being separately incurred.

New Delhi
The

17 MAY 1991

Countersigned

New Delhi
The

17 MAY 1991

A. C. Tiwari

(A. C. TIWARI)
Deputy Comptroller and Auditor
General-cum-Chairman,
Audit Board

C. G. Somiah

(C. G. SOMIAH)
Comptroller and Auditor General
of India

ANNEXURE A

(Ref. : Para 3.02)

Sl. No.	Plants	Name of the licensor/ Designer	Detailed Engineering by
1.	Ammonia Plant :		
	(i) Gassification Section	Shell (Process) Holland	P & D
	(ii) Rectisol Section	Lurgi (West Germany)	P & D
	(iii) Shift Conversion	P & D Division	P & D
	(iv) Synthesis Section	Montecatini (Italy)	P & D
	(v) Storage and Recovery Section	Do.	P & D
2.	Urea Plant	Do.	P & D
3.	Sulphuric Acid	P & D Division	P & D
4.	Phosphoric Acid	Nissan (Japan)	P & D
5.	Nitric Acid	P & D Division	P & D
6.	Ammonium Sulphate	P & D Division	P & D
7.	Methanol :		
	(i) Synthesis	Haldor Topsoe (Denmark)	P & D
	(ii) Refining, Storage and filling	P & D Division	P & D
8.	N.P.K. (15 : 15 : 15)	Stamicarbon (Holland)	ENSA HEURTEY
9.	Soda Ash	Polimex Chekop (Poland)	POLIMEX CHEKOP