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Second Consultation Meeting on the  
Fertilizer Industry

Innsbruck, Austria, 6-10 November 1978

Agenda Item 3(a)

PRELIMINARY DRAFT OF THE MODEL FORM OF TURN-KEY LUMP-SUM CONTRACT  
FOR THE CONSTRUCTION OF A FERTILIZER PLANT \*/

by

National Design and Industrial Services Corporation,  
Lahore, Pakistan

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## Introduction

1. At the First Consultation Meeting there was general agreement that the work done by UNIDO on model contracts would be of interest to many countries, particularly those in the early stages of development. The Meeting suggested that UNIDO should continue its investigations into alternative forms of contracts and should suggest guidelines for their use by developing countries. Different types of contracts should be considered.
2. UNIDO, with the assistance of experts and institutions acting as consultants to UNIDO<sup>1/</sup>, has prepared model forms of the following five types of contract:
  - (a) Turn-key lump-sum contract that covers supply of process know-how, engineering services, procurement of machinery, equipment and materials, civil works and erection. The contractor alone is responsible for all work up to the final acceptance test; he accepts full responsibility for the plant's performance. The work is performed for a fixed total price.
  - (b) Cost-reimbursable contract that covers most of the services included in the turn-key lump-sum contract. The contractor's responsibilities are more limited in some areas such as procurement. Know-how, engineering and procurement assistance are provided for a fixed fee; all other costs are charged on a reimbursable basis.
  - (c) Semi-turn-key contract that covers supply of the same services as in the turn-key lump-sum contract above but excluding civil works and erection at site for which the purchaser is responsible. Most of the work is performed by the contractor for a fixed fee. The contractor accepts responsibility for the plant's performance but not for completion on time.
  - (d) Supply of know-how and engineering services that covers supply of the process know-how, basic engineering, procurement assistance and assistance with supervision of the construction of a single plant. The contractor accepts responsibility for the plant's performance.
  - (e) Supply of know-how and engineering services that covers the same services as (d) above but for a number of similar plants at the same or other locations.

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<sup>1/</sup> For further details, see "The Preparation by UNIDO of Model Forms of Contract for the Construction of a Fertilizer Plant and Guidelines for their Use", ID/WG/281/2.

3. The preliminary draft of the Model Form of Turn-Key Lump-Sum Contract was prepared by the National Design and Industrial Services Corporation Limited of Lahore, Pakistan under the direction of the Chairman, Dr. Shah Nawaz. He was assisted by Mr. Zaheer Sajjad, Director, Finance and Planning, State Cement Corporation, Pakistan, and by Mr. D. Subramaniam, Legal Consultant on International Technology Contracts, United States of America.
4. An important contribution to the work was an initial draft of the Lump-Sum Turn-Key Contract prepared by Messrs. M.H. Al-Shukri and Mr. Adnan Al-Ani of the State Organization of Industrial Design and Construction, Ministry of Industry and Minerals, Baghdad, Iraq.
5. When this preliminary draft of the Model Form is finalized by UNIDO, it will provide a basis for drafting a Turn-Key Lump-Sum Contract. It is presented as a Conference Room Paper to the Consultation Meeting so that it may be made available to the interested parties, namely potential purchasers and contractors for study at a later date.
6. Since this is a preliminary draft, UNIDO would appreciate written comments addressed to the Head, Negotiations Section, United Nations Industrial Development Organization, P.O. Box 707, A-1011 Vienna, Austria.
7. When these comments have been received, UNIDO intends to prepare a first version of the UNIDO Model Form of Turn-Key Lump-Sum Contract with a view to eventual publication.
8. UNIDO is preparing a companion report entitled "Guidelines for the Use of UNIDO Model Forms of Contract". These Guidelines will contain advice on how to use the Model Forms of Contract. The reader of this document is advised to consult this document.
9. This preliminary draft of the Model Form of Turn-Key Lump-Sum Contract is being issued in English only. The Technical Annexures are included; they are prepared for an ammonia/urea complex based on natural gas.

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\* As listed pp. 1-2.

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LIST OF TECHNICAL ANNEXURES

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- XXVII. Civil engineering design and civil engineering works
- XXVIII. Insurance policies
- XXIX. Arbitration rules and procedures

AGREEMENT

This Agreement is made this \_\_\_\_\_ (day, date and year)  
and entered into between \_\_\_\_\_ (legal name of PURCHASER)

\_\_\_\_\_ having his registered office at \_\_\_\_\_ (place)  
and hereinafter referred to as PURCHASER which expression shall,  
unless repugnant to the context or contrary to the meaning thereof,  
include its successors and permitted assigns of the one part, and  
\_\_\_\_\_ (legal name of the CONTRACTOR)

\_\_\_\_\_ having his registered office at \_\_\_\_\_ (place)  
and hereinafter referred to as CONTRACTOR, which expression shall,  
unless repugnant to the context or contrary to the meaning thereof,  
include his successors and permitted assigns of the other part.

WITNESSETH

WHEREAS THE PURCHASER wishes to install at \_\_\_\_\_ (place) (Plant Site)  
facilities for the production of \_\_\_\_\_ (one thousand seven hundred and  
twenty five) metric tons of ammonia per day, and \_\_\_\_\_ (one thousand  
seven hundred and twenty-five) metric tons per day of urea.

WHEREAS THE PURCHASER wishes to avail of the CONTRACTOR's services  
in respect of the supply of licences, know-how basic design and  
engineering, supply of complete plant and equipment, design and  
construction of all civil work, complete erection of plant and  
equipment and commissioning and stabilisation of the total Plant  
facilities as mentioned hereinafter and

WHEREAS THE CONTRACTOR is willing to undertake such services as  
hereinafter agreed to with the PURCHASER, and

In consideration of the premises and mutual covenants herein contained,  
it is hereby agreed by the parties hereto as follows:

ARTICLE 1

DEFINITIONS

- 1.1 Unless the context otherwise requires the following expressions shall have the following meanings assigned to them in this article.
- 1.2 The "Contract" shall mean this agreement between the PURCHASER and the CONTRACTOR for the execution of the Works howsoever work including therein all the documents to which reference has been properly made in the Contract documents (including the amendments properly made from time to time), in order to ascertain the rights and the obligations of the parties.
- 1.3 The "PURCHASER" means the party named as such in this Contract or his successors or permitted assigns.
- 1.4 The "CONTRACTOR" means the party named as such in this Contract or his successors or permitted assigns.
- 1.5 The "Engineer" means the person(s) or firm(s) appointed from time to time and designated by the PURCHASER as his representative with full and complete authority to review all work on PURCHASER's behalf and grant such approvals as may be necessary for the implementation of the Contract.
- 1.6 The "Contract Price" means the total of the sums payable by the PURCHASER to the CONTRACTOR under Article 11 (Price and Terms of Payment).
- 1.7 "CONTRACTOR's Services" means the services to be provided and the work to be done by the CONTRACTOR in the execution of this Contract.
- 1.8 The "Plant" means those items of plant, machinery and equipment, as defined in this Contract, in the Annexures and in the Specifications which are to be supplied and constructed at the Site and in respect of which the CONTRACTOR's Services are provided.

- 1.9 "CONTRACTOR's Equipment" means any equipment, sheds, materials, tools, stores or things brought on Site by or on behalf of CONTRACTOR for the execution of the Contract, but NOT for permanent incorporation in the plant.
- 1.10 "Works" means the whole of the works, materials, plant and equipment, matters and things to be done, furnished, performed and used by the CONTRACTOR inclusive of his services under this Contract and, but without restricting the generality of the foregoing, includes according to the context, all or any one or more of the following viz; (Annexure I),
- (i) the provision and use by the CONTRACTOR of plant, equipment and materials;
  - (ii) all or any part or parts of the Work required to be done by the CONTRACTOR and services required to be performed by the CONTRACTOR under this Contract;
  - (iii) every structure, building, installation and/or alteration to be erected, constructed or made by the CONTRACTOR pursuant to this Contract.
- 1.11 "Site" means the land within which the Works are to be constructed as specified in Annexure I.
- 1.12 "Specification" means the technical criteria, definitions and parameters governing all of the Plant equipment, Work and capacities as set out in the Annexures to the Contract and as and if, from time to time amended in accordance with the Contract.
- 1.13 "Sub-CONTRACTOR" means any person or firm to whom any part of the CONTRACTOR Services or any part of the Works under the Contract is subcontracted by the CONTRACTOR.
- 1.14 "Holding Company" and "Subsidiary" have the meanings assigned to them by the Companies Act.
- 1.15 "Act of Bankruptcy" has the meaning assigned to it by the Bankruptcy Acts in the applicable jurisdictions under governing laws.
- 1.16 "Ammonia Process" shall mean the Know-How, Basic Engineering and the Licence provided by (Name of Licensor) for the construction, operation and maintenance of the Ammonia Plant.

- 1.17 "Urea Process" shall mean the Know-How, Basic Engineering and the Licence provided by (name of Licensor) for the construction, operation and maintenance of the Urea Plant.
- 1.18 "Ammonia Plant" shall mean the ammonia plant as described in Annexure VIII.
- 1.19 "Urea Plant" shall mean the Urea Plant described in Annexure VIII.
- 1.20 "Utilities" and "Off-Sites of Plant" shall mean the facilities demarcated and indicated in the general plot plan attached to Annexure VIII.
- 1.21 "Battery Limits" shall mean the area demarcated and indicated in the general plot plan attached as Annexure III and as detailed in Annexure II, and includes all the facilities embodied in this area for the production of urea and ammonia.
- 1.22 "Critical Items" shall mean the equipment as listed in Annexure VIII.
- 1.23 "Mechanical Completion" shall mean the time when the physical construction of the Plant has been completed, all mechanical tests as specified under (Annexure XX) have been satisfactorily completed (in accordance with the detailed procedures as shall be agreed between the parties), and the Mechanical Completion Certificates of the Plants have been issued.
- 1.24 "Mechanical Completion Certificate" means the document that will be issued certifying that Mechanical Completion of the Plant has been achieved.
- 1.25 "Absolute Guarantees" shall mean the performance guarantees of Ammonia Plant and Urea Plant relating to quantity and quality of products, as set forth in Article 19 and Annexure XVI.
- 1.26 "Penalizable Guarantees" shall mean the performance guarantees of the Plants relating to consumption of raw materials and utilities as set forth in Article 19.
- 1.27 "Performance Guarantees" shall mean the Absolute Guarantees and the Penalizable Guarantees.

- 1.28 "Guarantee Tests" shall mean the test operation of the Ammonia Plant and Urea Plant to be undertaken for the purpose of demonstrating the Performance Guarantees, as specified in Article 19.
- 1.29 "Products" shall mean the ammonia and the carbon dioxide produced in the Ammonia Plant and the urea produced in the Urea Plant, all of the quality as defined in Annexure XVI.
- 1.30 "Acceptance" shall mean the time when the certificates of Acceptance for the Ammonia Plant, Urea Plant and the Works have been issued by PURCHASER in accordance with Article 15.
- 1.31 "Start-Up" shall mean the date by which the operations of ~~pre-~~commissioning and commissioning shall have been completed and the Plant(s) commence(s) the production of specification grade Product(s).
- 1.32 "Completion of the Works" shall mean the time when all the Works to be performed by the CONTRACTOR under the Contract have been completed in accordance with the Contract.
- 1.33 "Approval" shall mean approval in writing. Decisions requiring approval shall also be deemed to encompass modifications or rejections, all to be in writing.
- 1.34 "Technical Documentation" shall mean any technical documentation to be supplied under the Contract and in particular the technical documents described in Annexure XV.
- 1.35 "Ton" refers to metric ton.
- 1.36 "Effective Date" shall mean the date on which the Contract is effective in pursuance of Article 13.

ARTICLE 2

SCOPE OF CONTRACT

- 2.1 The scope of the contract covers a turn-key contract which includes the grant of licence and know-how, to provide basic and detailed engineering, to supply all the plant and equipment, to design and construct all civil works, to erect the plant and equipment, to commission and startup the Plant and to demonstrate the ability of the Plant to continuously produce ammonia and urea with the specifications contained in the Contract, at a capacity of (1000) tons per day of ammonia and (1725) tons per day of urea with a stream factor of 330 days per calendar year, to be located at ( name of Site ) in ( name of country ).
- 2.2 The time schedule for the mechanical completion of the Plant shall be thirty-two (32) months from the Effective Date of the Contract with commercial production to commence not later than thirty-six (36) months from the Effective Date. The implementation of the Contract shall be within the time schedule for each stage as described in Annexure XV.
- 2.3 The target date for different elements of the construction and completion of the Plant are given in the bar chart attached to Annexure XV. It is, however, agreed that within two (2) months after the Effective Date of the Contract, the CONTRACTOR shall prepare and send to the PURCHASER a Critical Path Network (CPN) generally conforming to the bar chart attached, which shall be discussed between the PURCHASER and the CONTRACTOR at the meeting contemplated in Article 6.8 and shall after discussion be mutually approved. This CPN shall list all activities connected with the completion of the project.
- 2.4 The Critical Path Network shall be computerised by the CONTRACTOR and at the second design meeting contemplated under Article 6.8, the methodology shall be laid down to obtain the necessary inputs required to maintain and modify the Critical Path Network on a monthly basis.

Computerised print-outs indicating all activities and the float on a monthly basis shall be made available to the PURCHASER by the CONTRACTOR from the sixth month after the Effective Date.



ARTICLE 3

SCOPE OF WORK

- 3.1 In pursuance of the objectives contained in Article 2, the scope of the work required for the establishment of the Plant, is as follows:
- 3.1.1 Establishment of the design basis of the Plant.
  - 3.1.2 Supply of know-how and basic engineering, including but not limited to:
    - Process flow diagrams.
    - Material and energy balances.
    - Equipment data and specifications.
    - Piping and instrument diagrams and specifications.
    - Plant layout.
    - Electric distribution.
    - Effluent and emission specifications.
    - Operational manuals.
  - 3.1.3 The detailed engineering for the Plant.
  - 3.1.4 Establishment of the list of plant and equipment and identification of time critical and process critical items.
  - 3.1.5 Pre-qualifying Vendors for the supply of plant and equipment.
  - 3.1.6 Procurement of all plant and equipment and materials for the Plant, and procurement of spare parts, in accordance with but not limited to the itemized lists contained in Annexures VIII, IX, X, and XI.
  - 3.1.7 Inspection of plant and equipment during fabrication, on completion, and after packing, and providing certificates of inspection.
  - 3.1.8 Providing test certificates for plant and equipment wherever laid down under the laws of the country of fabrication and/or the laws of (PURCHASER's country).

- 3.1.9 Packing of the Plant in seaworthy/road-worthy packing, marking of the packages, transportation of the Plant from fabricator's works to Site, including loading and unloading at harbours, if any.
- 3.1.10 Arranging insurance during transportation.
- 3.1.11 Purchasing and acquiring the land for the Plant.
- 3.1.12 Clearing, levelling and otherwise developing the land.
- 3.1.13 Testing the soil characteristics of the Site, and in particular testing the points at which heavy loads are to be expected.
- 3.1.14 Construction of roads within battery limits.
- 3.1.15 (Optional) Construction of railway sidings within the battery limits and connecting to the national rail network.
- 3.1.16 Arranging for all telephone and other similar facilities for **communications within the Site and from Site to other places.**
- 3.1.17 Construction of civil engineering works within the Plant battery limits including:
  - (a) design of the Works,
  - (b) construction of the works.
- 3.1.18 Construction of a housing colony for erection and start-up personnel.
- 3.1.19 Construction of a housing colony for permanent staff and workers for the operation of the Plant.
- 3.1.20 Receipt and inspection of equipment at Site and making claims for insurance or for short supply, if required.
- 3.1.21 Storage of equipment at Site prior to erection.
- 3.1.22 Providing all erection equipment, tools and tackle, and procuring all erection materials.
- 3.1.23 Erecting all plant and equipment.

- 3.1.24 Providing training for plant Engineers and plant Operators.
- 3.1.25 Testing all erected plant and equipment individually, by sections and as a complete Plant, and carrying out all pre-commissioning procedures.
- 3.1.26 Supplying feedstock, chemicals and all other material inputs, including outside purchased utilities, necessary for the startup of the Plant.
- 3.1.27 Commissioning and startup of the Plant, until specification grade products are obtained.
- 3.1.28 Operation of the Plant from startup until completion of the guarantees for the Plant.
- 3.1.29 Conducting the Guarantee Tests.
- 3.1.30 (Optional) Management assistance for operation of the Plant for twelve (12) months after completion of guarantees.

3.2 The responsibility, subject to the details given in Articles 4 and 5, and the procedure laid down in Article 6 and elsewhere in the Contract, for each of the functions mentioned above shall be as follows:

- (a) The design basis, (Article 3.1.1) is contained in Annexures II and IV. However, this will be reviewed and checked by the CONTRACTOR, and the CONTRACTOR shall take responsibility that the Plant will meet its guarantees and operational characteristics when established at the Site.
- (b) Know-how and basic engineering (Article 3.1.2) will be supplied or procured by the CONTRACTOR from the Licensors, as per Article 4.
- (c) The detailed engineering of the Plant (Article 3.1.3) shall be undertaken by the CONTRACTOR.
- (d) The CONTRACTOR shall be responsible for the selection of Vendors (Article 3.1.5), provided however that where specified in Annexures VIII and/or Annexure XII the equipment so specified therein, shall be obtained from the selected Vendors.

- (e) The CONTRACTOR shall be responsible for the supply of plant and equipment for the Works. A list of the plant and equipment as well as other materials, which is to form part of the Contract is contained in Annexures VIII, IX, X and XI, representing supply from the Contractor which together with Annexure XIII, representing exclusions, which is to be provided by the PURCHASER represents a complete Plant for the objectives contained in Article 2. This list is not exhaustive and the CONTRACTOR shall establish a complete list of equipment and materials to be procured under this Contract, within four (4) months from the Effective Date of the Contract for approval by the PURCHASER. Any additional item required and not specified in Annexures VIII, IX, X, XI and XIII will be supplied by the CONTRACTOR. Notwithstanding anything to the contrary contained in the Contract, the CONTRACTOR shall supply a complete Plant for the production of (1000) tons per day ammonia and (1725) tons per day urea, along with all the specified utilities, within the battery limits specified in Annexure II, excluding only items which are the PURCHASER's responsibility and specified in Article 5 and exclusions contained in Annexure XIII.
- (f) The CONTRACTOR will undertake, in association with the PURCHASER, procurement of spare parts, in accordance with the provisions of Annexure XXVI of this Contract.
- (g) The CONTRACTOR shall inspect all equipment (Article 3.1.7) and arrange for all test certificates (Article 3.1.8) and shall arrange all packing and transportation FOB to point of despatch, including any export permits, if needed.
- (h) The CONTRACTOR shall be responsible for the transportation of equipment from the port of despatch FOB to the receipt CIF entry port in PURCHASER's country and to the Site if not specifically stipulated in the list of exclusions (Annexure XIII).
- (i) The CONTRACTOR shall be responsible for clearance of goods at the port of entry, but the PURCHASER will provide all necessary import permits or authorisations required for this purpose. The

- PURCHASER shall, subject to the provisions of Article 39, be responsible for the payment of customs duties at port of entry.
- (j) The limitation of size and weight of package at the entry port and to Site is contained in the Annexures to this Contract, and the CONTRACTOR will design and procure the Plant accordingly. Notwithstanding the statement of size limitation contained in the Annexure II(vi), the CONTRACTOR will be fully responsible for all movement of plant and equipment to the Site, and its assembly at Site.
  - (k) The CONTRACTOR shall be responsible for arranging insurance during transportation (Article 3.1.10).
  - (l) The PURCHASER will be responsible for obtaining the land (Article 3.1.11).
  - (m) The CONTRACTOR shall be responsible for all levelling, clearing or other development of the land (Article 3.1.12).
  - (n) While design soil conditions are contained in Annexure IV of the Contract, the CONTRACTOR will be responsible for carrying out soil tests (Article 3.1.13), and the CONTRACTOR will ensure that soil tests are carried out at points where heavy loads are to be expected, and will also review all load tests. If the results of the soil tests indicate a bearing capacity substantially different to that contained in Annexure IV, the CONTRACTOR and the PURCHASER will review this in accordance with Article 3.3.
  - (o) The CONTRACTOR shall be responsible for the design and construction of all road (rail) and other communications within the battery limits of the Plant, (Articles 3.1.14, 3.1.15, and 3.1.16), as well as for connecting the road to the main highway. The CONTRACTOR shall be responsible for rail communications up to the agreed "take-over" point near the Plant Site, which take-over point shall be established by the railway authorities in (PURCHASER's country).

- (p) The CONTRACTOR shall be responsible for the design (Article 3.1.17(a)) of all civil engineering works. The CONTRACTOR shall, however, supply the building line drawings, machinery and piping lay-out, and road and rail lay-outs for approval by the PURCHASER.
- (q) The CONTRACTOR shall be responsible for the construction of all civil engineering works including the housing colony for the erection staff (Articles 3.1.17(b) and 3.1.18).
- (r) The PURCHASER shall be responsible for the permanent housing colony (Article 3.1.19). The PURCHASER shall also have right of first refusal to purchase all housing built by the CONTRACTOR for his erection staff.
- (s) The CONTRACTOR shall inspect all equipment at Site and make arrangements for speedy replacement of any shortages in receipt, or for any damaged equipment. The CONTRACTOR shall be responsible for storage at Site (Articles 3.1.20 and 3.1.21).
- (t) The CONTRACTOR shall provide all erection equipment and materials (Article 3.1.22) for the erection and installation of the Plant. The CONTRACTOR shall be permitted to remove erection equipment from site after startup of the Plant (unless otherwise agreed) and PURCHASER will obtain permits for import and re-export of the erection equipment from (           country           ).
- (u) The Plant shall be erected (Article 3.1.23) by the CONTRACTOR, or by a third party appointed by the CONTRACTOR, provided that such third party has been approved by the PURCHASER, under the supervision of the CONTRACTOR's personnel.
- (v) The CONTRACTOR shall provide training to the PURCHASER's personnel as laid down elsewhere in the Contract (Article 3.1.24).
- (w) The CONTRACTOR's personnel at Site will carry out all testing (Article 3.1.25) of the Plant and the CONTRACTOR's personnel and the PURCHASER's personnel will undertake the startup and operation of the Plant until completion of the Guarantee Tests (Article 3.1.27), under the complete direction of the CONTRACTOR.

- (x) The PURCHASER will provide all feedstocks, outside utilities, chemicals and other materials required for the operation of the Plant (Article 3.1.26). The feedstocks shall be, as far as possible, in accordance with the specifications contained in this Contract or as otherwise agreed. The maximum quantity per hour and conditions of outside utilities (power, water, etc.) will be intimated by the CONTRACTOR to the PURCHASER within nine (9) months of the Effective Date of the Contract. The requirement of all chemicals and other material inputs required for the startup of the Plant and regularly thereafter, shall be intimated by the CONTRACTOR to the PURCHASER at least nine (9) months before the Mechanical Completion of the Plant.
- (y) The CONTRACTOR shall demonstrate the Guarantee Tests in accordance with the provisions laid down in the Contract. This shall be considered to be an essential part of the services of the CONTRACTOR.
- (z) Should the PURCHASER so desire, the CONTRACTOR shall enter into a separate agreement with the PURCHASER to manage the Plant, or to assist the PURCHASER to manage the Plant, as the PURCHASER may desire, for a period of twelve (12) months after completion of the Guarantee Tests.

3.3 If the soil tests carried out under Article 3.2(b) above indicate that the load-bearing capacity is less than indicated in Annexure IV, the PURCHASER and the CONTRACTOR will discuss the implications of the resulting change in the design of plant foundations, and shall agree on an additional price to be paid to the CONTRACTOR in accordance with Article 28. In case the load-bearing capacity is higher, the PURCHASER and the CONTRACTOR will likewise agree to a reduction in price.

3.4 In the event that any activity or work of the type necessary for the successful implementation of this Contract is not specifically mentioned in the scope of work above or in the specifications, drawings, or any of the Annexures to the Contract, but becomes necessary to ensure the

successful operation of the Plant according to the specifications laid down in the Contract, such activity or work shall also become part of this Contract as if the same had been originally included in the scope of work. The CONTRACTOR shall be responsible for all such work, unless otherwise agreed between the CONTRACTOR and the PURCHASER in writing.



ARTICLE 4

OBLIGATIONS OF THE CONTRACTOR

- 4.1 The obligations of the CONTRACTOR for specific items in the scope of the work are contained in Article 3 and are described in detail in Annexure VI or elsewhere in the Contract. The CONTRACTOR shall accept total responsibility for all items of work other than those that fall within the scope of the PURCHASER. The CONTRACTOR shall also be responsible for all work which may reasonably be inferred from his scope of work.
- 4.2 The CONTRACTOR shall, commencing within seven (7) days of the Effective Date of the Contract, and proceeding with utmost diligence and care, carry out the services laid down as his obligations in Article 3, and provide the documentation laid down in Annexure XV in order to meet the time schedule laid down in Annexure XV and indicated in the bar chart attached to that Annexure. Both parties to the Contract recognise that time is the essence of the Contract.
- 4.3 The CONTRACTOR shall execute the work in accordance with good engineering practice and to the reasonable satisfaction of the PURCHASER. Such execution of the work as is subject to variations will be handled according to the procedures laid down in Article 6 and/or Article 28.
- 4.4 While the basic design parameters laid down in Annexure IV have been approved by the PURCHASER, the CONTRACTOR acknowledges that he has satisfied himself as to the nature and location of the Site for the factory, the applicable laws, agreements and regulations, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labour, water, electrical power, roads and uncertainties of weather or similar physical conditions at Site, the configuration and conditions of the ground and the subsurface, the character of the equipment and facilities

needed preliminary to, and during the, progress of the work and all other matters which can in any way affect the work or the cost thereof to the CONTRACTOR under this Contract. The CONTRACTOR further acknowledges that subject to the provisions of Article 3.3, he has satisfied himself as to and assumes all risks relating to the quantity and quality of all surface and subsurface materials, including ground water to be encountered. The CONTRACTOR has reviewed all exploratory work done by or for the PURCHASER and information presented by the drawings and specifications constituting a part of the Technical Specification in the Annexures. Any failure of the CONTRACTOR to acquaint himself with all the available information will not relieve him from his responsibility for estimating properly the difficulty or cost of successfully performing the work. The PURCHASER assumes no responsibility for information and data furnished by him or for any understanding, opinions, or representations made or expressed by any of his officers or agents during or prior to the execution of this Contract unless:

- (a) Such understanding or representation is expressly stated in this Contract; and
- (b) this Contract expressly provides that the responsibility therefore is assumed by the PURCHASER.

Representations made but not so expressly stated, and for which liability is not expressly assumed by the PURCHASER in this Contract, shall be deemed only for the information of the CONTRACTOR.

4.5 The CONTRACTOR shall obtain the know-how for various processes from the Process Licensors as follows:

Ammonia Plant                    ( name of Licensor(s) )

Urea Plant                        ( name of Licensor )

(Specify any other e.g. water treatment.)

And shall design the Plant in conformity with the basic engineering and design criteria of the Process Licensors. The CONTRACTOR shall make available a copy of the **basic design package to the PURCHASER.**

- 4.6 The CONTRACTOR shall perform the general basic and detailed engineering of the Works and the process design, lay-out, equipment design, piping and instrument design, and all other design work as well as all erection work, so that the work shall constitute, when assembled, a technological entity, producing the final products of the quality and quantity contained in this Contract, and complying with the economic and technical performance figures contained in the present Contract.
- 4.7 The CONTRACTOR shall carry out the engineering of the Plant(s) in accordance with the standards and codes laid down in Article 4.3 and Annexure II. Where specialised design criteria are being used, the PURCHASER shall be advised of such specialised design codes. The CONTRACTOR will also take into account all safety rules normal to the industry, and any special provisions required in ( PURCHASER's country ).
- 4.8 Notwithstanding the use of the codes and standards indicated in Article 4.5, if the CONTRACTOR is aware of better engineering codes or design methods, or where experience from previous contracts has indicated improvement, the CONTRACTOR shall use such improved methods or codes in the design of the Works.
- 4.9 The CONTRACTOR shall advise the PURCHASER on pre-qualifying Vendors, and will place at the disposal of the PURCHASER all data that may be known to CONTRACTOR in connection with the actual operation of equipment of different Vendors.
- 4.10 The CONTRACTOR will supply all plant and equipment, materials and spare parts, will construct all civil engineering works and undertake all erection in accordance with the procedures laid down in Article 10 and elsewhere in the Contract and in Annexure XXVI. The CONTRACTOR shall ensure that all supply, construction and erection is undertaken so as to enable the Plant to meet the objectives stated in Article 2,

and the time schedule contained in Annexure XV, and the CONTRACTOR shall be responsible in any case for meeting the contractual guarantees contained in Article 19.

- 4.11 The CONTRACTOR shall provide an adequate number of personnel for the construction, erection, mechanical testing, commissioning, startup and initial operation of the plant, so as to meet the time schedules for the Works. The CONTRACTOR shall ensure that all supervisory personnel reach the Site of work in time so as to meet the requirements of the time schedule contained in Article XV.
- 4.12 The CONTRACTOR shall complete the mechanical completion of the Plant within thirty-two (32) months from the Effective Date of the Contract.
- 4.13 The CONTRACTOR shall undertake the initial Guarantee Tests of the Plant within fifteen (15) days after the startup of the Plant, but in any case not later than three (3) months after mechanical completion of the Plant provided that the PURCHASER has carried out his obligation to supply feedstock, outside utilities, chemicals and other agreed materials. The CONTRACTOR shall be allowed to extend this period and repeat Guarantee Tests in accordance with Article 19.10 of the Contract.
- 4.14 For a period of one (1) year after the Work has been accepted, the CONTRACTOR shall be responsible to correct the Works free of additional costs, in case the Plant is unable to give production at rated capacity on account of latent faults in design/equipment specification/process which did not show up at the time of Guarantee Tests or there are defects in the design or construction of the structures.
- 4.15 The CONTRACTOR shall ensure that the number and level of training (to be arranged by the CONTRACTOR within or outside the country of the PURCHASER) of the PURCHASER's personnel is adequate for smooth operation and maintenance of the Plant in good conditions.
- 4.16 Up to five (5) years after startup of the Plant, the CONTRACTOR shall answer questions related to the operation of the Plant. As promptly as possible after receipt of such enquiries, the CONTRACTOR will respond

in as much detail as possible. It is understood that there will be no limitations on the number of such queries. Independently of the specific questions asked by the PURCHASER, the CONTRACTOR, after approval of the PURCHASER, and at the PURCHASER's cost, will send an advisor to visit the Plant and review its operation suggesting ways to improve its operation at least once a year.

- 4.17 Throughout the execution of the work, the CONTRACTOR shall ensure that he, his employees, agents and invitees and his sub-contractors, their employees, agents and invitees while upon the Site comply with all applicable safety laws, rules and regulations. The safety of all persons employed by the CONTRACTOR and his sub-contractors on PURCHASER's premises or any other person who enters upon PURCHASER's premises for reasons relating to this Contract, shall be the sole responsibility of the CONTRACTOR. The CONTRACTOR shall at all times maintain good order among his employees and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him.
- 4.18 The CONTRACTOR shall provide the PURCHASER with office space facilities and secretarial and typing services for the representatives of the PURCHASER assigned to the CONTRACTOR's offices at Site or abroad.
- 4.19 It is specifically understood that since the present Contract is a lump-sum turn-key Contract, it is the obligation of the CONTRACTOR to carry out all or any work which may be required for meeting the objectives of this Contract, with the exception only of the PURCHASER's obligations as specifically stated in Article 5 and the exclusions contained in Annexure XIII.
- 4.20 The CONTRACTOR will obtain and maintain in force the insurance policies which are his responsibility as stated in Article 26.

ARTICLE 5

OBLIGATIONS OF THE PURCHASER

- 5.1 The scope of work to be undertaken by the PURCHASER within the overall scope of work shall be as given below and as described in Annexures VII and XIV or elsewhere in the Contract. The PURCHASER will carry out his obligations so as to enable the CONTRACTOR to meet the time schedule contained in Annexure XV.
- 5.2 The PURCHASER shall secure and make available to the CONTRACTOR within one month from the Contract, the lay-out and plot plan, the Site for construction of the Works free of all encumbrances, including the necessary right of way. The PURCHASER shall also make available adequate space for storage depots at or near the Site.
- 5.3 The PURCHASER shall obtain and make available to the CONTRACTOR all necessary permits/approvals and/or licences from local authorities and/or Government as may be necessary for the execution of the Contract inclusive of import licences, visas for CONTRACTOR's personnel, entry permits for erection equipment and any other CONTRACTOR's equipment which has to be exported.
- 5.4 The PURCHASER shall give his approval to all drawings, purchase orders, etc., as required under the provisions of Article 6 or elsewhere in this Contract.
- 5.5 The PURCHASER shall provide free of charge all the raw materials, fuel consumable items and make-up items necessary for the testing, commissioning, operation and maintenance of the Plant unless otherwise specifically mentioned in the specification or elsewhere in the Contract as to be supplied by the CONTRACTOR.
- 5.6 The PURCHASER shall provide free of charge operation and maintenance personnel for the CONTRACTOR throughout the period from the beginning of the mechanical testing of equipment till the date of acceptance of the Plant in numbers and of competence corresponding to the manning

requirements which are to be developed by the CONTRACTOR in the form of a Manpower and Qualification Chart and approval by the PURCHASER.

- 5.7 The PURCHASER shall provide the CONTRACTOR and his personnel deputed to Site with such facilities as are detailed in Annexure \_\_\_\_\_, (to be formulated as appropriate and enclosed in the list of Annexures).
- 5.8 The PURCHASER shall be responsible for making all payments to the CONTRACTOR in accordance with the provisions of this Contract.
- 5.9 The PURCHASER will provide and maintain the insurance policies which may be his specific responsibility as contained in Article 26.
- 5.10 The PURCHASER will provide the CONTRACTOR with office space, secretarial facilities and typing services for the CONTRACTOR's personnel assigned to the PURCHASER's office at ( \_\_\_\_\_ town \_\_\_\_\_).

ARTICLE 6

CO-OPERATION AND CO-ORDINATION BETWEEN  
CONTRACTOR AND PURCHASERS

- 6.1 The parties to this Contract shall provide all reasonable co-operation to implement the works as stipulated in the Contract. The parties to the Contract will meet periodically to take stock of the progress of work, costs incurred and suggest ways and means to improve the operations to expedite/economise the work and resolve outstanding issues between the parties. Minutes of meetings shall be recorded and circulated for confirmation and necessary action.
- 6.2 The PURCHASER and the CONTRACTOR each shall appoint a Project Manager to co-ordinate and monitor the work under this Contract. The Project Managers shall have the authority under this Contract to issue notices about work (about delays, quality, completion, requirements of services/materials/utilities/personnel, payments, conduct, access to work/documents/Government clearances where required, or other associated aspects), including variations/suspension/termination/resumption.
- 6.3 The PURCHASER shall appoint or designate an Engineer (or Engineers for different parts of the work) to represent him for granting all technical approvals as contemplated under the Contract. If the PURCHASER so desires, the Project Manager appointed by him under Article 6.2 may be designated as the Engineer. (If the PURCHASER intends to appoint a Management Consulting Company to act as the Engineers under this Contract on his behalf, however under the supervision of the PURCHASER's Project Manager, the name of the Consulting Company should be mentioned in this paragraph.)
- 6.4 All notices, instructions and decisions on the meetings shall be given in writing. Minutes of meetings between the CONTRACTOR and the PURCHASER or their authorised representatives held at Site, or in the office of the PURCHASER or the CONTRACTOR, after confirmation, shall have the same effect as notices in writing.



- 6.5 Within thirty (30) days from the Effective Date of the Contract, a meeting shall be held in ( PURCHASER's country ) between the CONTRACTOR and the PURCHASER and/or the Engineer to discuss all matters of common interest, including but not restricted to, the finalisation of co-ordination procedure, the detailed time schedule and a critical examination of the design basis.
- 6.6 The co-ordination procedure, which shall be prepared according to commonly accepted international practices, would become part of the Contract after it is agreed to and approved by the CONTRACTOR and the PURCHASER.
- 6.7 The co-ordination procedure shall include but will not be limited to:
- (a) Procedure for giving instructions, decisions and approvals.
  - (b) Assignment of work to the Project Engineers and Engineers of both the CONTRACTOR and the PURCHASER.
  - (c) Procedure for submission of drawings, equipment, specifications and other documents as may be required for approval.
  - (d) Procedure for according approval on behalf of the PURCHASER.
  - (e) Procedure for accounting the invoicing for the payments receivable by the CONTRACTOR.
  - (f) Procedure for approving and effecting payment by the CONTRACTOR.
  - (g) Address lists and telephone numbers of the Project Managers and/or Engineers of the CONTRACTOR and the PURCHASER responsible for any work under this Contract.
  - (h) Procedure for drawings and documents distribution for the CONTRACTOR and the PURCHASER.
  - (i) Procedure for the approval of technical specifications where not specified in the Contract.
  - (j) Procedure for the furnishing of Vendors lists or sources of procurement of equipment as may be necessary.

- 6.8 Within four (4) months from the Effective Date of the Contract, a further meeting would be held at ( PURCHASER's country ) between the CONTRACTOR and the PURCHASER to discuss the progress of work completed up to that time. This meeting would also review and approve of;
- (a) The detailed plant lay-out and the line drawings of the buildings.
  - (b) The final list of equipment, including sizes, materials of construction, and Vendors where not specified in the Contract.
  - (c) The Critical Path Network, which shall be prepared by the CONTRACTOR.
  - (d) Any problems arising from the detailed soil investigations.
  - (e) Procedure for training of the PURCHASER's personnel.
  - (f) The co-ordination procedure referred to above in Article 6.6 would be reviewed and revised in the light of the discussions held in the meeting referred to above and shall thereafter be final.
  - (g) Procedures for customs clearance and payment of import duties and taxes, etc.
  - (h) Procedure for clearance by the PURCHASER of the CONTRACTOR's personnel coming to Site.
  - (i) Method for computation of over-time, if applicable.
  - (j) Facilities to be provided to the CONTRACTOR's personnel at the Site by the PURCHASER.
- 6.9 As soon as work at Site commences, review meetings shall be held at the Site at the beginning of every month to review the progress at Site, to estimate the work done for purposes of maintaining the CPN (Article 2) and to discuss all outstanding issues. Costs in connection with any review meeting will be borne by each party for its own personnel.
- 6.10 For this purpose, the PURCHASER and the CONTRACTOR will both maintain, at their own cost, offices at Site.
- 6.11 Throughout the period of the Contract, the PURCHASER shall have the right to inspect the CONTRACTOR's work and the CONTRACTOR shall provide all

documentation to enable the PURCHASER or the Engineer Advisor to report monthly on the progress of work, and the deviations, if any.

- 6.12 The CONTRACTOR shall submit drawings, equipment specifications, and other documents, where required, for approval or distribution to the PURCHASER under this Contract. The PURCHASER shall return (if required) with approval or disapproval (reasons to be indicated if the requirements under the Contract are not met with technically/commercially) or suggest modifications within a period of thirty (30) days, after the date of submission, after which period the document will be considered as approved.
- 6.13 In the event that the PURCHASER suggests modifications, these shall be reviewed by the CONTRACTOR within thirty (30) days of receipt and shall be accepted by him, or he may request a review. If the CONTRACTOR does not request a review within thirty (30) days, it shall be assumed that the modifications proposed by the PURCHASER are accepted for implementation.
- 6.14 In the event of a request for a review by the CONTRACTOR, this shall be taken up at the next periodic review meeting, or, if required urgently, by an extraordinary review meeting, to be held in ( PURCHASER's country ) within fifteen (15) days after receipt of such request by the PURCHASER.
- 6.15 In the event of failure to agree at the review meeting, the CONTRACTOR's viewpoint will prevail, except, however, where it in any way modifies or alters the contractual obligations of the CONTRACTOR as stated or implied in this Contract or as agreed to at previous meetings. In such cases, the views of the PURCHASER shall prevail.

ARTICLE 7

ASSIGNMENT OF CONTRACT

- 7.1 This Contract shall inure to the benefit of and be binding upon the parties hereto and their and each of their executors, administrators, curators, successors and assigns but (as regards assigns of the CONTRACTOR) insofar only as such assigns are duly consented to by the PURCHASER under this Contract.
- 7.2 This Contract may not be assigned without the written consent of the PURCHASER.
- 7.3 Neither the whole nor any part of the work may be sub-contracted by the CONTRACTOR without the written consent of the PURCHASER.
- 7.4 Every sub-contracting by the CONTRACTOR shall provide that the Sub-contractor shall comply with all terms and conditions of this Contract, mutatis mutandis.

ARTICLE 8

SUPERVISION OF THE WORK

- 8.1 The CONTRACTOR shall provide supervisory services and an adequate number of suitably qualified and experienced personnel for the supervision of all work at Site. Such supervision will include, but not be limited to, the following:
- (a) Supervision of transportation equipment.
  - (b) Supervision of construction and erection equipment.
  - (c) Supervision of the civil works.
  - (d) Supervision of erection.
  - (e) Supervision of stores, and warehouse management.
  - (f) Supervision of all tests.
  - (g) Supervision of pre-commissioning and start-up operation.
  - (h) Supervision of the entire Works until final acceptance.
- 8.2 The CONTRACTOR or a competent and authorised agent or representative (approved in writing by the Engineer), is to be constantly on Site during working hours, until the Acceptance Certificate for the entire Works on Site has been issued and he shall give his whole time to the superintendence of this work. Such authorised agent or representative shall have full authority to act for and bind the CONTRACTOR and shall receive, on behalf of the CONTRACTOR, directions and instructions from the Engineer. The authorised agent or representative shall be sufficiently fluent in the language of the Contract or other languages to be agreed upon with the PURCHASER, to receive directions and instructions and to correspond with the PURCHASER and the Engineer in that language.

- 8.3 The CONTRACTOR will, upon a request of the PURCHASER or his Engineer, remove his authorised representative or any workman, if in the sole opinion of the Engineer or the PURCHASER, such representative or workmen are incompetent or have been conducting themselves improperly, and will promptly replace such representative or workmen.
- 8.4 The PURCHASER will nominate representatives who will be on duty on the Works wherever and whenever the necessity so arises. For supervision purposes, a duly appointed Engineer shall be nominated by the PURCHASER, in whom will be vested all the Engineer's authority as governed by the Contract. A copy of the instructions served from time to time by the PURCHASER's representatives or the Engineer shall be kept at all times at the Site by the CONTRACTOR.
- 8.5 Except as regards decisions made final by the Engineer under certain of the provisions of the Contract documents, and except the powers conferred on him hereof, relating to the settlement of disputes, the Engineer may from time to time delegate in writing to persons to be named by him, such of the powers, discretions and authorities vested in him by the Contract as he may think fit, and either generally or for particular areas, places or purposes, and the CONTRACTOR shall recognise such persons on written notice from the Engineer of their appointment and of the powers, discretions and authorities so delegated. No member of the Engineer's subordinate staff and no persons other than the Engineer shall have any authority to approve or bind the PURCHASER on the Engineer by any approval or passing of work or materials nor shall they have any authority to order any work involving delay or extra payment.
- 8.6 The CONTRACTOR shall, as regards the Works in all its several parts, comply with such directions, if any, as the Engineer may from time to time give in respect of the manner in which, the points at which and/or the places at which, such work is to be commenced, conducted and/or completed, and the CONTRACTOR shall permit the Engineer to have access to the Works at all times during the continuance

of the Contract and will provide the Engineer with full information concerning what is being done to execute the work, and will give the Engineer every possible assistance in respect of the performance of the Engineer's duty to see that the work is executed in accordance with this Contract, and also in respect of the performance and exercise of the duties and powers imposed directly or by inference upon the Engineer by this Contract.

8.7 The CONTRACTOR shall apply to the PURCHASER through the Engineer for any explanation which he may require in regard to the meaning and intent of any Article of the Contract pertaining to the method of execution of the Contract and will be held responsible for his failure to request or obtain such explanation.

ARTICLE 9

ACCESS TO WORK

- 9.1 The CONTRACTOR and the PURCHASER and any person authorized by either of them shall at all times have access to the Works, to all workshops and places where work is being done or prepared or where materials, manufactured articles or machinery are being obtained for the Works. The CONTRACTOR shall afford every facility for and assistance in, or in obtaining, the right to such access in connection with this Contract.
- 9.2 The PURCHASER shall afford every facility and assistance in, or in obtaining, the right of access to such information, Site, workshops or persons within ( PURCHASER's country ) as is required in connection with this Contract.
- 9.3 The CONTRACTOR and his authorized personnel shall have free access to the Site of the Works, storage yards, fabrication sheds, utilities and laboratories set up or intended for use for setting up the Works under the Contract. The PURCHASER shall provide necessary assistance in obtaining permission from his Government for visits/stay and travel of the CONTRACTOR or his authorized personnel.
- 9.4 The CONTRACTOR shall be entitled to visit the Works in operation for a period of five (5) years after Acceptance to examine it as to its operating results, to take measurements required for establishing exact operating date and demonstrate the Works to his potential customers. The CONTRACTOR shall give four (4) weeks notice to the PURCHASER for such visits, permission for which shall not be withheld by PURCHASER. However, the PURCHASER may exclude the nationals of certain countries from visiting the Works.
- 9.5 The CONTRACTOR shall be responsible, under applicable laws, rules and regulations, for damage done to highways, roads, bridges and other public utilities, by himself, his agents, his sub-contractors and their



staff in the execution of work under the Contract, and shall at his own cost repair and/or rectify such damage.

ARTICLE 10

SUPPLY OF GOODS AND DOCUMENTS  
AND EXECUTION OF WORKS

10.1 Supply of Goods

- 10.1.1 All goods supplied under the Contract shall be "brand new" and of the proper workmanship and material, and in accordance with the provisions of the Contract.
- 10.1.2 All goods shall be inspected by the CONTRACTOR before despatch, and on receipt at Site, and such reports shall be available to the PURCHASER at all times.
- 10.1.3 The PURCHASER or his agent shall have the right to inspect all goods during fabrication, on completion of fabrication, at despatch FOB or on receipt at Site. The inspection procedures are laid down in Article 18.

10.2 Marking, Packing and Despatch of Goods

- 10.2.1 All goods will be marked and the invoices prepared in accordance with the instructions of the PURCHASER, as specified in Annexure XXIV and/or which shall be given to the CONTRACTOR not later than the review meeting contemplated under Article 6.8.
- 10.2.2 On despatch of all goods, two copies of the invoices will be sent to the PURCHASER, or his Site representative by air mail so that the PURCHASER may promptly obtain any permits required. For goods requiring extended customs clearance procedure, the CONTRACTOR shall advise the PURCHASER in good time, in order to obtain clearance.
- 10.2.3 The CONTRACTOR recognises that certain goods, including materials for civil engineering cannot be imported into the PURCHASER's country. The CONTRACTOR shall purchase such goods locally and

will not be entitled to any claim in respect of increased costs in making local purchases.

- 10.2.4 Should the PURCHASER so desire, the CONTRACTOR will supply particulars of the manufacturer from whom the CONTRACTOR has purchased any plant, equipment, materials or spare parts, and will supply a "Certificate of Origin" if required by the PURCHASER.
- 10.2.5 All goods shall be adequately packed before despatch for the mode of transportation by which they are being despatched and for storage at Site. All packing cases will be properly marked and would contain the normal instructions such as "Fragile", "Top", "Bottom", etc. in the \_\_\_\_\_ language and the \_\_\_\_\_ language. All unpacked equipment will also be adequately tagged. All cases and unpacked equipment will also contain points for attachment of slings, and these points will be marked. All goods despatched by sea or over land will be adequately protected by protective coatings. Deck cargo will not normally be despatched, except where size limitations so require. In such cases the deck cargo will be completely protected, and fully painted with adequate types of protective paint. All closed packings will contain a packing list inside.
- 10.2.6 The CONTRACTOR shall be responsible for all despatches of goods to the Site, and will use the best and fastest means of transport available for meeting the time schedule for Mechanical Completion of the Plant. Should it be necessary, the CONTRACTOR shall despatch, at his own expense goods by air freight, if this is necessitated by the time schedule.
- 10.2.7 The dimensions of all packages shall be such that they can be transported to the Site. The CONTRACTOR shall be responsible

for obtaining any permits needed for this purpose, but the PURCHASER shall help the CONTRACTOR in obtaining such permits.

- 10.2.8 For purposes of storage at Site, all packages shall be marked in an appropriate manner (to be agreed upon at the meeting contemplated under Article 6.8) for store outdoors, under a roof, in locked warehouses or in rented premises, etc.

10.3 Supply of Documents

- 10.3.1 The documents and manuals to be supplied by the CONTRACTOR and the dates on which these are due are indicated in Annexures V and XXI.
- 10.3.2 All documents shall be sent to the PURCHASER by air freight in, at least, five (5) copies, including one reproducible copy. Immediately upon despatch, a telegram/telex shall be sent to the PURCHASER indicating the despatch, including air way bill number and, if possible, the flight number. The documents should, as far as possible, be sent by a direct flight to (name of airport in PURCHASER's country).

10.4 Storage of Goods at Site

- 10.4.1 The CONTRACTOR shall be obliged to have warehouse facilities ready at the Site in good time to receive packages. Where permanent facilities are not ready, the CONTRACTOR shall provide adequate temporary facilities at his cost at the Site, to the satisfaction of the Engineer. Notwithstanding the marking of packages, under Article 10.2.8 above, and the instructions contained in Annexure XXV, the instructions of the Engineer for storage will be followed in case the Engineer requires additional storage protection.
- 10.4.2 All goods and supplies will be checked by the CONTRACTOR for shortage or damage in good time to obtain timely replacements.
- 10.4.3 In the case of goods damaged in transit, these shall normally be replaced. However where the damage is minor, and subject to the approval of the PURCHASER or his representative, they

will be repaired at Site at the cost of the CONTRACTOR.

In the event of any dispute, the goods shall be replaced.

10.5 Design and Construction of Roads, Railway Sidings and Other Facilities

- 10.5.1 The roads shall be constructed by the CONTRACTOR according to the dimensions laid down in the final lay-out plan, which shall be approved by the PURCHASER.
- 10.5.2 All roads will be constructed with the materials, and according to the designs indicated in Annexure (e.g. IV), except where otherwise agreed by both parties. The lay-out of the railway lines shall be as approved by the PURCHASER in the final lay-out.
- 10.5.3 All railway sidings will be of \_\_\_\_\_ gauge, and will meet the requirements of the national rail network of (PURCHASER's country). Before commencement of work, wherein required, the CONTRACTOR shall obtain the written authorisation of the authorities in (PURCHASER's country). The materials used will be in accordance with the requirements and to the specifications of the national rail network.
- 10.5.4 The railway sidings shall be designed to move 1/2 of the production of the Plant i.e. \_\_\_\_\_ tons of urea per day, and to bring in \_\_\_\_\_ tons per day of raw materials, and adequate provision will be made for this purpose, in consultation with the railway authorities in (PURCHASER's country).  
(Alternative Article can be provided for countries where all design is done by the railway authorities).
- 10.5.5 The CONTRACTOR shall provide and install a line telephone exchange in the Works. The number and locations of telephone points shall be as agreed between both parties at the meeting contemplated under Article 6.8. \_\_\_\_\_ lines shall be left for connections by the PURCHASER to the housing colony. The

telephone exchange shall be compatible with and connected to \_\_\_\_\_ outside lines. The connection to the outside lines shall be arranged by the PURCHASER, but all costs in this connection will be borne by the CONTRACTOR.

10.6 Civil Engineering Works

10.6.1 Immediately on completion of the soil bearing tests, the agreed load-bearing capacity and approval of the building lay-out plan and the line drawings, the CONTRACTOR will undertake the design and construction of all civil engineering works within battery limits inclusive of process, utility and off-sites, all underground buildings, sewerage, drainage, water treatment plants, etc. The civil engineering works are further described and their execution specified in **Annexures IV and XXVII**, and shall be constructed in good time for the erection of machinery and in order to meet the agreed time schedule.

10.6.2 The CONTRACTOR shall furnish all materials and perform all labour to the extent that said labour and materials may be necessary for, or incidental to, the execution to full completion of the Works and testing of the quality of the same unless otherwise provided, wholly or in part, under the terms of the Contract.

All works and materials supplied under the specification shall be of the best and most suitable workmanship and quality, and in accordance with the provisions of **Annexures IV and XXVII**, and the decision of the Engineer as to the quality and suitability of materials or work shall be binding. The PURCHASER has the right to decide that materials of local (indigenous) origin shall be used whenever they are available in conformity with the specifications contained in **Annexures (IV, VIII and XXVII)**. Likewise, whenever possible, local labour shall be used.

10.6.3. The CONTRACTOR shall be responsible for the true and proper setting out of the Works, as approved by the Engineer, and for the provision of all necessary instruments, appliances and labour in connection therewith. If at any time during the progress of the Works, an error shall appear or arise in details of the position, levels, dimensions or alignment of any part of the Works, the CONTRACTOR on being required to do so by the Engineer shall at his own expense rectify such error to the satisfaction of the Engineer.

The checking of any setting out or of any line or level by the Engineer shall not in any way relieve the CONTRACTOR of his responsibility for the correctness thereof. The CONTRACTOR shall carefully protect and preserve all benchmarks, site rails, pegs and other things used in setting out the Works.

10.6.4 The Works throughout shall be carried out in such a manner as not to interfere in any way whatsoever with the traffic on any roads or footpaths at the Site and/or in the vicinity thereof.

Wherever required by the Engineer, the CONTRACTOR shall promptly remove any material or staging used by him or any of his sub-contractors which may interfere with the use of the roads, footpaths or open spaces on the Site and/or areas adjacent thereto.

10.6.5 No temporary building shall be erected by the CONTRACTOR without the approval of the Engineer. During the performance of his obligations under the Contract, the CONTRACTOR shall maintain and repair all buildings occupied by him to the satisfaction of the Engineer.

10.6.6 On the completion of the Works, the CONTRACTOR shall, except as otherwise specified, or if otherwise instructed by the Engineer, clear away and remove from the Site all constructional plant, CONTRACTOR's equipment, erection tools and equipment, surplus materials, rubbish and temporary works

of every kind and leave the whole of the Works clean and in a tidy condition to the satisfaction of the Engineer.

10.6.7 The CONTRACTOR shall make adequate provisions for the supply of water and other utilities, for the safety of workmen, for security of the Works, for the prevention and repair of damage to property and for constructing civil engineering works in such manner that access to all parts of the Site is available to the PURCHASER's representative(s).

10.6.8 The CONTRACTOR shall be responsible for the repatriation to those places where they were recruited from, such labour as is recruited from abroad or from long distances and employed subsequently on or in connection with the Works, and shall maintain such persons as are being repatriated in a suitable manner until such time as they shall have left the country or the area. In default, the PURCHASER may maintain and repatriate such persons and recover the costs from the CONTRACTOR.

10.7 Erection

10.7.1 The CONTRACTOR shall be responsible for the erection of all the plant and equipment within the battery limits specified in Annexure II(vii) and III. This will include, but not be limited to:

- (a) Erection of all heavy equipment in place.
- (b) Erection of all steel structures, walkways, gangways, stairs, platforms, etc.
- (c) Assembly and welding of all piping, fittings, etc. both above and below the ground.
- (d) Assembly and erection of instrumentation, panel control boards and all interconnecting wiring, piping and equipment.
- (e) Installation of all electrical equipment, and connection of all cables, starters and all other equipment.
- (f) Installing of all utility equipment, and connecting such equipment.



- (g) Insulation of all equipment where required (including supply of insulation).
- (h) Painting of all equipment (including supply of paint).
- (i) Installation of all workshop, laboratory and office equipment, including air conditioning equipment and telephone facilities.
- (j) Installation and erection of all waste treatment and sewerage facilities.
- (k) Installation of all safety and warning devices.
- (l) All or any other erection work that may be required to complete the Plant, other than the exclusions contained in Annexure XIII.

10.7.2 Before commencement of erection work in each unit, the Engineer shall certify that the civil engineering works have proceeded to a point where erection can be commenced. The CONTRACTOR will commence erection only after such certificate is entered in the Erection Journal.

10.7.3 The erection work shall proceed in an orderly manner so that the erection work in any section of the Plant is not held up, due to heavy work being undertaken in another section of the Plant, or due to the fact that work has not been undertaken elsewhere.

10.7.4 In the course of the erection work, journal or journals shall be kept for each unit of the Plant separately, which will lay down the erection programme, and the work actually accomplished on a weekly basis, and at the end of each calendar month. The Site representative of the CONTRACTOR and the PURCHASER will sign the Journal every month.

10.7.5 The representatives of both parties shall mutually agree on a procedure for testing/checking that a particular part of the Plant or the whole of the Plant or the Works has been properly erected/constructed and tested/completed, at least two (2) months before mechanical completion of the part to be tested, or the complete mechanical testing of the Plant or completion of the Works, as the case may be. Test procedures are indicated in Annexures \_\_\_\_\_ and \_\_\_\_\_.

10.7.6 On successful testing of a part of the Plant, a certificate of test shall be issued for the Plant. Upon successful completion of a part or whole of the civil engineering works, a Certificate of Completion will be issued.

10.7.7 On completion of all test certificates, tests will be conducted on the Plant as a whole, and on successful completion of these tests a Certificate of Mechanical Completion will be drawn up and signed by both the CONTRACTOR and the PURCHASER, or their authorised representatives.

10.8 Startup and Commissioning

10.8.1 At least three (3) months before the CONTRACTOR estimates that the mechanical completion of the Plant will have been completed, the CONTRACTOR will inform the PURCHASER that he intends to start-up the Plant.

10.8.2 The PURCHASER will make arrangements to supply all the feedstock, materials, etc. as contemplated in the Contract, and as previously intimated by the CONTRACTOR, as well as to supply all labour and personnel for the operation of the Plant.

10.8.3 The Plant shall thereafter be started-up and operated under the direct supervision of the CONTRACTOR until Guarantee Tests are completed.

10.9 Guarantee Tests and Acceptance

10.9.1 The procedure for running Guarantee Tests and the procedure for Acceptance of the Plant are contained in Articles 19 and 20 of the Contract.

ARTICLE 11

PRICE AND TERMS OF PAYMENT

11.1 The PURCHASER shall pay to the CONTRACTOR, as consideration for the execution of the Works (and subject always to any qualification provided for elsewhere in this Contract):

11.1.1 Insofar as these Presents constitute a fixed-price lump sum turn-key Contract: the sum of (total amount) which last cited price shall be conclusive as to the total amount payable under this Contract, IT BEING EXPRESSLY AGREED that if, for purposes of more detailed price-citation, as indicated by Article 11.2 to 11.8 hereunder, such prices shall operate only to such extent as not conflicting with the total amount payable under this Contract as cited in the opening provisions of this subarticle.

11.1.2 Each and every price cited in or contemplated by this Contract includes and covers all patent royalties and all taxes, rates, charges and assessments of any kind whatever (whether Federal, Provincial or Municipal, and whether or not in the nature of excise taxes/duties, tariffs, sales taxes, land taxes, licence fees or otherwise) pertinent to the material sold to the PURCHASER and/or to the performance of the Works, as well as all transportation costs and charges and all other costs and charges whatsoever relevant to such material and/or to such performance of the Work, except where specifically payable by the PURCHASER under the provisions of the Contract.

11.1.3 The above cited price shall be divided into the amounts contained in Articles 11.2 to 11.8 below for convenience in making payments at various stages.

- 11.2 For the supply of licences, know-how and basic engineering:
- |                       |            |              |
|-----------------------|------------|--------------|
| For the Ammonia Plant | ( Amount ) | ( Currency ) |
| For Urea Plant        | ( Amount ) | ( Currency ) |
| For Utilities         | ( Amount ) | ( Currency ) |

- 11.3 For the supply of complete Plant and equipment ex-Site inclusive of the engineering:
- ( Amount ) ( Currency )

- 11.4 For detailed civil engineering design, and execution of all civil works, including road, rail and telephone connections:
- ( Amount ) ( Currency )

- 11.5 For complete erection of Plant and equipment including the supply of erection materials and hire of erection equipment:
- ( Amount ) ( Currency )

- 11.6 For pre-commissioning and commissioning activities leading to the start-up of the Plant, as provided in Annexure XX:
- ( Amount ) ( Currency )

- 11.7 For providing training facilities for the PURCHASER's personnel as provided in Annexure XVIII:
- ( Amount ) ( Currency )

- 11.8 For the supply of 2 years requirement of spare parts:
- ( Amount ) ( Currency )

All the prices contained in Articles 11.2 to 11.8 above are firm and fixed for the duration of the Contract, and any extension thereof, and shall not be escalated in any manner and represent in aggregate the complete turn-key price for all the Work to be performed by the CONTRACTOR under the Contract.

- 11.9 The prices given in Articles 11.2 to 11.8 above are payable on the dates due in Articles 11.10 to 11.16 below in the currencies mentioned above. In the event that there is a delay in the CONTRACTOR's performance of his services and hence a delay in the payment for his services or supplies which results in an increase in the cost of the services or supplies to the PURCHASER, in terms of the currency of the (PURCHASER's country), the payment shall be adjusted

in such a manner that the PURCHASER shall pay at the conversion rate prevailing on the date that the services or supplies were due.

II. TERMS OF PAYMENT

- 11.10 The payment due to CONTRACTOR under Article 11.2 above shall be payable as follows:
- (a) 25% (amount) as an advance payment.
  - (b) 25% (amount) on receipt by the PURCHASER of a copy of the know-how and basic engineering documents.
  - (c) 50% (amount) on completion of the Guarantee Tests of the Plant and issuance of the Acceptance Certificate by the PURCHASER.
- 11.11 Payments due under Article 11.3 shall be paid as follows:
- (a) 10% as an advance payment.
  - (b) 10% at the end of the sixth month from the Effective Date, provided that the meetings contemplated under Articles 6.5 and 6.8 have been completed in all respects.
  - (c) 70% shall be paid pro rata on shipments of the Plant and equipment.
  - (d) 10% shall be paid on completion of the Guarantee Test of the Plant and issuance of the Acceptance Certificate by the PURCHASER.
- 11.12 Payments under Article 11.4 shall be paid as follows:
- (a) 10% as an advance payment.
  - (b) 10% on completion of the design work for the main buildings and structures of the Plant.
  - (c) 70% shall be paid as progressive payments in monthly instalments against actual progress of work on site as reported and approved by the Engineer.
  - (d) 10% on completion of the Guarantee Tests of the Plant and issuance of the Acceptance Certificate by the PURCHASER.

- 11.13 The payment due under Article 11.5 shall be paid as follows:
- (a) 10% as an advance payment.
  - (b) 15% on the receipt of CONTRACTOR's erection equipment at the Site.
  - (c) 55% as progressive payments in monthly instalments against actual progress of erection work on site as reported in the CONTRACTOR's monthly progress report and certified by the Engineer.
  - (d) 10% on mechanical completion of the Plant and issue of a Mechanical Completion Certificate.
  - (e) 10% on completion of the Guarantee Tests of the Plant and issuance of the Acceptance Certificate by the PURCHASER.
- 11.14 The payment under Article 11.6 will be paid as follows:
- (a) 45% on the first input of feedstock to the Plant.
  - (b) 45% on Start-up of the Plant and production of specification grade urea.
  - (c) 10% on completion of the Guarantee Test of the Plant and issuance of an Acceptance Certificate by the PURCHASER.
- 11.15 The payments due under Article 11.7 shall be payable on completion of the training of PURCHASER's personnel in accordance with Annexure XVIII.
- 11.16 The payments under Article 11.8 shall be paid as follows:
- (a) 10% on approval by PURCHASER of the list of spare parts.
  - (b) 80% pro rata on shipments of the spare parts.
  - (c) 10% on the successful completion of the Guarantee Tests of the Plant and issuance of an Acceptance Certificate by the PURCHASER, after deducting the value of the spare parts consumed by the Plant before the Guarantee Tests have been completed.

III. PROCEDURE AND DOCUMENTATION FOR EFFECTING PAYMENTS

- 11.17 All the advance payments envisaged under Articles 11.10 to 11.13 inclusive would be made to the CONTRACTOR at ( name of town ) on the CONTRACTOR furnishing a Bank Guarantee equivalent to the total amount of the advance payments from ( name of the Bank ) and confirmed in ( Purchaser's country ) AND on the CONTRACTOR furnishing a bond for the faithful performance of his services for an amount equivalent to ( state amount, suggested value is 15 per cent of the total contract price ) supported by a Bank Guarantee from ( name of the Bank ) or ( other banking agency ) acceptable to the PURCHASER, and confirmed in the PURCHASER's country.
- 11.18 The form of Bank Guarantee and performance bond required under Article 11.17 above and 11.20 below shall be in the proformas contained in Annexures XXII and XXIII and subject to the provisions of Article 12.
- 11.19 For the purpose of making the remaining payments under Articles 11.10 to 11.13 and the payments under Articles 11.14 and 11.16, the PURCHASER shall establish in favour of the CONTRACTOR at a specified Bank acceptable to CONTRACTOR an irrevocable letter of credit guarantee providing for payments in accordance with the stage and schedule laid down in Articles 11.10 to 11.14 inclusive and Article 11.16, against the supply of documents as listed hereinafter. These payments shall be made against invoices of the CONTRACTOR supported by the following documents:
- (a) For payments under Article 11.10(b), a certificate from the PURCHASER that the license for the use of know-how from the approved licensor and copies of the basic engineering documents have been received.
  - (b) For payments under Article 11.11(b), an invoice from the PURCHASER dated at the end of the sixth month of the Effective Date of the Contract, accompanied by a Certificate



from the PURCHASER that the meetings contemplated under Articles 6.5 and 6.8 of the Contract have been completed in all respects.

- (c) For payments under Articles 11.11(c), 70 per cent of the value of each shipment, against invoices to the PURCHASER supported by the following documents:
  - i) Clear on-Board Bill of Lading (except for equipment which by its size must be deck cargo where a bill of lading will be sufficient).
  - ii) Packing list.
  - iii) Certificate of Origin (where required).
  - iv) Certificate of the CONTRACTOR that all required tests and inspection have been successfully performed.
- (d) For payments under Article 11.12(b) against a certificate from the PURCHASER that copies of civil engineering designs have been received by the PURCHASER.
- (e) For payments under Article 11.12(c) against a monthly invoice from the CONTRACTOR indicating the percentage of civil work completed, duly certified by the PURCHASER or his representative, that the percentage of work stated in the invoice has been completed and the value related to such percentage progress has not been previously compensated and that the amount indicated in the invoice represents the amount due under the relevant articles of the Contract.
- (f) For payment under Article 11.13(b) against a certificate from PURCHASER that erection equipment has been received at Site.
- (g) For payments under Article 11.13(c) against an invoice from the CONTRACTOR indicating the percentage of progress in the erection of equipment as indicated in the monthly progress report, and the value related to such progress not previously compensated, duly certified by the PURCHASER or his representative.

- (h) For payment under Article 11.13(d), against the certificate of Mechanical Completion of the Plant issued by the PURCHASER.
- (i) For payment under Article 11.14(a), against a certificate from the PURCHASER that the feedstock has been introduced into the Plant and for payments under Article 11.14(b) against a certificate from the PURCHASER that the Plant has been started up and commercial grade urea obtained.
- (j) For payments under Article 11.15, against a certificate from the PURCHASER that the overseas training programme as envisaged in Annexure XVIII has been completed.
- (k) For payment against Article 11.16(a) against a certificate from PURCHASER that the list of spare parts has been approved.
- (l) For payment against Article 11.16(b) 80 per cent of the value pro rata on shipment of the spare parts against the documents mentioned in Article 11.19(c) above.

11.20 The final payments due under Articles 11.10 to 11.14 and Article 11.16 shall be made against a Certificate of Acceptance duly signed by the PURCHASER. Should the CONTRACTOR so desire these payments will be released on Completion of the Works against an unconditional bank guarantee for an equivalent amount to be provided by the CONTRACTOR.

11.21 If so desired by the PURCHASER a letter of credit shall be opened under Article 11.15 which shall be confirmed by the PURCHASER at the Bank specified by the CONTRACTOR. All the charges in this connection including the cost of confirmation shall be paid by the CONTRACTOR.

#### IV. TAXES

11.22 All payments referred to under this Article shall be net of and free of taxes in the PURCHASER's country. Any tax rebate or credit that may be available to the CONTRACTOR in respect of the amount received in this Contract in the CONTRACTOR's country due to amounts not being taxed shall be passed on to the PURCHASER within twenty days of the receipt of such rebate, or credit.

V. CURRENCY OF PAYMENTS

11.23 All payments under this Contract shall be made in the currency referred to under Articles 11.1 to 11.8.

VI. DATES OF ADDITIONAL PAYMENTS

11.24 Where not covered by letters of credit, payments covered by the Contract shall be made to the CONTRACTOR by the PURCHASER within two months of receipt by the PURCHASER of invoices duly certified by the PURCHASER's Site representatives subject nevertheless to all such deductions as the PURCHASER shall be entitled to make under any of the provisions of the Contract.

VII. DISPUTED AMOUNTS

11.25 If any dispute should arise as to the amount of payment to which the CONTRACTOR claims that he is presently entitled (including any question or dispute as to the amount of any deduction to be made under any provision of the Contract), the amount (if any) NOT in question or dispute shall be paid to the CONTRACTOR without waiting for the settlement of such question or dispute and the balance (if any) shall be paid within two months after such question or dispute has been finally settled and the amount payable ascertained.

VIII. APPROVAL

11.26 No certificate, other than the Final Acceptance Certificate or payment against a certificate, shall be taken to be an admission by the PURCHASER of the due performance of the CONTRACTOR's Obligations or any part thereof or the accuracy or validity of any claims by the CONTRACTOR. Notwithstanding the payment of the final amounts due to CONTRACTOR and the issue of the Acceptance Certificate, the CONTRACTOR's subsequent obligations as stated in the relevant Articles of the Contract shall remain.

IX. NO CLAIMS FOR INTEREST

11.27 The CONTRACTOR shall not have any right to file a claim for the interest on the amounts deducted or postponed from his payments.

X. DEDUCTIONS FROM PAYMENTS

11.28 In every case, when by virtue of the provisions of the Contract, the CONTRACTOR shall become liable for the payment of any sum of money to the PURCHASER on account of any injury indemnification, damages, loss, expenses, etc. the PURCHASER shall have the right to deduct such sum from any payment due or to become due to the CONTRACTOR, or recover such sum by any other lawful means. This sum shall be sufficient (as determined by the Engineer) to cover the aforesaid claims, damages, loss, expenses, etc. This sum shall be withheld without any legal or other formality or recourse to any judicial proceedings and it will be withheld by the PURCHASER until aforesaid claims, damages, etc. are finally settled.

ARTICLE 12

PERFORMANCE BOND AND BANK GUARANTEES

- 12.1 Upon the execution of the Contract, the CONTRACTOR shall provide to the PURCHASER, a Performance Bond guaranteed by an approved bank in (PURCHASER's country) in the form given in Annexure XXII for an amount equal to (equal to at least 15% or more of the total Contract price) in favour of the PURCHASER callable on request of the PURCHASER. The Performance Bond shall be valid for the period required under the Contract and CONTRACTOR shall take any and all actions including renewals at the appropriate times to keep the said Bond current and valid for the said period.
- 12.2 The advance payments as provided for under Article 11.17 shall be made by PURCHASER by direct remittance to (name of bank) and shall be receivable only if a Bank Guarantee in the form given in Annexure XXIII for (an amount equal to at least the total advance payment envisaged under Article 11.17) guaranteed by (name of bank) and confirmed in (name of PURCHASER's country) has been given by the CONTRACTOR to the PURCHASER.
- 12.3 Upon the completion of the Works, and provided the CONTRACTOR elects to exercise his option under Article 11.20, the CONTRACTOR shall deliver a Bank Guarantee for an amount equal to (Amount) at least equivalent to the amount of retention monies released by the PURCHASER under Article 11.20 from the (name of bank) and confirmed by a bank in (country of PURCHASER) in the form given in Annexure XXIII. This Bank Guarantee shall remain valid and in force up to the date of the acceptance of the Works, or any extensions thereof.

ARTICLE 13

EFFECTIVE DATE

- 13.1 The Contract shall become valid and effective after signing by both parties and on the date the last of the following requirements has been fulfilled:
- 13.1.1 Approval of the Government of \_\_\_\_\_ to be obtained by the PURCHASER.
  - 13.1.2 Approval of the Government of \_\_\_\_\_ to be obtained by the CONTRACTOR (if needed).
  - 13.1.3 The receipt by the CONTRACTOR of the advance payment as provided under Article 11.17.
- 13.2 The Effective Date shall be the date determined in Article 13.1, provided that the Letter of Credit for the balance of the Lump Sum Price as provided under Article 11.19 shall be opened by the PURCHASER within three months from the date of the receipt of the advance payment by the CONTRACTOR.
- 13.3 If the PURCHASER does not open the Letter of Credit specified in Article 11.19 within six months, after the Effective Date, or does not make equivalent arrangements, the CONTRACTOR shall have the right to demand satisfaction to cover his commitments.

ARTICLE 14

TIME OF ESSENCE

- 14.1 Both parties agree that time is the essence of the Contract and every endeavour shall be made to meet the target dates set forth in the Contract and in Annexure XV. All dates referred to in this Article and Annexure XV refer to months after the Effective Date.
- 14.2 It is agreed that the Mechanical Completion of the Plant in thirty two months after the Effective Date represents an essential part of the Contract and accordingly CONTRACTOR agrees that extensions beyond this time are penaltiabile as provided in Article 22. The CONTRACTOR also agrees to Start-Up and obtain commercial production of ammonia and urea within thirty six months after the Effective Date, provided that the PURCHASER provides the necessary feedstock and other items required for the Start-Up of the Plant, and specified in Article 5, not later than the thirty fourth month after Effective Date.

ARTICLE 15

COMPLETION OF WORK

- 15.1 Notwithstanding the time schedule contained as a guideline in this Contract and Annexure XV, the CONTRACTOR shall complete all his contractual obligations under this Contract.
- 15.2 The different sections or parts of the Works shall be considered to have been completed when the relevant provisions of Articles 15.4 to 15.8 have been met.
- 15.3 On Mechanical Completion of the Plant, each plant or plant section will be tested in accordance with Article 15.8 and Annexure XX, and will, as soon as possible thereafter, be brought into operation.
- 15.4 As soon as the Works, the Plant or any part thereof, is in the opinion of the CONTRACTOR substantially complete and ready for inspection the CONTRACTOR shall so notify the PURCHASER by means of a Construction Completion Report. This report shall state which parts of the Works or the Plant the CONTRACTOR proposes to demonstrate, have been completed in accordance with the specifications and have passed such tests as may have been included in the Contract or otherwise agreed. The CONTRACTOR shall propose a programme for such demonstration.
- 15.5 Upon satisfactory completion of any such demonstration the CONTRACTOR and the PURCHASER shall sign the Construction Completion Report stating that the CONTRACTOR has demonstrated that the Works or the Plant or part thereof is substantially complete and is in such a condition that any procedures needed before the plant is put into operation may safely be carried out. Such Construction Completion Report may include a note of any minor items requiring completion before the Start-Up.
- 15.6 If the PURCHASER is not satisfied that the Works or Plant or part thereof referred to in Article 15.4 is substantially complete he may endorse the Construction Completion Report accordingly, stating in



what way the Works or Plant or part thereof is not in accordance with the Contract. The CONTRACTOR shall then complete the Works or Plant or part thereof as necessary and shall repeat the procedure described in Article 15.4.

- 15.7 When all the items of equipment comprised in the Plant(s) or any of the sections of the Off Sites and Utilities have been completely erected as above, and installed and tested, CONTRACTOR shall prepare a Mechanical Completion Report which shall be signed by the CONTRACTOR and submitted to the PURCHASER for approval.
- 15.8 The pre-commissioning of the Plants and each section of the Utilities and Off Sites shall consist of the carrying out of such operations and making of such tests as are listed in Annexure XX to establish the correct mechanical functioning of the Plants. When all such operations and tests have been satisfactorily completed and the Mechanical Completion of the Works has been achieved, the CONTRACTOR shall prepare a Ready for Commissioning Report which shall be signed by both parties after joint examination of the Plants or sections of Utilities and Off Sites concerned and upon such signature the Ready for Commissioning of the Plants or sections or Utilities and Off Sites concerned shall be deemed to have taken place.
- 15.9 The operations and tests referred to in 15.6 and 15.7 above shall be carried out by CONTRACTOR's personnel and made under the supervision of the CONTRACTOR's and PURCHASER's personnel.
- 15.10 If any defect is found in the tests mentioned above in the Plant and equipment supplied, or in any of the Works, the CONTRACTOR shall immediately take steps to replace defective equipment or defective parts or repair defective works in the shortest possible time.
- 15.11 When all sections of the Plants are operating, and specification grade ammonia and urea are being continuously produced, the Plant shall be deemed to be in Commercial Production.
- 15.12 The CONTRACTOR will thereafter demonstrate the Guarantees of the Plant in accordance with the provisions of Article 19.

- 15.13 Subject to the provisions of Article 18 and Article 20, the Contract shall be deemed to have been completed when the CONTRACTOR shall have completed the Works and the Guarantee Tests laid down in Article 19 and the PURCHASER has given Acceptance Certificate thereof, or as otherwise laid down in the Contract including termination of the Contract or Arbitration. The PURCHASER shall thereafter take over the Works and issue a Take-Over Certificate.
- 15.14 Notwithstanding the taking over of the Plant by the PURCHASER, the CONTRACTOR shall assume the responsibility of starting up the Plant, and demonstrating that the Plant is capable of meeting the Guarantees specified in the Contract, together with his other obligations (such as mechanical guarantees, as stated in the Contract) and the CONTRACTOR hereby agrees to fulfil all such obligations under the Contract.
- 15.15 The PURCHASER shall give a Final Acceptance Certificate when all the requirements of the Contract have been met.

ARTICLE 16

EXTENSION OF TIME

- 16.1 If by reasons of any of the following factors beyond CONTRACTOR/PURCHASER's control affecting specific work under this Contract at CONTRACTOR's offices, shop where plant is being manufactured, or Plant Site viz:
- (a) Vandalism or malicious damage.
  - (b) Default on the part of PURCHASER.
  - (c) Failure on the part of other contractors (if any) of the PURCHASER affecting the Work.
  - (d) Extra work, improvements in design (agreed mutually) and
  - (e) Temporary suspension of work (in writing) under the instructions of PURCHASER or his authorized representative whereby the Work is unduly delayed.

The CONTRACTOR within ten days shall make a written request to the PURCHASER for extension of time for completion of Work or any portion of it, to the extent the factors affecting delay prevailed. Should the PURCHASER consider such claims valid, he shall grant such extension in time which shall reasonably compensate the loss of time of the CONTRACTOR. The CONTRACTOR can only claim extension if he had made the request in writing. This extension will be free of liabilities on either party on account of delay in specific activities affected by the above factors. The CONTRACTOR shall also extend the period of validity of the Bank Guarantee and Performance Bond to the same extent of time as the time of extension.

- 16.2 Should the CONTRACTOR discover any discrepancy or mistake in his process, engineering, instructions, specifications, inspections or plant and equipment supplied resulting in rectification steps (Article 27) the CONTRACTOR and the PURCHASER shall meet and agree to such extension in time as needed by the CONTRACTOR for the rectification of defects. The extension in time thus allowed to the CONTRACTOR shall in no way

absolve him of penalties/liabilities on delays (Articles 22, 23 and 25) except as provided in this Contract.

16.3 Even beyond the period stated in Article 16.2, if by this time the Absolute Guarantees of the Plants could not be successfully demonstrated, the CONTRACTOR shall continue his endeavour at his own cost to rectify the Plant provided the PURCHASER agrees to allow further extension in time in writing.

16.4 The CONTRACTOR's obligation to execute rectifications pursuant to 16.2 shall be limited to ten months from the date of start-up of the Plant(s), provided that the period during which the Plant(s) cannot be operated normally by CONTRACTOR or the period spent in the replacement of equipment if any such replacement is required under the Contract shall not be counted in computing the said (ten months period).

16.5 The PURCHASER may either

- (a) on his own initiative; or
- (b) on the application of the CONTRACTOR made before the day fixed for completion of the work or before any new date for completion fixed under this Subarticle

if, in the PURCHASER's opinion, it is in the public interest to extend the time for completion of the Work by fixing a new day for completion of the Work PROVIDED ALWAYS

- (c) that the PURCHASER shall be the sole judge as to what additional time, if any, may be allowed to the CONTRACTOR and the PURCHASER's decision as to the sufficiency thereof shall be final and binding upon the CONTRACTOR;
- (d) that any extension of time granted as aforesaid to the CONTRACTOR shall be so granted and accepted without prejudice to any rights or remedies of the PURCHASER whatsoever under this Contract;
- (e) that where such extension is granted on the PURCHASER's initiative, no consent thereto on the part of the CONTRACTOR shall be necessary; and

- (f) that in any event no extension of time, whether on the PURCHASER's initiative or on the application of the CONTRACTOR, shall be deemed to have been granted unless the PURCHASER specifically so states by written notice to the CONTRACTOR.

ARTICLE 17

MATERIALS AND WORKMANSHIP

- 17.1 The CONTRACTOR is responsible to satisfy the PURCHASER that the materials used in the construction of the Works and in the manufacture of equipment and machinery conform to the Specifications laid down in the Contract. The certificates for the materials must satisfy the minimum requirements, physical and chemical, laid down by the PURCHASER or required by the CONTRACTOR and testing of materials has been done by CONTRACTOR or his agents under the supervision of and to the satisfaction of the CONTRACTOR.
- 17.2 The CONTRACTOR will ensure during progressive inspection of equipment and fabrication that plant suppliers or his employees follow fabrication instructions and codes specified by the Process Licensor or normally used by the CONTRACTOR.
- 17.3 The CONTRACTOR shall ensure that the detailed design and material specifications for civil works are in accordance with the requirements of Ammonia and Urea Plants, particularly for all load bearing structures and those exposed to corrosive agents/environment. The CONTRACTOR will also ensure that all Civil Engineering follows the requirements contained in Annexure XXVII.
- 17.4 The responsibility of failure of the equipment, materials, machinery or structures due to improper material or workmanship shall devolve on the CONTRACTOR who will be liable to actions under Article 23 and 27.

ARTICLE 18

INSPECTION, TESTING AND CERTIFICATION

- 18.1 PURCHASER shall appoint an agent who shall be responsible for inspection of all equipment and spare parts during manufacture and prior to despatch. However, such inspection shall not, in any way, absolve the CONTRACTOR from his liabilities under the Contract. The CONTRACTOR shall provide all data and drawings to enable the Inspector to carry out inspection. Should the PURCHASER so desire, inspection may be deferred to the Site.
- 18.2 Notwithstanding the requirements of Article 18.1 above, the CONTRACTOR shall carry out in accordance with his standard procedure the inspection and testing, as per relevant codes given in the Specifications at the manufacturing point before despatching equipment. The CONTRACTOR shall also require manufacturers/suppliers to provide the necessary test certificates and all other documents required by the Inspecting Authorities or as **may be required by the PURCHASER** in terms of the regulations in force in ( country ) and/or as provided for in the Specification.
- 18.3 The CONTRACTOR will issue a certificate of inspection in respect of all items of plant and equipment, before despatch, and shall send copies to the PURCHASER of such certificates, and of tests carried out in connection with issue of such certificates.
- 18.4 Wherever required by the PURCHASER, the CONTRACTOR shall associate the PURCHASER or his representatives with his inspection.
- 18.5 The CONTRACTOR shall expedite and control the delivery by making his best efforts in order that the Equipment Supplier(s) maintain the terms and conditions of delivery of equipment and meet the time schedule laid down for the Contract.
- 18.6 The CONTRACTOR shall arrange all export licences, if necessary, to export the Equipment and spare parts to (PURCHASER's country).

18.7 The CONTRACTOR shall be responsible for the clearance of the Equipment, spare parts and Technical Documentation at (name of Port) or other entry points into (Country) and for internal despatch to Site.



ARTICLE 19

GUARANTEES AND PERFORMANCE GUARANTEE TESTS

- 19.1 This Article covers the Performance Guarantees of the Plant.
- 19.2 The Plants shall be capable of meeting the requirement of normal operation, capacity, quality of Products, consumption of raw materials and utilities, and efficiency of operations guaranteed by the CONTRACTOR, which shall be demonstrated by test runs as laid down in this Article provided that the Plant is operated in accordance with the CONTRACTOR's technical directions and instructions, and that such test runs are conducted in accordance with the conditions set forth herein. For the purposes of the Guarantee Tests, the ammonia storage and the urea storage and bagging shall be excluded from the definition of the Plant.
- 19.2.1 The production capacity of ammonia and urea from the Plants shall be in accordance with Article 19.6.1 and 19.6.2.
- 19.2.2 The quality of the ammonia from the Ammonia Plant and of the urea from the Urea Plant shall be in accordance with Annexure XVI.
- 19.2.3 The quality and quantity of carbon dioxide shall be adequate and suitable for the guaranteed capacity of the Urea Plant and quality of Urea Product.
- 19.2.4 The Plants are capable of sustained, steady and continuous operation.
- 19.2.5 The utilities and off-sites are adequate for the sustained and continuous operation of the Plant.
- 19.2.6 The consumption of utilities and raw materials in each of the Ammonia and Urea Plants are in accordance with guarantees given below.
- 19.2.7 The effluents from the Plant are in accordance with Annexure XVII.

19.3 For purposes of this Article, the guarantees outlined in Article 19.2 shall be divided into Absolute Guarantees and Penaltiable Guarantees, as follows:

19.3.1 Absolute Guarantees shall be:

- (a) The capacity of the Ammonia Plant
- (b) The capacity of the Urea Plant
- (c) The quality of ammonia and urea
- (d) The quality of effluents
- (e) The adequacy of the Utilities and Off-sites to meet the capacity of the Ammonia and Urea Plants when operating together.

19.3.2 The Penaltiable Guarantees shall be in respect of the consumption of raw materials and utilities for each of the Ammonia and Urea Plants.

19.3.3 The sustained steady operation of the Plant shall be demonstrated over a continuous period of, at least thirty days as given in the test procedure below. Notwithstanding the completion of such tests, the CONTRACTOR warrants that the Plant shall have been designed and procured for steady operation at a stream factor of three hundred thirty (330) days per year.

19.4 Absolute Guarantees shall be defined as those Guarantees which must be met to satisfy contractual requirements.

19.5 Penaltiable Guarantees shall be defined as those guarantees which if not met may be compounded by the payment of penalties as given in subsequent articles, provided, however, that if the consumption of raw materials exceeds by (3%) or that the overall guaranteed consumption cost is exceeded by (5%), the PURCHASER shall have the right to request the CONTRACTOR to rectify the defect/modify the Plant in accordance with relevant provisions of the Contract and to demonstrate by additional guarantee tests, that the consumption of raw materials and utilities are within the above limits.

19.6 Absolute Guarantees for individual Plants shall be as given hereunder:

19.6.1 Ammonia Plant

- 19.6.1.1 The absolute guarantees for the output of the Ammonia Plant shall be ( 1000 ) metric tons per stream day of specification grade ammonia (corrected for strength) representing 100% capacity of the Ammonia Plant, which shall produce 10,000 metric tons of specification grade ammonia in ten consecutive days.
- 19.6.1.2 The quality of the ammonia as per Annexure XVI analyzed in accordance with accepted international methods.
- 19.6.1.3 The quality and quantity of carbon dioxide to be adequate and suitable for the guaranteed capacity of the Urea Plant and for manufacture of the desired quality of urea product.

19.6.2 Urea Plant

- 19.6.2.1 The absolute guarantees for the output of the Urea Plant shall be 1725 metric tons per stream day of specification grade urea (corrected for strength) representing 100% capacity of the Urea Plant, which shall produce 17,250 metric tons of specification grade urea in ten consecutive days.
- 19.6.2.2 The quality of the urea as per Annexure XVI.

19.6.3 Notwithstanding the provisions of Articles 19.6.1.1 and 19.6.2.1 above the Absolute Guarantee for the Ammonia and Urea Plants shall be considered to be met if such plant produces 95% of the capacity of ammonia and urea respectively, and the CONTRACTOR agrees to pay the penalties stated in Article 22. The Absolute Guarantees shall only be deemed to have been met if the CONTRACTOR pays any penalties due under this Article.

19.7 Penaltiable Guarantees for individual plants shall be as given hereunder:

19.7.1 Ammonia Plant

19.7.1.1 The penaltiable guarantees for the Ammonia Plant shall be as given below:

	Units	Units per metric ton of ammonia (indicative only)*
a) Consumptions		
- Natural gas (1)	millions of kcal	(8.80)
- HP Steam	metric tons	(1.00)
- Electric Power (2)	Kwh	(32)
- Cooling water (32°C)	m <sup>3</sup>	(275)
- Boiler Feed Water (110°C, 120 Kg/cm <sup>2</sup> )	metric tons	(4.75)
b) Output		
- MP Steam	metric tons	(0.6)
- LP Steam	metric tons	(0.1)
- Purge gas	millions of kcal	(0.50)
- Boiler Feed Water Preheating	millions of kcal	(0.25)
- Condensates	metric tons	(3.00)

\*(Figures in brackets are indicative only)

Notes: (1) Natural gas consumptions refer to the consumption for process and fuel to primary reformer only.

(2) Electric power consumptions refer to process consumptions only, excluded being works lighting, instrumentation, air conditioning, etc.

19.7.1.2 It is understood that in the event there are changes in the individual figures setforth above, the guarantees given in Article 19.7.1.1 shall be deemed to be met if the total cost calculated as setforth in Article 23.2.4 is not exceeded.

19.7.2 Urea Plant

19.7.2.1 The penaltiable guarantees for the Urea Plant shall be as given below:

	Units	Units per metric ton of urea
a) Consumptions		
- Ammonia (as 100%)	metric tons	(0.580)
- HP Steam	metric tons	(1.20)
- Electric Power (1)	Kwh	(25)
- Cooling Water (32°C)	m <sup>3</sup>	(100)
b) Productions		
- LP Steam	metric tons	(0.10)
- Condensate	metric tons	(0.60)

Notes: (1) Electric power consumptions refer to process consumptions only, excluded being works lighting, instrumentations, air conditioning, urea storage and bagging, etc.

19.7.2.2 It is understood that in the event there are changes in the individual figures setforth above, the guarantees given in Article 19.7.2.1 shall be deemed to be met if the total cost calculated as setforth in Article 23.2.4 is not exceeded.

19.8 Performance Guarantee Test Procedures

19.8.1 Ammonia Plant

Performance guarantees of the Ammonia Plant shall be demonstrated by means of the following Performance Guarantee Tests:

19.8.1.1 A twenty days sustained continuous test under normal operating conditions in order to demonstrate the continuous steady operation and capacity at an average of 90% of capacity of the Ammonia Plant, along with the ability to produce specification grade ammonia and carbon dioxide, followed immediately by:

19.8.1.2 A ten (10) days continuous test under normal operating conditions in which the operation of the Ammonia Plant at 100% capacity and the consumption of raw materials and utilities will be demonstrated, while producing specification grade ammonia. The tests for capacity and quality will be for all ten (10) days of the test. 100% capacity of the Ammonia Plant shall be 10,000 metric tons of 99.8% Product and will be corrected for any increase in strength. For consumption of the raw materials and utilities the test period will be seven (7) days.

19.8.2 Urea Plant

Performance guarantees on the Urea Plant shall be demonstrated by means of the following Performance Guarantee Tests:

19.8.2.1 A twenty (20) days sustained continuous test under normal operating conditions in order to demonstrate the continuous steady operation and capacity at an average rate of 90% of the Urea Plant along with the ability to produce urea of specification grade, followed immediately by:

19.8.2.2 A ten (10) days continuous test under normal operating conditions in which the operation of the Urea Plant will be at 100% capacity, and the consumption of raw materials and utilities will be demonstrated while producing specification grade urea. The tests for capacity and quality will be for all ten days test period. 100% capacity of Urea Plant shall be 17,250 metric tons of 46.3% N. Product, and will be corrected for any increase in strength.

19.8.3 The ten (10) days guaranteed test(s) of the Plant(s) shall run immediately after the successful completion of the relevant twenty (20) days test(s).

- 19.8.4 With the ten days period specified above under 19.8.1 and 19.8.2, or as otherwise agreed, the Ammonia and Urea Plants will be run at capacity for three days to demonstrate that all services are adequate for the operation of the Ammonia and Urea Plants and utilities together.
- 19.9 The procedures to be followed for the execution of the Guarantee Tests shall be agreed upon between the parties three (3) months before the beginning of the above tests. Instruments tolerances shall be those given by the Suppliers of the instruments. PURCHASER shall have the right to specify instruments with low margin of tolerance for measurement of the Plant capacity and consumptions.
- 19.10 The Performance Guarantee Tests of the Plants shall be run under the supervision of the CONTRACTOR's personnel but all measurements will be taken jointly by PURCHASER and CONTRACTOR.
- 19.10.1 The first twenty (20) days test of Ammonia and/or Urea Plant shall commence within forty five (45) days from the start-up of the Plant(s). This forty five days period shall be extended if the Plant(s) is not able to operate normally due to no fault of the CONTRACTOR. In the event of failure of this test, the CONTRACTOR shall be permitted (three) other tests to be run within twelve months thereafter. However, this will not affect the provision of Article 19.11 below.
- 19.10.2 If, for reasons not attributable to the PURCHASER, the CONTRACTOR is not able to perform the test(s) within twelve months, the provisions of Articles 23 and 25 will apply.
- 19.10.3 CONTRACTOR shall have the right to have the Plant(s) operated in accordance with his requirements during the period allowed to the CONTRACTOR to perform the test(s) and PURCHASER's personnel shall work under the technical instructions of the CONTRACTOR. The PURCHASER shall have the right to operate the Plants as and when such operation shall not interfere with CONTRACTOR's work.
- 19.11 In the event of the CONTRACTOR not completing his Performance Tests of the Plant(s) within six (6) months after Start-Up of the Plant(s), PURCHASER shall have the right to stop all payments due to the

CONTRACTOR and the CONTRACTOR shall extend the validity of any Bank Guarantee, provided that the period during which the Plant(s) cannot be operated normally by the CONTRACTOR due to a fault of the PURCHASER shall not be counted in computing the said six month period.

- 19.12 If the ten days capacity Performance Test(s) are interrupted due to reasons for which the CONTRACTOR is not responsible, the Plant(s) shall be started again as soon as possible and when the Plant(s) has reached normal operating conditions, the Test(s) shall continue. The duration of the Test(s) shall be extended by the duration of such interruptions and the Test(s) shall then be deemed to have been performed continuously, provided however that the Plant has been operated for a minimum ten-day period continuously.
- 19.13 After completion of any Performance Test, monitored by the CONTRACTOR and the PURCHASER which the CONTRACTOR believes to be a successful test, the CONTRACTOR shall prepare a Performance Test Report which should be signed by the CONTRACTOR and submitted to the PURCHASER for approval.
- 19.13.1 If in PURCHASER's opinion, the said Report has been found to be satisfactory, the PURCHASER shall issue within thirty days from the CONTRACTOR's Report an Acceptance Certificate or shall inform CONTRACTOR's Site representative within the same period the reasons for non-acceptance.
- 19.13.2 In the event of the PURCHASER failing to issue the Acceptance Certificate or to inform the CONTRACTOR, the Acceptance of the Plant for which the Performance Test was conducted shall be deemed to have taken place.
- 19.14 All obligations of the CONTRACTOR with respect to guarantees, except mechanical guarantees mentioned in the Contract shall be deemed to have been fulfilled and the Plants accepted if for reasons attributable to the PURCHASER, the first Guarantee Test cannot be carried out within twenty four (24) months from the Mechanical Completion of the Plant. In such event, the Bank Guarantee shall expire automatically and the payment of the final instalment of the Lump Sum Price shall be made to the CONTRACTOR as provided in Article 11.



19.15 The Acceptance of the Plants under Articles 19.13 and 19.14 and the issue of certificates thereof, shall be considered to be provisional until all the obligations of the CONTRACTOR under this Contract shall have been met. The issue of these Provisional Acceptance Certificates shall, however, entitle the CONTRACTOR to receive all payments due on completion of Guarantees and Acceptance of the Plant in accordance with Article 11.

ARTICLE 20

CONDITIONS FOR ACCEPTANCE

- 20.1 The CONTRACTOR has provided to the PURCHASER all Certificates of Inspection and Certificates of Materials in case of each of the major equipment, machinery and section of the Works.
- 20.2 The CONTRACTOR has provided Mechanical Warranties and Performance Guarantees for equipment to the PURCHASER.
- 20.3 The CONTRACTOR has provided all documents listed in Annexure XV to the PURCHASER.
- 20.4 The CONTRACTOR has completed the Construction Completion Report in respect to each section of the Plant and the Works included in the Contract, which in his opinion, is complete in accordance with the Contract and have passed such tests as may have been specified in the Contract. The Construction Completion Report shall state that the CONTRACTOR proposes to demonstrate mechanical tests on sections of the Plant(s) and the Works within (seven to fourteen) days as agreed with the PURCHASER. The PURCHASER after duly satisfying himself with the tests demonstrated by the CONTRACTOR, shall have signed the Report.
- 20.4.1 In the event that the test results had been unsatisfactory in case of any section of the Plant or the Works, the PURCHASER shall endorse the same on the Construction Completion Report. The CONTRACTOR after rectifying defects shall demonstrate such of the tests as agreed to exhibit the performance of the section of the Plant or the Works in question to the satisfaction of the PURCHASER and thereafter obtain his signatures approving the relevant Construction Completion Report.
- 20.4.2 The Pre-commissioning Tests shall have been demonstrated on the equipment after preparing the completion report.
- 20.5 When the Construction Completion Report has been obtained and all tests have been satisfactorily completed, the Mechanical Completion of the Plant and completion of the Works have been successfully achieved

to the satisfaction of the PURCHASER who has approved the Completion Report for the Works, the CONTRACTOR shall prepare the Completion Report for signatures by both parties to the Contract after joint examination of the Plant and the Works. The Completion Report shall signify the acceptance of the completion stage of the Works and the readiness of the Plant for commissioning.

20.6 When Performance Guarantee Tests laid down in Article 19 in accordance with criteria laid down in Article 19.3 to 19.7 inclusive the methodology laid down in Article 19.8 and procedures laid down in Articles 19.9, 19.10, 19.11 to 19.13 shall have been successfully demonstrated to the satisfaction of the PURCHASER and the CONTRACTOR has prepared a Performance Test Certificate(s) and submitted the same for signatures and acceptance of the PURCHASER:

20.6.1 The approval to the Performance Test Certificate(s) by the PURCHASER without reservations shall be considered to signify the acceptance of the Plant(s)/Works and the obligations of the CONTRACTOR with respect to the Guarantee Tests stated in Article 19 shall be deemed to have been fulfilled.

20.6.2 If for any certain reason the Guarantee Test Performance is not accepted by the PURCHASER or is accepted subject to certain conditions for rectification of the defects, the CONTRACTOR shall have rectified the defects and demonstrated the Performance Guarantee Tests to the satisfaction of PURCHASER. During the period the defective sections of the Works are being set right, if certain sections of the completed Works which are considered to be satisfactorily completed, the same can be taken over by the PURCHASER without interfering in the efforts of the CONTRACTOR for rectification of defects or his obligations under the Contract.

20.7 Acceptance of the Works or of any specified section by the PURCHASER shall not affect the obligations of the CONTRACTOR under the Contract and shall not be construed as evidence that the Works or any part thereof is complete.

ARTICLE 21

WARRANTIES

- 21.1 The CONTRACTOR warrants that the CONTRACTOR shall take note in his supply of the limitations of handling goods to Site from (name of port) by road and/or rail to the Plant Site and satisfy himself in this connection.
- 21.2 CONTRACTOR shall provide warranties for mechanical soundness and guarantees for performance to be given by equipment as given elsewhere in the Contract. These warranties and guarantees shall be valid for a minimum period of twelve (12) months after Start-Up of the Plant and equipment or for a period not less than twenty four (24) months from Mechanical Completion of the Plant whichever is earlier. Such guarantees shall, in no event, absolve the CONTRACTOR from his overall responsibility for the continuous and steady operation of the Plant.
- 21.3 The CONTRACTOR warrants that all Civil Engineering has been constructed and equipment erected in accordance with internationally accepted codes and standards, or standards laid down elsewhere in the Contract and particularly in Annexure (e.g. IV). The CONTRACTOR warrants that he is fully aware of local codes and practices which may modify international codes and has undertaken all construction accordingly.
- 21.4 The CONTRACTOR warrants and guarantees all Civil Engineering (for the period laid down if any) in accordance with the laws and codes of (PURCHASER's country).

ARTICLE 22

PENALTIES

22.1 No bond or undertaking given or supplied by the CONTRACTOR to the PURCHASER (whether required by the terms of this Contract or by any other agreement between the parties hereto) shall in any way or to any degree affect, alter or limit the liability of the CONTRACTOR under this Contract and the acceptance by the PURCHASER of any such bond or other undertaking shall neither be interpreted or construed as effecting or implying any waiver by the PURCHASER of any PURCHASER-rights or remedies nor as the acceptance of coverage or protection in lieu of any PURCHASER-rights or remedies under this Contract.

22.2 The PURCHASER shall have the rights of set-off as follows:

22.2.1 In the event that the PURCHASER considers that it possesses a claim against the CONTRACTOR under, arising out of, or in any way connected with this Contract, the PURCHASER may at any time (whether before or after the completion of the work under this Contract and whether such completion is effected by the CONTRACTOR, the PURCHASER or another person) calculate the amount of the damage or loss upon which such claim is based and (without restricting any right of set-off or counter-claim given or implied by law) may set-off against any amount then or to be subsequently payable to the CONTRACTOR under this Contract, any sum deemed by the PURCHASER to be payable to the PURCHASER by the CONTRACTOR pursuant to any such above-mentioned claim, and, without restricting the generality of the foregoing, the PURCHASER may deduct from any sum otherwise then or to be subsequently payable or repayable to the CONTRACTOR under any provision of this Contract (including provisions pertaining to the

Performance Bond or Bank Guarantee) any sum so deemed payable or retainable to or by the PURCHASER either by virtue of other provisions of this Contract or by virtue of the right of set-off or counter-claim, whether as conferred by this Article or otherwise.

22.2.2 Should the PURCHASER exercise any such right of set-off as envisaged by Article 22.2.1 above, the PURCHASER shall specifically notify the CONTRACTOR in writing that the said right is being exercised IT BEING EXPRESSLY AGREED that no letter or other communication from the PURCHASER shall constitute such notification to the CONTRACTOR unless the said letter or other communication so stipulates.

22.2.3 At any time up to thirty (30) days after the receipt of the notification contemplated by Subarticle 22.2.2 above, the CONTRACTOR may institute proceedings in a Court of competent jurisdiction to establish that the damage or loss as calculated by the PURCHASER did not in whole or in part constitute a valid legal claim against the CONTRACTOR but after the expiry of the said thirty (30) days the CONTRACTOR shall be deemed to have acknowledged the validity, both as regards quantum and otherwise, of the aforesaid claim of the PURCHASER.

22.2.4 Should the amount of the above-mentioned claim of the PURCHASER exceed the amount or value of the set-off contemplated by Subarticle 22.2.1 above, nothing herein shall be construed as a bar to the right of the PURCHASER to adopt any other legal measures available against the CONTRACTOR for the amount of such excess.

22.3 The rights of the PURCHASER pursuant to Article 23 shall be in addition to, and shall not be prejudiced by, such further rights provided by this Article 22, or by any other provision of this Contract.

22.4 Except for the damages, penalties and other obligations stipulated in the Contract, the CONTRACTOR shall not be liable, in any event, whether under the Contract or for loss of anticipated profits, or any consequential loss or damage arising from any cause, except to the extent of repaying to the PURCHASER, or directing that payment be made to the PURCHASER any amounts receivable under Article 26, and/or pursuant to other insurance policies and coverages held by the CONTRACTOR.

ARTICLE 23

LIQUIDATED DAMAGES

- 23.1 The CONTRACTOR shall be liable to Liquidated Damages for default of responsibilities under provisions of Articles 10 and 19 of the Contract as under:
- 23.1.1 For the delay in the delivery of the technical documents stipulated in Annexure XV, the agreed Penalties shall be as follows:
- For each week of delay in submitting any document an amount of ( Amount ) subject to an overall maximum liability of ( Amount ) under this Article.
- 23.1.2 For delay in Completion of the Works. For each fifteen (15) days of delay an amount of ( Amount ) subject to a maximum of ( Amount ).
- 23.1.3 For delay in completing the Guarantee Tests beyond a period of nine months after Mechanical Completion of the Plant(s), provided such delay is not attributable to the PURCHASER, an amount of ( Amount ) for each fifteen days of delay, subject to a maximum of ( Amount ).
- 23.1.4 For non-fulfilment of absolute guarantees at 100% capacity but subject to fulfilment of absolute guarantees at 95% of capacity, a penalty of 1% of the total price of the Contract ( give amount ) (as stated in Article 11.1) for each 1% lower production than of the 100% urea.
- 23.2 In the event that the Absolute Guarantees have been successfully demonstrated but the Penaltiable Guarantees are not met, the CONTRACTOR shall pay by way of liquidated damages in consideration of any and all claims in connection with the non-fulfilment of the guaranteed consumption cost, (but subject to the provisions of Article 19.5), the following:



- 23.2.1 For the Ammonia Plant: for each full zero point five percent (0.5%) exceeding the guaranteed consumption cost as given in Article 23.2.4 below an amount of \_\_\_\_\_ up to a maximum of \_\_\_\_\_.
- 23.2.2 For the Urea Plant: for each full zero point five percent (0.5%) exceeding the guaranteed consumption cost as given in Article 23.2.4 below an amount of \_\_\_\_\_ up to a maximum of \_\_\_\_\_.
- 23.2.3 By the above payments in Articles 23.2 the obligations of the CONTRACTOR in connection with the Performance of Penaltiable Guarantees shall be considered as fulfilled and the Plant(s) accepted, subject to the provision of Article 19.5.
- 23.2.4 The daily guaranteed cost of manufacture shall be calculated by calculating the guaranteed daily cost of inputs of raw material and utilities minus the guaranteed output of utilities, according to the costs given below for each item, and multiplying by the guaranteed daily capacity of each Plant, to obtain the daily guaranteed net cost of raw materials and utilities.

Natural Gas	(value) per million Kcal.
HP Steam	(value) per ton
MP Steam	(value) per ton
LP Steam	(value) per ton
Cooling Water	(value) per m <sup>3</sup>
Boiler Feed Water	(value) per m <sup>3</sup>
Purge Gas of Ammonia Plant	(value) million Kcal.
Condensate	(value) per ton
Ammonia	(value) per metric ton

- 23.3 In the event of non-fulfilment of Absolute Guarantees, within nine months of Start-Up, the CONTRACTOR shall have the right to repair or replace equipment to fulfil the Absolute Guarantees within a further period of nine months. If the CONTRACTOR is unable to fulfil guarantees within the further period, the PURCHASER shall have the

right to recover the costs necessary to correct the Plant to assure that the Absolute Guarantees are met. The amount of such costs shall be assessed by an international competent authority solely appointed by the PURCHASER. The assessment made shall be final and binding upon the CONTRACTOR.

- 23.4 The PURCHASER, without prejudice to any other method of recovery, may deduct the amount of liquidated damages levied under the provisions of this Article from any payments due or which may become due to the CONTRACTOR. The payment or deduction of such liquidated damages shall not relieve the CONTRACTOR from his obligations to complete the Works or from any other of his obligations and liabilities under the Contract.

ARTICLE 24

BONUSES AND INCENTIVES

24.1 CONTRACTOR has agreed to perform the Works in a planned and expeditious manner so that the completion of all the Works is achieved according to the time schedule given in Article 2 and detailed in Annexure XV of the Contract. In the event that the CONTRACTOR is able to accomplish the Mechanical Completion of the Plant and demonstrate all the Guarantees given in Article 19 during a period of less than thirty eight months after Effective Date, the CONTRACTOR shall be entitled to receive Incentive Bonus as hereunder for each complete fifteen days saving in the time of completion of Guarantee Tests.

(a) \_\_\_\_\_% of the fixed prices under Article 11.1.1 subject to a maximum of ( Amount ). Payments under this Article shall be made within six months of Acceptance of the Works provided no latent basic defect appears in the Works during this period affecting its capacity or performance.

24.2 Should the Completion of the Works be accomplished by the CONTRACTOR within thirty two months from Effective Date, and if for reasons attributable to the PURCHASER, the plant cannot be started up within four months thereafter, the CONTRACTOR would be entitled to an Incentive Bonus as below for each complete fifteen days.

(a) \_\_\_\_\_% of the fixed price under Article 11.1.1 subject to a maximum of ( Amount ).

ARTICLE 25

LIABILITIES

- 25.1 The CONTRACTOR shall properly cover up and protect until taken over (or accepted) any section or portion of the Works liable to injury or damage by exposure to the weather, and shall take every reasonable precaution to protect any section or portion of the Works undertaken against loss or damage from any cause. The CONTRACTOR shall at his own cost make good any damage to the Works that may occur thereto.
- 25.2 The CONTRACTOR shall at his own expense make good to the satisfaction of the Engineer any damage that may occur to any part of the Works after it has been taken over, if such damage results from any wrongful or negligent act or omission of the CONTRACTOR, his servants, employers, agents or sub-contractors.
- 25.3 Any damage or loss caused to the property of the PURCHASER or to the property of any third person by the CONTRACTOR, his sub-contractors, agents, employees or servants shall be made good by the CONTRACTOR.
- 25.4 In case of loss or damage to the Works after take over arising from or occasioned by causes for which the CONTRACTOR is not responsible under the Contract, the same shall, if required by the PURCHASER, be made good by the CONTRACTOR at the cost of the PURCHASER at a price to be mutually agreed upon between the CONTRACTOR and the PURCHASER.
- 25.5 The CONTRACTOR shall not be liable to the PURCHASER for:
- (a) any claim made against the PURCHASER except as provided in this Contract;
  - (b) any damage or injury caused by or arising from the acts or omissions of the PURCHASER or his employees, servants and agents.
- 25.6 The total liability of the CONTRACTOR under the Contract shall not exceed US\$ \_\_\_\_\_. However, this liability is not applicable

to the CONTRACTOR's liability for fulfilment of Absolute Guarantees and reimbursement to the PURCHASER of any amount received by the CONTRACTOR under the provisions of Article 26.

ARTICLE 26

INSURANCE

- 26.1 Without restricting in any manner the generality of any other provision of the Contract, and in particular any such provision as pertaining to the liability or responsibility of the CONTRACTOR, it is expressly agreed that throughout the period commencing from the date of commencement of Work, and continuing until Final Acceptance of the Works;
- 26.1.1 The CONTRACTOR shall at his own cost take out and keep in force the Insurance Policies enumerated in Annexure XXVIII for such time as may be necessary under the Contract.
- 26.1.2 The CONTRACTOR shall, at his own expense, maintain additional insurance policies in a form and with a company or companies approved by the PURCHASER, such policies to be of the respective natures, in the amounts, against the risks, and for the periods required by the Contract, or implied therein.
- 26.1.3 To the extent that such a policy is available, the PURCHASER and the CONTRACTOR shall by mutual agreement obtain a special insurance policy at the cost of the CONTRACTOR (where the PURCHASER shall be deemed to be the beneficiary) providing coverage for consequential loss caused by defective design, material or workmanship. It is expressly agreed however that no liability shall attach to the PURCHASER or the CONTRACTOR purely by reason of payment of the premium for such a policy.
- Each of the policies envisaged by subarticles 26.1.1, 26.1.2 and 26.1.3 above is to contain such specific terms and conditions, if any, as stipulated or contemplated in Annexure XXVIII.
- 26.2 Within thirty (30) days after obtainment of each such policy as contemplated by 26.1 above, the CONTRACTOR shall deposit an original of such policy with the PURCHASER provided, however, that

acceptance by the PURCHASER of any such original shall for no purpose be construed as an acknowledgement by the PURCHASER that the insurance is adequate in nature, amount and/or scope.

26.3 The CONTRACTOR shall, whenever required from time to time by the PURCHASER, submit to the PURCHASER proof that the insurance contemplated by 26.1 above as his responsibility remains in force.

26.4 Should the CONTRACTOR fail to take out and/or keep in force insurance as contemplated by 26.1 above then the PURCHASER may at the PURCHASER's option either:

- (a) take out insurance considered appropriate by the PURCHASER, in which event any premiums paid or payable by the PURCHASER shall immediately constitute a debt due from the CONTRACTOR to the PURCHASER, the amount of which debt, without restricting or superseding any other rights or remedies of the PURCHASER, may be retained as PURCHASER monies out of any amount otherwise payable by the PURCHASER to the CONTRACTOR;
- (b) hold the CONTRACTOR liable in the same manner and degree as if the CONTRACTOR were the insurance underwriter of a policy such as contemplated by 26.1 above.

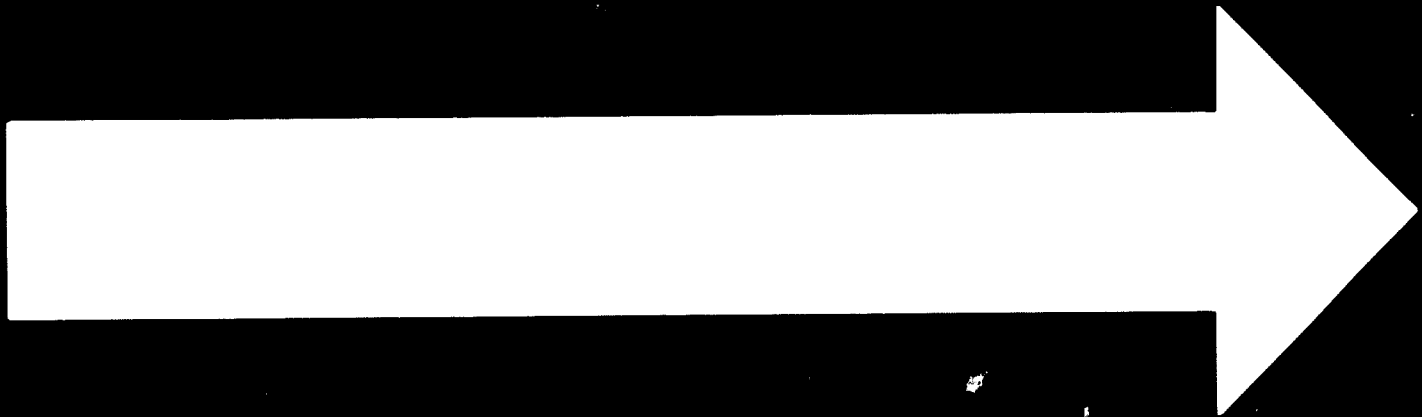
ARTICLE 27

RECTIFICATION OF DEFECTS

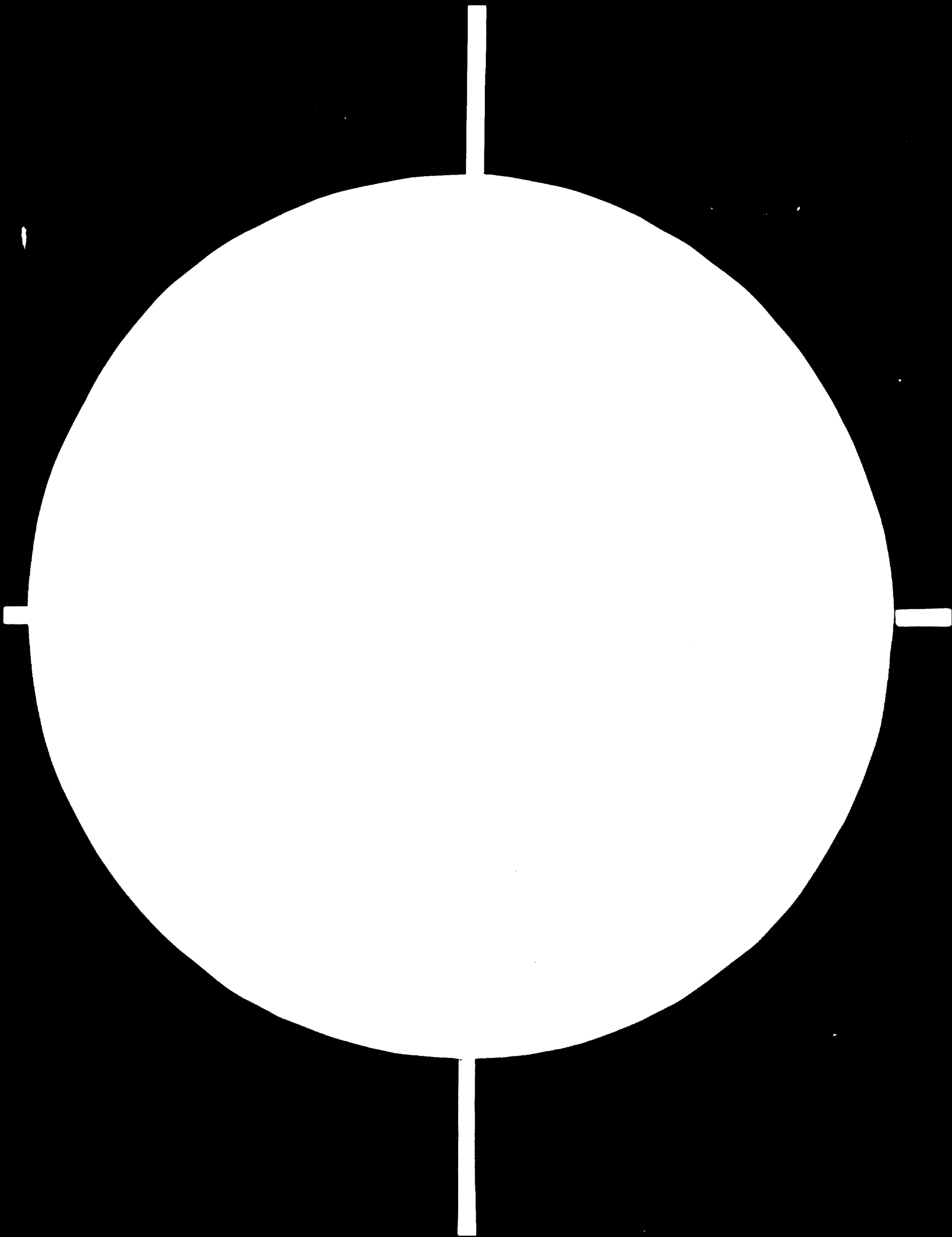
- 27.1 Every part of the Works shall be at the risk of the CONTRACTOR until it is taken over by the PURCHASER and the CONTRACTOR shall at his own expense make good to the satisfaction of the Engineer any damage that may occur thereto.
- 27.2 The CONTRACTOR shall also at his own expense make good to the satisfaction of the Engineer any damage that may occur to any part of the Works after it has been taken over, if such damage results from any wrongful and negligent act or omission of the CONTRACTOR, his servants or agents, done or omitted, before the expiration of the last of the defects liability period.
- 27.3 In relation to the Works, or any specified section thereof or any Plant and equipment, the mechanical warranty period shall end twelve (12) months after Start-up of the Plant, and the defects liability in the case of Civil Engineering and Erection, twelve (12) months after Acceptance of the Works. If, however, Acceptance or Start-Up is delayed solely by any breach by the PURCHASER then the said period of twelve months shall be reduced or extinguished by the extent of such delay.
- 27.4 The CONTRACTOR shall with all reasonable speed make good all defects in the Plant and equipment or the Works which may appear within the defects liability period irrespective of the causes thereof.
- 27.5 Subject to the PURCHASER affording the CONTRACTOR the necessary access and, where appropriate, permitting any defective material or equipment to be removed, the CONTRACTOR shall make good all such defects in one or more of the following ways:
- (a) by doing work of repair or alterations at the Site;
  - (b) by removing defective material or equipment from the Site and repairing it elsewhere;
  - (c) by removing defective material or equipment from the Site and replacing it by fresh material or equipment.



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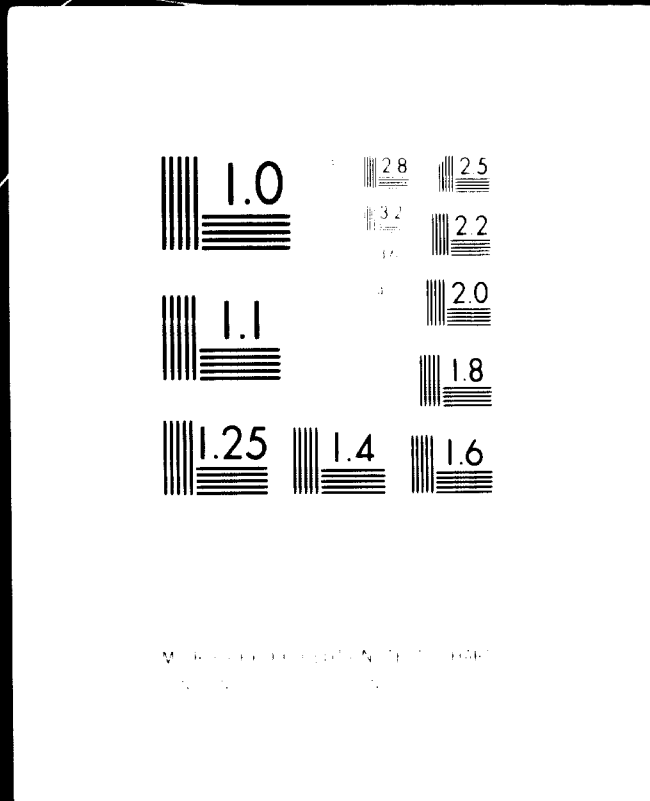
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The CONTRACTOR shall, if so required by the Engineer, submit his proposals for making good any defect to the Engineer for his approval.

- 27.6 The Engineer may require the CONTRACTOR to carry out any appropriate take-over test following the making good of any such defect for the purpose of establishing that the defect has indeed been made good.
- 27.7 Where, in pursuance of this Article, the CONTRACTOR removes defective equipment and replaces it with fresh equipment, then the defects liability period shall begin to run afresh in relation to such equipment as if it had been taken over on the date when it passes the appropriate take-over test, or, where no such test is required to be carried out, on the date when it is first put into satisfactory use.
- 27.8 If the CONTRACTOR shall neglect or refuse to make good within a reasonable time any defect for which he is responsible under this Article, then the PURCHASER or Engineer may make good such a defect in such manner as thought fit.
- 27.9 If any such defect is attributable to any breach of the Contract committed by the CONTRACTOR, the CONTRACTOR shall bear his own costs of making good the defect, or if the PURCHASER has made good the defect in pursuance of the failure of the CONTRACTOR to do so in a reasonable time, CONTRACTOR shall reimburse the PURCHASER his costs of so doing. If the CONTRACTOR does not reimburse the PURCHASER within a reasonable time, the PURCHASER shall be entitled to recover the cost from the CONTRACTOR by deducting the amount from any moneys due or which may become due to the CONTRACTOR.
- 27.10 The CONTRACTOR or the PURCHASER, as the case may be, shall, in every case, keep such contemporary records of his costs of making good any defect in pursuance of this Article as the Engineer may reasonably require and shall provide the Engineer with copies thereof as and when he may require them.

ARTICLE 28

VARIATIONS, CHANGES AND ADDITIONS  
TO SCOPE OF WORK

- 28.1 The PURCHASER, or if authorized by him, the Engineer shall have full powers, subject to the provisions hereinafter contained, from time to time during the execution of the Contract by notice in writing to direct the CONTRACTOR to alter, amend, omit, add to or otherwise vary any of the Works and the CONTRACTOR shall carry out such variations and be bound by the same conditions, so far as applicable, as though the said variations were stated in the Specifications.
- 28.2 Notwithstanding the detailed instructions provided in Annexure XIX, in any case in which the CONTRACTOR has received any such direction from the PURCHASER/Engineer which either then or later will, in the opinion of the CONTRACTOR, involve an increase or decrease in the Contract Price, the CONTRACTOR shall, as soon as reasonably possible and before proceeding with the variation, advise the PURCHASER in writing to that effect. The difference in cost to the PURCHASER, if any, occasioned by any such variations, shall be added to or deducted from the Contract Price as the case may be. The amount of such difference shall be agreed to after discussions between the Engineer and the CONTRACTOR, subject to approval of the PURCHASER.
- 28.3 Upon receiving a variation order from PURCHASER/Engineer, if in the opinion of the CONTRACTOR such variation is likely to prevent or prejudice the CONTRACTOR from or in fulfilling any of his obligations under the Contract, he shall notify the PURCHASER thereto in writing and the PURCHASER and Engineer shall decide forthwith whether or not the same shall be carried out. If the Engineer re-confirms in writing his intention to carry out the variations, then the said obligations of the CONTRACTOR shall be modified to such an extent as may be justified.
- 28.4 Except for the provision of Article 28.3, any variations or alterations ordered by the PURCHASER/Engineer shall not in any way vitiate or

invalidate the obligations of the CONTRACTOR under the Contract.

- 28.5 The CONTRACTOR shall send to the Engineer once in every month the account giving particulars (as fully detailed as possible) of all claims for any additional expense to which the CONTRACTOR may consider himself entitled and of all extra/additional work ordered by the PURCHASER/Engineer, that he had executed during the preceeding month. No claim for payment for any such work will be considered which has not been included in such particulars, provided always that the PURCHASER/Engineer shall be entitled to authorise payment to be made for any such work notwithstanding the CONTRACTOR's failure to comply with this condition, if the CONTRACTOR has at the earliest practicable opportunity notified the Engineer that he intends to make claim for such work.
- 28.6 That the CONTRACTOR may at any time during his performance of the Contract submit to the Engineer for his approval written proposals for a variation of the Works. If the CONTRACTOR is of opinion that such variation is necessary to correct any defect in the Works which has occurred or which would otherwise occur, then such proposals shall specify such defect and state the reasons for the CONTRACTOR's said opinion.
- 28.7 If the Engineer approves the CONTRACTOR's proposal, then subject to Sub-Article 28.9, the CONTRACTOR shall make the variation so approved.
- 28.8 The Engineer shall not refuse to approve any variation which is necessary to correct any defect in the Works which has occurred or which would otherwise occur if the CONTRACTOR's proposal therefore specify such defect. In all other cases, the Engineer may give or refuse his approval as he thinks fit and his decision shall be final.
- If any dispute shall arise in between the Engineer and the CONTRACTOR, as to whether the Engineer was entitled to refuse his approval under this Subarticle, it shall be referred to a neutral person for a decision under the provisions of Article 45.
- 28.9 If the Engineer considers that any deduction from the Contract Price ought fairly to be made in respect of any variation ordered by him

under this Article, then he shall so notify the CONTRACTOR when giving such approval. The CONTRACTOR may within fourteen days of the giving of such approval by notice to the Engineer elect not to make the variation and shall in that event not be bound to do so.

28.10 The CONTRACTOR shall not be entitled to any extra cost on account of a variation proposed/initiated by him. Any deduction in the Contract Price agreed to between the Engineer and the CONTRACTOR pursuant to such Subarticle 28.9 above, shall be deducted from the Contract Price.

ARTICLE 29

RIGHT FOR USE OF PROPRIETARY RIGHTS AND LICENCES

- 29.1 The CONTRACTOR affirms that the CONTRACTOR has obtained the right to grant and hereby does grant to the PURCHASER irrevocable, non-exclusive, non-transferable licences to use for the operation of all the processes in the Plant, and in particular, the Ammonia Process and the Urea Process.
- 29.2 The CONTRACTOR shall ensure that the Process Licensors make available to the PURCHASER all basic process data received by the CONTRACTOR from Process Licensors relating to the Contract, and that all basic process documentation and all drawings prepared by the CONTRACTOR shall be made available to the PURCHASER. The CONTRACTOR also undertakes to make available to the PURCHASER the latest know-how and techniques available to the Process Licensors and to the CONTRACTOR at the time of design.
- 29.3 The CONTRACTOR shall ensure that the Process Licensors and/or the CONTRACTOR shall make available free of cost to the PURCHASER within ten (10) years from the Effective Date, any development in operating techniques, preventive maintenance and safety measures applicable to the Plants made and within the knowledge of the CONTRACTOR.



ARTICLE 30

SECRECY

- 30.1 The PURCHASER agrees that he shall treat as confidential all process and technical information, know-how, documents, data and drawings owned and supplied by the CONTRACTOR according to the Contract and hereinafter called confidential information. The CONTRACTOR shall, after obtaining a declaration of acceptance to the provisions of this Article from the PURCHASER's Representative and/or Engineer, make the confidential information available to the PURCHASER's Representative and/or the Engineer. The PURCHASER shall not without the approval of the CONTRACTOR make the confidential information available to a third party, other than where required by law, and provided that when so required by law the PURCHASER shall inform the CONTRACTOR.
- 30.2 This Article shall not apply to such confidential information:
- 30.2.1 As is or becomes in the public domain.
- 30.2.2 As is known to the PURCHASER, his Representatives or the Engineer before the obtaining of declaration required of them under Article 30.1.
- 30.3 The PURCHASER shall not use the confidential information for any purpose other than completing, operating, repairing, maintaining or modifying the Plants. Similarly, the CONTRACTOR will not use any technical data or confidential drawings or technical documents given by the PURCHASER, his Representatives or the Engineer, to the CONTRACTOR except for the purposes connected with the Contract.
- 30.4 The aforementioned obligations of Article 30 subject to Article 30.5 hereafter shall not be affected by termination of this Contract.
- 30.5 The provisions of Subarticles 30.1, 30.2, 30.3 and 30.4 shall be valid for a period of ten (10) years from the Effective Date.
- 30.6 The CONTRACTOR shall provide guarantees to the PURCHASER relative to the continued use of know-how and patented processes, etc., over an agreed period of time without prejudice to any matter occurring which might inhibit the continued use of the acquired know-how and processes.

ARTICLE 31

PATENTS

- 31.1 The CONTRACTOR shall indemnify and hold harmless the PURCHASER and anyone directly or indirectly employed by him from and against all claims, damages, losses, and expenses (including legal fees) arising out of any infringement of such rights during or after completion of the work, and shall defend all such claims in connection with any alleged infringement of such rights. The foregoing notwithstanding, the CONTRACTOR shall continue his performance of the work utilising substantial non-infringing equipment and methods.
- 31.2 The PURCHASER shall give the CONTRACTOR prompt notice, in writing, of any claim or suit. The CONTRACTOR shall have sole charge and direction of the defence and disposal of such suit and the PURCHASER shall render all reasonable assistance. The PURCHASER shall have the right to be represented by counsellor of his own choice at his own expense.
- 31.3 The CONTRACTOR shall have the right to acquire immunity from suit and to make or cause to be made alterations at his cost to the Plant to eliminate the alleged infringement provided such alteration does not prevent the Plant from meeting its Performance Guarantees mentioned in Article 19.
- 31.4 Neither the CONTRACTOR nor the PURCHASER shall settle or compromise any suit or action without the written consent of the other if settlement or compromise obliges the other to make any payment or part with any property, to assume any obligation or grant any licences or other rights, or to be subjected to any injunction by reason of such settlement or compromise.

ARTICLE 32

DISCLOSURES

- 32.1 The PURCHASER shall not disclose any confidential information (obtained from the CONTRACTOR) to a third party without the approval of the CONTRACTOR other than where required by law when the PURCHASER shall inform the CONTRACTOR.
- 32.2 Obligation under Article 32.1 shall be valid for a period of ten (10) years after the Effective Date subject to Article 30.2.
- 32.3 The CONTRACTOR shall not pay any agents' fees, discount or other commissions to any third party in relation to the award of this Contract to the CONTRACTOR. If any agents' fees are payable to agents in ( PURCHASER's country ) by virtue of agreements made at least twelve (12) months before the award of this Contract, the PURCHASER shall, before the award of this Contract, advise the client of the name of the agent and quantum of fees payable.

ARTICLE 33

INDEMNIFICATION

33.1 Subject only to Article 33.2 below, the CONTRACTOR shall indemnify and save harmless the PURCHASER from and against all claims, demands, losses, costs, damage, actions, suits or proceedings by whomsoever made, brought or prosecuted in any manner based upon, arising out of, related to, occasioned by or attributable to the activities of the CONTRACTOR under or in connection with this Contract or to an infringement or alleged infringement by the CONTRACTOR on a patent of invention.

33.1.1 For the purpose of Subarticle 33.1 above, "activities" includes an act improperly carried out, an omission to carry out an act and a delay in carrying out an act.

33.2 The PURCHASER shall indemnify and save harmless the CONTRACTOR from and against all claims, demands, losses, costs, damage, actions, suits or proceedings arising out of the CONTRACTOR's activities under this Contract which are directly attributable to lack of, or a defect in, title or an alleged lack of, or a defect in, title to the Site of the Works.

ARTICLE 34

FORCE MAJEURE

34.1 In the Contract, Force Majeure shall be deemed to be any cause beyond the reasonable control of the CONTRACTOR or the PURCHASER as the case may be which prevents or impedes the due performance of the Contract and which, by due diligence, the affected party is unable to avoid or overcome through its individual concerted effort.

Force Majeure shall include, but shall not be limited to the following:

- any war or hostilities;
- any riot or civil commotion;
- any earthquake, flood, tempest, lightning, unusual weather, or other natural physical disaster, impossibility of use of any railway, port, airport, shipping service or other means of transportation;
- any accident, fire or explosion;
- any strike, lock-out, concerted acts of workmen or other industrial disturbance affecting the performance of the contractual obligations;
- shortages or unavailability of materials if beyond CONTRACTOR's control;
- any act of any Government.

34.2 If either party is prevented or delayed in the performance of any of its obligations under the Contract by Force Majeure, and if the affected party has given written notice thereof to the other party within the shortest possible time, specifying the matter constituting Force Majeure with necessary evidence that a contractual obligation is thereby prevented or delayed, and the further period for which it is estimated that such prevention or delay will continue, then the affected party shall be excused the performance or punctual performance as the case may be of such obligation as from the date of such notice for so long as may be justified.

- 34.3 The PURCHASER or the CONTRACTOR as the case may be shall be diligent in attempting to prevent or remove the cause of Force Majeure. The parties upon receipt of Notice of Force Majeure under Article 34.2 shall confer promptly with each other and agree upon a course of action to remove or alleviate such causes.
- 34.4 If by virtue of Article 34.2, either of the parties is excused from the performance or punctual performance of any obligation for a continuous period of six (6) months then the parties shall consult together with a view to agreeing what action should in the circumstances be taken and what amendments to the terms of the Contract ought to be made.
- 34.5 If by virtue of Article 34.2, either of the parties is excused from the performance or punctual performance of any obligation for a continuous period of (\_\_\_\_) months for one or more causes and if the consultations referred to in the preceding Subarticle 34.4 have not resulted in agreement or have not taken place because the parties have been unable to communicate with one another, then subject to the provisions of Article 36, the parties shall thereupon be finally released from further performance of all obligations of the Contract (other than those contained in Articles 30, 31 and 32) and subject as aforesaid the Contract shall automatically be terminated.
- 34.6 Nothing herein shall in any manner affect the validity of the Contract. Both the PURCHASER and the CONTRACTOR shall be prompt and diligent to remove all causes of interruption or delay in the work, insofar as each is liable to do so.

ARTICLE 35

SUSPENSION OF WORK

- 35.1 The PURCHASER may, when in the PURCHASER's opinion it is deemed necessary, require the CONTRACTOR to suspend execution of the work either for a specified or unspecified period by communicating notice to that effect to the CONTRACTOR.
- 35.2 The CONTRACTOR, upon receiving notice of the PURCHASER's requirement pursuant to Subarticle 35.1 above, shall suspend all operations except those which, in the Engineer's opinion, are necessary for the care or preservation of the Works.
- 35.3 During the period of suspension, the CONTRACTOR shall not remove from the Site any material, any part of the Works, or any Plant without the consent of the Engineer.
- 35.4 If the period of suspension is thirty (30) days or less, the CONTRACTOR, upon the expiration of the period of suspension, shall resume the execution of the Contract and the CONTRACTOR is entitled to be paid the cost, calculated in accordance with Article 11 and other relevant Contract provisions, of any material, work and/or Plant necessarily involved in complying with the suspension.
- 35.5 If the period of suspension is more than thirty (30) days and if, upon the expiration of the period of suspension, the PURCHASER and the CONTRACTOR agree that the fulfilment of the Contract be effected by the CONTRACTOR, the CONTRACTOR shall resume operations and fulfil the Contract in accordance with any terms and conditions agreed upon by the PURCHASER and the CONTRACTOR.
- 35.6 If upon the expiration of a period of suspension of more than thirty (30) days the PURCHASER and the CONTRACTOR do not agree that the Contract will be fulfilled by the CONTRACTOR or they are unable to agree upon the terms and conditions under which the CONTRACTOR will fulfil the Contract, the notice of suspension shall be deemed to be a notice of termination pursuant to Article 36 hereunder.

ARTICLE 36

TERMINATION OF CONTRACT

- 36.1 The PURCHASER may at any time by giving notice in writing to that effect terminate this Contract.
- 36.2 The CONTRACTOR will upon receipt of a notice pursuant to Article 36.1 above cease all operations forthwith.
- 36.3 If the Contract is terminated pursuant to Article 36.1, the PURCHASER will pay to the CONTRACTOR an amount equal to the lesser of
- 36.3.1 the cost as agreed upon by the CONTRACTOR and the PURCHASER of the Works supplied or done by the CONTRACTOR as at the date of termination less all amounts already paid to the CONTRACTOR by the PURCHASER, and less all amounts which the CONTRACTOR is liable to pay to the PURCHASER, and
- 36.3.2 the amount calculated in accordance with the Terms of Payment which would have been payable to the CONTRACTOR had such CONTRACTOR fulfilled the Contract.
- 36.4 In the event that the CONTRACTOR and the PURCHASER are unable to agree upon the cost, then the parties shall resort to Arbitration under Article 46.



ARTICLE 37

CANCELLATION OF THE CONTRACT

37.1 In any of the following cases, namely,

- 37.1.1 where the CONTRACTOR has made default or delayed in commencing or in diligently executing the Works or any portion thereof to the satisfaction of the Engineer, and the PURCHASER or the Engineer has given notice thereof to the CONTRACTOR and has by such notice required the CONTRACTOR to put an end to such default or delay, and such default or delay continues for days after such notice was given;
- 37.1.2 where the CONTRACTOR has made default in the completion of the Works, or any portion thereof, within the time limited for such completion by the CONTRACTOR;
- 37.1.3 where the CONTRACTOR has become insolvent;
- 37.1.4 where the CONTRACTOR has committed an act of bankruptcy;
- 37.1.5 where the CONTRACTOR has abandoned the Work;
- 37.1.6 where the CONTRACTOR has entered into a sub-contract or made an assignment of this Contract without the required consent; or
- 37.1.7 where the CONTRACTOR has otherwise failed to observe or perform any of the provisions of this Contract (including, without restricting the generality of the foregoing), failure to deliver to the PURCHASER all or any portion of the Works;

the PURCHASER may, without any other authorisation, take all or any part of the Contract and/or of the Works out of the CONTRACTOR's hands and may employ such means as the PURCHASER sees fit to complete this Contract and/or the Works.

37.2 Where this Contract, the Works, or any portion or portions thereof has or have been taken out of the CONTRACTOR's hands under Subarticle 37.1, the CONTRACTOR shall not, except as provided in Subarticle 37.3

hereunder, be entitled to any further payment including payments then due and payable but not paid and the obligation of the PURCHASER to make payments as provided for in the Terms of Payment shall be at an end and the CONTRACTOR shall be liable to and upon demand therefore pay to the PURCHASER an amount equal to all loss and damage suffered by the PURCHASER by reason of the non-fulfilment of this Contract and/or the Works by the CONTRACTOR.

- 37.3 Where this Contract, the Works, or any portion or portions thereof has or have been taken out of the CONTRACTOR's hands under Article 37.1 and is subsequently completed by the PURCHASER, the Engineer shall determine the amount, if any, of holdback and Progress Claims of the CONTRACTOR unpaid at the time of taking the Work out of the CONTRACTOR's hands that, in the Engineer's opinion, are not required by the PURCHASER for the purposes of the Contract and the PURCHASER shall, if of the opinion that no financial prejudice to the PURCHASER will result, authorise payment of that amount to the CONTRACTOR.
- 37.4 The taking of this Contract, of the Works, or of any portion thereof, out of the CONTRACTOR's hands pursuant to this Article does not operate so as to relieve or discharge the CONTRACTOR from any obligation under this Contract or imposed upon the CONTRACTOR by law except the obligation to complete physically the execution of such portion of the Contract and/or the Works so as taken out of the CONTRACTOR's hands.
- 37.5 If this Contract, the Works, or any part thereof is taken out of the CONTRACTOR's hands pursuant to this Article, all material, plant and interest of the CONTRACTOR in all real property, licences, power and privileges acquired, used or provided by the CONTRACTOR for purposes of this Contract shall be the property of the PURCHASER without compensation to the CONTRACTOR and in particular, but without effecting any liability or obligation of the CONTRACTOR and/or any PURCHASER right imposed, conferred, or contemplated by any other provision of this Contract, the PURCHASER may, at his option, sell or otherwise dispose of, at forced sale prices, or at public auction or at private sale or otherwise, the whole or any portion of such material, and/or plant at such price or prices as he may see fit and retain the proceeds

of any such sale or disposition as well as all other amounts then or thereafter due by the PURCHASER to the CONTRACTOR, all in satisfaction or partial satisfaction (as the case may be) of any loss or damage which the PURCHASER has sustained or may sustain by reason aforesaid.

37.6 Subject to Article 37.5 above, if the PURCHASER considers that any PURCHASER property-interest possessed by virtue of Article 37.5 above, is no longer required for the purposes of the Contract, and that it is not in the interests of the PURCHASER to retain such property-interest then, upon written notice to such effect from the PURCHASER to the CONTRACTOR, such property-interest shall become the property of the CONTRACTOR.

ARTICLE 38

GENERAL PROVISIONS

38.1 No Implied Obligations

No implied obligation of any kind by or on behalf of the PURCHASER shall arise from anything in this Contract, and the express covenants and agreements herein contained and made by the PURCHASER are and shall be the only covenants and agreements upon which any rights against the PURCHASER are to be founded; and, without limiting the generality of the foregoing, this Contract supersedes all communications, negotiations and agreements, either written or oral, relating to the work and made prior to the date of this Contract.

38.2 Waiver or Estoppel

Notwithstanding anything contained elsewhere in this Contract no waiver or estoppel (if any) arising against a right or remedy of the PURCHASER on any occasion shall be deemed operative against such right or remedy if the relevant factual circumstances continue in existence beyond the date upon which such waiver or estoppel first arose or if there occur, subsequent to the said date, factual circumstances (whether or not similar to those first mentioned above) upon or against which the PURCHASER right or remedy would normally be invocable.

38.3 Provisions for Execution of the Work

The CONTRACTOR will provide everything necessary for the execution of the Work except things in respect of which this Contract expressly provides otherwise and except the Site of the Work if the Work when completed is to remain permanently affixed thereon.

38.4 Protection of Work and Documents

38.4.1 The CONTRACTOR will guard or otherwise protect the Work and shall protect the Contract, Plans and Specifications, information, material, and real property provided by the PURCHASER to the CONTRACTOR against loss or damage from any

cause, and without limiting the generality of the foregoing, from espionage and sabotage and will not disclose, issue, or use the foregoing except as may be essential for the fulfilment of this Contract without the written consent of the PURCHASER;

- 38.4.2 If any document or information given or disclosed to the CONTRACTOR is given a security rating the CONTRACTOR will take all measures directed by the PURCHASER to ensure the maintenance of the security rating;
- 38.4.3 The CONTRACTOR will provide facilities for and will assist any person authorized by the PURCHASER to inspect or to take security measures in respect of the Work;
- 38.4.4 The Engineer may direct the CONTRACTOR to do such things and to construct such works at his own cost, as the Engineer considers reasonable and necessary in order to ensure compliance with or to remedy a breach of the Article.

38.5 Precautions Against Damages, Infringements, Fire, etc. and Safety Measures

- 38.5.1 The CONTRACTOR shall at the CONTRACTOR's own expense do whatever is necessary to ensure that
- (a) no person, property, right, easement, or privilege is injured, damaged or infringed by reason of the CONTRACTOR's activities under this Contract;
  - (b) pedestrian and other traffic on any public or private road or waterway is not unduly impeded, interrupted or endangered by the execution or existence of the Work, material and/or Plant;
  - (c) fire hazards are eliminated and in the case of a fire in or about the Works, that it is promptly extinguished;
  - (d) the health of all persons employed in connection with this Contract is not endangered;
  - (e) adequate medical supervision of all persons employed in connection with this Contract is maintained;

- (f) adequate sanitation measures in respect of the Work are taken; and
- (g) all stakes, pegs, buoys and marks placed on or about the Works by or under the authority of the Engineer are protected and are not removed, defaced or altered.

38.5.2 The Engineer may direct the CONTRACTOR to do such things and to construct such Works as the Engineer considers reasonable and necessary to ensure compliance with or to remedy a breach of Subarticle 38.1 above.

38.5.3 The CONTRACTOR will at his own expense comply with a direction of the Engineer made pursuant to Subarticle 38.5.2 above.

38.6 Sales Territory

The PURCHASER has the right to sell the products and intermediates in the international market without any restriction imposed by the CONTRACTOR.

ARTICLE 39

ACCOUNTING AND INSPECTION OF RECORDS

- 39.1 The CONTRACTOR shall maintain suitable accounting and other relevant records and shall preserve these records for a period of at least one year after the Acceptance of the Works or the Termination of the Contract under Article 36.
- 39.2 The CONTRACTOR shall provide facilities to the PURCHASER and the Engineer to have access to and inspect CONTRACTOR's accounting and other records for evaluating the cost of variations under Article 28 or in assessing the cost of work done upon termination of the Contract pursuant to Article 36, or for exercising any such obligation under the Contract, which requires the access to and the inspection of the records of the CONTRACTOR.

ARTICLE 40

DETERMINATION OF REIMBURSABLE COSTS

(not applicable)



ARTICLE 41

LANGUAGE GOVERNING THE CONTRACT

41.1 The language of the Contract shall be \_\_\_\_\_. All correspondence, information, literature, data, manuals, etc. required under the Contract shall be in the \_\_\_\_\_ language.

41.2 All expatriates brought to the site by the CONTRACTOR should preferably be conversant in the \_\_\_\_\_ language. In the alternative, the CONTRACTOR shall make arrangements for the availability on Site of adequately experienced translators who can translate from \_\_\_\_\_ language to \_\_\_\_\_ language.

ARTICLE 42

APPLICABLE LAWS AND CONFORMITY WITH LOCAL STATUTES

- 42.1 The laws applicable to the Contract shall be the laws of the land where the Plant Site is located or as otherwise agreed between the parties in conformity with laws of the country where the Plant is located.
- 42.2 The CONTRACTOR, his staff, and representatives shall observe all codes, laws and regulations in force in the country of the PURCHASER and in the region where the Plant is located. In the event that any code, law or regulations enacted after the Effective Date of the Contract, affects the CONTRACTOR's obligations under this Contract, the PURCHASER shall either
- (a) obtain appropriate exemption(s) from the relevant authorities on the CONTRACTOR's behalf, or
  - (b) negotiate with CONTRACTOR for appropriate change(s) in the scope of the Work to be performed under the Contract, together with such changes in price as are proper.

ARTICLE 43

STANDARDS AND CODES

- 43.1 The standards used for the Works, except where mandatory local standards are available, shall be internationally recognised codes and standards wherever available. A list of international standards for Ammonia and Urea Plants and the Works is indicated in Annexure II. These or equivalent national standards will be permitted in designing the Works and for preparation of Specifications.
- 43.2 Wherever relevant international standards are not available, or where special standards of the CONTRACTOR or suppliers of Plant and equipment have been used for Ammonia and/or Urea Plants and civil engineering works, these may be used, provided that these are equivalent or better to International Standards, where the latter are available.
- 43.3 Mandatory national standards to which equipment must be designed or procured are indicated in Annexure II.

ARTICLE 44

NOTICES

44.1 Any notice to be given to or served upon either party under the Contract shall be deemed to have been properly served in the event that:

- 44.1.1 (a) Any notice to be given to the CONTRACTOR is conveyed by registered air mail post to or left at the address stated below, followed thereafter by the transmission of the same notice by cable or telex with a copy to be delivered to the CONTRACTOR's Site office at ( town ).  
(CONTRACTOR's address, cable address and telex number)
- (b) In the case of a notice to be served on the PURCHASER it is sent by registered air mail post to or left at the address stated below, followed thereafter by the transmission of the same notice by cable or telex.  
(PURCHASER's address, cable address and telex number)
- (c) In the case of a notice or information to be sent to the Engineer by the CONTRACTOR, or to be sent by the Engineer to the CONTRACTOR, such notice shall be delivered to the respective Site offices at ( town ).

44.1.2 When any such notice is sent by registered air mail post it shall be deemed to have been duly served at the expiration of seven (7) days following the date of posting and in proving such service it shall be sufficient to prove that the letter containing the notice was properly addressed as and put into the post as a registered air mail letter.

44.2 Either party may, by notice to the other party in writing, change its postal address, cable address or telex address for receiving such notices.

ARTICLE 45

SETTLEMENT OF DISPUTES

- 45.1 In the event of any dispute, difference of interpretation or clarification of certain provisions of the Contract, both parties shall promptly make endeavour to resolve the dispute or differences by mutual discussions and agreement. Should the dispute or differences continue to remain unresolved, both parties may nominate a neutral person to negotiate and reconcile the dispute, or the differences or give clarifications on the disputed provisions of the Contract.
- Pending resolution of any such claim or dispute, the CONTRACTOR will perform in accordance with the PURCHASER's instructions without prejudice to any claim by the CONTRACTOR for additional compensation and/or time to complete the Work if such instructions require him to perform above and beyond the requirements of the Contract and not merely in accordance with the reasonable meaning and intent thereof.
- 45.2 The CONTRACTOR will carry on the Work and maintain progress according to the schedule during the period the dispute is under consideration of the parties or the neutral person in pursuance of Article 45.1 above.
- 45.3 In case the efforts of the neutral person nominated by the two parties fail to resolve the differences, both parties to the Contract shall proceed to Arbitration under Article 46 of this Contract.

ARTICLE 46

ARBITRATION

- 46.1 (a) Either the PURCHASER or the CONTRACTOR may demand arbitration with respect to any such claim, dispute or other matter that has been referred to the PURCHASER. However, no demand for arbitration of any such claim, dispute or other matter shall be made until the earlier of (a) the date on which the PURCHASER has rendered his decision, or (b) the tenth day after the CONTRACTOR has presented his evidence to the PURCHASER if he has not rendered his written decision before that date. No demand for arbitration shall be made later than ten days after the date on which the PURCHASER has rendered his written decision in respect of the claim, dispute or other matter as to which arbitration is sought; and the failure to demand arbitration within said ten-day periods shall result in the PURCHASER's decision being final and binding upon the CONTRACTOR.
- (b) All claims, disputes and other matters in question arising out of, or relating to, this Contract or the breach thereof which cannot be resolved by the parties except for claims which have been waived by the making or acceptance of final payment as provided by Article 11 above, shall be decided by arbitration in accordance with the terms contained in Annexure XXIX attached hereto. This agreement so to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrator shall be final, and judgements may be entered upon it in any court having jurisdiction thereof.
- (c) Notice of the demand for arbitration shall be filed in writing with the other party to the Contract in accordance with the conditions contained in the Annexure referred to in Article 46.1 above. The demand for arbitration shall be made within the period specified in Article 45 where applicable, and in all other cases, within the time (as specified in Annexure XXIX attached) after the claim, dispute or other matter in question

has arisen, and in no event shall it be made after institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations;

- (d) The CONTRACTOR will carry on the Work and maintain the progress schedule during any arbitration proceedings, unless otherwise agreed by the PURCHASER in writing.

Technical annexures for the preliminary draft of the UNIDO  
model form of a lump-sum turn-key contract for the  
construction of a fertilizer plant

ANNEXURE I

BRIEF DESCRIPTION OF THE WORKS

The object of this Contract is to establish on a lump-sum turn-key basis, an Ammonia Plant with a daily capacity of (1000) tons per day along with a Urea Plant with a capacity of (1725) tons per day, to be located at (details of location) in (country).

The Plant will use natural gas from (source) as raw material, and will be designed to the process technology of (licensor) for the ammonia plant, and of (licensor) for the urea plant.

The basic steps in the manufacture of ammonia shall start from the specified natural gas as feed and shall consist of natural gas compression, hydrotreating and desulphurization, primary and secondary steam reforming, waste heat recovery to generate steam, high and low temperature shift conversion, CO<sub>2</sub> removal and recovery, methanation of carbon oxides, compression of synthesis gas using a turbine driven centrifugal compressor and ammonia synthesis.

The basic steps in the manufacture of urea are as follows:  
(Provide also a brief description of the urea process and other essential units envisaged by the Contract).

The facilities to be provided will include the generation of power and steam, for which an optimum balance between electric and steam drives will be made by the CONTRACTOR, and the Plant will use a closed cooling water circuit, with cooling towers and make-up water from (source).

The effluents from the plant will be disposed off to (disposal point) - and effluent treatment facilities will be provided to make the effluents fit for such disposal.



The plant site is located at a distance of \_\_\_\_\_ kilometres from the nearest large habitation and plant discharges to the air will be controlled accordingly.

NOTE: The description of the processes and block diagrams and/or the preliminary P and I flow-sheets may be taken from the tender documentation or should comply with those agreed upon at the offer stage of the pre-contract discussions.

ANNEXURE II

BASIS OF DESIGN

1. Raw material specifications

The raw material (natural gas) specifications should contain data on:

- (i) Source
- (ii) Pressure at battery limits of the plant site.<sup>1/</sup>
- (iii) Analysis of the gas, including, to the extent possible, the following:

Methane,	%	by volume
Ethane,	%	
Propane,	%	
Butane,	%	) If available in quantity the % in i-form and n-form should be given.
Pentane,	%	
Hexane,	%	
Nitrogen	%	
Carbon Dioxide	%	
Inerts	%	
Oxygen	%	
Water Content	%	
Total Sulphur	ppm v/v	
Sulphur as		
H <sub>2</sub> S	ppm v/v	
Sulphur as		
Organics	ppm v/v (including CoS)	
Lower Calorific		
value	Kcals/Nm <sup>3</sup> .	

Note: If data on Organic Sulphur, as ppm CoS, Mercaptans, Thiophenes etc. is available, this should be indicated.

2. Meteorological data

(a) Available average data

The available meteorological data for the Site (or the nearest station to Site) should contain the following information for each month of the year.

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<sup>1/</sup> Upper and lower limits of pressure should be indicated as this may have a bearing on the standard design pressure of equipment at the plant inlet point.

- (i) Daily average maximum temperature, °C.
- (ii) Daily average minimum temperature, °C.
- (iii) Monthly rainfall, mm
- (iv) Dry and wet bulb (°C), preferably both for morning (indicate time) and the afternoon
- (v) Prevailing wind direction,  
(If available, a complete rhumb-card indicating the yearly average occurrences of winds in the prevailing directions should be attached).

(b) Extremes recorded

This should contain data on the extremes recorded for:

- (i) Maximum temperature, °C
- (ii) Minimum temperature, °C (indicate whether pipes freeze)
- (iii) Maximum rainfall recorded in 24 hours
- (iv) Maximum recorded wind velocity. (Indicate occurrence of typhoons etc. or make reference to relevant standards concerning wind load design data at various levels of the highest structure to be designed).

3. Soil conditions

Soil conditions should include:

- (a) The type of soil.
- (b) The sub-soil water level at Site.  
(indicate whether water is sweet, saline or sea water).
- (c) The design bearing load capacity.

In case the soil bearing capacity differs considerably in various places of the plot, a plot plan indicating drilling points and findings should be attached.

4. Codes and standards<sup>1/</sup>

British and American standards applicable to the ammonia and urea plants and off-sites are as follows:

Reinforced and prestressed structures for storage of liquids	BS	CP	2007
Steel structures	BS	449	
Steel chimneys	BS	4076	
Steam boilers, superheaters and coils	ASME boiler and pressure code sect. I		

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<sup>1/</sup> The agreed upon British and American standards are given as examples. Other standards such as German DIN, Japanese JIS etc. should be specified accordingly if required or envisaged as alternates.

Convection coils	ASME
Tubular exchangers	ASME code, section VIII. Div. I and II TEMA standards (Class R)
Surface condensers etc.	American Heat Exchanger Institute
Pressure vessels (including condenser shells)	ASME code, section VIII, Div. I and II
Refrigerated tanks	API Std. 620 (with Appendices)
Atmospheric storage tanks	API Std. 650
Piping systems	ANSI B 31.3 ANSI B 16.5 ASME and API codes
Pressure relieving system	API. RP-520
Electrical code of practice	BS- CP321, 326, 1003 (for tropical usage) with class E insulation.
Electrical systems and electrical equipment	National codes
Instruments	ISA standards. (These depend on supplier practices and types of instruments. Applicable standards should be agreed upon between the CONTRACTOR and PURCHASER).
Hazard area classification	API American Petroleum Institute safety codes.

5. Statutory regulations

The statutory regulations relating to codes or other standards, or Factory Acts applicable in the PURCHASER's country should be specified herein. This particularly refers to boiler codes, and acceptance procedures applicable for endorsement of foreign standards prior to manufacture of the equipment. If necessary translations of local standards and regulations should be prepared and annotated to point out differences and permissible exceptions for imported equipment.

6. Limitation on transportation of equipment

The data supplied here should include:

- (a) Maximum lift available at port. (If ship's derricks can be used this should be stated).
- (b) Maximum dimensions and weights which can be carried by road from port to the Site.
- (c) Maximum dimensions and weights which can be carried by rail from port to the Site.

If possible drawings of waggon profiles, and section profiles of the smallest tunnel/bridge above rail etc. should be given.

7. Definition of battery limits

The battery limits of the area of plant design should be clearly stated and indicated on the preliminary plot plan with approximate data on elevation of the connecting points above and underground. An example is given below:

- Inputs - Natural gas shall be supplied by the gas distribution company, at a single point on the boundary of the plant, (Unit inlet or battery limit).
- Water shall be pumped to the plant site and will be available (provide separate data on cooling water and well water etc. as make-up water and utility water) at a single point in the plant. A plant storage at ground level of \_\_\_\_\_ m<sup>3</sup> is to be provided, and water will flow to this storage. All treatment and pumping facilities for the water will be a part of the CONTRACTOR's supply. Steam and power requirements will be generated in the Plant. External steam and power supplies will be connected to the respective points as indicated on the plot plan (separately for different parameters).
  - Standby and construction electric power will (or will not) be available. (Give details if available. Otherwise indicate type of emergency power source desired. This can also be used for construction).
  - All chemicals, catalysts will be supplied at storages/warehouses at ground level. (Indicate location at the construction site or within the plot).

Outputs - Power. Additional power to the extent of \_\_\_\_\_ KW will be generated for use by the PURCHASER (Housing Colony, Tubewell etc.).

- Surplus steam and condensate (specify parameters and quantities) will be piped to point \_\_\_\_\_ indicated on the plot plan.
- Facilities will be designed for filling liquid ammonia cylinders/ammonia tank wagons at a maximum rate of \_\_\_\_\_ tons per 8 hours.
- Urea will be packed in (50 kg net weight) bags. The bags will be (give details).
- Transport of urea will be:  
\_\_\_\_\_ % by road in \_\_\_\_\_ ton trucks from (No.) outlets.  
\_\_\_\_\_ % by rail in \_\_\_\_\_ ton wagons from (No.) outlets.

Rail/truck locations will be indicated by the CONTRACTOR but will be finalised after discussion with the PURCHASER and the national rail authorities.

- Effluents will be disposed off to \_\_\_\_\_.

Within the above battery limits, the entire plants and structures including the utilities and off-sites contained in Annexure VIII shall be designed by the CONTRACTOR. It is generally understood that if not specifically mentioned, the connecting points of inlet and outlet pipes will be one metre outside the battery limits or 250 mm above ground/floor level, flanged or unflanged, with the cut-off valves included in the scope of deliveries under this Contract.

## 8. Characteristics of utilities and services and limits of supply:

### 8.1 Electric Power:

- (a) All purchased standby electric power shall have the following characteristics, (indicate voltage, phases, cycles, 3 or 4-wire system).
- (b) All generated power shall have the following characteristics: (this should be discussed by the PURCHASER and the CONTRACTOR and should conform to national standards as far as possible).
- (c) Power supplied outside the battery limits shall have the following characteristics: (voltage, phases, cycles, 3 or 4-wire system).

### 8.2 Water

(Specify separately for water from different sources, as river, sea, well, pretreated water, recycled steam condensate etc.).

- (a) The source of water shall be (source)
- (b) The water has the analysis given below:

	<u>Normal</u>	<u>Variations</u>
Total hardness, ppm $\text{CaCO}_3$		
P.Value, ppm $\text{CaCO}_3$		
M Value, ppm $\text{CaCO}_3$		
Calcium ppm $\text{CaCO}_3$		
Magnesia ppm $\text{MgCO}_3$		
Sodium ppm Na		
Iron, ppm Fe		
Chloride, ppm Cl		
Sulphate, ppm $\text{SO}_4$		
Silica (dissolved), ppm $\text{SiO}_2$		
Total dissolved Solids, ppm		
Total suspended solids ppm		
pH		
Conductivity micro-mhos/cm.		

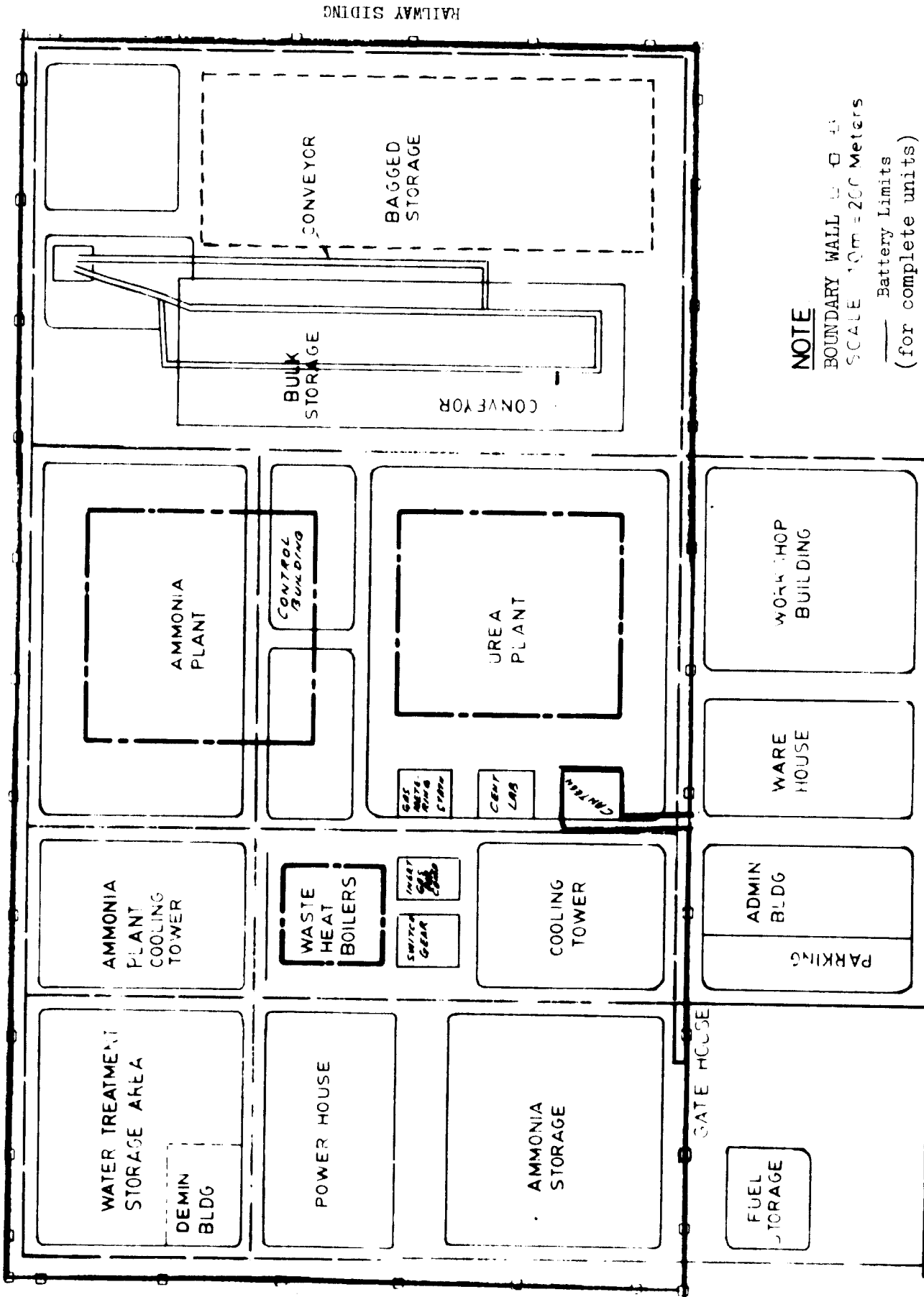
(c) (If there are large variations these should be explained in detail).

9. Effluent standards

(Local effluent standards, if any should be stated and indication should be made whether off-site biological waste water treatment is required, or envisaged in the design, or included in the scope of deliveries).

# BATTERY LIMITS ( AMMONIA / UREA PLANT )

ANNEXURE III



**NOTE**  
 BOUNDARY WALL 1.0 m  
 SCALE 1:1000 = 200 Meters  
 Battery Limits  
 (for complete units)

MAIN ROAD

RAILWAY SIDING

GATE HOUSE



ANNEXURE IV

DESIGN CRITERIA AGREED

(a) Meteorological:

- (i) The plant and equipment, particularly the 100 per cent capacity of the Air Compressor and the Prilling Tower will be designed for a maximum ambient in temperature of \_\_\_\_\_°C. (Suggest equivalent to extreme recorded).
- (ii) The plant and equipment, particularly piping shall be designed for a minimum temperature of \_\_\_\_\_°C. Water piping (shall/shall not) be designed for freezing conditions. (Suggest temperature in minimum recorded).
- (iii) Design will be for a maximum rainfall of \_\_\_\_\_ mm in 24 hours. (If flash storms of a few hours are possible, this should be indicated).
- (iv) The cooling towers shall be designed for an extreme wet bulb of \_\_\_\_\_°C, and dry bulb of \_\_\_\_\_°C, and will be designed to give cooling water of (32°C). (This is the suggested maximum for tropical countries. It can rise to 34°C in such areas as Bangladesh).
- (v) The Barometric pressure, when corrected to sea level can reach a minimum of (975) millibars, (can be lower for some areas). This must be corrected for the height above sea level of the Site which is \_\_\_\_\_ metres.
- (vi) Design wind velocity shall be \_\_\_\_\_ K.p.h. (or indicate local standards if applicable and specified for different levels above ground).

(b) Seismic Factor

The Seismic factor at Site, for design can be taken as \_\_\_\_\_.

(For purposes of structural design, seismic conditions and maximum wind velocity shall not be considered as occurring simultaneously).

(c) Natural Gas:

- (i) The Plant shall be designed for natural gas conditions as given in Annexure II, with the following extreme design analysis:  
(Give extreme ranges for each component of Natural Gas)

- (ii) The Sulphur guard will be for \_\_\_\_\_ ppm Sulphur. For design purposes the ratio of non-reactive to reactive sulphur shall be \_\_\_\_\_% to \_\_\_\_\_%.
  - (iii) The design intake pressure of gas shall be \_\_\_\_\_ Kgm/cm<sup>2</sup> at the battery limits of the entire works. (Refer to maximum pressure or standard design pressure for piping and valves).
  - (iv) Design temperature of natural gas at the battery limits shall vary between \_\_\_\_\_ °C and \_\_\_\_\_ °C.
- (d) Water:
- (i) The analysis of make-up water used for design shall be the extreme conditions contained in Annexure II.
  - (ii) Make-up water shall not exceed \_\_\_\_\_% of the circulating water. (For desert conditions 5-7%).
  - (iii) Where sea water is used for cooling, the sea water conditions at Site shall be carefully examined by CONTRACTOR to guard against fouling or corrosion. Sea water design intake temperature shall be (maximum recorded) and the outlet temperature of sea water from the Plant shall not exceed \_\_\_\_\_ °C, (for use of certain alloys, should not exceed 38°C).
  - (iv) The cooling water circuit shall be designed for a maximum T of \_\_\_\_\_ °C. (Suggested max. 10°C in tropics).
  - (v) The analysis of the demineralized water produced in the plant, in particular the Silica content, shall be suitable for use in (105) Kgm/cm<sup>2</sup> steam boilers and in the Ammonia plant circuit.
  - (vi) No parts of the cooling water circuit (pipes, valves and instrumentation) shall contain copper and copper alloys.
- (e) Soil Conditions
- Design load bearing capacity shall be as in Annexure II.
- (f) Electrical Generation
- (i) The Works shall be self-sufficient for electrical power. Power exported from the battery limits will be \_\_\_\_\_ Kw. Emergency Power supply is to be provided.

(ii) Line Voltages and characteristics shall be as follows:

High Tension: V 3 Phase, 3 wire 50 or 60 Hz A.C.  
3-Phase: V 3 Phase, (3 or 4) wire, 50 or 60 Hz A.C.  
1-Phase: V 1 Phase, (3 or 4) wire, 50 or Hz A.C.

(iii) Voltages for electrical motors shall be H.T. voltage for motors of 200 Kw or more, and L.T. 3 phase voltage for smaller motors.

(iv) Instrument Voltages shall be: (details).

(g) Instruments Air

The Complex shall be self-sufficient in instrument air supply under the following conditions:

- Outlet pressure conditions from instrument air unit 7 Kg/cm<sup>2</sup>g
- Quality Dew point below minus 20°C  
(for tropical countries  
otherwise minus 40°C)  
Free of oil.

(h) Inert Gas

Inert gas for the Plants shall be produced by the combustion of natural gas at the following conditions:

- Pressure 6 Kg/cm<sup>2</sup>g minimum
- Temperature Ambient
- Quality Suitable for plant purging  
and catalyst reduction.

(Alternatively: specify pure nitrogen, if available from existing external sources, air separation plant etc.).

(i) Steam

Three steam systems shall be provided in the Complex. These are:

	Pressure Kg/cm <sup>2</sup> g	Temperature °C
High pressure steam (HP)	(105)	(500)
Medium pressure steam (HP) ranges:	(37/25)	(270/225)
Low pressure steam (LP) ranges:	(4.5/2.5)	(155/138)

(in one system)

A steam condensate recycling system for non-contaminated steam shall be envisaged.

Surplus or contaminated steam condensate shall be:

- Cooled locally to \_\_\_\_\_ °C and discarded into \_\_\_\_\_  
water system sewage, cooling
- Flushed and piped to \_\_\_\_\_ (indicate place  
of utilization of waste heat or purification, or hot process  
water tank etc.

(j) Primary Reformer Furnace

The design of the reformer furnace shall be based on (a single row arrangement of reformer tubes or as otherwise agreed, please specify).

(k) Other Design Criteria

1. All dimensions and weights and measures including instrumentation will be indicated in the (metric) system. The dimensions of piping and parts of the heat exchangers may be indicated in the English system (indicate applicable standards).

2. Copper and copper bearing alloys shall not be used in the complex except for electrical system other than the grounding system and where otherwise agreed.

3. The Synthesis Gas Compressor system shall operate at a pressure of \_\_\_\_\_  $\text{Kgm/cm}^2$  at the intake of the Synthesis Gas loop. (Indicate standard design pressure which is higher).

4. Design criteria for concrete and steel structures (incl. anti-corrosion protection, prilling tower storage, flooring etc.) are as follows:  
\_\_\_\_\_ (or make reference to Annexure XXVII).

(l) Effluent Disposals and Emission Standards

See Annexure XVII.

ANNEXURE V

DOCUMENTS REQUIRING APPROVAL OF THE PURCHASER

1. Technical Documents for the following:
  - 1.1 Process:
    - (a) Process Flow Sheets (Plants and Utilities)
    - (b) P and I diagrams " "
  - 1.2 Equipments and Machines:
    - (a) Specifications for all Equipment and Machinery
    - (b) List of recommended vendors of critical items
    - (c) List of Recommended Spare Parts
  - 1.3 Piping:
    - (a) General layout of the Works
    - (b) Plot Plan for the Plants
    - (c) Terminal point drawings for interconnection of pipes going in and coming out of the Complex
  - 1.4 Instrumentation:
    - (a) General description of the Process with regard to the instrumentation
    - (b) General description of the control system and the proposed types of instrumentation
    - (c) Specifications of Control panels and Control desks.
    - (d) Description of the alarm and interlocking system
  - 1.5 Electrical:
    - (a) Electrical power balance and motor list
    - (b) Single line electrical diagram

1.6 Civil Engineering:

- (a) General Plot Plan
- (b) Foundation layout with locations and above ground dimensions
- (c) Layout of underground installations. Plans showing trenches for pipes and cables, sewage disposal
- (d) Preliminary profile drawings of the buildings with location of equipment and details of loads
- (e) Drawings showing where anticorrosion protection of structures and floors is necessary. Suggested maintenance access areas and apertures

2. As-built Documentation:

(These do not require PURCHASER'S approval but the PURCHASER will have the right to check)

- (a) Complete Civil Engineering drawings for all buildings including foundation details, steel details, and all structural details.
- (b) Complete as-built equipment layout
- (c) Complete as-built P and I drawings and piping isometrics
- (d) Complete as-built Instrument details and layout
- (e) Complete as-built electrical layout and cable details
- (f) Complete list of plant and equipment, with sizes of all technical parts, materials of construction, and for moving equipment, name of suppliers.

ANNEXURE VI

DETAILED DESCRIPTION OF SERVICES TO BE  
PERFORMED BY THE CONTRACTOR

These shall include but not be limited to;

1. Licences and Know-how
  - 1.1 Obtain the Licences and basic engineering for the plants from:
    - 1.1.1 (Process Licensor) for the manufacture of (1000) metric tons per stream day of specification grade Ammonia
    - 1.1.2 (Process Licensor) for the manufacture of 1725 metric tons per stream day of Urea
    - 1.1.3 (Process Licensor) for (specify other units).
2. Planning and Designing
  - 2.1 Procedures
    - 2.1.1 Determine procedures for the design of the plants and provide the philosophy and procedure for the design of the Utilities and Off-sites
    - 2.1.2 Suggest construction and commissioning procedures of the Plants
  - 2.2 Provide process block flow diagrams of the Plants
  - 2.3 Draw up a preliminary time schedule and critical path network for the engineering, procurement and deliveries, construction and commissioning of the entire works
  - 2.4 At an appropriate date, draw up a schedule showing the over-all cost and cash disbursements for the purchase of spare parts and the time when disbursement is anticipated
  - 2.5 Provide a general layout of the Works
  - 2.6 Assist in planning studies made by the PURCHASER
  - 2.7 Draw up a preliminary one-line electrical diagram
  - 2.8 Tabulate finalized design data

- 2.9 Draw up general specifications and recommendations for the plant and equipment, tools and materials to be used
- 2.10 Prepare block flow diagrams for Utilities
- 2.11 Prepare a plan for technical training
- 2.12 Prepare a preliminary organization structure for the Plants including manpower requirements
- 2.13 Prepare a list of reliable international suppliers of Equipment, for determining the final list of possible suppliers (see also Annexure XII)
- 2.14 Undertake the detailed engineering of the works to the extent necessary to supply the equipment and to perform the erection of the equipment

3. Civil Engineering

- 3.1 Provide the load and line layout data required to perform the civil, structural and architectural design for the works
- 3.2 Undertake the Civil Engineering design of all the structures and buildings in accordance with Annexure XXVII
- 3.3 Undertake the entire construction of all civil engineering works within battery limits, in accordance with Annexure XXVII

4. Supply of Equipment and Procurement of Spare Parts

- 4.1 Prepare a detailed equipment list
- 4.2 Check the detailed list with the list contained in Annexure VIII, and where there are inconsistencies obtain PURCHASER's approval
- 4.3 Procure and ship F.O.B. all plant and equipment that may be required under the Contract, in accordance with the specifications contained in Annexure VIII or approved by the PURCHASER
- 4.4 Arrange for transport to (port). No transshipment shall be permitted and transport must be direct
- 4.5 Arrange clearance at (port) and forwarding to (Site)



- 4.6 Arrange transport from port to Site
- 4.7 Arrange all Insurance from Suppliers works to Site
- 4.8 Check all equipment on arrival at Site. Identify shortages, put in Insurance claims and arrange replacements
- 4.9 Arrange to supply any equipment and materials to be locally procured
- 4.10 Supply a first charge of all catalysts, and one spare charge for each catalyst
- 4.11 Supply a first filling of all process chemicals (excluding feedstock)
- 4.12 Prepare a schedule of Equipment and spare parts deliveries and regularly follow up with the Suppliers so that the schedule is met
- 4.13 Undertake inspection and expediting services
- 4.14 Procure spare parts as per Annexure XXVI
- 4.15 Report at regular intervals to PURCHASER on anticipated deliveries

5. Planning

- 5.1 Prepare detailed works schedule and critical path network
- 5.2 Prepare drawings to be sent to the Site
- 5.3 Assist in Battery Limit connections of the Works
- 5.4 Submit progress report to PURCHASER and advise on steps that will be taken by CONTRACTOR to expedite erection, precommissioning and start-up
- 5.5 Arrange for overseas training of PURCHASER's personnel as provided in Annexure XVIII

6. Erection, Precommissioning Start-up and Operation

- 6.1 Perform the entire erection, and project management in accordance with Article 4 and 10
- 6.2 Undertake the installation of the Equipment and field fabrication, and provide all erection equipment for this purpose
- 6.3 Recommend an organization structure for the Works including manpower requirements, operators and technical personnel

- 6.4 Obtain, compile and draw-up operating manuals including analytical procedures and maintenance instructions, as per Annexure XXI
  - 6.5 Recommend inventory requirements for Chemicals, catalysts and supplies and assist in preparation of spare parts list and inventories
  - 6.6 Establish precommissioning and start-up programme
  - 6.7 Undertake the commissioning of machinery in co-operation with suppliers
  - 6.8 Undertake pressure testing (acceptance tests) of boilers and pressure vessels falling under the jurisdiction of local technical inspection and supervisory authorities
  - 6.9 Undertake, using PURCHASER's operators, the precommissioning and start-up of the Utilities and the Plants
  - 6.10 After discussions with the PURCHASER, to draw up the procedure for the performance of guarantee tests
  - 6.11 Perform guarantee tests according to the Contract
  - 6.12 Provide all the necessary documentation
7. Time Schedule for the Works and Reporting
- 7.1 Set up effective procedures for controlling and regularly reporting to PURCHASER the over-all progress on the Works in terms of time throughout the duration of the Contract
8. Miscellaneous
- 8.1 The CONTRACTOR will undertake any other services required for the turn-key establishment of the Works, other than those to be specifically arranged by the PURCHASER.

ANNEXURE VII

DETAILED DESCRIPTION OF SERVICES TO BE  
PERFORMED BY THE PURCHASER

1. The PURCHASER will provide facilities to the personnel of the CONTRACTOR deputed for work at PURCHASER's Head Office.
2. The PURCHASER shall obtain necessary area of land for the Works at the proposed site.
3. The PURCHASER may if he so desires, undertake independent inspection, of all or any Equipment, machinery and materials required for setting up the Works.
4. The PURCHASER shall arrange import permits/licences for all imported equipment and materials (as agreed between PURCHASER and CONTRACTOR) as are needed for the setting up of the Works, and will arrange export permits for the erection equipment of the CONTRACTOR.
5. The PURCHASER shall arrange all feed stocks, chemicals, catalysts, lubricants and utilities of quality as provided in the Contract or as otherwise agreed.
6. The PURCHASER shall arrange for classroom and on-the-job training of staff in addition to overseas training provided by the CONTRACTOR.

ANNEXURE VIII

SCOPE OF DELIVERY OF EQUIPMENT AND  
EQUIPMENT SPECIFICATIONS

1. The Annexure should state "The list of equipment given below is not exhaustive. The equipment to be engineered and supplied will include all equipment within the Battery Limits of design required to produce ammonia and urea, and to meet the Guarantees contained in the Contract."
2. (Complete Flow Sheets, and P + I diagrams, Plant Lay-out, Machinery Lay-out, diagrams etc. should be attached).
3. Each piece of equipment must be specified under each of the headings given below, and should contain the following data.

<u>Equipment</u>	<u>Number on Flow Sheet</u>	<u>Size and Technical Data</u>	<u>Material of Construction</u>
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3.1 The Plant sections suggested are:

3.1.1 Ammonia Plant

- (a) Desulphurization, Reforming and Conversion
- (b) Carbon Dioxide Removal and Methanation
- (c) Compressors and Drivers
- (d) Ammonia Synthesis
- (e) Purge Gas Absorption
- (f) Ammonia Storage

Note: Equipment within the subsections may be categorized as for the urea plant, using equivalent code numbers.

3.1.2 Urea Plant

- (a) Reactors
- (b) Towers
- (c) Heat Exchangers
- (d) Separators

- (e) Tanks
- (f) Ejectors
- (g) Compressors
- (h) Turbines
- (i) Pumps
- (j) Miscellaneous equipment

3.1.3 Product handling, bagging and storage

- (a) Urea handling equipment to storage
- (b) Urea storage (suggested capacity 60,000 tons)
- (c) Urea reclaiming equipment with a capacity of 160 metric tons per hour
- (d) Screening and dedusting for the reclaimed urea from the storage
- (e) Bagging station provided with a suitable number of bagging lines for a total bagging capacity of 160 metric tons per hour of urea

Each line will be completed with the hopper weighing machine, bagging machine, stitching machine or bag sealing or valve bag filling machines and a conveyor system for bulk and bagged urea

- (f) Road and rail cars loading system for bags shipment, to be dispatched as follows:

\_\_\_\_\_ % by road

\_\_\_\_\_ % by rail

Bags shall be with open mouth (valve) and for (50 kg) net contents.

The actual list of the equipment shall be determined during the layout and engineering design.

4. Utilities

- 4.1 The services that shall be provided in the plants are:  
(Supplement as appropriate).

- 4.1.1 Cooling water system
- 4.1.2 Raw water treatment
- 4.1.3 Demineralized water system
- 4.1.4 Fire-fighting and fire alarm system
- 4.1.5 Plant and instrument air system

- 4.1.6 Natural gas distribution system
- 4.1.7 Inert gas system
- 4.1.8 Effluents collection and disposal system
- 4.1.9 Steam generation, distribution and condensate recovery system
- 4.1.10 Interconnection (piping) system within the complex
- 4.1.11 Electric power generation and distribution system, lighting system, earthing system, emergency power generation and distribution system.

The actual list of itemized equipment shall be determined during the layout and engineering design.

5. Off-sites

5.1 The off-sites facilities that shall be provided in the works are:

- 5.1.1 Workshops for mechanical, electrical and instrumentation, maintenance and motor garage
- 5.1.2 Control laboratory
- 5.1.3 Warehouses for spare parts, stores, chemicals and lubricants
- 5.1.4 Administration and community buildings
- 5.1.5 Telephone and plant intercommunication system
- 5.1.6 Erection equipment
- 5.1.7 Fire-fighting equipment and health protection appliances.

6. Lists of equipment given for the plants represent only the itemized equipment and machinery, it being understood that bulk materials such as piping, electricals, instrumentation, insulation and painting necessary for the Plants are to be included in the scope of the equipment.

7. Critical items

7.1 (These need to be discussed at the time of the Contract because technologically and time critical items tend to change owing to process and market developments).

7.2 (Critical items for one contract have been:)

7.2.1 Ammonia

- (i) Primary reforming furnace
- \*(ii) Waste heat boiler

- (iii) Ammonia synthesis convertor
- \*(iv) Ammonia chillers
- \*(v) Air compressor with turbine
- \*(vi) Refrigerating ammonia compressor with turbine

7.2.2 Urea

- (i) Synthesis reactor
- (ii) Urea stripper
- (iii) 1st carbamate condensor
- (iv) 2nd carbamate condensor
- \*(v) Carbon dioxide compressor with turbine

7.2.3 Utilities

- \*(i) Turbo-generators

Note: (a) Items marked \* were time critical at that time.  
(b) At that time the desired equipment for the designed synthesis loop pressure could only be obtained from one supplier of synthesis gas compressor in time.

ANNEXURE IX

LIST OF CATALYSTS

(The type and quantity of catalysts should be specified, as well as the name of the suppliers).

The following catalysts are proposed for the Ammonia Plant as an example:

Duties	Particle size (mm)	Bulk Density (Kg/1)	Expected life (year)
<u>Desulphurisation</u>			
1. Hydrogenation of Natural Gas	2 - 5	0.85	4
2. H <sub>2</sub> S absorption	4 x 6	1.38	1/2/5
3. Activated Carbon			
<u>Reforming</u>			
4. Primary Reforming	16/6 5/16	1.66	3
5. Secondary "	19/9/19	1.0	5
<u>Conversion</u>			
6. H.T. Shift	6 x 6	1.06	3
7. L.T. Shift	4½ x 4½	1.06	2
<u>CO<sub>x</sub> Removal</u>			
8. Methanation	5 - 10	0.90	5
<u>Synthesis</u>			
9. HN <sub>3</sub> Synthesis	1½ - 3	2.7	5



ANNEXURE X

LIST OF SPARE PARTS

1. Within 6 months of the effective date of the Contract, the CONTRACTOR shall submit to the PURCHASER a list of Spare Parts required for 2 years operation of the Plant, along with an estimate of costs.
2. This list will include Spare Parts of a proprietary nature which will be purchased from suppliers, along with the main equipment.
3. For Spare Parts of critical items, orders will be placed along with the order for critical items.
4. Following the supply of lists for spares, the CONTRACTOR and the PURCHASER (or his Engineer) will scrutinise such lists, and will decide on the spare parts to be purchased, along with the revised cost.  
(Note: recommended over-all spare part purchase is 8% of the C + F cost of equipment for 2 years operation).
5. The Spare Parts will thereafter be purchased in accordance with the Contract, and Annexure XXVI.

ANNEXURE XI

LIST OF CHEMICALS

1. In addition to the catalysts contained in Annexure IX, the following additional chemicals will be provided.

(List of chemicals particularly overall charges of chemicals for the Carbon Dioxide removal system, water treatment, Anticorrosion, Antiscaling).

2. The annual requirements of the above chemicals are estimated as follows:

(Annual requirements including quantities to be kept on stock for replacement in emergency cases to be stated for each item).

3. At the projected meeting in the 4th month after effective date, the PURCHASER will advise the CONTRACTOR of the chemicals which can be procured in the PURCHASER's country, and those which must be imported.

4. CONTRACTOR shall thereafter arrange to procure in accordance with the Contract and Annexure XXVI, the initial requirement of chemicals, along with one years requirement of such chemicals. First change of chemicals will be supplied free by the CONTRACTOR.

ANNEXURE XII

LIST OF PREQUALIFIED VENDORS FOR  
CRITICAL EQUIPMENT

This equipment includes such dependable manufacturers of equipment, who had sufficient experience and provided heavy/long delivery/special/high duty equipment to the design of an engineering company in the shortest time. The specific equipment may vary from time to time and case to case. The CONTRACTOR should be restricted to such suppliers.

(i) Compressors and Pumps

Name of Company Country

(ii) Power Plants (Boiler House/Turbines/Transformer/Switchgear).

Name of Company Country

(iii) Reactors

Name of Company Country

(iv) Primary Reformer/Structure (For)

Name of Company Country

(v) Pressure Columns and Vessels

Name of Company	Country
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(vi) Manufacturers of special grade stainless steel

Name of Company	Country
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The above list is only indicative and may be supplemented in the course of engineering.

ANNEXURE XIII

EXCLUSIONS FROM THE SCOPE OF WORK OR SERVICES TO BE PERFORMED  
BY THE CONTRACTOR

1. The following scope of work or services will be EXCLUDED from the scope of design, procurement and erection supervisory services of the CONTRACTOR.

(a) Procurement of land for the Works on the Site.

(b) The procurement of all start-up chemicals. However, the first and a spare charge of catalysts which will be procured by the CONTRACTOR. The CONTRACTOR will furnish a list of such chemicals.

(c) The recruitment of all personnel for start-up and operation of the plant (other than the CONTRACTOR's expatriate personnel). The CONTRACTOR will however, advise the PURCHASER on qualification of such personnel, and will test them if required.

(d) The supply of all operational Chemicals, raw materials or other materials required for steady operation of the Plant, other than the first change of process Chemicals. (As provided in 1 (b) above).

(e) Management of the Works, after acceptance except as provided in the Contract.

ANNEXURE XIV

SCOPE OF WORK AND SERVICES TO BE PERFORMED  
BY THE PURCHASER

The scope of work and services to be performed by the PURCHASER  
are the items shown as Exclusions in Annexure XIII.

ANNEXURE XV

TIME SCHEDULE OF IMPLEMENTING EACH STAGE OF THE CONTRACT

1. TIME SCHEDULE

1. General basis of the over-all time schedule:

The time schedule for the completion of the works has been shown in the bar-chart attached (attach a bar chart) hereafter as a part of this Annexure and is based on the following considerations:

1.1 - All dates referred to hereafter start from the effective date.

1.2 - Delivery CIF of the equipment (with the exclusion of critical items) shall start from the \_\_\_ month (suggested 15th month) and end (95% of the value) by the \_\_\_ month. (Suggested 29th month)

1.3 - Delivery CIF of critical items shall end by \_\_\_ month. (Suggested 27th month)

1.4 - Duration of transport from ex-work deliveries to site is approximately 2 months.

1.5 - Civil work construction beginning from the 10th month.

1.6 - The duration of erection has been estimated on the basis that it will be performed by an experienced erection company.

1.7 - The last dates of deliveries as shown in the attached time-schedule are not the dates when shipment will be made. It is understood that there shall be shipments prior to that date, as and when the equipment is ready.

2. TECHNICAL DOCUMENTATION

2.1 The technical documentation described in this Annexure shall be supplied by the CONTRACTOR to the PURCHASER and shall include all the documents necessary to maintain the equipment and purchase spare parts. The technical

documentation shall be in English and shall include but not be limited to the following items, which shall be supplied not later than the time indicated against each item (the indicated times are in months and referred to the final issue of the documents as starting from the effective date).

2.1.1 Process Documentation

Delivery within  
(months)

(a)* Process flow sheets	
- for the plants	5
- for the utilities	8
(b)* P & I diagrams	
- for the plants	12
- for the utilities	15
(c) Material and heat balances for the plants and utilities	9
(d) Description of the process and information on the products	6
(e) List and process data sheets for all equipment and machines	9
(f) Specification of raw materials, utilities and chemicals	6
(g) Consumption of raw materials and utilities and chemicals	9
(h) Peak and average requirements of utilities for use in engineering of utilities	6(p)
(i) Properties of effluents (gaseous, liquid and solid wastes)	6(p)
(j) Details concerning quantities, frequency of discharge, temperatures etc. of effluents and waste materials	9
(k) Operating personnel required and their duties	12



2.1.2 Equipment and machines documentation

- (a)\* Specifications for all equipment and machinery 12
- (b) Manufacturers catalogues 24
- (c) Manufacturer's drawings for all equipment and machinery 24
- (d) Requirements for installation, maintenance and start-up for all equipment and machinery 24
- (e)\* List of recommended spare parts 15
- (f) Manufacturer's certificates and documents concerning workshop testing, pressure testing and acceptance by authorized inspectors of official inspection authorities in the manufacturers' countries 24

2.1.3 Piping documentation

- (a) Pipe line list and specifications including insulation requirements 9
- (b)\* General layout of the works 6
- (c)\* Plants plot plans 9
- (d)\* Terminal point drawings for the interconnection of pipes, going in and coming out of the works 6(p)
- (e) Model of the process plants and off-site units 18

2.1.4 Instrumentation documentation

- (a)\* General description of the process as it affects the instrumentation 8
- (b) General description of the control system and instrumentation
- (c) Detailed description of the alarm and inter-locking system 18
- (d) Description of the control room 18

(e)	Description of the special provisions for instrumentation in hazardous areas	15
(f)	Requirements for installation and start-up of the various types of instruments	24
(g)*	Specifications of control panels and control desks	18
(h)	List of instruments	8
(i)	Data sheets for all instruments	15
(j)	Orifice plate specification and typical calculation	18
(k)	Control valve specifications and typical calculation	18
(l)	Cable list	18
(m)	Instrument air tubing list	18
(n)	List of abbreviations and symbols used	8
(o)	Manufacturers pamphlets	24
(p)	Operation and maintenance instructions	24
(q)	List of settings of switches and relays for operation of alarms and interlocks	24
(r)	List of codes and standards used	8(p)

2.1.5 Electrical documentation

(a)*	Electrical power balance and motor list	6
(b)	Electrical diagrams	
	*- one line diagram	6
	- general and detailed diagrams	12
(c)	Electrical layouts and cable routing	18
(d)	Electrical equipment specifications and list	15
(e)	Installation, operation and maintenance instructions	24

2.1.6 Civil Engineering

The CONTRACTOR shall supply to the PURCHASER the basic data and detailed drawings of all civil engineering.

This documentation shall include:

- (a)\* General plot plan 4(p)
- (b)\* Foundations layout and details both below and above ground dimensions, and full details of reinforcement, and load characteristics 6(p)
- (c) Layout for underground installations showing trenches for pipes and cables, sewage disposal points etc. 6(p)
- (d)\* Complete civil engineering drawings of the buildings with location of equipment and details of loads, including loads and stresses from heavy piping supports 6(p)
- (e) Additional information on profile and loading drawings required for future expansions 9
- (f) Details of lightening protection provided for the plant 10

2.1.7 General documentation

- (a) Operating manuals including detailed instructions for the start-up, shut-down, operation at reduced capacity and for action in the plants in the event of break-down in the supply of raw materials and utilities, emergency instructions 24(p)
- (b) As-built documentation as specified in Annexure V clause 2
- (c) Recommendations for the protection of the plants and personnel against industrial hazards based on safety regulations of the country of origin of equipment 24
- (d) Instructions for the maintenance of the works with drawings, and maintenance manuals of all equipment 24

- |   |    |
|---|----|
| (e) Recommendations for the personnel number and qualifications, necessary to properly operate and maintain the plants (in addition to point 2.1.1.k) | 24 |
| (f) Recommendations for quality, quantity, frequency and points of lubrication preferably on internationally available and acceptance products        | 24 |

## 2.2 Delivery procedure of documentation

The procedure for the delivery of the documentation supplied by the CONTRACTOR shall be as follows:

- 2.2.1 The documentation shall be delivered to the PURCHASER's representative in the CONTRACTOR's offices or despatched to PURCHASER by air-way bill on a freight pre-paid basis and PURCHASER shall acknowledge each despatch immediately after receiving it. The date of delivery shall be taken to be the date of delivery to the PURCHASER's representative or the date of the air-way bill as the case may be.
- 2.2.2 The documentation shall be supplied in six (6) copies and a reproducible copy (with the exclusion of the catalogues, pamphlets and manuals supplied by the machinery suppliers.

2.3 The items of technical documentation marked (p) are the penalti-able documents mentioned in Article 11 and 25.

2.4 The items of technical documentation marked with an asterisk (\*) are those for which the approval of PURCHASER is required as mentioned in Annexure V of the Contract.

Note: A separate time schedule and bar chart may be worked out for delivery of documentation, showing separately for each item of of the above scope

- Contractor's documentation
- Subcontractors' and manufacturers' documentation
- Approval by the PURCHASER as per Annexure V.

Time schedule

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AMMONIA/UREA COMPLEX  
OVERALL EXPECTED TIME SCHEDULE

Description	MONTH
1. ENGINEERING	
11 PROJECT ENG	
12 DETAILED ENG	
13 CIVIL ENG	
14 PIPING ENG	
15 ELECTRICAL & INSTRUM ENG	
16 EQUIPMENT & MACHINERY	
2. PROCUREMENT & SHIPPING	
21 VESSEL COLUMNS/TANKS	
22 HEAT EXCH & HEATERS	
23 MACHINERY	
23 PIPING MATERIAL	
25 ELECTRICAL MATERIAL	
25 INSTRUM MATERIAL	
27 STEEL STRUCTURE	
3. CONSTRUCTION	
31 CIVIL WORKS	
31 STEEL STRUCTURES	
33 PIPING INCLUDING FABRICATION	
34 MECHANICAL ERECTION	
35 ELECTRICAL ERECTION	
36 INSTRUMENTATION ERECTION	
37 INSULATION & PAINTING	
4. CRITICAL EQUIPMENT	
41 ENGINEERING	
42 PROCUREMENT SHIPPING	
43 ERECTION	
5. PRE-COMMISSIONING/START-UP	
51 TESTS	
52 START-UP	
DELIVERY TO SITE	

MECHANICAL COMPLETION  
COMPLEXION

ANNEXURE XVI

QUALITY OF PRODUCTS  
(typical example)

1. AMMONIA

NH <sub>3</sub> Contents	99.8% by wt. minimum (G)
Water and Inerts	0.2% by wt. maximum (G)
Oil	5 ppm maximum (G)
Pressure at the battery limits of Ammonia Plant	(20 Kg/cm <sup>2</sup> g)

2. CO<sub>2</sub> GAS ON DUTY BASIS

CO <sub>2</sub> Contents	98.5% by Vol. minimum (G)*
Inerts, including water vapour	1.5% by Vol. maximum
Pressure at the battery limits of Ammonia Plant	(0.05% Kg/cm <sup>2</sup> g)
(* Take note of maximum outlet temperature)	

3. UREA

Type	Prilled (coated/uncoated)
Nitrogen	46.3% by wt. minimum (G)
Biuret	0.9% by wt. maximum (G)
Moisture	0.3% by wt. maximum (G)
Size	90% between 1 mm and 2.4 mm
Temperature	Not exceeding 65°C at the bottom of prilling tower

The characteristics marked with (G) are those for which the performance guarantees for quality of products are referred to.

ANNEXURE XVII

QUALITY AND QUANTITY OF EFFLUENTS  
EFFLUENT STANDARDS AND EMISSION STANDARDS

The quantity of effluents from the Complex shall not exceed the following under normal operating conditions:

(1) From Ammonia Plant (Benfield Section)

- Flow rate	3.3 t/hr
- Quality	Waste water saturated with CO <sub>2</sub> at 42°C with - approx. 50 ppm K <sub>2</sub> CO <sub>3</sub> - traces of DEA

(2) From Urea Plant

- Flow rate	39 t/hr condensate at 55°C containing approx. 200 ppm NH <sub>3</sub> and 400 ppm Urea
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Note: In some cases in compliance with local standards the process condensate may require further treatment within the Battery Limits of the Urea Plant or the Complex so that under (2) the effluent from the waste water desorber unit should be specified.

(3) Cooling Tower System

(a) Losses (evaporation)	400 m <sup>3</sup> /h
(b) Blow down and mist loss	230 m <sup>3</sup> /h
(c) Ammonia content	___ ppm NH <sub>3</sub>
(d) Urea content	___ ppm Urea

(The effluents shall be delivered at agreed designated points in the Plant Battery Limits).

ANNEXURE XVIII

TECHNICAL TRAINING OF PURCHASER'S PERSONNEL

1. The CONTRACTOR will provide technical training for the PURCHASER's personnel in accordance with Article 3 and 4.15 of the Contract for the following personnel and for the time stated against each personnel.

<u>Designation</u>	<u>Number</u>	<u>Time</u>	<u>Training Units</u>
(a) Chief Production Manager	1	7 months	Ammonia Plant Urea Plant Overall Management
(b) Chief Mech. Engineer	1	6 months	Ammonia Plant and Urea Plant Maintenance facilities Instruments
(c) Production Engineers	4	6 months	Ammonia Plant
		1 month	Urea Plant
	4	6 months	Urea Plant
		1 month	Ammonia Plant
(d) Electrical Engineer	(1)*	3 months	Power Station
(e) Instruments Engineers	2	6 months	Instruments. Course Plant Instrument Maintenance
(f) Maintenance Engineers	2	3 months	Maintenance of Plants Workshops
(g) Chemists	2	3 months	Laboratory and Field Analysis
(h) Chief Chemist	1	3 months	Laboratory and field Analysis. Research

2. In addition the CONTRACTOR will assist the PURCHASER in setting up a training school at site to train plant engineers and operators in operation of the plants, and field staff in maintenance of the plants.

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\* / May be increased to 4 if required.



ANNEXURE XIX

PROCEDURES FOR CHANGES IN THE SCOPE OF WORK

(This has already been dealt with in great detail under Article 28, VARIATIONS, CHANGES AND ADDITIONS TO SCOPE OF WORK).

In specific cases where modifications of details of the process documentations are expected owing to new developments based on recent research at the time of signing the Contract, Annexure XIX is to be used to specify particular procedures.

ANNEXURE XX

PRE-OPERATING PROCEDURES AND PROCEDURES FOR  
GUARANTEE TESTS

1. Mechanical Completion Operations:

These operations include the following:

- 1.1 Conduct the hydrostatic, pneumatic, and other field tests of operating equipment embodied in the Plants which are set forth in the specifications.
- 1.2 Prepare all sections of the Plants and Utilities to meet safety requirements.
- 1.3 Align pumps and drivers.
- 1.4 Install packings in pumps and compressors.
- 1.5 Install packings and lubricants in valves and cocks.

2. Pre-commissioning Operations:

These operations include the following:

- 2.1 Fill lubricating and seal oil in the Equipment where required.
- 2.2 Check motor rotation and turbine speed, including overspeed trips.
- 2.3 Furnish and install startup suction strainers in pumps, blowers and compressors.
- 2.4 Circulate lubricating and seal oil in blowers and compressors to assure correct operations.
- 2.5 Dry out and cure linings in primary waste heat boiler, secondary reformer, transfer line auxiliary boilers of the Utilities etc., dry out primary reformer heaters and other such refractories.
- 2.6 Clean all lines of loose materials by flushing or blowing and do any other special cleaning or preparation of individual lines as may be called for in the specifications or drawings, including cleaning of the H.P. steam system, demineralized water lines and CO<sub>2</sub> removal system. Boil out auxiliary boilers and waste heat boilers.

- 2.7 Pull all blinds except those installed for operation.
  - 2.8 Install orifice plates after lines are hydrostatically tested and flushed.
  - 2.9 Check correct action of instruments as far as possible.
  - 2.10 Connect thermocouples, check connexions and check-out circuits.
  - 2.11 Remove all loose material from vessels and load all internals and packing materials. Vessels to be closed up except vessels containing catalysts.
  - 2.12 Load all catalysts and close up the reactors.
  - 2.13 Fill electrical equipment with oil as required.
  - 2.14 Check electrical installation to check operability.
  - 2.15 Conduct preliminary tightness tests and purge the unit.
  - 2.16 Conduct pre-operation pressure testing and acceptance tests as required by local technical inspection authorities and issue the pertinent documents.
  - 2.17 Conduct a simulated operation of sections of the plant using air, water and steam wherever possible. Circulate water through the piping system where possible. Operate all pumps which can be run on cold or hot water for an adequate time following special instructions worked out for this purpose.
3. Guarantee tests
- 3.1 Procedure for these shall follow the procedures laid down in Article 19 of the Contract.

ANNEXURE XXI

MANUALS

1. As part of his Contract Services, the CONTRACTOR shall provide to the PURCHASER 6 copies each of the following Manuals: (Give full details)

- (a) Operating Manual, with complete details of the operation at capacity under all conditions of the Ammonia and Urea Plants to produce specifications grade products.
- (b) Maintenance Manual, for the maintenance of all major Plant and Equipment, particularly all Pumps, Turbines, Compressors, Workshop Machines, Electrical Motors, Generators, etc. This will be in addition to machinery supplier's Maintenance Sheet, and will include instructions on lubrication.
- (c) Manual of Safety Procedures, for all Safety and Emergency measures for operation of the Plant.
- (d) Manual of Analytical procedures for all routine, emergency and monitoring tests required for the operation of the plant, monitoring the effluents and emissions and checking the quality of raw materials and finished products.
- (e) Manual for Monitoring Environmental Aspects.
- (f) Manual for Instrumentation Maintenance.
- (g) Special instructions for maintenance and calibration of in-line analysers.

2. All the above manuals shall be in the (\_\_\_\_\_) language.

3. In addition the CONTRACTOR will provide the PURCHASER in original, all pamphlets, installation, operation and maintenance instructions etc., received from supplier's and where required shall identify the equipment to which such instructions refer.

ANNEXURE XXIII

FORM OF BANK GUARANTEE

At the request of (Name and Address of CONTRACTOR) (hereinafter called CONTRACTOR), We hereby give our irrevocable guarantee No. \_\_\_\_\_ for a maximum amount of \_\_\_\_\_ (Amount)

In consideration of the CONTRACTOR having entered into a Contract dated \_\_\_\_\_ (hereinafter called "Contract") with \_\_\_\_\_

(name and address of the PURCHASER), (hereinafter called PURCHASER) for the setting up of Ammonia, Urea and Auxilliary Plants on a turn-key basis at \_\_\_\_\_

as desired by the PURCHASER we (Bank) do hereby agree and undertake to pay forthwith to the PURCHASER in repatriable (U.A.) currency on demand by PURCHASER and without prior recourse to CONTRACTOR such sum or sums not exceeding \_\_\_\_\_ (Amount) \_\_\_\_\_ as may be demanded by the PURCHASER stating that the CONTRACTOR has failed to fulfil his obligations relevant to Performance Guarantees under the Contract for which reasons the CONTRACTOR is liable under the Contract.

It is understood and agreed that any demand made hereunder by the PURCHASER shall be conclusive evidence of CONTRACTOR's failure to comply with his obligations relevant to Performance Guarantees under the Contract.

The amount being guaranteed hereunder shall be applied towards the payment by CONTRACTOR of damages under and in accordance with the Contract.

This bank guarantee shall come into force immediately and shall remain valid for a period of \_\_\_\_\_ months such period to be extended for additional six (6) monthly periods, in accordance with the Contract, up to the date of acceptance by PURCHASER of the Plants as per the Contract and we \_\_\_\_\_ (Bank) \_\_\_\_\_ shall at all times prior to such acceptance be bound on the demand of PURCHASER to forthwith pay to the PURCHASER in parts or in full the amount guaranteed hereof.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ (Bank)

ANNEXURE XXIV

PACKING, SHIPPING AND MARKING INSTRUCTIONS

1. The CONTRACTOR shall ensure that in procurement and in inspection, all items of equipment are delivered in proper sea-worthy packing, and where special protection is required, shall so specify in the procurement specifications, and will inspect the items accordingly.
2. The CONTRACTOR shall ensure that clean bills of lading are obtained for all deliveries. Where space limitations will only permit deck cargo, CONTRACTOR shall specify the special protective measures required to protect equipment during sea transport.
3. Where air or land shipment is involved, CONTRACTOR shall give appropriate packing instructions.
4. In the event that due to late deliveries or procurement, shipments have to be made by air instead of by sea, CONTRACTOR will advise PURCHASER on packing and give appropriate instructions.
5. During Inspection, the CONTRACTOR shall ensure that:
  - (a) A packing list is enclosed with all closed packages.
  - (b) Signs are placed in \_\_\_\_\_ and \_\_\_\_\_ languages indicating top and bottom, and where essential, points for locking crane lifts.
  - (c) The packages are marked as given below:  
(alternately as agreed between PURCHASER and CONTRACTOR).  
(marking instructions)
  - (d) Certificates of origin, where required, are available.
6. The number of invoices, the methods of despatch of original invoices, etc., will be in accordance with Annexure XXVI.

ANNEXURE XXV

STORAGE AT SITE, GENERAL AND MARKING INSTRUCTIONS

The CONTRACTOR shall review when the procurement has been planned to further streamline these instructions also supplying numbers allotted to equipment and parts and strategy for storage erection, and marking.

1. The area for the storage of equipment should be:

- (i) At a distance from fuel oil storages
- (ii) Near the points of erection, also near rail siding
- (iii) Higher in level by about ( ) inches above the rest of the site or raised by earth filling
- (iv) Properly consolidated and paved with (bricks) suitable for heavy trucks and mobile cranes and sloping towards arterial drains
- (v) Provided with arterial drains joining with common drains at either end
- (vi) Adequate to store all equipment (area approx \_\_\_\_\_), machinery and materials except large towers, reactors and boilers
- (vii) Well connected by internal roads to different points where equipment is to be installed
- (viii) Cordoned with boundary wall/barbed wire
- (ix) Properly lighted.

2. Storage instructions:

- (i) Equipment packages to be stored in bags so that a package is reached from one side by a lifting device (crane, trolleys, fork lifters etc.) and provide free access on two other sides, free access at all places for fire fighting purpose
- (ii) Packages are placed on bricks allowing free flow of water or approach of lifting tackle underneath
- (iii) Packages are stored in rows depending on the erection plan

ANNEXURE XXVI

PROCUREMENT PROCEDURES FOR SPARE PARTS

1. The mode of procurement of spare parts, is given in this Annexure.
2. CONTRACTOR will supply a complete list of spare parts within \_\_\_\_ months of the Effective Date, with itemized prices for approval by the PURCHASER. PURCHASER will convey his approval within 3 months, or suggest changes.
3. The CONTRACTOR will give to the PURCHASER a list of companies pre-qualified by him for purchase of different types of spare parts. PURCHASER shall have the right to add or subtract from such list of prequalified vendors.
4. The PURCHASER and the CONTRACTOR shall agree on the general format of the purchase orders to be issued for procurement at the meeting proposed in the 4th month after the Effective Date.
5. The CONTRACTOR shall after approval by the PURCHASER of the spare part list issue tender specifications for each item of spare parts, modifying or extending the general format as the need may arise. Where PURCHASER's representatives are available at CONTRACTOR's offices, PURCHASER's representatives will approve such specifications.
6. The CONTRACTOR shall receive bids and will open the price tenders in accordance with the procedure laid down between the PURCHASER and the CONTRACTOR (and the name of financing agency). Any clarification requested from Bidders shall be undertaken in writing or in the presence of the Site representatives of the PURCHASER. Where Site representatives of the PURCHASER are not present, complete minutes of such meetings will be sent to the PURCHASER.
7. The CONTRACTOR shall prepare bid tabulations in ample detail to enable PURCHASER to select the final bidder, and will make recommendations to the PURCHASER on the selection of the vendors. Should the chosen vendor not be the lowest bidder, full details will be supplied on reasons for rejection of other vendors. The CONTRACTOR and the PURCHASER will jointly select the vendor with whom the order is to be placed.



8. The CONTRACTOR will prepare the final purchase orders, fully safeguarding the PURCHASER's interest, for signature by the PURCHASER or his representative at Site.
9. The PURCHASER shall thereafter open letters of credit, or provide appropriate payment guarantees acceptable to the vendor, within the time limits agreed in the purchase order.
10. The CONTRACTOR shall ensure that all orders are placed for delivery dates in accordance with the time schedule laid down in Annexure XV. The PURCHASER shall ensure payment in accordance with the purchase orders.
11. For purchases made under loans from (name of financing agency) the CONTRACTOR undertakes to follow the procedures of such financing agency, without extra charge to the CONTRACTOR.

ANNEXURE XXVII

CIVIL ENGINEERING DESIGN AND CIVIL ENGINEERING WORKS

This Annexure can only be prepared in detail for a specific project.  
It should contain:

1. Design criteria.
2. Material specifications.
3. List of buildings.
4. Type of buildings:
  - Details of:
    - Foundations
    - Structures
    - Roof
    - Flooring
  - Details of protected areas.
5. Construction specifications.
6. Checks and repairs.

When formulating this Annexure care should be taken that no repetition and contradiction occurs with stipulations laid down in other Annexures, e.g. II, IV (k) 4., VI (3), XV (2.1.6.)

ANNEXURE XXVIII

INSURANCE POLICIES

I. INSURANCE POLICIES

1. "Construction All Risks" (C.A.R.) or "Erection All Risks" (E.A.R.) policy. This is to insure the Works under construction, including all plant buildings, equipment and materials incidental thereto, while at the site from the start of work until final Acceptance by the PURCHASER.

This insurance would normally be in the name of the PURCHASER and CONTRACTOR.

2. "Machinery Breakdown Policy" to cover the breakdown of machinery while under construction or during trial operation of the Plant, including boilers, pressure vessels, turbines etc., and explosion risks incidental thereto.
3. Endorsement to the above policies, particularly to the E.A.R. policy, for "faults in design", covering the replacement and repair of machinery damaged due to faults in design, faulty workmanship and faulty material, up to the Guarantee Tests.
4. "Loss of Advanced Profits Insurance" (sometimes called "Machinery Consequential Loss ((Interruption)) Insurance") which covers consequential loss to the PURCHASER, after start-up, due to faults in erection or mechanical or electrical breakdown.
5. "Professional Indemnity Insurance" which covers the errors and omissions, negligence, failure in performance, mistakes in design, etc., of the engineering companies.
6. "Marine Insurance" or "Cargo Insurance Policies" covering the transit of goods ex-works from the fabricator's workshops to the Site of the Plant. This may or may not include War Risks insurance, as agreed by the PURCHASER and the CONTRACTOR.

7. Bodily Injury and Personal Liability Insurance, including that to third parties.
8. Specific insurances or endorsements for such items as elevator and hoist liability, shoring, blasting, excavating etc.
9. Coverage of Insurance Liabilities on the use of Automobiles, Trucks, Aircraft, Launches, Tugs, Barges, etc.
10. Insurance of liability for payments under Workmen Compensation Acts, as required under appropriate legislation.
11. Insurance for PURCHASER's transport.
12. Bodily Injury and Personal Liability Insurance for PURCHASER's personnel.

## II. RESPONSIBILITY FOR COVER

1. The CONTRACTOR at his own cost shall be responsible for the taking out of all the above mentioned policies except for items 11 and 12 above.

## III. GENERAL PROVISIONS

1. All policies taken out by the CONTRACTOR shall to the extent possible be jointly in the name of the CONTRACTOR and the PURCHASER.
2. In particular cases e.g. when there is a Faulty Design endorsement to the E.A.R. policy, insurance companies may insist on the policy being taken out jointly in the name of the CONTRACTOR and PURCHASER.

ANNEXURE XXIX

To be drafted later by UNIDO



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