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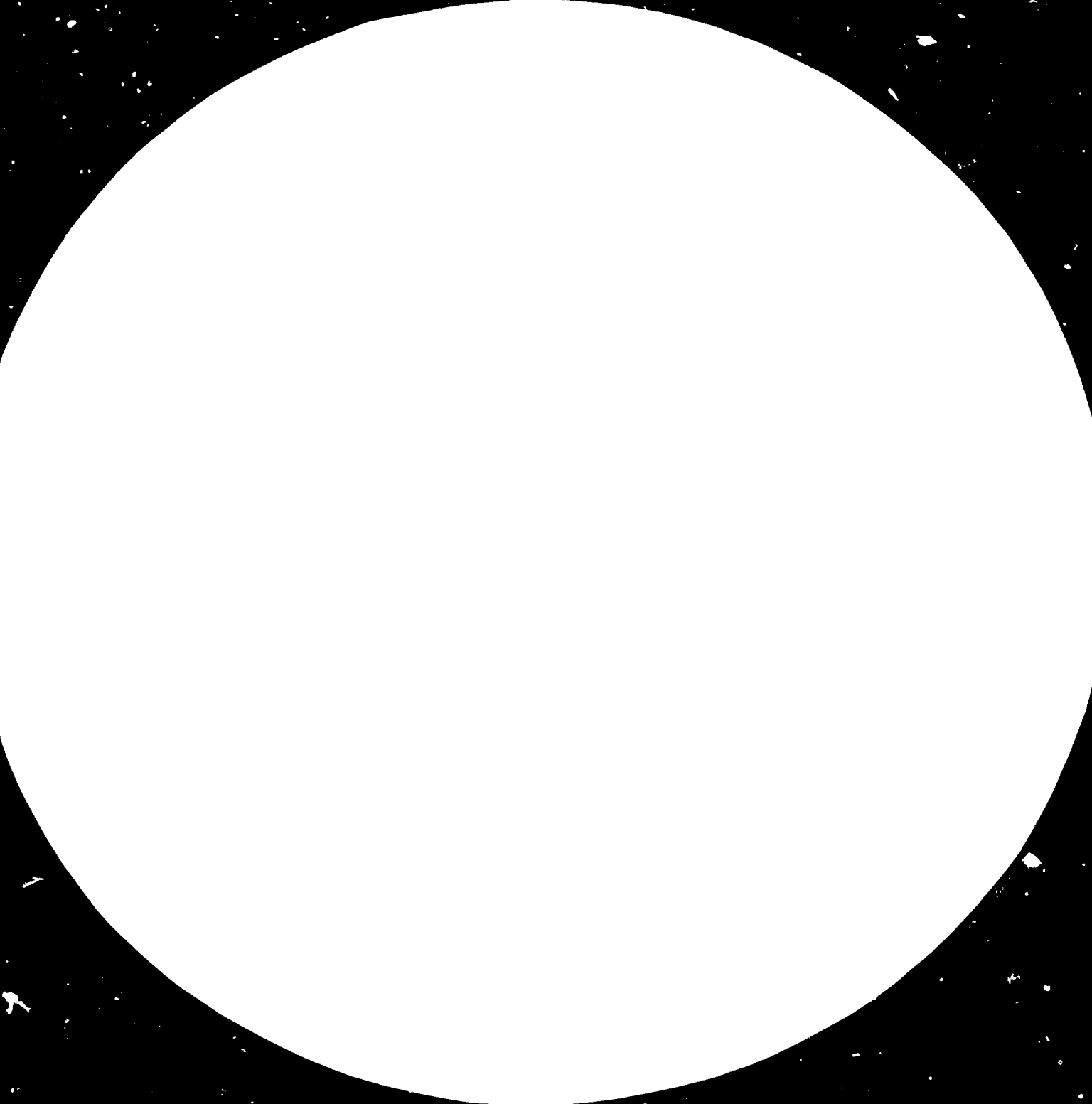
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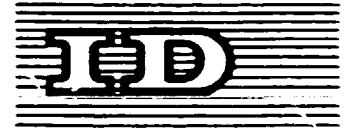
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United Nations Industrial Development Organization

Distr.
LIMITED

ID/WG.318/1
21 March 1980

ENGLISH

Third Consultation on the Fertilizer Industry
São Paulo, Brazil, 29 September - 3 October 1980

SECOND DRAFT OF THE UNIDO MODEL FORM OF
TURN-KEY LUMP-SUM CONTRACT FOR THE
CONSTRUCTION OF A FERTILIZER PLANT*

by the UNIDO Secretariat

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INTRODUCTION

1. The Second Consultation on the Fertilizer Industry in Innsbruck, Austria, 6-10 November 1978, requested the UNIDO Secretariat to prepare a UNIDO Model Form of Turn-Key Lump-Sum Contract for the Construction of a Fertilizer Plant for consideration by the Third Consultation in 1980.
2. The UNIDO Secretariat requested comments on the draft of a Turn-Key Lump-Sum Contract prepared for UNIDO by National Design and Industrial Services Corporation Limited of Lahore, Pakistan which was made available to participants at the Second Consultation Meeting as document ID/WG.281/CRP.2. Written comments were received from a number of participants at the Consultation and a few other suppliers and purchasers of fertilizer plants.
3. With the benefit of these comments, the First Draft of the UNIDO Model Form Turn-Key Lump-Sum Contract was prepared for the consideration of the Expert Group Meeting on UNIDO Model Forms of Contract for Fertilizer Plants convened in Vienna from 26-30 November, 1979.
4. This Second Draft was prepared taking into account comments made at the Expert Group Meeting. As suggested, the order of the Articles has been changed to correspond to the plan of implementing the work and some Articles have been combined, thereby reducing the number from 47 to 40.
5. The Annexures for this contract specific to an ammonia/urea complex will be issued as an addendum to this document. A similar set of Annexures for a phosphoric acid/triple super-phosphate fertilizer complex is under preparation.

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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 "Absolute Guarantees" shall mean the performance guarantees of Ammonia and Urea Plants relating to capacity of the Plant(s) and quality of the products, as set forth in Article 26 and Annexure XVI.
- 1.3 "Act of Bankruptcy" has the meaning assigned to it by the Bankruptcy Acts in the applicable jurisdictions under governing laws.
- 1.4 "Approval" shall have the meaning ascribed in Article 39.3.
- 1.5 "Battery Limits" shall be defined to mean and include the overall facilities embodying the Plant as detailed in Annexure III, being all of the facilities required for the production of Ammonia and Urea including the power plant, other utilities and off-sites.
- 1.5.1 The Battery Limits of each individual plant (Ammonia and Urea Plants) shall include all the facilities existent between the points at which raw materials and influent streams enter the Plant and the points at which finished materials and effluent streams leave the Plant and shall be deemed to include, except where otherwise provided, the storage for the products.
- 1.6 "Commercial Production" shall mean the continuous production of specification grade ammonia and urea at the rate and for the period specified in Article 18.11.
- 1.7 "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, and the Acceptance Certificate has been issued.

- 1.8 "Confidential Information" shall mean the Confidential Information defined as such in Article 7.
- 1.9 "Contract" means this Contract (together with the Annexures and Specifications) entered into between the PURCHASER and the CONTRACTOR for the execution of the Works howsoever made, together with all of the documents to which reference has been made in the Contract documents, including such amendments and/or changes, (properly made from time to time by mutual agreement between the parties) to the documents constituting this Contract.
- 1.10 "CONTRACTOR" means the party named as such in this Contract or his successor or permitted assigns.
- 1.11 "CONTRACTOR'S Equipment" means any equipment, sheds, materials, tools, stores or things brought on Site by or on behalf of the CONTRACTOR for the execution of the Contract, but not for permanent incorporation in the Plant.
- 1.12 "Contract Price" means the total amount referred to in Article 20.1, subject however, to any valid adjustments made through the application of relevant contractual provisions provided for therein or as specifically elsewhere provided for in the Contract.
- 1.13 "CONTRACTOR'S Services" means the services to be provided and the work to be done by the CONTRACTOR in the execution of the Works, as set out in the Contract.
- 1.14 "Critical Items" shall mean all the equipment specifically designated as such in Annexure VIII.
- 1.15 "Days" shall be calendar days.
- 1.16 "Engineer" means the person(s) of firm(s) appointed from time to time and designated by the PURCHASER as its representative with specified authority to review all work on the PURCHASER'S behalf and to give such instructions and/or grant such approvals as may be necessary for the purposes of this Contract.

- 1.17 "Equipment" shall mean all of the equipment, machinery, materials, and first charge of chemicals and catalysts required to be incorporated permanently into the Plant(s) (with the exclusion of materials for civil works) in order for the Plant to be built in accordance with the Contract.
- 1.18 "Final Acceptance" shall be deemed to mean the date on which the Work(s) are finally accepted in accordance with Article 18 and specifically Article 18.20 and a Final Acceptance Certificate is issued.
- 1.19 "FOB", "CIF" and "C and F" shall have the meanings assigned to them in "INCOTERMS 1953", published by the International Chamber of Commerce.
- 1.20 "Guarantee Tests" shall mean the test operation of each individual plant and the Plant as a whole to be undertaken for the purpose of demonstrating the Performance Guarantees, as specified in Article 26.
- 1.21 "Holding Company" and "Subsidiary" have the meanings assigned to them by the prevailing statutes in the applicable jurisdictions under governing laws.
- 1.22 "Initial Operation" shall mean providing the first feed of the feedstock to the Plant concerned.
- 1.23 "Materials" means machinery, other items of equipment and other things needed or intended to form part of the Plant.
- 1.24 "Mechanical Completion" shall mean the time when the physical construction of the Plant(s) 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 each of the Plants and inclusive of facilities within the Plants, and all sections of the Off-sites and Utilities have been issued.

- 1.25 "Mechanical Completion Certificate" means the document that will be issued pertaining to the Mechanical Completion of the Plant.
- 1.26 "Modification(s)" or "Modify" shall for the purposes of Article 29 be deemed to cover all work and/or services within the scope of the Contract required to be undertaken by the CONTRACTOR (which require implementation by a change order but do not involve any increase in price) incidental to and/or involving, corrective engineering, replacement and/or repair of equipment and parts related thereto, and/or elimination or design and/or mechanical and/or process defects whether or not the causes requiring the modifications became patently or latently manifest, and whether or not the said defects or malfunction or problem arises in relation to a process, mechanical and/or design relationship, and/or relates to insufficiency and/or inadequacy in workmanship and/or materials and/or specifications, and includes corrective work related to civil engineering, construction and site preparation, all within the scope of the Work(s).
- 1.27 "Penalizable Guarantees" shall mean the performance guarantees of the Plant(s) relating to consumption of raw materials and utilities as set forth in Article 26.
- 1.28 "Performance Guarantees" shall mean the Absolute Guarantees and the Penalizable Guarantees.
- 1.29 "Plant" means the ammonia plant, the urea plant, the off-sites, utilities and the administrative, maintenance, laboratory and other facilities as defined in this Sub-article, in the Annexures and the Specifications, to be supplied by the CONTRACTOR under the terms of this Contract, to be constructed at the Site, and in respect of which the CONTRACTOR's Services are provided.

- 1.29.1 "Ammonia Plant" shall mean the ammonia plant as described in Annexure VIII.
- 1.29.1.1 "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, under the Contract.
- 1.29.2 "Urea Plant" shall mean the urea plant described in Annexure VIII.
- 1.29.2.1 "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, under the Contract.
- 1.30 "Products" shall mean the ammonia and the carbon dioxide produced in the Ammonia Plant and the urea provided in the Urea Plant, of such quality as defined in the Annexures and Specifications.
- 1.31 "Provisional Acceptance" shall be deemed to mean the date when the individual plants have been provisionally accepted and confirmed by the issue of a Certificate of Provisional Acceptance in accordance with Article 18, and demonstration of the capability of the utilities and off-sites (together with the sufficiency of carbon dioxide) to meet the guarantees specified in Article 26.
- 1.32 "PURCHASER" means the party named as such in this Contract or his successors or permitted assigns.
- 1.33 "Ready for Operation" shall mean that the Plant(s) concerned have completed the Mechanical Completion Tests and are ready for Initial Operation.

- 1.34 "Rectification" or "Rectify" shall have the meaning ascribed in Article 29 and shall in all cases be deemed to cover work and/or services within the scope of the Contract which do not require implementation by change order and do not involve any increase in price.
- 1.35 "Site" means the land upon which the Works are to be constructed as specified in Annexure I.
- 1.36 "Specifications" means the technical criteria, definitions and parameters governing all of the Plant, equipment, Work(s) and capacities of the Plant(s) as set out in the Contract, Annexures and Specifications as amended from time to time in accordance with the Contract.
- 1.37 "Sub-CONTRACTOR" means any person or firm to whom any part of the CONTRACTOR Services or the execution of any part of the Works is subcontracted by the CONTRACTOR, subject to any governing provisions of this Contract.
- 1.38 "Start-up" shall mean and refer to 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).
- 1.39 "Technical Documentation" shall mean the technical documents described in Annexure XV to be supplied by the CONTRACTOR under the Contract and shall include all other technical documentation required to be supplied by the CONTRACTOR.
- 1.40 "Ton(s)" refers to metric ton.
- 1.41 "Utilities" and "Off-Sites of Plant" shall mean the facilities demarcated and indicated in the general Annexures and the plot plan attached to Annexure VIII.
- 1.42 "Work(s)" means the whole of the work(s), materials, plant (as defined in Article 1.29), and equipment, matters and things to be done, furnished, performed, accomplished and provided by the CONTRACTOR (inclusive of his services under this Contract) but without restricting the generality of the foregoing, includes, according to the context all the relevant particulars specified elsewhere in this Contract.

1.43 "Vendor" shall mean the person or persons from whom the supply of any part of the Plant is obtained by the CONTRACTOR for the purposes of this Contract.

ARTICLE 2

OBJECT OF THE CONTRACT AND COST OF THE PROJECT

- 2.1 The object of the Contract is to establish a modern, reliable, efficient and integrated Plant, suitable to the location for the production of ammonia and (prilled/uncoated) urea, together with the required utilities, off-sites and other facilities, all of which together are defined as the Work(s). The scope of the Contract covers a turn-key supply, 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 start-up 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.
- 2.2 The location of the Plant shall be at (Name of Town) in (Country).
- 2.3 The Contract envisages the provision of both on-site and off-site training services and facilities, for the PURCHASER's personnel, to enable them to operate and manage the Works at optimum capacity and efficiency.
- 2.4 The time schedule(s) required to be maintained to complete the Complex on time shall be as follows and the CONTRACTOR and PURCHASER shall take all the necessary steps to adhere to them. The periods referred to herein in respect of the time schedule(s) shall be deemed to commence from the Effective Date of the Contract in each case.
- 2.4.1 Basic Engineering and Know-how documents shall be made available to the PURCHASER from second (2) to eighth (8) month.

- 2.4.2 Construction of equipment foundations and Plant Buildings shall start in the Tenth (10) month, and all major Plant Buildings shall be completed (except for finishing) in the twenty fourth (24) month. The buildings shall however be ready for machinery erection in sufficient time for erection.
- 2.4.3 FOB Delivery of equipment (with the exception of the critical items) shall commence no later than in the fourteenth (14) month and shall end (95% by value) no later than in the twenty fourth (24) month.
- 2.4.4 Delivery FOB of critical items of equipment shall not exceed twenty six (26) months.
- 2.4.5 Erection of the Plant shall start no later than the fifteenth (15) month.
- 2.4.6 The Plant shall be mechanically complete by the thirty second (32) month, and shall be started-up not later than 2 months thereafter.
- 2.4.7 The Plant shall be deemed to be in commercial production on or before the end of the thirty sixth (36) month.
- 2.5 The CONTRACTOR and the PURCHASER agree that the current Battery Limits cost of the project as of the date of the award of the Contract shall be determined as follows:
- 2.5.1 (i) Know-how and Basic Engineering
(ii) Plant, materials, Machinery FOB/EX-Works including detailed engineering, inspection and procurement
(iii) Freight, Insurance, Clearance, Transport to Site
(iv) Civil Engineering (including foundations)
(v) Erection (including Erection Equipment and Site Supervision)
(vi) Training
(vii) Start-up, Commissioning and Management of the Plant Operations until Provisional Acceptance

(viii)	Spare parts	_____
	Total Contract price	_____
(ix)	Other Costs of the PURCHASER	
	including preliminary costs,	
	supervisory expenses, overheads	
	during construction, transport	
	costs, etc. (including contingencies)	_____
	Total Project Cost	_____

2.5.2 The costs specified in Article 2.5.1 (i to vii inclusive) shall be firm. The cost specified under 2.5.1 (ix) shall be deemed to be an estimate and shall not be construed as being firm.

2.5.3 The cost specified in Article 2.5.1 (viii) shall represent an estimate determined by the PURCHASER and CONTRACTOR for the purchase of spare parts in accordance with Article 10. The cost of spare parts utilized by the CONTRACTOR (until satisfactory completion of the Guarantee Tests) shall be included within the cost stated in Article 2.5.1 (ii).

The CONTRACTOR shall maintain suitable accounting and other relevant records pertaining to the requirements of Article 23.

ARTICLE 3

OVERALL SCOPE OF WORK AND DIVISION OF RESPONSIBILITY

- 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
 - Pipe and instrument diagrams and specifications
 - Plant layout
 - Electric steam and other distribution systems
 - Effluent and emission specifications
 - Operational manuals
 - Maintenance 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 for workshops, other maintenance shops, laboratory facilities, storages, and other facilities at Site, including Administrative office and First Aid facilities, 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 and transportation
 - 3.1.9.1 Packing of the plant in seaworthy/roadworthy packing, marking of the packages, and transport of the plant and equipment from fabricators' works to the point of despatch FOB/FOR as the case may be.
 - 3.1.9.2 Transport of the equipment from point of despatch FOB/FOR to Site, including loading and unloading at harbours and customs clearance, if any.
- 3.1.10 Taking of all necessary insurance coverages.
- 3.1.11 Purchasing and acquiring the land for the Plant.
- 3.1.12 Clearing, levelling and the development of 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 Construction of railway sidings within the Battery Limits and connection to the national rail network. (Optional)
- 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:
 - 3.1.17.1 Design of the Works.
 - 3.1.17.2 Construction of the Works.
- 3.1.18 Construction of housing for erection and start-up personnel.
- 3.1.19 Construction of a township 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 managers, plant Engineers, plant Operators, maintenance and administrative personnel.
- 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 start-up of the Plant.
- 3.1.27 Commissioning and start-up of the Plant, until specification grade products are obtained.
- 3.1.28 Operation of the Plant from start-up until completion of the guarantee tests for the Plant.
- 3.1.29 Conducting and completing the Guarantee Tests.
- 3.1.30 Management of the operations of the Plant after Mechanical Completion and until satisfactory completion of the Performance Guarantee Tests and Provisional Acceptance of the Plant, pursuant to the provisions of Article 17.
- 3.1.31 (Optional) Management Assistance following Provisional Acceptance of the Plant until Final Acceptance as specified in Article 17.
- 3.1.32 (Optional) The provision of Technical Advisory Services in accordance with terms and conditions to cover those services referred to in Article 17.

- 3.2 For each of the functions described in the scope of work above, the obligations of the CONTRACTOR and PURCHASER (as more particularly expressed in Articles 4 and 5 and elsewhere in the Contract) and the responsibilities for co-operation, co-ordination, tests, guarantees, commissioning and conditions of Acceptance as laid down elsewhere in the Contract shall be as follows:
- 3.2.1 The PURCHASER shall be responsible for the work to be undertaken under Article 3.1.11 and Article 3.1.19.
- 3.2.2 Unless otherwise agreed the CONTRACTOR shall be responsible for the design basis as stated in Article 3.1.1 above, and the CONTRACTOR also agrees and acknowledges that he shall accept final responsibility for the accuracy, suitability and adequacy of the information supplied by the PURCHASER, and shall ensure that the operational characteristics of the Plant are secure and guaranteeable.
- 3.2.3 The CONTRACTOR and the PURCHASER shall be responsible for taking out the insurances referred to in Article 3.1.10, in accordance with Article 24.
- 3.2.4 The PURCHASER will be responsible for providing the start-up feedstocks and other materials as contemplated under Article 3.1.26, subject to the CONTRACTOR giving adequate advance notification of the dates when they shall be required together with complete specifications of materials which may or may not be specified in the Contract, as provided in Article 5.8, and satisfaction of all other requirements.
- 3.2.5 All other work whether specifically mentioned in Article 3.1, or otherwise, required for the establishment of a turn-key plant within the contractual terms, the specified plot plan and Battery Limits shall be undertaken by the CONTRACTOR, and shall include, but shall not be limited to the obligations of the CONTRACTOR specified in Article 4.

- 3.2.6 The services relating to Management of Plant Operations, optional Management Assistance and optional Technical Advisory Services contemplated under Articles 3.1.30, 3.1.31 and 3.1.32 shall be embodied in appropriate arrangements and agreements executed by virtue of the application of Article 17.
- 3.3 In the event that any activity or work of the nature 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 of this Contract, but becomes necessary to ensure the successful operation of the Plant according to the specifications laid down in the Contract and the intent thereof, 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 fully responsible for all such work, and all costs and expenses incidental thereto shall be to the CONTRACTOR's account.
- 3.4 Except where otherwise not provided for within the terms of Article 15 or elsewhere in this Contract, the PURCHASER and the CONTRACTOR may by mutual agreement, amend or change the conditions governing the responsibilities or work to be undertaken, without prejudice to the expressed and/or implied obligations of the parties as stated in the Contract. All amendments and/or changes to be incorporated to the terms of the Contract shall be properly made by duly constituted and authorised representatives of the parties herein, and the Contract together with such amendments and/or changes, shall be deemed to have full force and effect.

ARTICLE 4

OBLIGATIONS OF THE CONTRACTOR

- 4.1 The overall obligations of the CONTRACTOR pursuant to this Contract and for specific items in the scope of the work are described more particularly in this Article, Annexure VI as well as in other relevant parts of this Contract. The CONTRACTOR shall accept total responsibility for all work except those that are within the scope of the PURCHASER's responsibilities. The CONTRACTOR shall also be liable for all work which may be reasonably inferred from the scope of his responsibilities.
- 4.2 The CONTRACTOR shall, commencing within (7) days of the Effective Date of the Contract, proceed with utmost diligence and care in carrying out all of the services specified as his obligations in Articles 3, 4 and 6 and elsewhere in the Contract and provide such documentation indicated in Annexure XV in order to meet the time schedules laid down in that Annexure and indicated in the bar chart attached to that Annexure.
- 4.3 The CONTRACTOR shall execute the work in accordance with good engineering practice to the reasonable satisfaction of the PURCHASER. The execution of the work shall be subject to such variations, changes and additions that may be required to be incorporated in accordance with the provisions of Article 15.
- 4.4 The CONTRACTOR acknowledges that he has fully satisfied himself as to the nature and location and suitability of the Site for the Plant, the applicable laws, agreements and regulations, the general and local conditions applicable to the CONTRACTOR's work, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labour, water, electrical power, approach roads and uncertainties of weather or similar physical conditions at Site, the conformation 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 CONTRACTOR's work services, obligations, or the costs thereof to the CONTRACTOR under this Contract. The CONTRACTOR further acknowledges that subject to the provisions of Article 4.4.2 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 technical specifications and other pertinent documentation. Any failure of the CONTRACTOR to acquaint himself with all the necessary data and information will not relieve him from his ultimate responsibilities under the Contract, and in any event shall not be cause for any claims for increases in the payments pursuant to the Contract.

4.4.1 The design bases for the works are contained in Annexures II and IV. However this shall be reviewed for accuracy by the CONTRACTOR and the CONTRACTOR shall take full responsibility for ensuring that all design criteria used for the design or operation of the Works are adequate and sufficient.

4.4.2 If the soil tests conducted under Article 4.17 indicate that the load bearing capacity is less than as indicated in Annexure IV, the PURCHASER and CONTRACTOR shall mutually agree on the resultant change and implications in the design of the plant foundations.

4.5 The CONTRACTOR shall provide or obtain (as the case may be) the know-how for various processes from the Process Licensors as follows:

Ammonia Plant (name of Licensor(s))

Urea Plant (name of Licensor(s))

(Specify any other e.g. water treatment)

and shall design the Plant in conformity with the basic engineering criteria of the Process Licensors.

Documentation relative to all know-how and basic engineering provided by the CONTRACTOR or obtained from the Licensors shall be provided to the PURCHASER by the CONTRACTOR. The CONTRACTOR also hereby agrees that such documents referred to in this Article 4.5 shall cover and be based upon the latest commercially proven know-how available to the Process Licensors at the time of making such documents available (such documentation to cover the state-of-the-art of the know-how at the time of the signing of the Contract, or if mutually agreed to, at a later date) and that the detailed engineering will be undertaken by the CONTRACTOR according to the latest design standards available and/or known to the CONTRACTOR at the time of design. The CONTRACTOR further specifically agrees to provide documentary evidence in proof of the acceptance by the Process Licensor of the conditions governing the supply of know-how and basic engineering referred to herein, and furthermore shall ensure that the Process Licensor is in full agreement with the requirements of Articles 7 and 33 of this Contract in connection therewith.

- 4.6 The CONTRACTOR shall undertake the detailed engineering of the Work(s) and shall perform the general and detailed engineering of the Plant and the process design, layout, equipment design, piping and instrument design, and all other design work in order that:
- 4.6.1 The Plant shall constitute, when assembled, a technological entity, capable of producing the final products of the quality and quantity in accordance with the criteria and Performance Guarantees set out in this Contract and complying with the economic and technical performance figures contained in this Contract.
- 4.6.2 The design work undertaken shall oblige the CONTRACTOR to place at the disposal of the PURCHASER all data and documentation required by the latter to carry out his obligations in accordance with Article 3, and Article 5, so that the Plant can meet the time schedules laid down in the 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 25 and Annexure II. Where specialized design criteria are being used, the PURCHASER shall be advised of such specialized design codes. Notwithstanding the use of the Codes and Standards indicated in Article 25 if the CONTRACTOR is aware up to the date of signing the Contract of superior engineering codes or design methods, or where experience from previous contracts has resulted in proven improvements, the CONTRACTOR shall use such improved methods or codes in the design of the Plant and where required, shall make these appropriate data in design methods available to the PURCHASER. The CONTRACTOR shall also take into account all safety rules/regulations normal to industry-practice, and project safety regulatory provisions required in (PURCHASER's country), as stated in Annexure II.
- 4.8 The CONTRACTOR shall be responsible for the selection of Vendors. Provided, however, that wherever specified in Annexures VIII and/or Annexure XII the equipment so specified therein, shall be obtained from the selected Vendors. The CONTRACTOR agrees and acknowledges that notwithstanding anything to the contrary expressed the CONTRACTOR shall assume complete responsibility for all the terms of guarantee provisions and such other criteria established by this Contract, inclusive of the warrantability and fitness of the equipment, plant and materials for the intended use, and the provisions of Articles 25, 28 and 30 shall apply mutatis mutandis.
- 4.9 The CONTRACTOR shall be responsible for the supply of the complete plant and equipment in accordance with Article 12 and as expressed elsewhere in this Contract. The list of the Plant and Equipment as well as other Materials in Annexures VIII, IX, X and XI, shall represent supply from the CONTRACTOR, which together with Annexure XIII, (with exclusions therein), to be provided by the PURCHASER, shall represent the complete Plant. The CONTRACTOR shall establish a more 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(s) required but not specified in Annexures VIII, IX, X, XI and XIII shall be supplied by the CONTRACTOR. Notwithstanding anything

to the contrary expressed in the Contract, the CONTRACTOR shall supply a complete Turn-Key Plant for the production of (1000) tons per day ammonia and (1725) tons per day urea, together with all the specified off-sites and utilities with the other facilities within the Battery Limits specified in Annexure II, excluding those items which are the PURCHASER's responsibility as specified in Article 5 and other exclusions as may be expressed in the Contract.

- 4.10 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 schedules contained in Annexure XV, and the CONTRACTOR shall be fully responsible for meeting the contractual guarantees, and tests contained in Article 26, and for delivering a complete operable plant in accordance with the Contract.
- 4.11 The CONTRACTOR shall undertake, in association with the PURCHASER, procurement of spare parts, in accordance with the provisions of Article 25.10, Article 10 and Annexure XXVI of this Contract.
- 4.12 The CONTRACTOR shall inspect all equipment in accordance with Article 14 and arrange for all test certificates and shall arrange all packing export permits and transportation FOB to point of despatch.
- 4.13 The CONTRACTOR shall be responsible for the transportation of equipment from the port of despatch FOB to the receipt CIF entry port in the PURCHASER's country and onward despatch to the Site. The CONTRACTOR shall be responsible for clearance of goods at the port of entry, but the PURCHASER will provide all necessary import permits or authorizations required for this purpose and shall be responsible for demurrage and charges arising out of his failure to provide such permits. The CONTRACTOR shall be subject to the provisions of Article 14.15 and 14.16. The PURCHASER shall be responsible for the payment of customs duties at port of entry.

- 4.14 The limitations as to size and weight of packages at the entry port and to Site are contained in the Annexures to this Contract, and the CONTRACTOR shall design and procure the Plant accordingly. Notwithstanding the statement of size limitation contained in Annexure II (vi), the CONTRACTOR shall be fully responsible for the proper movement of plant, equipment and material to the Site, and its installation at Site.
- 4.15 The CONTRACTOR shall be responsible for arranging insurance during transportation as required by Article 24.
- 4.16 The CONTRACTOR shall be responsible for all levelling, clearing or other development of the land.
- 4.17 While design soil conditions are contained in Annexure IV of the Contract, the CONTRACTOR will be responsible for carrying out soil tests 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 different to that contained in Annexure IV, the CONTRACTOR and the PURCHASER will review this in accordance with Article 4.4.2.
- 4.18 The CONTRACTOR shall be responsible for the design and construction of all road (rail) and other communications within the Battery Limits of the Plant, 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).^{1/}
- 4.19 The CONTRACTOR shall be responsible for the design 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, which approval will not be unreasonably withheld.

^{1/} Rail sidings are often undertaken by national railway authorities only.

- 4.20 The CONTRACTOR shall be responsible for the construction of all civil engineering works including the housing colony for the erection staff. The PURCHASER shall be responsible for the permanent housing colony. The PURCHASER shall have the right of first refusal to purchase the housing built by the CONTRACTOR for his erection staff.
- 4.21 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.
- 4.22 The CONTRACTOR shall provide all erection equipment and materials for the erection and installation of the Plant. The CONTRACTOR shall be permitted to remove erection equipment from Site after start-up of the Plant (unless otherwise agreed) and the PURCHASER shall be obliged to apply for the necessary permits for import and re-export of the erection equipment from (country) and shall undertake all necessary steps to obtain these permits as early as practicable.
- 4.23 The Plant shall be erected by the CONTRACTOR as specified in Article 12.7 and in Annexure XXIX.
- 4.24 The CONTRACTOR shall provide an adequate number of personnel for the construction, erection and mechanical testing, commissioning, start-up and initial operation of the Plant, so as to meet the specified time schedules. The CONTRACTOR shall train the PURCHASER's personnel to assist in the commissioning, start-up, operation and maintenance of the Plant in accordance with the requirements of Article 16. The CONTRACTOR shall provide the necessary supervisory personnel and shall ensure that all such personnel reach the Site of work in time so as to meet the requirements of the time schedules contained in Article XV.

- 4.25 The CONTRACTOR shall complete the Mechanical Completion of the Plant within thirty two (32) months from the Effective Date of the Contract, and shall comply with the requirements of Article 18.
- 4.26 The CONTRACTOR's personnel at Site will carry out or cause to be carried out all mechanical testing of the Plant and the CONTRACTOR's personnel and the PURCHASER's personnel shall assist in the start-up and operation of the Plant until completion of the Guarantee Tests, under the complete responsibility and direction of the CONTRACTOR.
- 4.27 While the PURCHASER will provide all feedstocks, outside utilities, chemicals and other materials required for the operation of the Plant in accordance with Article 5.8; the CONTRACTOR shall supply a first charge of all catalysts, and the chemicals agreed as the CONTRACTOR's scope of supply in Annexures IX and XI. 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 for the start-up of the Plant and regularly thereafter, until take-over shall be intimated by the CONTRACTOR to the PURCHASER at least nine (9) months before the Mechanical Completion of the Plant.
- 4.28 The CONTRACTOR shall satisfactorily demonstrate to the PURCHASER the carrying out of the performance of the Guarantee Tests in accordance with the provisions laid down in the Contract.
- 4.29 Subject to Articles 18 and 26 the CONTRACTOR shall commence the initial Guarantee Tests of the Plant within fifteen (15) days after the start-up of the Plant, but in any event not later than ninety (90) days following 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 in accordance with his obligation under Article 5. The CONTRACTOR shall be allowed to extend this period and repeat Guarantee Tests in accordance with Article 26.10.1 of the Contract.

- 4.30 In furtherance of Article 4.24 the CONTRACTOR shall provide training to the PURCHASER's personnel in accordance with Article 16. The CONTRACTOR shall try to 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 peak condition.
- 4.31 The CONTRACTOR shall be responsible for the necessary rectifications, corrections and/or modifications of the Plant pursuant to the Contract requirements (free of any additional costs to the PURCHASER) within 12 months of the Provisional Acceptance of the Plant in the event that for any reason attributable to the CONTRACTOR, the Plant is found to be incapable of continued production at the rated capacity on account of design defects, latent and/or patent faults, and/or other inadequacies in any one/or other of process(es),/design/ equipment supply/civil engineering/erection and the works or portions or parts thereof which were not apparent or recognizable at the time when the CONTRACTOR demonstrated the Guarantee Tests. The responsibilities of the CONTRACTOR specified in this Article and in the other Articles of the Contract shall apply mutatis mutandis.
- 4.32 Without prejudice to the provisions of this Contract the CONTRACTOR shall assume the responsibilities of managing the Plant (and shall provide in-plant training to the PURCHASER's personnel upon agreed conditions) in accordance with the provisions of Article 17.1 following Mechanical Completion of the Plant until Provisional Acceptance of the Works, following completion of the Performance Guarantee requirements provided by Article 19.

- 4.33 Throughout the execution of the Work(s), the CONTRACTOR shall ensure that it, its employees, agents and invitees and its sub-contractors, their employees, agents and invitees while upon the Site comply with all applicable safety laws, rules and regulations. The conduct and safety of all persons employed by the CONTRACTOR and its sub-contractors on 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 its employees and shall not employ on the Work any unfit, undesirable person or anyone not skilled in the work assigned to him.
- 4.34 The CONTRACTOR shall provide the PURCHASER with a reasonable amount of office space and facilities and secretarial and typing services and telephone and telex services for the representatives of the PURCHASER assigned to the CONTRACTOR's offices.
- 4.35 The CONTRACTOR shall be responsible for taking out and keeping in force the various Insurance policies which are his responsibility under Article 24 (and as specified therein), and shall in any event carry such corporate Insurance policies consistent with its activities as a CONTRACTOR.
- 4.36 The CONTRACTOR shall provide such assurances as the PURCHASER may reasonably require concerning the essential legal validity and enforceability of this Contract insofar as the CONTRACTOR is concerned, including (without limitation) evidence that the CONTRACTOR is a properly organized legal entity duly entitled to perform this Contract and that the CONTRACTOR has properly executed this Contract in accordance with all legal requirements, of governing charter and by-laws, and of its governing Board of Directors, as the case may be.
- 4.37 Within six (6) months of the Mechanical Completion of the Plant (as specified in Article 18 of this Contract) the CONTRACTOR shall prepare a set of "as-built" drawings or their equivalent for the Plant, under its supervision.

- 4.38 The CONTRACTOR shall do whatever is necessary to reasonably ensure that:
no person, property, right, easement, or privilege is injured, damaged or infringed by reason of the CONTRACTOR's activities under this Contract; pedestrian and other traffic on any public or private road or waterway outside the Battery Limits of the Plant is not unduly impeded, interrupted or endangered by the execution or existence of the Work, material and/or Plant; fire hazards are eliminated and in the case of a fire in or about the Works, that it is promptly extinguished; the health of all persons employed in connection with this Contract is not endangered; adequate medical supervision of all persons employed in connection with this Contract is maintained; adequate sanitation measures in respect of the Works are taken; and 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; on completion of the Works, the Site is cleared of all obstruction, temporary structures and unused material.
- 4.39 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 Article 4.38 above.

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 as elsewhere expressed in the Contract. The PURCHASER will carry out his obligations so as to enable the CONTRACTOR to meet the time schedules contained in Annexure XV.
- 5.2 The PURCHASER shall be responsible for the acquisition and obtaining physical possession of the land.
- 5.3 The PURCHASER shall secure and make available to the CONTRACTOR within one month from the Contract the land indicated on 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.
- 5.4 The PURCHASER shall obtain and make available to the CONTRACTOR (and/or facilitate the arrangements for) all necessary permits/approvals and/or licences from local authorities and/or Government (of PURCHASER's country) 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. The applicable procedure and division of responsibilities shall be as detailed in the co-ordination procedure envisaged in Article 6.7.12.
- 5.5 The PURCHASER shall be responsible for payment of Custom's Duties, or to reimburse the CONTRACTOR for such duties as may be assumed, in accordance with Article 4.13.
- 5.6 Whenever any approval(s) are required from the PURCHASER under the provisions of this Contract, such approvals or reasons for withholding such approvals shall be conveyed to the CONTRACTOR within ten (10) days of receipt unless if otherwise provided in this Contract. If no reply is received from the PURCHASER within

the period specified, such items submitted for approval shall be deemed to be approved subject however to the right of the PURCHASER pursuant to Article 37.

- 5.7 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.
- 5.8 The PURCHASER shall provide all feedstocks, outside utilities, chemicals and other materials required for the operation of the Plant except the first charge of catalysts and chemicals to be supplied by the CONTRACTOR within his scope of supply. The feedstocks shall be 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 six (6) months of the Effective Date of the Contract. The requirement of all chemicals and other material inputs required for the start-up 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.
- 5.9 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 approved by the PURCHASER.
- 5.10 The PURCHASER shall provide the CONTRACTOR and his personnel deputed to Site after take-over with such facilities as are in Annexure XXVII.

- 5.11 The PURCHASER shall be responsible for making all payments to the CONTRACTOR in accordance with the provisions of this Contract.
- 5.12 The PURCHASER will provide and maintain the insurance policies which may be his specific responsibility as contained in Article 24.
- 5.13 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 PURCHASER

- 6.1 The parties to this Contract hereby agree to undertake all reasonable co-operation to implement the Works as stipulated in the Contract. The parties to the Contract through their designated representatives will meet periodically to take stock of the progress of Work, and suggest ways and means to improve the operations and to expedite 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 with permission to act in accordance with specific terms of authority.
- 6.3 The PURCHASER shall appoint or designate an Engineer (or Engineers for different parts of the Work) to represent it for the purposes of technical approvals as contemplated under the Contract. If the PURCHASER so desires, the Project Manager appointed by him under Article 6.2 may also be designated as the Engineer. ^{1/}
- 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.

^{1/} If the PURCHASER intends to appoint a Consulting Company, to act as the Engineers under this Contract on his behalf, (subject, however, to the jurisdiction of the PURCHASER's Project Manager), the name of the Consulting Company should be mentioned in this paragraph.

- 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 finalization of co-ordination procedure, the detailed time schedules and a critical examination of the design basis.
- 6.6 The co-ordination procedure, (which shall be prepared in accordance with accepted international practices) shall become part of the Contract by reference, following agreement and respective approval by the CONTRACTOR and the PURCHASER.
- 6.7 The co-ordination procedure shall include but will not be limited to:
- 6.7.1 Procedure for giving instructions, decisions and approvals.
 - 6.7.2 Assignment of responsibilities to the Project Managers and Engineers of both the CONTRACTOR and the PURCHASER.
 - 6.7.3 Procedure for submission of drawings, equipment, specifications and other documents as may be required for approval.
 - 6.7.4 Procedure for according approval on behalf of the PURCHASER.
 - 6.7.5 Procedure for accounting the invoicing for the payments receivable by the CONTRACTOR.
 - 6.7.6 Procedure for approving and effecting payment to the CONTRACTOR, including elaboration of the circumstances in which the PURCHASER may withhold payments due.
 - 6.7.7 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.
 - 6.7.8 Procedure for drawings and documents distribution for the CONTRACTOR and the PURCHASER.
 - 6.7.9 Procedure for the approval of technical specifications where not specified in the Contract.
 - 6.7.10 Procedure for the furnishing of Vendors' lists or sources of procurement of equipment as may be necessary.

- 6.7.11 Limitation of authority relative to Contract amendments and/or modifications.
 - 6.7.12 Division of responsibilities for the provision of permits and approvals (as more particularly referred to in Article 5.4) with clear delineation of the specific responsibilities for obtaining necessary permits, approvals on the part of the PURCHASER and CONTRACTOR respectively.
- 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 shall review and finalize the following listed matters and definitize open items being such of those items that are yet not concluded or are inconclusive.
- 6.8.1 The detailed Plant lay-out and the line drawings of the buildings.
 - 6.8.2 The final list of equipment, including sizes, materials of construction, and Vendors where not specified in the Contract.
 - 6.8.3 The Critical Path Network, which shall be prepared by the CONTRACTOR.
 - 6.8.4 Any problems arising from the detailed soil investigations.
 - 6.8.5 Establishment of the procedure and details for training of the PURCHASER's personnel.
 - 6.8.6 Procedure for training of the PURCHASER's personnel.
 - 6.8.7 The co-ordination procedure referred to above in Article 6.6 shall be revised as required in accordance with the agreed minutes of the meeting referred to above, and shall thereafter be finalized.
 - 6.8.8 Procedures for customs clearance and payment of import duties and taxes, etc.

- 6.8.9 Procedure for clearance by the PURCHASER of the CONTRACTOR's personnel coming to Site.
- 6.8.10 The method agreed for computation of over-time, if applicable.
- 6.8.11 Facilities to be provided to the CONTRACTOR's personnel at the Site by the PURCHASER.
- 6.9 As soon as work at the 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 Critical Path Network (Article 12) and to discuss and settle outstanding issues. Costs in connection with any review meetings 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 his designated representatives 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 respond with such approval or disapproval as required (with reasons to be indicated if certain of the requirements under the Contract do not appear to be met with technically and/or commercially) or suggest modifications within a period of thirty (30) days, after the date of submission, after which period such of these documents shall be deemed to be approved.

- 6.13 In the event that the PURCHASER requires changes, additions and modifications, these shall be reviewed by the CONTRACTOR within thirty (30) days of receipt and the provisions of Articles 15, and 29 shall apply. 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 without qualification.
- 6.14 In the event of a request for a review by the CONTRACTOR, the same terms as those applicable to Article 6.13 shall apply, and if urgent resolution of a matter is required the said thirty (30) day period referred to in Article 6.13 shall be reduced as agreed between the parties.
- 6.15 Failure to reach agreement(s) at the review meeting(s) referred to in Articles 6.5 and 6.8 shall not in any way modify, alter, change or affect the contractual obligations of the CONTRACTOR as stated expressly or impliedly in this Contract or as agreed between the parties.
- 6.16 The PURCHASER, if he so desires, shall have the right to assign up to a maximum of four (4) engineers to the design offices of the CONTRACTOR at (town) to be present during the detailed design of the Plant, and the procurement of the equipment. The CONTRACTOR shall make available all documentation, calculations etc. on the detailed design of the Plant and the procurement to the Engineers of the PURCHASER: All costs in connection with the travel and stay of the Engineers shall be borne by the PURCHASER.

ARTICLE 7

PROPRIETARY RIGHTS AND LICENCES,

SECRECACY AND PATENTS

- 7.1 The CONTRACTOR hereby affirms that it has or has obtained the unqualified right(s) to grant, and hereby does grant to the PURCHASER irrevocable, non-exclusive, non-transferable, fully paid-up licence(s) for use in the operation of all the processes in the life time of the Plant, and in particular, the Ammonia Process and the Urea Process.
- 7.2 The CONTRACTOR shall ensure (through specific arrangements, with proof provided to the PURCHASER) that the Process Licensors shall make available to the PURCHASER through the CONTRACTOR 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 also be made available to the PURCHASER together with copies of all documents mentioned in Article 3. The CONTRACTOR also hereby undertakes to make available to the PURCHASER the latest know-how and techniques available to the Process Licensors at the signing of the Contract and to the CONTRACTOR at the time of design.
- 7.2.1 In circumstances where the CONTRACTOR is unable or unwilling to make available to the PURCHASER the necessary process know-how and related information, the PURCHASER shall be free to approach the Process Licensor(s) directly.
- 7.2.2 The PURCHASER shall also have the right to establish direct contractual arrangements with the said Process Licensor in the event that the circumstances envisaged in Article 33 apply.
- 7.3 The CONTRACTOR shall ensure that the Process Licensors and the CONTRACTOR shall make available to the PURCHASER for a period of ten (10) years from the Effective Date of the Contract:

- 7.3.1 Free of charge technological developments and improvements in operating techniques, preventive maintenance and safety measures applicable to the Plants constructed pursuant to this Contract, and other relevant data and proprietary information that may or may not become licensable by the Process Licensors within the same period. The PURCHASER will also make available to the Process Licensor, free of charge, any improvements in operating techniques which the PURCHASER shall have made in the same period.
- 7.3.2 On payment, at a reasonable cost, rights to use proprietary processes developed or acquired by the CONTRACTOR including patented processes which could result in significant improvement(s) in the capacity, reliability and efficiency of the Plant, and quality of the products.
- 7.3.3 The CONTRACTOR shall be required to undertake of its own accord the obligations set forth in Article 7.3.1 and Article 7.3.2 for the period specified in Article 7.3. The PURCHASER shall be under no obligation to monitor the technological developments and other items referred to in Article 7.3.1 to be entitled to the benefits flowing by virtue of this Article.
- 7.4 The CONTRACTOR shall undertake to enter into specific arrangements with the Process Licensor(s) (with satisfactory proof provided to the PURCHASER) to ensure the continued availability to the PURCHASER of confidential information similar in scope and content to that provided pursuant to Article 7.3.
- 7.5 The PURCHASER shall not be deemed to have infringed the conditions stipulated in this Article, where following the Final Acceptance of the Plant(s) (but within the period specified in Article 7.13)

the PURCHASER determines that modifications of the Plant(s) are required to be made (which in its opinion would result in improved or better Plant operation) or where the PURCHASER requires an expansion or modernization of the Plant(s) with incorporation of contemporary technology, and, in consideration of the foregoing the PURCHASER has requested the CONTRACTOR to assist in accomplishing the necessary work, and the CONTRACTOR is unable or unwilling (for whatsoever reason) to undertake same, then the PURCHASER shall have the right to employ or retain any other person, firm or agency to undertake and complete such work above referred to, and in such an eventuality, the PURCHASER shall not be held to be in breach of the secrecy provisions of this Article.

- 7.6 For the purposes of this Article, the grant to the PURCHASER of the right to use the processes referred to in Article 7.1 shall not be interpreted to mean a passing to the PURCHASER of proprietary rights and title to the processes.
- 7.7 The provisions of Article 7.12 applicable to continuation of secrecy obligations upon termination and/or cancellation shall apply in like manner to the provisions of this Article relating to the right for use of proprietary rights and licences.
- 7.8 The PURCHASER agrees that he shall treat as confidential all process and technical information, proprietary know-how, patented processes, documents, data and drawings supplied by the CONTRACTOR (whether owned by the CONTRACTOR or otherwise) in accordance with this Contract, all of which is hereinafter referred to as "confidential information". The PURCHASER shall not without the prior approval of the CONTRACTOR divulge such confidential information available to a third party, other than required by law, and provided that when so required by law, the PURCHASER shall duly advise the CONTRACTOR.
- 7.9 This Article shall not apply to such confidential information:
- 7.9.1 Which is or becomes a part of the public domain, through no fault of the PURCHASER.

- 7.9.2 Which is already known to the PURCHASER, his representatives or Technical Advisor, before the agreement as to confidentiality was given under Article 7.8.
- 7.10 The PURCHASER shall not utilise the confidential information for any purpose other than for completing, operating, using, repairing, maintaining or modifying the Plant(s). Similarly, the CONTRACTOR will not use or divulge any technical data or confidential information and drawings or technical documents given by the PURCHASER, his representative or Technical Advisor, to the CONTRACTOR except for the purposes strictly connected with the Contract.
- 7.11 The CONTRACTOR shall provide firm guarantees to the PURCHASER relative to the continued use of know-how and patented processes, and associated proprietary knowledge, similar in scope and content to the "confidential information" in Article 7.8, without prejudice to any matters occurring which might inhibit the continued use of the acquired know-how and procedures.
- 7.12 The PURCHASER and CONTRACTOR hereby agree that the obligations contained in this Article subject to Article 7.13 below, shall not be affected by a Termination and/or Cancellation of this Contract under Article 36 herein.
- 7.13 Except when otherwise agreed, the PURCHASER's obligations pursuant to the provisions of Articles 30.1, 30.2 and 30.3 shall be valid for a period of eight (8) years from the Effective Date of the Contract.
- 7.14 The PURCHASER shall give the CONTRACTOR prompt notice, in writing, of any claim or suit (referred to in Article 22.1) of which it has knowledge. The CONTRACTOR shall have sole charge and direction of the defence and disposal of such suit of action and the PURCHASER shall render all reasonable assistance but shall not be obligated to sustain any expenses. The PURCHASER shall have the right to be represented by legal counsel experienced in technology contracts of its own choice at its own expense.

- 7.15 The CONTRACTOR shall have the right to acquire immunity from suit and to make or cause to be made alterations at its own cost to the Plant(s) to eliminate the alleged infringement provided such alteration does not prevent the Plant(s) from meeting its Performance Guarantees mentioned in Article 19.
- 7.16 Neither the CONTRACTOR nor the PURCHASER shall settle or compromise any suit or action without the written consent of the other if such settlement or compromise would oblige 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.
- 7.17 The CONTRACTOR shall indemnify and hold harmless the PURCHASER in connection with any liabilities arising out of patent infringement and/or matters arising out of secrecy and/or proprietary information referred to in Articles 7.8 and/or 7.13 in accordance with the requirements of Article 22.1.
- 7.18 The PURCHASER shall not disclose any "confidential information" defined in Article 7.8 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 (Article 7.8).

ARTICLE 8

EFFECTIVE DATE OF CONTRACT

- 8.1 The Contract shall become valid upon the formal execution (signature) by the duly authorized officers of the PURCHASER and CONTRACTOR properly witnessed and sealed and in accordance with the applicable law. The Effective Date of the Contract shall be the date on which the PURCHASER's definitive advice to proceed is received by the CONTRACTOR, which shall occur when the last of the following requirements has been fulfilled:
- 8.1.1 Approval of the Contract by the Government of (_____) where the Plant is to be located, such approval to be obtained by the PURCHASER, if required.
 - 8.1.2 Approval of the Government of (_____) where the CONTRACTOR resides and has his principal place of business, if required, such approval to be obtained by the CONTRACTOR.
 - 8.1.3 The Provision by the CONTRACTOR of the Performance Bond as provided under Article 21.1 under the terms of the Contract, to be effected in any event prior to the remittance of the advance payment by the PURCHASER referred to in Article 21.2 and Article 8.1.4.
 - 8.1.4 The remittance of the advance payment by the PURCHASER as provided under Article 21.2 under the terms of the Contract, secured by the Bank guarantee as provided by the CONTRACTOR in accordance with Article 21.2.

- 8.2 If the PURCHASER does not open the Letter of Credit specified in Article 20.19 or does not make equivalent arrangements within six (6) months, the CONTRACTOR may elect (at his own discretion) to suspend its activities and obligations under the Contract until such time as Article 20.19 is complied with.
- 8.3 The expression "Effective Date" whenever used in this Contract or in the Annexures or in the Specifications (or in any other document deemed to form a part of this Contract) shall be interpreted to mean "Effective Date of Contract".

ARTICLE 9

ASSIGNMENT OF CONTRACT

- 9.1 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, however subject to the provisions of Article 9.2.
- 9.2 This Contract may not be assigned by the CONTRACTOR without the written consent of the PURCHASER.
- 9.3 The PURCHASER shall have the right to assign the Contract provided that such assignment does not increase the CONTRACTOR's liabilities over what they would have been if such assignment or transfer had not been made, and provided that the obligations of the PURCHASER are binding upon the assignee, as specified in Article 9.1, with assured guarantees for payment(s) under the Contract.
- 9.4 The CONTRACTOR shall not sub-contract the whole or any part of the Work and/or services relating to the design, procurement, start-up, operations or test running of the plant and equipment (as defined in the Contract) with respect to the Works, without the written consent of the PURCHASER. Furthermore, the CONTRACTOR shall also strictly adhere to the requirements of Article 12.1.7 (and as elsewhere expressed in the Contract) and as specified in Annexures VIII and XII in connection with the supply of critical items by selected manufacturers and machinery from specified manufacturers.
- 9.5 The CONTRACTOR may sub-contract any other work or services under the Contract, provided the PURCHASER is advised of all such sub-contracts. Where sub-contracts are to be awarded to firms or individuals in (PURCHASER's country), the PURCHASER shall have the right to pre-qualify all firms or persons bidding for such sub-contracts.
- 9.6 The CONTRACTOR shall ensure that every sub-contracting by the CONTRACTOR shall comply with all terms and conditions of this Contract, mutatis mutandis.

ARTICLE 10

PROCUREMENT

- 10.1 The CONTRACTOR shall supply to the PURCHASER the following services in connection with the procurement of two-years requirements of spare parts, for use from the period after successful completion of the Performance Guarantee Tests, in accordance with Annexure XXVI, and subject to Articles 25, 29 and 30.
- 10.1.1 The CONTRACTOR shall submit a list of spare parts for the approval of the PURCHASER in any event not later than the twelfth month after Effective Date.
- 10.1.2 Where spare parts of a proprietary nature are to be procured, the CONTRACTOR shall obtain from the suppliers directly in the name of, and for, the PURCHASER a list of 2-years supply of spare parts as recommended by the supplier, for approval of the PURCHASER.
- 10.1.3 For all other spare parts, and for any other equipment to be purchased through the CONTRACTOR, the CONTRACTOR shall prepare bid documents on the basis of the technical specifications prepared by him and submit the same to the PURCHASER or his Technical Advisor deputized for this purpose, for relevant approval, and shall issue the same to the Vendors.
- 10.1.4 The CONTRACTOR shall send the bid documents on behalf of the PURCHASER to the respective Vendors listed in the Vendors list (which list shall be previously agreed upon between the parties).
- 10.1.5 The CONTRACTOR shall use its best endeavours to obtain from the Vendors a minimum three competitive (3) offers.

10.1.6 The offers received from the Vendors shall be evaluated by the CONTRACTOR who shall submit the bid evaluation with appropriate recommendations to the PURCHASER or his Technical Advisor for the relevant final selection. The PURCHASER's final selection of the Vendor shall be communicated to the CONTRACTOR within twenty (20) days from the date of the CONTRACTOR's submission of the bid tabulation.

10.1.7 After the selection of the Vendor(s) by the PURCHASER, the CONTRACTOR shall purchase the spare parts or other equipment and on delivery despatch them, in accordance with Article 12.

10.2 The provisions of this Article 10 shall be subject to the application of Articles 25.10 and 29.5 mutatis mutandis and the CONTRACTOR acknowledges furthermore that the procurement of spare parts are inherently part of the essential requirements of the Contract and CONTRACTOR's obligations for performance.

ARTICLE 11

TIME OF ESSENCE

- 11.1 Time shall be deemed to be of the essence of the Contract.
- 11.2 The CONTRACTOR acknowledges and agrees that it is capable of completing its contractual obligations within the time schedules set forth in this Contract, and that it possesses the necessary skills and means to discharge its responsibilities in a proper, efficient and expeditious manner.
- 11.3 The CONTRACTOR agrees that the timely completion of the Works herein (by virtue of this Turn-Key Contract) is an integral part of the responsibilities assumed by the parties to this Contract, and accordingly, the CONTRACTOR agrees to adhere strictly to the contractual requirements of time and promises to fulfil its contractual obligations speedily, competently and reliably.
- 11.4 The CONTRACTOR acknowledges and agrees that the supply of the plant, equipment, materials and spare parts (together with the services related thereto) is crucial to the schedules for completion of the Works, and the CONTRACTOR hereby obligates itself and ensures that its scope of supply and services provided under this Contract are in conformity with the requirements of the contractual time-schedule(s) (expressly or impliedly), and, shall furthermore, in anticipation of any delay or shortfall in the scope of its supply and/or services undertake steps forthwith to remedy the delay and/or (in consultation with the PURCHASER) utilize alternate resources immediately available without compromising any of the contractual criteria as to quality and/or quantity with respect to such goods and services.

ARTICLE 12

DELIVERY AND EXECUTION OF THE WORK(S)

12.1 Supply of Goods

- 12.1.1 All goods to be supplied under this Contract shall be "brand new" and in accordance with the provisions of this Contract, and all such goods shall have been inspected and tested before despatch in accordance with Article 14.
- 12.1.2 The Plant and Equipment to be supplied under this Contract are itemised in Annexure VIII, and indicated on the flow sheet and general diagrams attached to the Annexure.
- 12.1.3 The technical specifications for the equipment and the materials of construction are contained in Annexure VIII and the CONTRACTOR shall supply such of the equipment and materials in strict conformance to the technical specifications and materials of construction specified. Any change in the materials of construction shall be subject to approval by PURCHASER which permission shall not be unreasonably withheld.
- 12.1.4 The CONTRACTOR acknowledges that the list contained in Annexure VIII is not exhaustive and within 4 months after Effective Date, the CONTRACTOR shall provide a revised list to the PURCHASER for his review, and approval particularly where the list or technical specifications and/or materials of construction have been altered. This list shall also indicate the auxiliary plant such as pipes, valves, instruments, electrical cables etc. which are to form part of the plant and equipment.

- 12.1.5 Where materials of construction or technical specifications are not specified, the materials shall be such as are proven to be resistant to those chemicals with which they come into contact, and the technical specifications shall be such as to ensure meeting the guarantees for the Plant.
- 12.1.6 Notwithstanding any approval(s) of the PURCHASER to any of the technical specifications and for materials of construction, the plant and equipment shall be of such quality and criteria so as to be able to meet the contractual obligations of the CONTRACTOR, particularly as to those relating to guarantees and warranties.
- 12.1.7 The PURCHASER and CONTRACTOR agree that certain items of equipment shall be obtained by the CONTRACTOR from selected vendors only. The list of these critical items and the selected vendors from whom they shall be procured are provided in Annexures VIII and XII. The CONTRACTOR shall procure the equipment from such vendors only unless otherwise agreed in writing between the CONTRACTOR and PURCHASER.
- 12.1.8 The CONTRACTOR shall include the cost of one charge of each catalyst required and one spare charge, within the Contract price. The type and specifications of catalysts to be supplied are given in Annexure IX.
- 12.1.9 The CONTRACTOR shall provide the type and quantities of chemicals identified as within the scope of his supply in Annexure XI.
- 12.1.10 The CONTRACTOR shall supply all other materials required for the operation of the Plant including, in particular, a first charge of refrigerant for all equipment requiring such charge.

- 12.1.11 The CONTRACTOR shall inspect the items of equipment referred to in Article 12.1.1 and 12.1.2 before despatch and on receipt at Site and if PURCHASER so desires, inspection reports for such items of equipment shall be made available to the PURCHASER.
- 12.1.12 The PURCHASER or his agent shall have the right to inspect equipment, materials and goods during fabrication or before despatch in accordance with Article 14.

12.2 Marking, Packing and Despatch of Goods

- 12.2.1 All goods shall be marked and the invoices prepared in accordance with the instructions of the PURCHASER, as specified in Annexure XXIV and/or as provided to the CONTRACTOR not later than the review meeting contemplated under Article 6.8.
- 12.2.2 On despatch of all goods, two copies of the invoices will be sent to the PURCHASER, or his Site representative by airmail so that the PURCHASER may promptly obtain any permits required. For goods requiring extended customs clearance procedure, (significant details of which shall be reasonably given by the PURCHASER prior to the review meeting contemplated under Article 6.8) the CONTRACTOR shall advise the PURCHASER sufficiently in advance, in order to obtain clearance.
- 12.2.3 The CONTRACTOR acknowledges that certain goods, including materials for civil engineering shall not be imported into the PURCHASER's country. The CONTRACTOR shall purchase such goods locally and shall not be entitled to any claim(s) for increased costs in making such purchases. The CONTRACTOR shall ensure that the requirement for the purchase of local materials or goods does not adversely affect any of the criteria

expressed in the specifications or warranties or guarantees under this Contract, and the CONTRACTOR shall be obliged to advise the PURCHASER in advance (of any such purchase being made) in any such eventuality. Permits required for local purchase(s) shall be obtained by the PURCHASER. In the event that import restrictions are introduced after the Effective Date of the Contract, which substantially raise the price of imported materials, the PURCHASER and CONTRACTOR shall meet to decide on the net result and effect of such restrictions, including any impact on the time schedules or cost(s) if any.

- 12.2.4 The CONTRACTOR shall supply particulars of the manufacturer from whom the CONTRACTOR has purchased any plant, equipment, materials or spare parts, and shall supply a "Certificate of Origin" if required by the PURCHASER.
- 12.2.5 All goods shall be adequately and properly packed before despatch to satisfactorily cope with the mode of transportation utilized (particularly to ensure the avoidance of damage and deterioration) and for subsequent storage at Site. All packing cases will be properly marked in accordance with Annexure XXV. All goods despatched, by sea or over land, shall be adequately protected by protective coatings. Cargo shall not be despatched on deck except where size limitations so require, and in such event further precautions for packing and latching shall be taken. The deck cargo shall be completely protected, and fully painted with adequate types of protective paint. All closed packings shall contain a packing list(s) inside.

- 12.2.6 The CONTRACTOR shall be responsible for all despatches of equipment, materials and goods to the Site, and shall use the safest and most expeditious means of transport available to comply with the time schedules for Mechanical Completion of the Plant. The CONTRACTOR shall despatch, at his own expense goods by air freight, if this is necessitated by the time schedules.
- 12.2.7 The CONTRACTOR acknowledges its familiarity with facilities at the harbours (both in the manufacturer's and PURCHASER's country) and between the harbour and Site. The CONTRACTOR shall be responsible for the packing and delivery of the equipment (packed in proper dimensions as to size) in such manner that the equipment arrives at Site for erection, within the Contractual time schedules. The CONTRACTOR shall be responsible for obtaining any road or rail permits required for the purposes, but the PURCHASER shall assist the CONTRACTOR in obtaining such permits.
- 12.2.8 For purposes of storage at Site, all packages shall be marked in an appropriate manner for storage outdoors, under a roof, in locked warehouses or in rented premises, etc. as agreed upon at the meeting contemplated under Article 6.8.

12.3 Supply of Documents

- 12.3.1 The documents and manuals to be supplied by the CONTRACTOR within the deadline dates are indicated in Annexures V, XV and XXI.
- 12.3.2 All documents shall be forwarded to the PURCHASER by air freight with a minimum of five (5) copies, including one reproducible copy. Immediately upon despatch, a telegram/telex shall be sent to the

PURCHASER confirming the despatch, indicating the air way bill number, the flight number or other express means of transportation. The documents shall as far as practically possible be sent by a direct flight to (name of airport in PURCHASER's country).

12.4 Storage of Goods at Site

- 12.4.1 The CONTRACTOR shall be obliged to arrange for and have ready adequate warehouse facilities at the Site to receive packages. In the event that permanent facilities are not ready or available, the CONTRACTOR shall provide sufficiently adequate temporary facilities at his cost in good time at the Site, to the satisfaction of the PURCHASER. Notwithstanding the requirement for the marking of packages, under Article 12.2.8 above, and the instructions contained in Annexure XXV, the instructions of the Engineer as regards storage shall be adhered to in the event that additional storage protection is required.
- 12.4.2 The CONTRACTOR shall expeditiously check all goods and supplies for shortage or damage (no matter howsoever caused) and shall obtain immediate replacements, and the CONTRACTOR shall advise the Engineer of appropriate details.
- 12.4.3 In the case of goods, equipment or materials damaged in transit, such shall be replaced. Where the damage is determined to be minor, (and subject to the approval of the PURCHASER or his representative), repairs shall be undertaken at Site and the costs incurred shall be to the account of the CONTRACTOR as specified in Article 29.8. In the event of any dispute as to the extent of damage sustained, the goods shall be replaced and the CONTRACTOR shall abide by the decision of the PURCHASER.

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

- 12.5.1 The roads shall be constructed by the CONTRACTOR in accordance with the dimensions laid down in the final lay-out plan, which shall generally conform with the Plot Plan attached to this Contract and shall be approved by the PURCHASER.
- 12.5.2 All roads shall be constructed in accordance with the specified materials, and the designs shown in Annexure XXVIII, except where otherwise agreed by both parties. The lay-out of the railway lines shall be generally in conformity with the Plot Plan attached and shall be approved by the PURCHASER as regards the final lay-out.
- 12.5.3 All railway sidings shall be of _____ gauge, and shall meet the requirements of the national rail network of (PURCHASER's country). The materials used shall be in accordance with the requirements and the specifications on the national rail network as specified in Annexure XXVIII.
- 12.5.4 The railway sidings shall be as indicated in the Plot Plan and designed to transport $\frac{1}{2}$ of the production of the Plant, i.e. _____ tons per day of urea, and to transport _____ tons per day of raw materials, and adequate provisions shall be made accordingly, (in consultation with the railway authorities in (PURCHASER's country)).^{1/}
- 12.5.5 The CONTRACTOR shall provide and install a line telephone exchange in the Works. The maximum number of lines shall be (_____) and locations of telephone

^{1/} (Alternative Article can be provided for countries where all design is done by the railway authorities.)

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 shall be borne by the CONTRACTOR.

12.6 Civil Engineering Works

- 12.6.1 Immediately upon completion of the soil bearing tests, and acknowledgement of the load-bearing capacity and approval of the building lay-out plan and the line drawings, the CONTRACTOR shall immediately undertake the design and construction of all civil engineering works within the Battery Limits (inclusive of process, utility and off-sites, all underground buildings, sewerages, drainage, water treatment plants, etc.). The civil engineering works are further described and their execution specified in Annexures IV and XXVIII, and such works shall be constructed in a timely manner for the erection of machinery and in order to meet the agreed time schedules.
- 12.6.2 The CONTRACTOR shall furnish all materials, perform all labour and fulfil all requirements related thereto to the extent that said labour and materials may be necessary for, or incidental to, the execution and completion of the Works, and the testing of the quality of the same in whole or in part (unless otherwise provided) under the terms of the Contract. All work and material supplied under the Contract shall be of the best and most suitable workmanship and quality, strictly in accordance with the provisions of Article 25,

Annexures IV and XXVIII, and the decision of the Engineer as to the quality and suitability of materials and/or work shall be binding. The PURCHASER shall have the right to decide whether materials of local (indigenous) origin shall be used when available provided that they are in conformity with the specifications contained in Annexures IV, VIII and XXVII, however, that in the event that the use of local materials result in higher ex-plant costs (even though imported materials are freely available), the CONTRACTOR shall so advise the PURCHASER together with an estimate of the increased costs. The PURCHASER at his discretion may decide to use the higher-cost local materials, in which event an adjustment of price shall be made as necessary. Similar considerations shall apply to the availability of local labour and cost factors.

- 12.6.3 The CONTRACTOR shall be responsible for the true and proper setting out of the Works, as approved by the PURCHASER, and for the provision of all necessary instruments, appliances and labour in connection therewith. If at any time during the progress of the Works, faults and/or error(s) manifest themselves with regard to details of the position(s), levels, dimensions or alignment of any part of the Works, the CONTRACTOR shall of his own accord and expense rectify such faults and/or errors to the satisfaction of the Engineer. The review or approval 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 and adequacy thereof. The CONTRACTOR shall carefully protect and preserve all benchmarks, site rails, pegs and other things utilized in setting out the Works.

- 12.6.4 The undertaking of the Works throughout shall be carried out in such a manner as not to interfere with the traffic on any roads or footpaths leading to the Site and/or in the vicinity thereof, and wherever required by the Engineer, the CONTRACTOR shall promptly remove any material or staging used by him or any of his sub-contractors which cause interference with the use of the roads, footpaths or open spaces on the Site and/or areas adjacent thereto.
- 12.6.5 No temporary building shall be erected by the CONTRACTOR without the approval of the Engineer, which approval shall not be unreasonably withheld. 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.
- 12.6.6 On the completion of the Works, the CONTRACTOR shall, (except as otherwise specified or 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.
- 12.6.7 The CONTRACTOR shall make adequate arrangements during the phases of Construction for the availability of drinking water, construction water and other utilities, provisions for the safety of workmen, for security of the Works, for the prevention of damage to property (and repairs as necessary) and for constructing civil engineering works in such a manner that access to all parts of the Site is available to the PURCHASER's representative(s).

12.6.8 The CONTRACTOR shall be responsible for the repatriation of labour from the place(s) of recruitment and shall bear all costs and expenses incidental thereto and shall maintain such persons in a suitable manner during such time as they are employed or utilized (through sub-contracting) by the CONTRACTOR. If at the appropriate time(s) such persons are not repatriated within a reasonable period or if they are not maintained by the CONTRACTOR as required, the PURCHASER may maintain and repatriate such persons and such costs incurred shall be to the account of the CONTRACTOR.

12.7 Erection

- 12.7.1 The CONTRACTOR shall be responsible for the erection of all the plant and equipment within the Battery Limits (inclusive of those specified in Annexure III). Without limiting the generality of the foregoing, these shall include, but shall not be limited to:
- 12.7.1.1 Erection of all equipment in place.
 - 12.7.1.2 Erection of all steel structures, walkways, gangways, stairs, platforms, etc.
 - 12.7.1.3 Assembly and welding of all piping, fittings, etc. both above and below the ground.
 - 12.7.1.4 Assembly and erection of instrumentation, panel control boards and all interconnecting wiring, piping and equipment.
 - 12.7.1.5 Installation of all electrical equipment, and connection of all cables, starters and all other equipment.
 - 12.7.1.6 Installing of all utility equipment, and connecting such equipment.

- 12.7.1.7 Insulation of all equipment where required (including supply of insulation).
- 12.7.1.8 Painting of all equipment (including supply of paint).
- 12.7.1.9 Installation of all workshop, laboratory and office equipment, including air conditioning equipment and telephone facilities.
- 12.7.1.10 Installation and erection of all waste treatment and sewerage facilities.
- 12.7.1.11 Installation of all safety and warning devices.
- 12.7.1.12 All or any other erection work that may be required to complete the Plant, other than the exclusions contained in Annexure XIII.
 - 12.7.1.12.1 The erection of the plant and equipment shall conform with the details specified in Annexure XXIX.
- 12.7.2 The CONTRACTOR shall supply all materials needed for the erection and installation of the Works, all tools, tackles, cranes and other erection equipment required, and shall provide all instruments required for the proper erection and testing of the Works.
- 12.7.3 Before commencement of erection work in any building or Plant area, the Engineer shall certify that the civil engineering works have proceeded to the stage wherefrom erection can be commenced. The CONTRACTOR shall commence erection work only after such certificate is entered in the erection journal referred to below.
- 12.7.4 In the course of the erection work, journal or journals shall be kept for each unit of the Plant separately,

which shall progressively show the erection programme, the work actually completed on a weekly basis, and as at the end of each calendar month. The Site representative of the CONTRACTOR and the PURCHASER shall sign the journal every month.

- 12.7.5 The authorised representatives of the PURCHASER and the CONTRACTOR shall mutually agree on a procedure for testing/checking that any part(s) or the whole of the Plant or the Works have been properly erected, constructed, tested and/or completed, before at least two (2) months prior to the 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. The test procedures leading to mechanical completion of the Works shall thereafter follow as stated in Article 18.

12.8 Start-up and Commissioning

- 12.8.1 The CONTRACTOR shall inform the PURCHASER that the Plant(s) are proposed to be started-up at least three (3) months prior to the estimated time for the Mechanical Completion of the Plant(s).
- 12.8.2 The PURCHASER shall accordingly arrange to supply the necessary feedstock, materials, etc. as obligated by the Contract, and shall also supply all labour and personnel for the operation of the Plant.
- 12.8.3 The Plant shall thereafter be started-up and operated under the direct charge and supervision of the CONTRACTOR until Guarantee Tests are satisfactorily completed.

12.9 Guarantee Tests and Acceptance

12.9.1 The procedure(s) for running, demonstrating and proving the Guarantee Tests and the procedure for the Acceptance of the Plant are contained in Articles 26 and 18 of the Contract, and in other relevant parts of the contractual documentation.

12.10 Time Schedules

12.10.1 The target dates for different elements of the construction and completion of the Plant are indicated in the bar chart attached to Annexure XV. It is, however, agreed that within two (2) months after the Effective Date of the Contract (Article 8), the CONTRACTOR shall prepare a Critical Path Network, which shall list significant activities connected with the completion of the Project.

12.10.2 The Critical Path Network shall be computerized by the CONTRACTOR and at the first design meeting contemplated under Article 6.5, the methodology shall be laid down to obtain the necessary inputs required to maintain the print-out and deviations on a monthly basis. The Critical Path Network itself shall be changed and modified as soon as slippage of 10% occurs. Computerized print-outs indicating all activities and the float on a monthly basis shall be made available to the PURCHASER by the CONTRACTOR.

ARTICLE 13

SUPERVISION OF THE WORK AND ACCESS TO WORK

- 13.1 The CONTRACTOR shall provide all of the required supervisory and management services pursuant to the Contract. An adequate number of suitably qualified and experienced personnel shall be available for the supervision of all work at Site until Provisional Acceptance of the Works. Such services shall include, but shall not be limited to, the following:
- 13.1.1 Supervision and management of transportation equipment.
 - 13.1.2 Supervision and management of construction and erection equipment.
 - 13.1.3 Supervision and management of the civil works.
 - 13.1.4 Supervision and management of erection.
 - 13.1.5 Supervision and management of stores and warehouse management.
 - 13.1.6 Supervision and management of all tests.
 - 13.1.7 Supervision and management of pre-commissioning and start-up operations.
 - 13.1.8 Supervision and management of the entire Works until Provisional Acceptance.
- 13.2 The CONTRACTOR (as represented by a duly authorized party on its behalf) shall be constantly on Site during working hours, until the Provisional Acceptance of the entire Works has been issued and such party shall devote its entire time to the superintendence of this work. Such authorized party shall have full authority to act for and bind the CONTRACTOR and shall receive, on behalf of the CONTRACTOR, directions and instructions from the PURCHASER's Engineer. The authorized party shall be sufficiently fluent in the language governing the Contract and/or in languages as agreed upon with the PURCHASER so as to be able to receive directions and instructions and to correspond with the PURCHASER and the Engineer in that language.

- 13.3 The CONTRACTOR shall, upon a request of the PURCHASER or his Engineer, remove his authorized representative or any workman, if in the opinion of the Engineer or the PURCHASER, such representative or workmen are incompetent or have been conducting themselves improperly, and the CONTRACTOR shall promptly replace such representative or workmen in equal number. The Engineer shall advise the CONTRACTOR of his reasons for requesting such replacement(s) however, any decision made by the Engineer shall be final.
- 13.4 The PURCHASER shall appoint representatives (which shall include the Engineer) who shall be on duty at the Works wherever and whenever necessary, and in any event during all normal working hours. The PURCHASER's appointee shall be competent and duly qualified to discharge the project responsibilities entrusted to him and he shall be vested with appropriate authority to act on the PURCHASER's behalf. Copies of contractual instructions issued by either party to the Contract upon the other shall be kept at all times at the Site by the CONTRACTOR.
- 13.5 Subject to specific approval for the exercise of, and delegation of powers authorized by the PURCHASER vis-a-vis its representatives, the Engineer may formally delegate to such persons specified by him, limited powers, discretions and authority as necessary, and the CONTRACTOR shall recognize such persons on written notice from the Engineer of their appointment and as regards their powers, discretions and authority so delegated. The CONTRACTOR acknowledges that the members of the Engineer's subordinate staff or delegates and persons, including the Engineer shall have such qualified authority to approve or bind the PURCHASER as regards any approvals, passing of work or materials, authority to order any action or work involving delay or extra payment in accordance with the specific powers delegated by the PURCHASER to its representatives.

- 13.6 The CONTRACTOR shall, (without derogating from the contractual schedule), comply with such directions, issued by the Engineer from time to time in respect of the form and manner in which 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 tenure of the Contract and shall provide the Engineer with full information and data concerning the progress and execution of the work. The Engineer shall be rendered all necessary assistance to facilitate the performance of his duties, to ensure that the work is being executed in accordance with this Contract.
- 13.7 The CONTRACTOR shall not be prevented from making application directly to the PURCHASER for appeal and/or clarifications arising out of instructions or directions given by the Engineer.
- 13.8 For the purposes of this Article the expression "Supervision" shall be deemed to include direction and responsibility for the activities or matters or work or procedures being the subject of supervision and management (as described in Article 17.1) of all of the Works until Provisional Acceptance.
- 13.8.1 Following the Provisional Acceptance of the Works the obligations of the CONTRACTOR relating to supervisory activities shall comprise of Management Assistance and Mechanical Advisory Services pursuant to Articles 17.2 to 17.7 (inclusive).
- 13.9 The CONTRACTOR and the PURCHASER and any person(s) 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 undertaken, prepared or where materials, manufactured articles or machinery are being obtained for the Works. The CONTRACTOR shall afford every facility for access to any place where work is being undertaken under this Contract and shall give every assistance in obtaining the right for such access in connection with the execution of the work under this Contract.

- 13.10 The PURCHASER shall afford every facility and assistance in, or for obtaining, the right of access to such information, Site, workshops or persons within (PURCHASER's country) as is required in connection with this Contract.
- 13.11 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. In the areas of the Site where the CONTRACTOR is working, he shall have exclusive access, except for the supervising staff of the PURCHASER and/or the Engineer. The PURCHASER shall provide necessary assistance in obtaining permission from his Government for visits/stay and travel of the CONTRACTOR or his authorized personnel.
- 13.12 The CONTRACTOR shall be entitled to visit the Works in operation for a period of three (3) years after Provisional Acceptance to examine it as to its operating results, to take measurements required for establishing exact operating data and demonstrate the Plant 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 Plant and/or the Site.
- 13.13 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.

13.4 Where in the opinion of the Engineer:

- 13.4.1 It is necessary that third parties (whether additional contractors or otherwise) provided that such parties are not direct competitors of the CONTRACTOR be sent to check the Work of the CONTRACTOR, the CONTRACTOR shall to the satisfaction of the Engineer, allow them access to the Work and/or the Site thereof and shall co-operate with them in the carrying out of their duties and obligations. The foregoing shall not prejudice the rights of the CONTRACTOR relative to the terms of Article 7, and the third parties shall not disrupt the activities or obligations of the CONTRACTOR.
- 13.14.2 If the sending on to the Work and/or the Site thereof of a third party under Article 13.14.1 does not arise from any non-fulfilment of the CONTRACTOR's obligations and, in addition, could not have been reasonably foreseen or anticipated by the CONTRACTOR when entering into this Contract, and, if proven to the reasonable satisfaction of the PURCHASER, the CONTRACTOR has incurred expense in complying with Article 13.14.1 in respect of such third party, the PURCHASER (if the CONTRACTOR has given written notice of the CONTRACTOR's claim before the expiration of thirty days from the sending on to the Work and/or Site thereof of the third party or third parties involved) shall pay to the CONTRACTOR the cost of any services provided by the CONTRACTOR.

ARTICLE 14

INSPECTION, TESTING AND CERTIFICATION

- 14.1 The CONTRACTOR shall assume full responsibility for the inspection, testing and certification of all equipment, materials, spare parts and other items during manufacture and prior to despatch, prior to and during inspection and upon arrival at the Plant Site for incorporation into the Works. Notwithstanding the appointment of a duly authorized representative by the PURCHASER (if any) to witness the activities referred to, the CONTRACTOR shall be liable for the proper, adequate and sufficient conduct of the functions envisaged in this Article, pursuant to Articles 25 and 28.
- 14.2 The CONTRACTOR:
- 14.2.1 Shall undertake, at the shops of fabricators during manufacture and before despatch (in accordance with agreed procedures) the necessary inspection and certification testing to assure conformance with the relevant codes and standards provided in the specifications.
- 14.2.2 During progressive inspection of equipment fabrication shall take every necessary measure to ensure that the fabricators and/or their employees strictly follow fabrication instructions and codes specified by the CONTRACTOR and/or Process Licensor and that the quality of workmanship is maintained at acceptable levels to enable the production of equipment and other items in accordance with the minimum qualitative standards expressed in the Contract.

- 14.2.3 Shall require its suppliers to provide the necessary test certificates in proper form together with all other documents required by the Inspecting Authorities in the country of manufacture or as may be required by the PURCHASER in consideration of the regulations in force in (country) and/or as provided for in the specifications.
- 14.3 The CONTRACTOR:
- 14.3.1 Shall issue such confirmation to the PURCHASER's inspectors prior to their inspection, when the equipment, machinery or material is ready for final inspection.
- 14.3.2 Shall issue proper Certificates of Inspection in respect of all items of Plant and Equipment respectively, before despatch, and shall send copies of such Certificates to the PURCHASER, and certificates of tests carried out in connection with the issue of such Certificates of Inspection.
- 14.4 The CONTRACTOR shall expedite and control the delivery by making his best efforts in order that the Equipment Supplier(s) maintain the delivery of equipment in order to meet the time schedules laid down for the Contract.
- 14.5 The PURCHASER may appoint representatives or a sub-contractor to act as his representative for inspection of equipment during manufacture or prior to despatch. When any equipment is ready for inspection, the CONTRACTOR shall give at least forty-five (45) days notice to the PURCHASER's representative of the time, place and goods to be inspected. Should the PURCHASER's representative desire to be present the CONTRACTOR shall be advised within thirty (30) days thereafter. Wherever required by the PURCHASER, the CONTRACTOR shall associate the PURCHASER or his representative with such inspection, and shall undertake the necessary co-ordination for joint inspections. The presence of the PURCHASER's representatives shall not in any manner qualify

the CONTRACTOR's obligation under this Contract. The presence of the PURCHASER's representatives also shall not in any way imply contractual acceptance of goods or transfer of ownership.

14.5.1 Inspection and Tests at Factory All work shall be subject to inspection and testing at CONTRACTOR's factory and shall conform to the requirements of the Contract.

14.5.2 Inspection and Test at Site All work shall be subject to inspection and testing on Site and shall conform to the requirements of the Contract. After installation of the Work on Site, the CONTRACTOR shall carry out such required tests to prove compliance with the Contract, notwithstanding any tests which may have been carried out earlier at CONTRACTOR's factory.

14.5.3 Inspection and Tests on Mechanical Completion Pursuant to the provisions of Article 18, the CONTRACTOR shall, upon due notice to the PURCHASER of his readiness to undertake the tests to demonstrate and prove completion of the Works, proceed forthwith to commence the procedures in accordance with the requirements of Article 18, but subject to the provisions referred to therein.

14.6 All equipment, machinery, material and work performed in connection with this Contract shall be available for inspection by the PURCHASER (through his duly authorized representative, including his underwriters as the case may be). The CONTRACTOR, its sub-contractors, and/or suppliers shall provide safe and necessary access for the inspection envisaged by this Article. The PURCHASER shall be afforded full and free access to the shops, factories, site or places of business of the CONTRACTOR, the sub-contractors and/or suppliers for such inspection to determine the condition and progress of work under the Contract. Neither

the failure to make such inspection nor failure to discover defective workmanship, materials or equipment, nor approval of, or payment to the CONTRACTOR for such work, materials or equipment (pursuant to this Contract) shall prejudice the rights of the PURCHASER thereafter to require correction, replacement or reject the same as herein provided. If any services or workmanship supplied by the CONTRACTOR, the sub-contractors and/or suppliers are determined by the PURCHASER, either during the performance of the work, on inspection, or during any applicable warranty period(s), to be defective and not complying with requirements of this Contract and arising out of the fault or negligence of the CONTRACTOR, the sub-contractors and/or suppliers, the PURCHASER shall notify the CONTRACTOR in writing that such work is being rejected. Thereupon the CONTRACTOR shall, at his own expense, promptly remove and replace or correct such defective work by making the same comply strictly with all requirements.

14.7 If the PURCHASER waives his right of inspecting or testing as herein provided, it shall in no way relieve the CONTRACTOR of full liability for the quality, proper operation and performance of the completed work, and/or sections or parts thereof, nor shall it prejudice or affect the rights of the PURCHASER set forth under the Contract.

14.8 Should the PURCHASER's representative establish during inspection any deficiency in the inspected items, the CONTRACTOR shall take immediate steps to eliminate them. The CONTRACTOR shall maintain records of deficiencies noted and corrected. In case of a difference of opinion, the CONTRACTOR may proceed to act on his own responsibility as regards the despatch of such goods and equipment, but subject however, to the relevant provisions of Article 25 and Articles 27 to 30 inclusive.

- 14.9 The CONTRACTOR shall at the PURCHASER's cost and after notice from the PURCHASER review the quality of the items being supplied by the PURCHASER as listed in Annexure VIII and elsewhere in the present Contract, as soon as they shall have been manufactured (but prior to beginning of the erection of each item) and shall fully satisfy himself as to whether the specifications of the technical documents supplied by the CONTRACTOR have been met, and if not, the CONTRACTOR shall advise the PURCHASER of such non-compliance concerning the use of wrong materials of construction specified by the CONTRACTOR for manufacture of these goods. The CONTRACTOR shall convey such findings to the PURCHASER immediately in writing and of his requirements for the necessary modifications, if any, and the PURCHASER shall undertake such modifications or repairs immediately. Should modification or repair of any of the goods have occurred, the CONTRACTOR shall repeat the inspection after the modifications or repairs have been completed, at the PURCHASER's cost and the CONTRACTOR shall fully satisfy himself as to the sufficiency and adequacy of such modifications.
- 14.10 Where the CONTRACTOR or any of his sub-contractors are undertaking any performance tests of any equipment to be supplied under this Contract, or any tests required under statutory law, the CONTRACTOR shall give at least forty-five (45) days notice of such tests to the PURCHASER, or his representatives if such have been designated, and if desired the said representatives shall be present at such tests.
- 14.11 The PURCHASER shall have the right to inspect all buildings and Civil Works during and after construction, (except for minor items such as painting etc. which may be inspected subsequently) and shall certify that such works are complete, in accordance with Annexure XXVIII, and Article 18.

- 14.12 The PURCHASER shall have the right to inspect all the erection of plant and machinery, and all piping, instrumentation, electrical installation and wiring, insulation, painting and all other work connected with erection as detailed in Annexure XXIX.
- 14.13 During all inspection, the PURCHASER or his representatives may have recourse to such tests as they may consider necessary in order to establish whether the materials, objects, supplies or methods of construction and erection are of the requisite quantity and quality. The PURCHASER or his representatives may require the replacement or repair, as the case may be, of items which do not conform with the Contract, even after they have been incorporated into the Works, and the provisions of the Contract referred to in Article 14.8 shall apply mutatis mutandis.
- 14.14 The CONTRACTOR shall place at the disposal of the PURCHASER, free of charge, such instruments, and in particular equipment for the radioactive check of welds, along with specialized operating staff, if requested by the PURCHASER, to enable the PURCHASER to carry out his inspection of the CONTRACTOR's work or supplies, efficiently.
- 14.15 The CONTRACTOR shall ensure that the despatch and delivery of plant and equipment are expeditiously implemented and efficiently co-ordinated as required by Article 4.13 in complete accordance with the terms, conditions and procedures for delivery in this Contract and/or also as may be contained in any Purchase Orders issued to Vendors.
- 14.16 The CONTRACTOR shall take all necessary measures to ensure that all export licences (if necessary) and shipping documentation are arranged and issued in a timely manner.
- 14.17 The inspection by the PURCHASER and/or repair or replacement of equipment or construction works at the request of the PURCHASER shall not excuse the CONTRACTOR from the liabilities, warranties or guarantees as expressed in this Contract.

ARTICLE 15
VARIATIONS, CHANGES AND ADDITIONS
TO SCOPE OF WORK

- 15.1 The PURCHASER shall have full powers, subject to this Article and other provisions of the Contract from time to time during the execution of the Contract by notice in writing to direct the CONTRACTOR to alter, amend, omit, change, modify, add to or otherwise vary any of the Works and the CONTRACTOR shall carry out such work and be bound by the same conditions, so far as applicable, as though the said variations were stated in the Contract and Specifications.
- 15.2 Notwithstanding the detailed instructions provided in Annexure XIX, when the CONTRACTOR has received any direction from the PURCHASER/Engineer which may, in the opinion of the CONTRACTOR, involve a change 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. Subject to the provisions of Article 15.3 and 15.9, 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. In the event of any difference in opinion, the cost of the variation may be assessed in accordance with Article 37.
- 15.3 If the changes requested by the PURCHASER are due solely to defects, omissions or errors in the Plant(s) or Works(s) as indicated in Article 18.17 and requiring additional time provided for in Article 29.10 which could alter, add to, change or vary considerably the amount of work already within the scope of obligations of the CONTRACTOR or its sub-contractor(s),

the PURCHASER shall not be liable to pay any additional costs. The CONTRACTOR acknowledges that there shall be no entitlement for any claims for any increases in the amount of work undertaken or to be undertaken for rectification work or modifications undertaken whether or not related to design and/or other errors, mistakes, omissions and lack of accuracy, in undertaking its obligations herein, including that mentioned in Article 15.5.

- 15.4 The CONTRACTOR may at any time during his performance of the Contract submit to the PURCHASER for his approval written proposal(s) for a variation of the Works. If the CONTRACTOR is of the 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. The CONTRACTOR, in connection with any proposal he makes pursuant to this Article and Article 4.4.2 and/or for a contract modification pursuant to Article 29.10 and/or any other Article, shall furnish a breakdown in sufficient detail to permit an analysis of all material, labour, equipment, sub-contracts and project schedule overruns (estimated) and design changes and shall include in such proposal or report all work involved in the variation and/or modification, whether such work was deleted, to be added or changed. The request for time extension shall be supported by such justification as may be deemed necessary.
- 15.5 Changes or variations pursuant to this Article shall not justify extra costs in any event, even if such changes or variations are as a result of changes in detailed project schedule created by change in material deliveries, and/or incidental to time changes related to mechanical completion, or due to changes in piping layout or design performed by the CONTRACTOR as a result of detailed engineering.

- 15.6 If the PURCHASER approves the CONTRACTOR's proposal, then subject to Articles 15.4, 15.5 and 15.9, the CONTRACTOR shall make the variation so approved. The PURCHASER 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 is not accepted, or if any modifications or rectifications are required pursuant to Article 18.18. In all other cases, the PURCHASER may give or refuse his approval as he thinks fit and his decision shall be final.
- 15.7 The CONTRACTOR shall not be entitled to any extra cost on account of a variation proposed or initiated by him. Any deduction in the Contract Price agreed to between the PURCHASER and the CONTRACTOR pursuant to such Article 15.2 shall be deducted from the Contract Price.
- 15.8 Upon receiving a notice of a change order from the PURCHASER and if in the opinion of the CONTRACTOR such variation is likely to prevent or prejudice the CONTRACTOR from fulfilling any of his obligations under the Contract, he shall notify the PURCHASER thereto in writing and the PURCHASER shall decide forthwith whether or not the same shall be carried out. If the PURCHASER 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 and subject to the provision of Articles 30, 15.3 and 15.5.
- 15.9 Except for the provision of Article 15.8, 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.
- 15.10 In the event that the PURCHASER and the CONTRACTOR are unable to agree on whether such required services are within the contractual obligations of the CONTRACTOR, or if the PURCHASER considers that the payment demanded for such required services by the CONTRACTOR is exorbitant, a neutral person (mutually appointed by the CONTRACTOR and PURCHASER) shall

have the right to decide on the quantum of payment, if any, which may be payable by the PURCHASER to the CONTRACTOR. In such an eventuality the CONTRACTOR shall proceed without delay to carry out the design changes, and/or provide the services which are the subject of the dispute, pending the decision of the neutral person. The decision of the neutral person shall be without prejudice to the rights of the CONTRACTOR and PURCHASER for submission of the dispute to Arbitration.

- 15.11 All additional payments for the required work or services due from the PURCHASER to the CONTRACTOR under the provisions of this Article shall be embodied in a Change Order upon conditions specified therein which shall be signed by the PURCHASER and the CONTRACTOR (or their authorized representatives), and such Change Order(s) shall be deemed to form part of the Contract and subject to all of the terms and conditions therein, unless otherwise excepted.
- 15.12 Any and all modifications to the technical specifications pursuant to the Contract (as may be specified further in the Annexures) agreed to by the PURCHASER shall be embodied in a Change Order which shall be signed by the PURCHASER and the CONTRACTOR (or their authorized representatives), and such Change Orders shall be deemed to form part of the Contract and subject to all of the terms and conditions therein, unless otherwise excepted.
- 15.13 The PURCHASER and CONTRACTOR estimate that an amount of (Amount and Currency) may be required for variations, and additions as provided by this Article and/or for any further specialized equipment which may be required by the PURCHASER. The PURCHASER shall be obliged to make the necessary arrangements for obtaining the amount(s) if due under the terms of this Contract. However, the extent, necessity and requirement for the expenditure of such amount(s) shall be at the sole discretion of the PURCHASER.
- 15.14 The provisions of Articles 18, 25, 28 and 29 shall apply mutatis mutandis to the terms of this Article.

ARTICLE 16

TRAINING

- 16.1 The CONTRACTOR agrees and acknowledges that the adequate training of the PURCHASER's personnel is a necessary condition for the fulfillment of the objectives of the Contract.
- 16.2 The CONTRACTOR shall provide training for the PURCHASER's personnel both at Site and at plants outside (PURCHASER's country) in accordance with the requirements of Annexure XVIII, Article 4 and Article 16.3.
- 16.3 Training facilities to be provided by the CONTRACTOR shall be as detailed in Annexure XVIII.
- 16.4 The PURCHASER and the CONTRACTOR shall agree at the first co-ordination meeting contemplated under Article 6.8, the time, place and details to be established for the training of the PURCHASER's personnel and final details for training shall be forwarded to the PURCHASER within _____ months following the Effective Date. The CONTRACTOR covenants that he shall competently train the PURCHASER's personnel for the purposes and on the basis referred to herein for the periods contemplated in Article XVIII at a plant or plants, using the Processes of the Licensors identified in Article 4.5 which have commenced production in the five years immediately preceding the Effective Date of this Contract.
- 16.5 The PURCHASER shall undertake to provide personnel for training with qualifications and experience recommended by the CONTRACTOR and agreed to by the PURCHASER.

ARTICLE 17

MANAGEMENT AND TECHNICAL ADVISORY SERVICES

- 17.1 The CONTRACTOR shall manage the operations of the Plant following the Mechanical Completion stage as specified in Article 18. The management of the Plant by the CONTRACTOR shall cease upon the successful completion of the Performance Guarantee Tests and Provisional Acceptance of the Works by the PURCHASER. The provisions of Articles 13, 18, 26 and 29 shall apply mutatis mutandis to the requirements for proper and satisfactory management of the Plant operations by the CONTRACTOR.
- 17.2 The CONTRACTOR shall provide Management Assistance Services to the PURCHASER from Provisional Acceptance stage until the Final Acceptance of the Works. The CONTRACTOR shall provide necessary Site personnel in accordance with Article 17.3 hereunder.
- 17.3 The CONTRACTOR's staff required to accomplish Management Assistance Services in accordance with Article 17.2 above shall consist of:
- (List of Personnel as indicated in (supplementary document))^{1/}
- 17.3.1 The number and type of CONTRACTOR's personnel to be maintained at Site for the purposes of Management Assistance shall as far as practicable be selected by CONTRACTOR and PURCHASER from the category of personnel who have been responsible for the actual start-up and operation of the Plant up to and including the Performance Guarantee Tests.
- 17.4 The CONTRACTOR's obligations pursuant to the requirements of Article 17.2 shall be as follows:

^{1/} It is suggested that the minimum requirements should be:
2 Production Engineers, 1 Maintenance Engineer (Mechanical)
1 Maintenance Engineer (Instrumentation)

- 17.4.1 Provide Management Assistance to the PURCHASER to ensure maintenance of production levels at optimum capacity, and with maximum efficiency.
 - 17.4.2 Provide Management Assistance to the PURCHASER to assure maintenance of the plant and equipment to enable operations to be kept at design levels of production, and efficiency ratios.
 - 17.4.3 Provide Management Assistance to the PURCHASER through in-plant training of PURCHASER's personnel.
- 17.5 During the period between the Provisional Acceptance stage and the Final Acceptance of the Works, all Plants shall be operated at pre-established levels and under agreed conditions.
- 17.5.1 In the event of a disagreement between the CONTRACTOR and PURCHASER as to the capacity at which a Plant or Plants should operate, the views of the PURCHASER shall prevail.
 - 17.5.2 In every case where the CONTRACTOR's personnel at Site apprehend any damage to plant and/or equipment, as a result of conditions leading to overloading, and/or inadequate or poor maintenance, the PURCHASER's representative at Site shall be informed forthwith in writing.
 - 17.5.3 Provided however that if the PURCHASER elects to operate any piece of equipment above its designed (nameplate) capacity, or operates such of them with inadequate maintenance in disregard of the instructions of the CONTRACTOR's instructions the Mechanical Warranties in respect of such equipment shall (in the appropriate case) lapse, and the CONTRACTOR shall not be held responsible for mechanical failure of the equipment even though the Mechanical Warranties specified in Article 28.3 in respect of such equipment have not been exhausted.

- 17.6 In the event that the PURCHASER so desires, he may retain part or all of the personnel covered by Article 17.3 for an extended period, not to exceed (18) months after Final Acceptance of the Plant, on terms and conditions to be mutually agreed in advance and the payment of additional fees to the CONTRACTOR.
- 17.7 Following the management of the Plant by the CONTRACTOR in accordance with the provisions of Article 17.2 and subsequent to Final Acceptance of the Plant, the CONTRACTOR shall agree to grant an option to the PURCHASER for the execution of a separate Agreement for the provision of Technical Advisory Services to be provided by the CONTRACTOR to the PURCHASER upon mutually agreed terms to cover those services mentioned below. Such an Agreement shall become effective immediately following Final Acceptance of the Plant and shall have a duration of not less than _____ () years. The PURCHASER may exercise the said option (at his sole discretion) no later than the expiry of one month following Provisional Acceptance. For the purposes of this Contract the rights and obligations envisaged in such an Agreement for Technical Advisory Services shall be considered to be wholly separate and distinct from the liabilities and the responsibilities contained in this Contract. The terms of such Agreement shall include (but shall not be restricted to) any one and/or other of the following matters:
- 17.7.1 Provision of senior advisory personnel to conduct half-yearly review of Plant and efficiency of its operations.
- 17.7.2 Recommendations as to improvement of plant operations.
- 17.7.3 Provision of answers to technical queries related to plant operations.

ARTICLE 18

COMPLETION OF WORK(S), TAKE-OVER AND
CONDITIONS OF ACCEPTANCE

- 18.1 The CONTRACTOR shall execute the work diligently and shall adhere strictly to the requirements for expeditious completion of the Works, notwithstanding the contractual time schedules provided herein.
- 18.2 The Work(s) and/or sections and/or parts thereof shall be considered to have been completed when the requirements of Articles 18.4 to 18.7 have been satisfied, but subject to the provisions of Articles 18.9 and 18.17 herein. However, notwithstanding the foregoing, the Work(s) or sections and/or any parts thereof shall not be deemed to have been completed if subsequent events necessitate requirement(s) for rectification and/or modifications to the Works(s), sections and/or parts thereof, whether occurring before or after Provisional Acceptance.
- 18.3 As soon as any parts of the Works or Plant or any part thereof, is in the opinion of the CONTRACTOR substantially complete and ready for inspection the CONTRACTOR shall notify the PURCHASER (by means of a Construction Completion Report) that the Plant or a section thereof is ready for Mechanical Completion Tests. This report shall indicate which parts of the Works or the Plant the CONTRACTOR proposes to demonstrate, have been completed in accordance with the specifications and have passed initial inspection tests as may have been specified in the Contract. The CONTRACTOR shall prepare and submit a programme of tests to prove the individual equipment and/or sections of a Plant.
- 18.4 Upon satisfactory inspection of the plant and/or equipment and/or section of a Plant, the CONTRACTOR and the PURCHASER shall sign the Construction Completion Report stating that

the Plant or part thereof has been inspected and is substantially complete and that any procedures required to prove the mechanical fitness and demonstration of Mechanical Guarantees prior to the Plant being put into operation may safely be carried out. (Such Construction Completion Report may include a note of any minor items which can be completed after start-up). The signing of the Construction Completion Report by the PURCHASER shall not be deemed to constitute an acknowledgement or confirmation or agreement as to the suitability or fitness of the equipment and/or section of a Plant for the purposes intended.

- 18.5 If the PURCHASER is not satisfied that the Plant or part thereof referred to in Article 18.3 is substantially complete he may endorse the Construction Completion Report accordingly, and particularize as to the reasons why such Works or Plant or part thereof is not in accordance with the Contract. The CONTRACTOR shall thereafter complete the Works or Plant or part thereof as shall be required and shall be prepared to provide adequate proof of such completion. The failure by the CONTRACTOR to complete the Works or Plant or parts thereof shall entitle the PURCHASER to withhold immediately all or part of the payments then due to the CONTRACTOR.
- 18.6 When all the items of equipment in a Plant or any of the sections of the Off-sites and Utilities are ready and have been completed pursuant to this Contract (viz. erected, installed and tested), the CONTRACTOR and PURCHASER shall review the procedures for the pre-agreed tests for the demonstration of the Mechanical Completion of the Plant to be undertaken in accordance with Annexure XX (or otherwise) and the detailed procedures therewith.
- 18.7 The pre-commissioning of the Plants and each section of the Utilities and Off-sites and the carrying out of the Mechanical Completion Tests shall consist of the carrying out of such operations and making of such tests as are detailed in Annexure XX to establish the correct mechanical functioning of

the Plants. When all such operations and tests have been fully and satisfactorily completed individually and/or together on the Ammonia Plant, the Urea Plant, the Power Plant and all sections of Utilities and Off-sites subject to the provisions of Article 18.9 and the Mechanical Completion of the Works has been achieved, the CONTRACTOR shall thereupon prepare a Mechanical Completion Report which shall be signed by both parties following a joint examination of the Plant(s) or those sections of Utilities and Off-sites concerned, and upon such signature of such Report by both parties, the Mechanical Completion of the Plants or sections of Utilities and Off-sites concerned shall be deemed to be achieved. The considerations applying to the signing of the Mechanical Completion Report by the PURCHASER shall be similar and in like manner to the signing of the Construction Completion Report by the PURCHASER pursuant to Article 18.4 and the PURCHASER shall not be deemed to have made any acknowledgement, or confirmation or agreement thereby.

- 18.8 The operations and tests referred to in 18.6 and 18.7 above shall be carried out in a competent manner by the CONTRACTOR's personnel under its direction and responsibility and in the presence of the PURCHASER's personnel.
- 18.9 If during the course of the tests mentioned above, any defect(s) or malfunction(s) become apparent in the plant and/or equipment supplied, or in any part of the Works, the CONTRACTOR shall immediately take steps to replace the defective equipment and/or rectify the defective part of the Works in the minimum of time, as required by Articles 25.4 (if applicable), 28 and 29 and subject to Article 30.
- 18.10 Upon Mechanical Completion of any Plant and testing of each Plant in accordance with Article 15.7 and Annexure XX, as soon as possible thereafter, the relevant Plant shall be brought into operation.

- 18.11 Thereafter the Plant shall be started-up and when all sections of the Plants are in a satisfactory operating state, and specification grade Ammonia and Urea are in continuous and uninterrupted production for (____) days at (____)% capacity in accordance with the terms of the Contract, then, the Plant shall be deemed to be in Commercial Production.
- 18.12 The CONTRACTOR shall thereafter be responsible for demonstrating that the Plant(s) is capable of achieving all the Guarantee Tests and requirements specified in Article 26 and as elsewhere expressed in the Contract to prove contractual compliance.
- 18.13 The Plant shall be deemed to have been Provisionally Accepted when the CONTRACTOR shall have satisfactorily demonstrated that the Plant is capable of meeting its Performance Guarantees as specified in Article 26 and the PURCHASER has given a Provisional Acceptance Certificate following satisfactory discharge of the conditions of Article 18.14 below, subject however to the exercise of the rights of the PURCHASER pursuant to Articles 14, 25, 28 and this Article.
- 18.14 The conditions governing acceptance shall be as provided herein and as elsewhere expressed in this Contract. The Provisional Acceptance Certificate shall be issued when all of the following have been satisfactorily discharged together with full compliance by the CONTRACTOR of all other contractual terms:
- 18.14.1 When the CONTRACTOR has provided to the PURCHASER all Certificates of Inspection and Certificates of Materials applying to each of the major equipment, and machinery.
- 18.14.2 When the CONTRACTOR has prepared a statement indicating the start and end of the Mechanical Warranty period for each item of equipment and machinery and provided the same to the PURCHASER, after confirmation by the Engineer in writing of the accuracy of the dates contained therein.

- 18.14.3 When the CONTRACTOR has provided all documents listed in Annexure IV to the PURCHASER, including as-built drawings.
- 18.14.4 When the CONTRACTOR has completed the Civil Construction of all the buildings and other Civil Engineering in the Works and has obtained a "Civil" Construction Completion Report in respect of all Civil Works.
- 18.14.5 When the CONTRACTOR has completed the Construction Completion Report in respect of each equipment/section/Plant(s) included in the Contract, in accordance with Article 18.3 of the Contract, and the tests have been successfully completed and the Plant(s) have demonstrated their capability as may have been specified in the Contract. (The Construction Completion Report shall state that the CONTRACTOR proposes to demonstrate tests on the equipment/section/Plant(s) within seven to fourteen (7 to 14) days of the date therefrom as agreed with the PURCHASER. The PURCHASER after having duly satisfied himself as to the adequacy and completeness of the tests demonstrated by the CONTRACTOR shall have signed the Report accordingly).
- 18.14.5.1 In the event that any of the test(s) results have been unsatisfactory in reference to any equipment/section/Plant(s), the PURCHASER shall endorse the same on the Construction Completion Report. The CONTRACTOR shall rectify defects and undertake such corrective measures as are necessary in accordance with the requirements of Article 15.9 and shall demonstrate such of the tests as required to prove the performance of the equipment/section/Plant(s) in question to the satisfaction of the PURCHASER, and, thereafter shall obtain the PURCHASER's signatures approving the relevant Construction Completion Report.

- 18.14.5.2 The Pre-commissioning Tests shall be demonstrated on the equipment after preparation of the Construction Completion Report.
- 18.14.6 When all Mechanical Completion tests have been satisfactorily completed, and the Mechanical Completion has been successfully proved and the CONTRACTOR and PURCHASER have signed the Mechanical Completion Report following joint examination of the Plant. The Mechanical Completion Report shall signify the acceptance of the mechanical completion stage of the Works, and the readiness of the Plant for commissioning in accordance with the provisions of Article 18.7.
- 18.14.7 When the Performance Guarantee Tests (governed by Article 26, in accordance with criteria stated in Articles 26.3 to 26.7 inclusive, the methodology specified in Article 26.8 and procedures indicated in Articles 26.4, 26.10, 26.11 to 26.13 and subclauses thereof) shall have been successfully demonstrated, completed, and proved in accordance with the Contract, and the CONTRACTOR has prepared Performance Test Certificate(s) and submitted the same for signatures and acceptance by the PURCHASER.
- 18.14.7.1 The approval of the Performance Test Certificate(s) by the PURCHASER (if without reservations) shall be expressed in the Provisional Acceptance Certificate which shall be signed by PURCHASER signifying the acceptance of the Plant(s)/Works, and the completion of the obligations of the CONTRACTOR with respect to the Guarantee Tests stated in Article 26 shall be deemed to have been fulfilled.

18.14.7.2 If for any reason the Guarantee Test performance is not accepted by the PURCHASER, or is accepted subject to certain conditions for modification or rectification of defects and the CONTRACTOR has modified or rectified the defects pursuant to Article 29 and demonstrated Performance Guarantee Tests to the satisfaction of the PURCHASER, the Plant shall be deemed to have been Accepted.

18.14.8 When all of the required Management Services pursuant to Article 17.1 have been satisfactorily discharged.

18.15 The CONTRACTOR's work at Site shall be deemed to have been completed only when the CONTRACTOR shall have received the Provisional Acceptance Certificate from the PURCHASER pursuant to Article 20 herein as qualified by the provisions of Article 15.13.

18.16 The Provisional Acceptance of the Plant or the Take-Over of any specified part or section of the Plant(s) by the PURCHASER shall not in any way release the CONTRACTOR from his obligations (expressly or impliedly) under the terms of this Contract, and shall not be construed as evidence that any portions of the Work(s), part(s), section(s), and/or material(s) thereof are complete.

18.17 If for reason attributable to the CONTRACTOR (whether directly or indirectly), the CONTRACTOR is unable to demonstrate any or all of the Guarantee Tests and/or Performance Requirements referred to in Article 18.12 above pursuant to Articles 18 and 26, the provisions of Articles 27.2 to 27.5 (inclusive) (as the case may be) shall apply but subject nevertheless to the requirements of Article 18.18 below.

18.18 The CONTRACTOR shall be responsible in any event for undertaking repairs and modification(s) of the Plant(s) and/or of any of the sections and/or parts thereof, in relation to any part of the Work(s) supplied by him or for which he is responsible under this Contract, and, without restricting the generality of the foregoing, in any one and/or other of the following circumstances, namely:

- 18.18.1 If Guarantees and/or Performance Guarantee Tests and/or any of the tests or pre-commissioning tests required are not capable of being commenced, undertaken, or completed for reasons attributable to the CONTRACTOR's work and/or services, referred to in the Contract and in Article 18.17.
- 18.18.2 If the Plant(s) and/or parts or sections thereof, and/or Process(es) are found to be incapable or insufficient due to the reasons, inter alia, referred to in Article 4.31.
- 18.18.3 If the quality of workmanship and materials fail to comply with the requirements of the Contract as specified in Article 25.
- 18.18.4 If the requirements as to Warranties are found to have been breached or are not in accordance with the Contract pursuant to Article 28.
- 18.18.5 If any of the civil engineering and/or Site work required to be undertaken by the CONTRACTOR under the Contract is incomplete or inadequate.
- 18.18.6 If any rectification(s) undertaken pursuant to Article 29.1 are found to be inadequate or insufficient.
- 18.18.7 If any work pursuant to the requirements of the Contract is incomplete, insufficient or inadequate.

Any and all modification(s) required to be undertaken under the terms of the Contract shall be governed by the provisions of Article 29.10 to 29.14 (inclusive), and such modification work

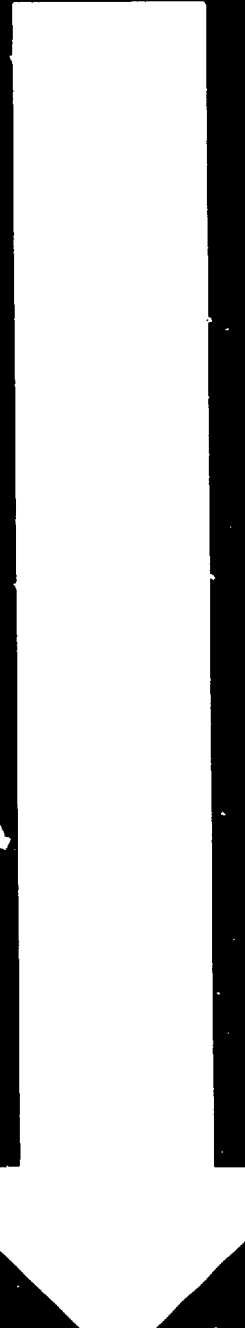
shall be accomplished in a diligent and bona fide manner to the reasonable satisfaction of the PURCHASER. The conditions governing extension(s) of time required to complete such work and the terms of such extension(s) shall be determined in accordance with the provisions of Article 29.10 subject however to the provisions of Article 25 and Articles 28 to 30 (inclusive). The modification(s) undertaken shall not be deemed to be complete until all the contractual stipulations governing such work and services are satisfied, and the cause(s) giving rise to the necessity for such modification(s) are eliminated. The CONTRACTOR shall not require the PURCHASER to provide a formal waiver of rights and/or remedies prior to agreeing upon modification work required pursuant to appropriate provisions of the Contract.

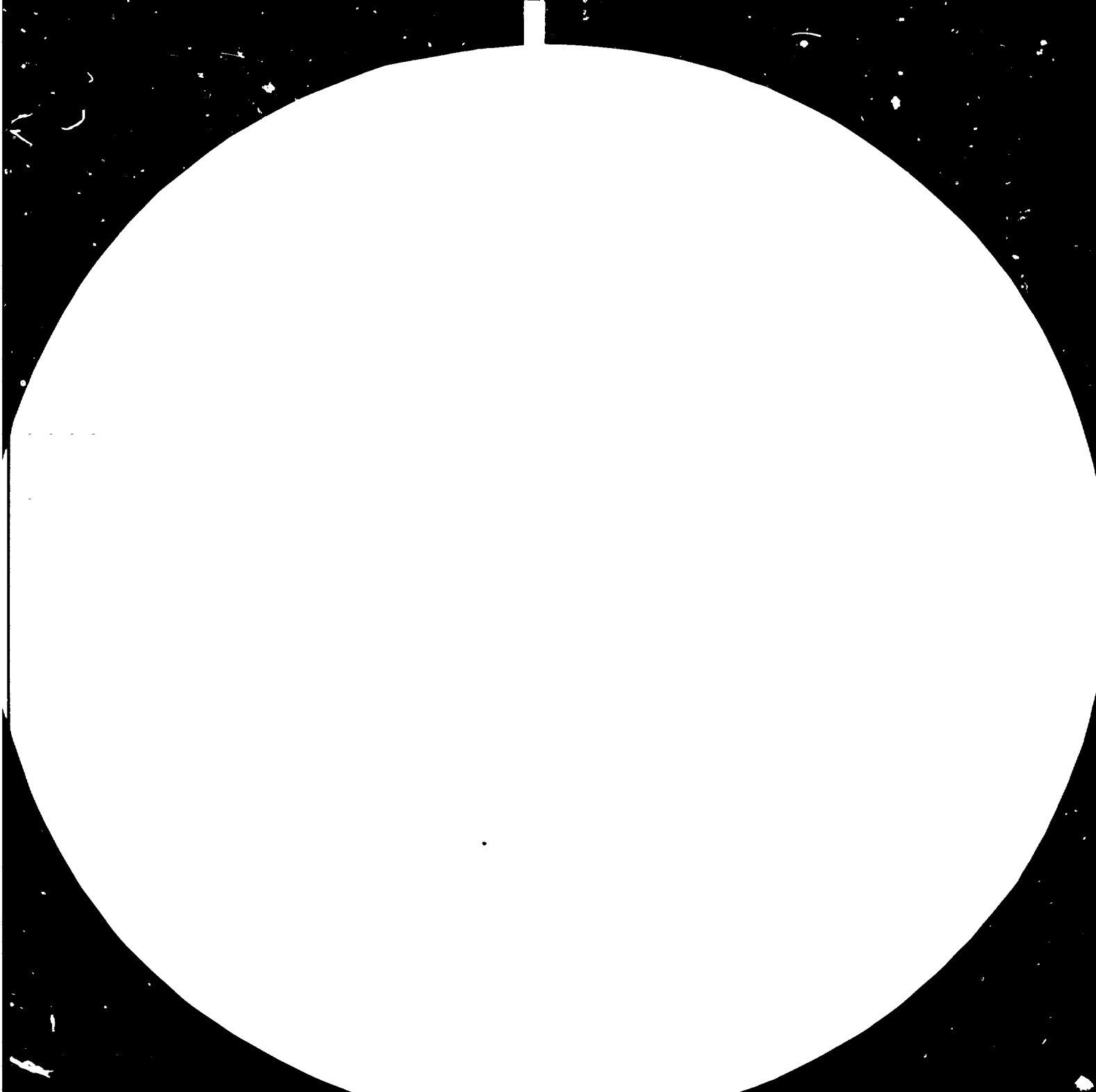
- 18.19 Unless otherwise agreed or in the event that the rectifications and modifications have not been satisfactorily completed and in any event without prejudice to the rights of the PURCHASER under the Contract, the PURCHASER shall take-over the Plant upon the issue of the Certificate of Provisional Acceptance. Upon Take-Over, the PURCHASER shall be responsible for the management, operation and maintenance of the Work(s), and shall take out and carry such insurances as may be deemed necessary.
- 18.20 The PURCHASER shall issue a Final Acceptance Certificate when all the conditions specified in this Article and in Articles 17.2 to 17.5 (inclusive) together with all of the contractual requirements have been satisfactorily complied with. Subject to Articles 18.17 and 18.18 the PURCHASER shall issue the Final Acceptance Certificate within 12 months of the Provisional Acceptance of the Plant, unless during the intervening period the Plant has shown defects referred to in Article 4.31 and/or requirements for modifications specified in Article 29.10.
- 18.21 The provisions of Articles 4.33, 25, 26 and 29 (as the case may be) shall apply to the provisions of this Article *mutatis mutandis*.

ARTICLE 19

EXTENSION(S) OF TIME

- 19.1 If by reason of the happening of any one and/or other or the following occurrences which are de facto beyond the CONTRACTOR's or PURCHASER's control namely:
- 19.1.1 Vandalism;
 - 19.1.2 Malicious Damage;
 - 19.1.3 Death or Injury to essential personnel;
- (but not including any of the occurrences or events covered by Articles 18.18, 29.10 or Article 34) which affect or delay specific work required to be undertaken pursuant to this Contract, the CONTRACTOR shall within ten (10) days of such occurrence specified above, make written request to the PURCHASER for a reasonable extension of time for completion of work or any portion of it to the extent that the factors affecting delay prevailed in the circumstances. Should the PURCHASER consider such request justified, he shall grant such extension in time which shall reasonably make up for the delay(s) suffered by the CONTRACTOR. The PURCHASER's grant of such extension pursuant to Article 19.1) shall be without prejudice, and the CONTRACTOR shall be fully liable for the completion of all of the specific work and activities affected by the above-mentioned delay or occurrences in like manner as prior to the happening of the occurrences referred to. The CONTRACTOR shall also extend the period of validity of the Bank Guarantee(s) and Performance Bond commensurate with the period of extension granted by the PURCHASER.
- 19.2 Payments and/or entitlement to any costs pursuant to this Article, or pursuant to the provisions of Article 32 or 34 shall be established on a quantum meruit basis. Provided however that in the circumstances envisaged by Article 32 that the Suspension of Work was not made necessary due to breach of contract by the CONTRACTOR, and provided that the CONTRACTOR has otherwise adhered to the terms of the Contract.







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- 19.3 In the event of the occurrences referred to in Article 19.1 or Article 32.4 and 32.5 the conditions of any extension granted shall (if applicable) be included as an amendment to the existing documents governing the activities or work affected or delayed by the occurrences referred to above, as provided by the terms of Article 3.4.
- 19.4 For the purpose of Article 19.1 only, "delay(s)" shall be construed to refer to any day or period being utilized legitimately for completion of the work under the Contract, if on any such day or period the causes accepted by the PURCHASER as being beyond the control of the CONTRACTOR referred to in Article 19.1 above delayed completion of the work.

ARTICLE 20

CONTRACT PRICE, TERMS OF PAYMENT,
BONUSES AND INCENTIVES

20.1 The PURCHASER shall pay to the CONTRACTOR, as consideration for the execution of the Contract, the performance of the CONTRACTOR's services and completion of the Works, the total amount of

(Insert Price and Currency)

hereinafter referred to as the Contract Price. The Contract Price shall be subject to the provisions of Article 20.2 below.

20.1.1 Insofar as these presents constitute a Lump-sum Turn-key Contract the Contract Price mentioned in Article 20.1 above shall be final and conclusive as to the total amount payable under this Contract, its being expressly agreed that, for the purposes of a more detailed price-citation, there is provided hereinbelow a breakdown of the Contract Price (as categorized in Articles 20.2 to 20.8 hereunder) to the intent that such amounts broken down shall be valid only to the extent that the total of the amounts in the said categories do not exceed the Contract Price payable as above-mentioned, subject to the provisions of the terms of payment herein.

20.1.2 The Contract Price mentioned in Article 20.1 above shall be modified only if the PURCHASER acknowledges that additional services and/or additional equipment outside the scope of this Contract and/or improvements to the specifications, pursuant to Article 15, justify an increase or decrease in the Contract Price, or as otherwise formally agreed in writing between the PURCHASER and CONTRACTOR as regards work, services, equipment, materials or responsibilities hereinbefore not included within the scope of the Contract, and the aforementioned Contract Price may in the proper case be increased or decreased to a Total Adjusted Contract Price. The CONTRACTOR acknowledges that costs

arising out of changes in material and equipment due to modifications and/or rectifications required shall not be treated as changes and extras within the provisions of Article 15.

20.1.3 The Contract Price mentioned in Article 20.1 above shall (for the purposes of convenience) be divided into the categorized amounts stated in each of Articles 20.2 to 20.8 below respectively to facilitate the identification of payments required to be made when due at progressive stages.

20.2 For the granting of the licences, know-how and supply of basic engineering for the Plant referred to in Article ____:

For the Ammonia Plant	(Amount)	(Currency)
For the Urea Plant	(Amount)	(Currency)
For Utilities	(Amount)	(Currency)

20.3 For the supply of Plant, equipment, materials ex-Site (inclusive of the engineering and related services) referred to in Article ____:

(Amount) (Currency)

20.4 For the detailed civil engineering design work, and completion of all civil works, including road, (rail) and telephone connections and related services, referred to in Article ____:

(Amount) (Currency)

20.5 For complete erection of plant and equipment including the supply of erection materials and hire of erection equipment and related services:

(Amount) (Currency)

20.6 For services related to Management, Operations and Supervision:

(Amount) (Currency)

20.6.1 For Management, Supervision, Pre-commissioning and Commissioning Operations from Mechanical Completion of the Plant until completion of Guarantee Tests and issue of Provisional Acceptance Certificates as

provided by Articles 13, 17.1, 18.13 and Annexure XX, and as elsewhere provided in this Contract, the Start-up of the Plant, as provided in Annexure XX; and for the services to be performed by the CONTRACTOR in connection therewith:

(Amount) (Currency)

20.6.2 For providing Management Assistance from the completion of Guarantee Tests until Final Acceptance of the Plant as required by Articles 17.2 to 17.5 (inclusive); and for providing mechanical warranties in accordance with the Contract:

(Amount) (Currency)

20.7 For providing training facilities for the PURCHASER's personnel as provided in Annexure XVIII:

(Amount) (Currency)

20.8 For the supply of two (2) years requirement of spare parts, and services related thereto as required by Article 10:

(Amount) (Currency)

20.9 All the prices contained in Articles 20.2 to 20.8 above are fixed and firm for the duration of the Contract and any extension(s) thereof and shall not be escalated in any manner. The amounts stated in this Article shall be payable on the dates due in the Contract in the currencies mentioned. The schedule of payments and the amounts stated to be payable by the PURCHASER to the CONTRACTOR herein, shall in all cases be subject to adjustments due to the causes referenced in Article 20.24 below, which are exemplified in the provisions of the Contract herein.

20.10 The payment due to the CONTRACTOR under Article 20.2 above shall be made as follows:

20.10.1 (25%) (amount) as an advance payment.

20.10.2 (50%) (amount) on receipt by the PURCHASER of a copy of the know-how and basic engineering documents as listed in Articles 3.1.2 and 4.5.

- 20.10.3 (25%) (amount) on completion of the Guarantee Tests of the Plant and issuance of the Provisional Acceptance Certificate by the PURCHASER.
- 20.11 Payments due under Article 20.3 shall be made as follows:
 - 20.11.1 10% as an advance payment.
 - 20.11.2 10% at the end of the sixth (6) month from the Effective Date, provided that the meetings contemplated under Articles 6.5 and 6.8 have been held and all related matters completed in all respects.
 - 20.11.3 60% shall be paid pro rata on shipments of the plant and equipment.
 - 20.11.4 10% shall be paid on completion of the Guarantee Test of the Plant and issuance of the Provisional Acceptance Certificate by the PURCHASER.
 - 20.11.5 10% shall be paid on the issuance of a Final Acceptance Certificate by the PURCHASER.
- 20.12 Payments under Article 20.4 shall be paid as follows:
 - 20.12.1 10% as an advance payment.
 - 20.12.2 10% on completion of the design work for the main buildings and structures of the Plant.
 - 20.12.3 65% shall be paid as progressive payments in monthly instalments against actual progress of work on Site as reported and approved by the Engineer.
 - 20.12.4 15% on completion of the Guarantee Tests of the Plant and issuance of the Provisional Acceptance Certificate by the PURCHASER.
- 20.13 The payment due under Article 20.5 shall be paid as follows:
 - 20.13.1 10% as an advance payment.
 - 20.13.2 15% on the arrival of CONTRACTOR's erection equipment at the Site.

- 20.13.3 50% 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.
 - 20.13.4 10% on mechanical completion of the Plant and issue of a Mechanical Completion Certificate.
 - 20.13.5 10% on completion of the Guarantee Tests of the Plant and issuance of the Provisional Acceptance Certificate by the PURCHASER.
 - 20.13.6 5% on issuance of the Final Acceptance Certificate.
- 20.14 The payments under Article 20.6 will be made as specified herein:
- 20.14.1 Pursuant to Article 20.6.1 the payments shall be made as follows:
 - 20.14.1.1 25% of the amount stated in Article 20.6.1 on the Mechanical Completion of the Plant.
 - 20.14.1.2 25% of the amount stated in Article 20.6.1 on the first input of feedstock to the Plant.
 - 20.14.1.3 25% of the amount stated in Article 20.6.1 on commercial production of specification grade urea as defined in Article 18.
 - 20.14.1.4 25% of the amount stated in Article 20.6.1 on completion of the Guarantee Test of the Plant and issuance of the Provisional Acceptance Certificate by the PURCHASER.
 - 20.14.2 Pursuant to Article 20.6.1 the payments shall be made as follows:
 - 20.14.2.1 25% following three (3) months after satisfactory fulfillment of the Performance Guarantee Tests.
 - 20.14.2.2 25% following six (6) months after satisfactory fulfillment of the Performance Guarantee Tests.

20.14.2.3 25% following nine (9) months after satisfactory fulfillment of the Performance Guarantee Tests.

20.14.2.4 25% upon issuance of the Final Acceptance Certificate.

20.15 The amount(s) due under Article 20.5 shall be payable as follows:

20.15.1 15% upon agreement of the program of training.

20.15.2 65% during training as specified in Annexure XVIII.

20.15.3 25% on completion of the overseas training of the PURCHASER's personnel, in accordance with Annexure XVIII.

20.16 The payments under Article 20.8 shall be paid as follows:

20.16.1 10% on approval by the PURCHASER of the list of spare parts.

20.16.2 65% pro rata on shipments of the spare parts.

20.16.3 25% on the successful completion of the Guarantee Tests of the Plant and issuance of a Provisional Acceptance Certificate by the PURCHASER after deducting the value of the spare parts consumed by the Plant before the Guarantee Tests have been completed unless such spare parts have been fully replaced by the CONTRACTOR.

20.17 The provisions of Article 27 (Liquidated Damages) shall apply mutatis mutandis in relation to any delays suffered in the fulfillment of the Contract pursuant to the requirements of this Article and time overruns.

20.18 All the advance payments due from the PURCHASER to the CONTRACTOR pursuant to Articles 20.10 to 20.13 inclusive shall be made in accordance with Article 21.2 upon the satisfactory fulfillment by the CONTRACTOR of its obligations as stated in the provisions of Articles 21.1 and 21.2.

20.19 For the purpose of making the remaining payments under Articles 20.10 to 20.14 and 20.16, the PURCHASER shall establish in favour of the CONTRACTOR at a specified Bank in (the CONTRACTOR's country or as agreed otherwise) an irrevocable transferable and divisible Letter of Credit providing for payments in accordance with the stage and schedule laid down in Articles 20.10 to 20.14 inclusive and Article 20.16, in conjunction with the documents-supply specified hereinafter. The payments under the Letters of Credit referred to in Article 20.19 shall be made only upon the fulfillment of the procedure mentioned hereunder, subject to the application of Article 20.17 (Liquidated Damages) and/or any final provisions under the Contract as the case may be:

20.19.1 For payments under Article 20.10.2, a Certificate from the PURCHASER shall be presented stating the documents required to be provided under Article 3.1.2 and 4.5 have been received.

20.19.2 For payments under Article 20.11.2, an invoice from the CONTRACTOR dated at the end of the sixth (6) month of the Effective Date of the Contract shall be presented accompanied by a Certificate from the PURCHASER that the meetings contemplated under Articles 6.5 and 6.8 of the Contract have been held and that all matters related thereto have been completed and complied with in all respects.

20.19.3 For payments under Article 20.11.3, 60% of the value of each shipment, against invoices, to the PURCHASER supported by the following documents:

20.19.3.1 Clean on-Board Bill of Lading (except for equipment forwarded as deck cargo in which event a bill of lading shall be sufficient).

- 20.19.3.2 Packing list.
- 20.19.3.3 Certificate of Origin (where required).
- 20.19.3.4 Certificate of the CONTRACTOR that all required tests and inspections under the Contract have been successfully performed.
- 20.19.3.5 (Other documents as specified).
- 20.19.4 For payments under Article 20.12.2 a Certificate from the PURCHASER shall be presented confirming that copies of civil engineering designs have been received by the PURCHASER.
- 20.19.5 For payments under Article 20.12.3: 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 monthly invoices submitted by the CONTRACTOR have been completed, and that 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 Contract.
- 20.19.6 For payment under Article 20.13.2 a certificate from the PURCHASER confirming that erection equipment has arrived at Site.
- 20.19.7 For payments under Article 20.13.3: Against an invoice from the CONTRACTOR indicating that percentage of progress in the erection of equipment as indicated in the monthly progress report of the CONTRACTOR and that the value related to such progress has not been previously compensated, duly certified by the PURCHASER or his representative.

- 20.19.8 For payment under Article 20.14.1.2, a certificate shall be issued by the PURCHASER confirming that the first input of feedstock has been introduced into the Plant and for payments under Article 20.14.1.3 a certificate from the PURCHASER shall be issued confirming that the Plant has been started-up and that continuous commercial grade urea is being obtained at the rate specified in Article 18.11.
- 20.19.9 For payments under Article 20.14.2.1, a certificate shall be issued by the PURCHASER confirming that the Management Assistance given pursuant to Article 17.3 has been provided and that the personnel have fulfilled their functions, during the period regarding which payment is to be made.
- 20.19.10 For payments under Article 20.15, a certificate from the PURCHASER shall be presented stating that the overseas training programme as envisaged in Annexure XVIII has been completed.
- 20.19.11 For payment against Article 20.16.1 a certificate from the PURCHASER confirming that a satisfactory list of spare parts with necessary details has been received and approved.
- 20.19.12 For payment due under Article 20.16.2 being 65 percent of the value pro rata on shipment of the spare parts, proper invoices shall be presented to the PURCHASER supported by the documents of the same nature mentioned in Article 20.11.3 above.
- 20.19.13 Certificate(s) to be issued by the PURCHASER under the provisions of Article 20.19 shall not be unreasonably withheld.

- 20.20 The balance of the payments under Articles 20.10 to 20.14 (inclusive), and Article 20.16 shall be made as follows:
- 20.20.1 The payments under Articles 20.10.3, 20.11.4, 20.12.4, 20.13.5, 20.14.1.4 and 20.16.3 shall be made against Certificate(s) of Provisional Acceptance issued by the PURCHASER.
- 20.20.2 The payments under Articles 20.11.5, 20.13.6 and 20.14.2.4 shall be made against Certificate(s) of Final Acceptance issued by the PURCHASER.
- 20.20.3 The CONTRACTOR may request that the payments to be made pursuant to Articles 20.20.1 and 20.20.2 be released upon satisfactory Mechanical Completion of the Works in accordance with Article 18, in consideration of an unconditional Bank Guarantee issued in the PURCHASER's favour for an equivalent amount to be provided by the CONTRACTOR in the form and manner specified by Article 21.3.
- 20.20.4 The Certificates referred to in this Article 20.20 shall be withheld by the PURCHASER only for cause.
- 20.21 At the discretion of the PURCHASER a Letter of Credit may be opened in consideration of progression of activities pursuant to Article 20.15 which if opened shall be confirmed by the PURCHASER at the Bank specified by the CONTRACTOR. In such an eventuality the CONTRACTOR shall provide a Bank Guarantee in accordance with Article 21.2 which guarantee shall be released upon satisfactory completion of training. All charges incurred in connection with the cost of confirmation shall be paid by the CONTRACTOR.
- 20.22 Without prejudice to the PURCHASER's rights, in the event that, for reasons not attributable to the CONTRACTOR, the Plant has been mechanically completed but not started-up within the required eighteen (18) months after the Mechanical Completion of the Plant, the CONTRACTOR shall be entitled to the payments

due under Articles 20.10.3, 20.11.4, 20.12.4, 20.13.5, 20.14.4 and 20.16.3 (in like manner as if the Plant had been mechanically completed and that the Guarantee Tests had been fulfilled) within sixty (60) days after notifying the PURCHASER in accordance with the provisions of Article 20.23, and by presenting:

- 20.22.1 An invoice in triplicate signed by an Authorized Officer of the CONTRACTOR.
 - 20.22.2 An affidavit executed by the CONTRACTOR stating that for reasons not attributable to the CONTRACTOR the Mechanical Completion of the Plant has not been accomplished, or the Plant has not been started-up as the case may be.
 - 20.22.3 Proof as to the issue of an open unconditional Bank Guarantee in the form specified in Annexure XXIII for the proper amount (as specified in Article 20.23 below).
 - 20.22.4 Proof as to the notification made by the CONTRACTOR to the PURCHASER as required by the provisions of Article 20.23, together with presentation of Bank Guarantee(s) commensurate with the payment(s) claimed.
- 20.23 Should the CONTRACTOR wish to invoke his rights for payment of the amount under Article 20.22 he shall promptly notify the PURCHASER by telegram, and by letter, of his claim. Should the PURCHASER dispute such claim, the CONTRACTOR shall nevertheless be entitled to receive the payments stated to be due under Article 20.22 against presentation of the said documents specified in Article 20.22.1 to 20.22.3 inclusive, together with a Bank Guarantee (for amount(s)) equivalent to payments under the relevant Articles referred to in Article 20.22 in the form given in Annexure XXIII. The Bank Guarantee shall be valid for twelve (12) months, but if the PURCHASER or the CONTRACTOR should refer any dispute arising

therefrom to Arbitration then in such eventuality such Bank Guarantee shall continue to remain valid until a period of at least three (3) months after the Award of the Arbitrator.

- 20.24 Without prejudice to the PURCHASER's rights, in the event that, for reasons not attributable to the CONTRACTOR, the Plant has been mechanically completed but not started-up within thirty (30) months after Mechanical Completion of the Plant, the CONTRACTOR shall be entitled to the payments under Articles 20.11.5, 20.13.6 (and, in the applicable case, pursuant to the requirements of Article 20.14.2.4) and the procedure to be applied on the CONTRACTOR's entitlement to payment(s) claimed, shall be in like manner as that provided in Article 20.22 above, subject however to the CONTRACTOR complying with the requirements of Article 20.23 above.
- 20.25 The PURCHASER and the CONTRACTOR agree that the payments due under this Article shall be subject to claims, deductions or debts arising out of default, breach and/or reduced work and services than that contemplated by the original terms of the Contract herein.
- 20.26 Any payments due under the Contract (which are not secured by Letters of Credit), shall be made to the CONTRACTOR within (eight (8)) weeks of receipt by the PURCHASER of invoices duly certified by the PURCHASER's Site representative, subject nevertheless, to legitimate deductions as the PURCHASER shall be entitled to make under the provisions of the Contract.
- 20.27 In the event of disputes as to any amount(s) or payment which the CONTRACTOR claims is presently due (including any question or dispute related to the amount of any deduction that may have been made by the PURCHASER under any provisions of the Contract), the CONTRACTOR shall be entitled to receive the uncontested portion of the amount, however, such payment of the uncontested portion of the amount shall not

prejudice the rights of the PURCHASER to recover such amount in any manner that he may deem fit; Such uncontested portions of amounts shall be receivable by the CONTRACTOR within eight (8) weeks following ascertainment of the amount.

- 20.28 Subject to national laws in the PURCHASER's country, the amounts to be paid to the CONTRACTOR under the Contract shall be net and free of any Income Taxes or other taxes, duties, or imposts or levies in (PURCHASER's country). Any tax rebate or credit that may be available to the CONTRACTOR in the CONTRACTOR's country in respect of the taxes paid by the PURCHASER due to the existence of a double taxation agreement shall be passed on to the PURCHASER within twenty (20) days of the receipt of such rebate, or credit.
- 20.29 Any and all Bank Guarantees to be provided by the CONTRACTOR pursuant to the Contract shall be encashable by the PURCHASER in (indicate currency). Such guarantees shall be valid for the period required under the Contract and the CONTRACTOR shall take any and all actions including renewals at the appropriate times to keep the said guarantees current and valid for the said periods.
- 20.30 The CONTRACTOR hereby agrees to perform the work in well-planned and expeditious manner so that the completion of the work at various stages and that of the whole Works is achieved according to the time schedules given in Article 2 and detailed in Annexure XV of this Contract. In the event that the CONTRACTOR fully accomplishes the Mechanical Completion of the Plant work under Article 18 and demonstrates the Guarantees required pursuant to Article 26 during a period before the end of thirty-six (36) months after the Effective Date of the Contract as required by the provisions of Article 4.26 the CONTRACTOR shall be entitled to receive Bonus or Incentive as hereunder specified for each complete week of saved time in terms of the Completion of the Works:

20.30.1 ()% of fixed price(s) under Article 20.1 subject to a maximum of () amount.

Payments under this Article shall (subject to Article 4.22) be made within twelve (12) months after Provisional Acceptance of the Plant provided no defects appear in the Plant as expressed in Article 18 and/or equipment during this period affecting its capacity, performance and/or operations.

20.31 Should the Mechanical Completion of the Works be accomplished by the CONTRACTOR within thirty-two (32) months of the Effective Date, and if for reasons attributable solely to the PURCHASER, the Plant cannot be started-up within four (4) months thereafter, the CONTRACTOR shall be entitled to a Bonus or Incentive as below for each complete fifteen (15) days of saved time:

20.31.1 ()% of the fixed price under Article 20 subject to a maximum of () amount.

20.32 All amounts payable pursuant to this Article shall be subject to Articles 18, 24, 26, 28 and 30, of this Contract.

20.33 Payments due under this Article shall be made within twelve (12) months of Provisional Acceptance, but no later than upon Final Acceptance.

ARTICLE 21

PERFORMANCE BONDS AND BANK GUARANTEES

- 21.1 Upon the execution of the Contract, the CONTRACTOR shall provide to the PURCHASER, a Performance Bond guaranteed by an approved Bank and/or Bonding Institution in (PURCHASER's country) in the form given in Annexure XXII for the amount of (Amount) in favour of the PURCHASER. The Performance Bond shall be valid for the period required under the Contract and such extensions thereof, and the CONTRACTOR shall take any and all actions including renewals at the appropriate time to keep the said Bond current and valid for the said period. This Performance Bond shall be released upon Final Acceptance of the Plant.
- 21.2 In consideration of the advance payment remitted by the PURCHASER (as provided for herein) the CONTRACTOR shall provide an adequate Bank Guarantee or in lieu an Advance Payment Bond shall be for an amount equivalent to the sum total of the advance payment required to be made by the PURCHASER pursuant to Articles 20.10 to 20.13 (inclusive). The advance payments due from the PURCHASER shall be remitted directly to (Name of Bank) for the CONTRACTOR's account. The amount of the Bank Guarantee or Advance Payment Bond shall be released within _____ (___) months after the Effective Date of the Contract.
- 21.3 Upon Mechanical Completion of the Plant, and provided the CONTRACTOR elects to exercise his option under Article 20.20, the CONTRACTOR shall deliver a Bank Guarantee for an amount equal to (Amount) at least equivalent to the amount of retention monies requested to be released by the PURCHASER under Article 20.20 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 Final Acceptance of the Plant, or any extension(s) thereof.

21.4 The Bank Guarantee envisaged in Article 20.23 shall be in like form as that specified in Article 21.2 above and such Bank Guarantee shall remain valid for the period(s) mentioned in Article 20.23.

ARTICLE 22

INDEMNIFICATION

22.1 Subject only to Article 22.2 below, the CONTRACTOR shall indemnify and hold harmless the PURCHASER and anyone directly or indirectly employed by it from and against all claims, demands, losses, costs, damages, actions, suits, expenses (including legal fees) 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 of a patent or invention (for patents granted up to Provisional Acceptance of the Plant) and/or to know-how referred to or "Confidential Information" in Articles 7.8 and 7.13 during and after completion of the Work(s), and shall defend all such claims (filed by whomsoever) in connection with any infringement or alleged infringement of such rights. The foregoing notwithstanding, the CONTRACTOR shall continue its performance of the work utilizing substantial non-infringing equipment and methods (where possible) but may be subject to reduction in payments as may be determined by the PURCHASER.

22.1.1 For the purpose of Article 22.1 above, "activities" includes an act improperly carried out, an omission to carry out an act and a delay in carrying out an act.

22.2 The PURCHASER shall indemnify and save harmless the CONTRACTOR from and against all claims, demands, losses, costs, damages, 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 23

PROJECT ACCOUNTING AND AUDIT

- 23.1 The CONTRACTOR shall maintain suitable accounting and other relevant records pertaining to the payments received by him from the PURCHASER and the quantum of work done or equipment supplied against which such payments were made, and shall preserve these records for a period of at least two years after Final Acceptance of the Works or the Termination of the Contract.
- 23.2 The CONTRACTOR shall provide facilities to the PURCHASER and the Engineer to have access to and inspect the CONTRACTOR's accounting and other records for evaluating (if necessary) the cost of any work undertaken pursuant to Article 15 or in assessing the cost of any work done on the request of the PURCHASER.
- 23.3 The CONTRACTOR shall be subject to audit by the PURCHASER of time-logs of the CONTRACTOR, if any prices or part of prices under the provisions of Article 15 are based on time-charges as well as increased costs incidental to Article 36.2.2.
- 23.4 The PURCHASER or any Auditors nominated by the PURCHASER, or its Government, shall have the right to audit all payments made on behalf of the PURCHASER by the CONTRACTOR under the Contract, and the CONTRACTOR shall be obliged to provide any other financial data and information required at the option of the PURCHASER in regard to the transactions between the PURCHASER and the CONTRACTOR, pursuant to this Contract.

ARTICLE 24

INSURANCE

24.1 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 beginning from the date of commencement of the work or Effective Date of the Contract, whichever is earlier, and continuing until Final Acceptance of the Work(s) (and/or for such extended periods that the PURCHASER and CONTRACTOR may agree upon and/or required by law):

24.1.1 The CONTRACTOR shall take out and keep in force various Insurance Policies including those enumerated in Article 24.5 for such period(s) of time as may be necessary under the Contract and for the full and complete discharge of the CONTRACTOR's responsibilities and liabilities.

24.1.2 The CONTRACTOR shall, at the CONTRACTOR's expense, maintain additional insurance policies, normal to its activities through its corporate coverage (in regard to which the PURCHASER shall be entitled to be informed), 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.

Each of the policies envisaged herein, shall contain such specific terms and conditions, stipulated as being required or obliged to be included by virtue of the responsibilities and obligations contained in this Contract.

24.2 Within thirty (30) days after obtainment of each of such policies contemplated by Article 24.1.1 above, the CONTRACTOR shall deposit originals of each of such policies with the PURCHASER as required by Article 24.3 below, 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.

24.3 The CONTRACTOR shall, within thirty (30) days after obtainment of each policy contemplated by Article 24.1.1 above, deposit authenticated copies of the originals of each such policy, as proof that the insurance(s) contemplated by 24.1 above being its responsibility, remain in force and the PURCHASER shall be entitled to ask for such proof updated from time to time and duly authenticated.

24.4 Should the CONTRACTOR fail to take out and/or keep in force the insurances contemplated by 24.1 within the scope of its responsibility, then the PURCHASER may at the PURCHASER's option either:

24.4.1 take out insurance(s) considered appropriate and necessary in the circumstances, 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, superseding or invalidating any other rights or remedies of the PURCHASER under this Contract or otherwise may be retained as the PURCHASER's monies out of any amount(s) otherwise payable by the PURCHASER to the CONTRACTOR;

24.4.2 hold the CONTRACTOR liable in the same manner and degree as if the CONTRACTOR were the insurance underwriter of the policies such as those contemplated by 24.1 above.

- 24.5 The Insurance Policies referred to in Article 24.1 required to be taken out by the CONTRACTOR (naming the PURCHASER as ultimate beneficiary) shall be as follows:
- 24.5.1 "Construction All Risks" (C.A.R.) liability or "Erection All Risks" (E.A.R.) policy (inclusive of third party cover) in the name of the PURCHASER and CONTRACTOR to insure the project under construction, including all plant, equipment and materials incidental thereto, while at the site from the start of work until final acceptance by the PURCHASER. Endorsements to the policy shall include coverage for E.A.R., "faults in design", requiring the replacement and repair of damaged machinery due to faults in design, faulty workmanship and faulty material, up to the guarantee tests. Specific insurances for Bodily Injury and Personal Liability Insurance, (excluding that to third parties) and endorsements for such items as elevator and hoist liability, shoring, blasting, excavating shall also be included.
- 24.5.2 "Loss of Advanced Profits Insurance" (otherwise called "Machinery Consequential Loss (Interruption) Insurance)" to cover consequential loss to the PURCHASER, which may arise following any damage to the Plant during testing and maintenance periods providing extended cover to that already provided by the C.A.R./E.A.R. policy.
- 24.5.3 "Machinery Breakdown Policy" to cover the breakdown of machinery during testing, at start-up or during trial operation of the Plant, including boilers, pressure vessels, turbines etc., and explosion risks incidental thereto.

- 24.5.4 "Professional Indemnity Insurance" to cover the liability for errors and omissions, negligence, failure in performance, mistakes in design, etc., arising from the CONTRACTOR's work.
- 24.5.5 "Marine Insurance" or "Cargo Insurance Policies" to cover the transit of goods ex-works from the fabricator's workshops to the site of the Plant. (This shall include War Risks insurance, under the discretionary responsibility of the CONTRACTOR).
- 24.5.6 Insurance Liability to cover for the use of Automobiles, Trucks, Aircrafts, Launches, Tugs, Barges, etc.
- 24.5.7 Liability insurance for payments under Workmens' Compensation Acts, as required under applicable legislation.
- 24.6* To the extent not covered by the above policies and provided such policy is available, the PURCHASER and the CONTRACTOR shall by mutual agreement obtain a special insurance policy (where the PURCHASER shall be deemed to be the beneficiary) providing coverage for consequential loss caused by defective design, material or workmanship (including defective construction or erection) within the control of the CONTRACTOR or his sub-contractors, suppliers or manufacturers. It is expressly agreed however that no liability to the extent that it refers to consequential loss only shall attach to the PURCHASER or the CONTRACTOR purely by reason of payment of the premium for such a policy.
- 24.7 The CONTRACTOR shall be responsible for the taking out all of the policies referred to in Article 24.1 as enumerated in

* Article 24.1 uses the wording suggested by the First Working Group on Contracts and Insurance, for fertiliser Plants convened by UNIDO at Vienna, 14-17 February 1978. See Report of the Meeting (ID/WG.269/2.Rev.1).

Article 24.5 together with other policies referred to in Article 24.1.2, except the following which the PURCHASER shall carry (unless otherwise agreed between the parties):

24.7.1 Accident Insurance for PURCHASER's personnel at site.

24.7.2 Insurance for PURCHASER's transport (e.g. Automobiles) of which PURCHASER is the owner.

24.7.3 All policies taken out by the CONTRACTOR except Professional Indemnity Insurance shall be jointly in the name of the CONTRACTOR and the PURCHASER with the PURCHASER designated as the ultimate beneficiary.

24.8 Any failure by the CONTRACTOR to maintain all or any of the Insurances required to be carried by is by virtue of this Article and in keeping with its contractual responsibilities shall be deemed to be a fundamental breach of this Contract.

24.9 If the work and/or any portion or portions thereof be lost, damaged or destroyed and monies are payable to the PURCHASER in respect of the loss, damage or destruction under the insurances maintained by the CONTRACTOR pursuant to this Article above or otherwise, the monies will be held by the PURCHASER for the purposes of this Contract, and:

24.9.1 The PURCHASER may elect to retain absolutely the said monies in such event, the monies belong absolutely to the PURCHASER, and,

24.9.2 The CONTRACTOR shall be liable to the PURCHASER in an amount equal to the amount by which the insurance monies payable is less than the loss, damage, and/or including costs associated with clearing and cleaning the site of the work, and,

24.9.3 There shall be a financial accounting between the PURCHASER and the CONTRACTOR in respect of the portion of the work which was lost, damaged or destroyed and in respect of which monies have

been retained absolutely by the PURCHASER and there shall be included in the financial accounting all amounts paid or payable by the PURCHASER under this Contract together with all amounts paid or payable by the CONTRACTOR under this Contract to the PURCHASER, and the PURCHASER will pay to the CONTRACTOR any amount which the financial accounting shows to be payable by the PURCHASER to the CONTRACTOR under this Contract and similarly the CONTRACTOR will pay to the PURCHASER any amount which the financial accounting shows to be payable by the CONTRACTOR to the PURCHASER under this Contract;

24.9.4 Upon payment as required by Article 24.9.3 above by the PURCHASER or the CONTRACTOR, as the case may be, the PURCHASER and the CONTRACTOR are discharged from all rights and obligations under this Contract in respect of the portion of the work which was lost, damaged or destroyed and in respect of which monies have been retained absolutely by the PURCHASER as though such portion of the work had been fully completed and executed by the CONTRACTOR in accordance with this Contract.

ARTICLE 25

GUARANTEE OF WORKMANSHIP AND MATERIALS

- 25.1 The CONTRACTOR shall be responsible for the quality of all materials and workmanship of the complete Work(s), and unless as otherwise specifically provided, all plant, equipment, materials, apparatus, articles, instruments and all other goods required to be supplied by the CONTRACTOR under this Contract shall be new and of the most suitable grade for the purposes intended, and to the Contract specifications, standards and regulations detailed in Annexures II, IV, XXVI and XXVII, and the CONTRACTOR shall in any event (whenever applicable) take into account the domestic standards and regulations of the PURCHASER's country. Unless otherwise already contained in the CONTRACTOR's proposal, the CONTRACTOR shall furnish to the PURCHASER upon his request any further details relating to identifying data and information respecting the performance, capacity, nature and rating of the machinery, and mechanical and other equipment which the CONTRACTOR contemplates incorporating in the Works. Machinery, equipment, material and articles installed or used (without prior approval if such is required) shall be at the risk of subsequent rejection. All work, labour and services under this Contract shall be performed in a skilful and workmanlike manner.
- 25.2 The CONTRACTOR agrees and acknowledges that the PURCHASER has not entered into any contractual relationship, directly or indirectly, with the CONTRACTOR's sub-contractors, suppliers, vendors, agents, manufacturers and/or fabricators (unless otherwise specified), and accordingly, the CONTRACTOR hereby agrees to assume full responsibility for the guarantee of workmanship and materials as provided in this Article (together with the inherent warranties as expressed in Article 28) with respect to the scope of the CONTRACTOR's supply under the Contract.

- 25.3 The CONTRACTOR shall be fully responsible for ensuring that all of the materials used in the manufacture of equipment and machinery and other contractually required items are correct and that they completely conform to the specifications stated in the Contract. The CONTRACTOR shall ensure that his supplier's certificates for the materials satisfy the minimum requirements (physical and chemical) specified by the CONTRACTOR, conform to the requirements stated in the Annexures to the Contract, and the CONTRACTOR shall have undertaken random testing of materials and shall have satisfied himself as to their adequacy, sufficiency and propriety thereof. The provisions of Articles 27, 29 and/or 30 shall apply mutatis mutandis with respect to any breach by the CONTRACTOR of his obligations pursuant to this Article with respect to the standard of care required to be exercised by him, and as to the contractual guarantees herein pertaining to the quality of workmanship and materials of the complete Work(s).
- 25.4 If the materials or workmanship fail to comply with the requirements of the Contract, or if any of the tests or plant operations prove or indicate the existence of any fault or defect in any part(s) and/or section(s) or the Work(s), the CONTRACTOR shall forthwith (at his own cost) re-execute or make good the defective materials and/or faulty workmanship or alter same to ensure compliance with the Contract, and thereafter (at the discretion of the PURCHASER) new tests and inspections shall, if required, be carried out. If the CONTRACTOR defaults or delays in diligently commencing, continuing and completing the making good of the defective materials and/or faulty workmanship as required by the terms of this Contract, then the PURCHASER shall do so, or cause same to be done by any other firm or corporation (of the PURCHASER's choice) in any manner and by any means the PURCHASER considers expedient or advisable in the circumstances and the CONTRACTOR shall be liable for all costs, charges and expenses

incurred by the PURCHASER in connection therewith, and such monies shall be considered as a debt due to the PURCHASER from the CONTRACTOR. The provisions of this Article 25.4 shall be deemed to be complementary to Articles 18 and 29.

- 25.5 The CONTRACTOR shall be responsible for all civil engineering Works to be constructed at Site. The CONTRACTOR shall maintain an adequate amount of staff at site for such work and all related activities thereto (such as the taking of samples etc. where required for testing). Any samples and/or the results of tests etc. shall be available for inspection by the PURCHASER if required.
- 25.6 Notwithstanding the obligations and contractual liabilities of the CONTRACTOR as contained in this Article and as elsewhere expressed in this Contract, the PURCHASER shall have the right to appoint Inspectors for reviewing Civil Engineering Works (including roads, rail connections) at site, and to assure themselves that the work is being conducted with suitable materials and in the approved manner, as specified in Annexure XXVII, or as otherwise agreed. The PURCHASER's representatives shall have the right to take away any samples of civil engineering materials for analysis. The CONTRACTOR shall fully co-operate with the PURCHASER in the exercise of such rights and these activities by the PURCHASER and the CONTRACTOR shall not be absolved from any of the liabilities as mentioned in this Article.
- 25.7 The CONTRACTOR shall continuously direct and supervise all erection work at site. This shall include the supervision and review of all pressure welds (whether in pipes or otherwise) by X-ray or radiation photographs, to ensure complete stability and any photographs taken shall be made available to the PURCHASER's Inspectors.
- 25.8 At least two (2) months before erection commences at site the CONTRACTOR shall submit to the PURCHASER a programme of tests to be undertaken during erection on different sections

of the plant and upon agreement by the PURCHASER and such tests shall be conducted accordingly, and records of such tests kept in a journal which shall be signed by the representatives of the PURCHASER and CONTRACTOR.

- 25.9 The PURCHASER or his representatives shall at all times have the right to inspect and spot check all work being undertaken at the site and to take away samples of materials being used for analysis to check their suitability with the Contractual requirements.
- 25.10 In consideration of the procurement of spare parts by the CONTRACTOR on behalf of the PURCHASER pursuant to Article 10, the CONTRACTOR shall use its best efforts (for the benefit of the PURCHASER) to obtain from vendors and/or suppliers of the spare parts as the case may be, guarantees that all materials entering into and incidental to the manufacture of the spare parts etc., are free from defects and faulty workmanship. The vendors or suppliers shall agree to repair or replace F.O.B. plant site, at their own expense, any defective material, supplies, or equipment (comprised in the spare parts) provided such defects are discovered within thirty-six (36) months after the date of shipment or twelve months after commencement of use, whichever comes first, and the vendor or supplier, as the case may be, is given written notification as soon as defects are discovered.
- 25.11 The standards and codes to be used for the Works are provided in Annexure II, Annexure XXVIII and Annexure XXIX inclusive. The CONTRACTOR shall utilize these standards (or where applicable mandatory national standards) and/or superior standards if known to CONTRACTOR (as required by the provisions of Article 4.7) for the design, procurement, supply and erection of the Works. Wherever standards or codes are not explicitly stated in the Contract, internationally recognized standards or codes, or those which have been previously used by the CONTRACTOR in a working Ammonia/Urea Plant may be used, subject to the approval of the PURCHASER.

25.12 In case of dispute arising on any matter concerning the acceptability or the qualitative level of Standards or Code(s) the onus shall be upon the CONTRACTOR to prove to the PURCHASER the superiority or better competence of those Standard(s) or Code(s) recommended (or adopted) by the CONTRACTOR pursuant to this Contract.

ARTICLE 26

GUARANTEES AND PERFORMANCE GUARANTEE TESTS

- 26.1 This Article covers inter alia the Performance Guarantees of the Plant and the governing provisions of the Contract as to the proper fulfillment of the contractual obligations as to the Performance Tests and the guarantee requirements, and the requirements for modifications and rectifications to the Plants and Works.
- 26.2 The plant supplied by the CONTRACTOR shall be capable of meeting the full requirements of normal operation, capacity, quality of Products, consumption of raw materials and utilities, all of which are hereby guaranteed by the CONTRACTOR, which shall be proven and demonstrated by test runs as specified in this Article and in the Annexures and Specifications (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. The PURCHASER shall comply with the provisions of Article 5.7 to 5.10 (inclusive). The CONTRACTOR shall comply with the specified requirements of the Contract to ensure that the Plant(s) and Works are proved to be capable by virtue of the Guarantees and Tests to be completed. For the purposes of the Guarantee Tests, the urea storage and bagging shall be excluded from the definition of the Plant.
- 26.2.1 The production capacity of ammonia and urea from the Plants shall be (1000) tons per day ammonia and (1725) tons per day urea.
- 26.2.2 The quality of the ammonia from the Ammonia Plant and of the urea from the Urea Plant shall be in accordance with Annexure XVI.
- 26.2.3 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.

26.2.4 The Plants shall be capable of sustained, steady and continuous operation.

26.2.5 The Utilities and Off-sites shall be adequate for the sustained and continuous operation of the Plant.

26.2.6 The consumption of utilities and raw materials in each of the Ammonia and Urea Plants are in accordance with guarantees given below.

26.2.7 The effluents from the Plant are in accordance with Annexure XVII.

26.3 For purposes of this Article, the guarantees outlined in Article 26.2 shall be divided into Absolute Guarantees and Penaltiable Guarantees, as follows:

26.3.1 Absolute Guarantees shall be:

26.3.1.1 The capacity of the Ammonia Plant

26.3.1.2 The capacity of the Urea Plant

26.3.1.3 The quality of ammonia and urea

26.3.1.4 The quality of effluents and emissions

26.3.1.5 The adequacy of the Utilities and Off-sites and sufficiency of carbon dioxide to meet the capacity of the Ammonia and Urea Plants when operating together.

26.3.1.6 The capacity of the Steam and Power generating facilities.

26.3.2 The Penaltiable Guarantees shall be deemed to be in respect of the consumption of raw materials and utilities for each of the Ammonia and Urea Plant, and fuel for the Power Station.

26.3.3 The sustained steady operation of the Plant shall be demonstrated over a continuous period of, at least thirty (30) days as given in the test procedure below.

Notwithstanding the completion of such tests, the CONTRACTOR warrants that the Plant supplied under the Contract shall have been designed for steady continuous operation at a stream factor of three hundred thirty (330) days per year.

- 26.4 Absolute Guarantees shall be defined as those Guarantees which must be met to satisfy the conditions expressed more particularly in this Article and as well as elsewhere referred to and the CONTRACTOR agrees and acknowledges that the completion of such Absolute Guarantees shall be essential to the completion of the Works and the fulfilment of the CONTRACTOR's obligations under the Contract in consideration of the Prices and Terms of Payment herein contained.
- 26.5 Penaltiable Guarantees shall be defined as those guarantees which if not met may be compounded by the payment of Liquidated Damages as specified in Article 27, without prejudice to the entitlement of the PURCHASER under the terms of the Contract for the completed Plant and Works provided, however, that if the consumption of raw materials exceeds by (3%) or that the overall guaranteed consumption cost is exceeded by (5%), then the CONTRACTOR shall without further delay modify the Plant as required by, and in accordance with Articles 18.17 and 18.18, respectively of the Contract, and shall thereafter demonstrate by additional guarantee tests, that the consumption of raw materials and utilities are within the above limits. The provisions of Articles 14, 18, 25 and 28 relating to the obligations of the CONTRACTOR under this Contract shall apply mutatis mutandis.
- 26.6 Absolute Guarantees for individual Plants shall be as given hereunder:

26.6.1 Ammonia Plant

26.6.1.1 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 (10) consecutive days. In the event that the provisions of Article 26.6.3 are invoked by the CONTRACTOR the Absolute Guarantees will be 95% as provided in that Article.

26.6.1.2 The quality of the ammonia as per Annexure XVI is as analyzed in accordance with international methods contained therein.

26.6.1.3 The quality and quantity of carbon dioxide is adequate and suitable for the guaranteed capacity of the Urea Plant and for manufacture of the desired quality of Urea Product.

26.6.2 Urea Plant

26.6.2.1 The Absolute Guarantees for the output of the Urea Plant shall be (1725) metric tons per stream day of specification grade urea representing 100% capacity of the Urea Plant, which shall produce (17,250) metric tons of specification grade urea in ten (10) consecutive days. (In the event that the provisions of

Article 26.6.3 are invoked by the CONTRACTOR and satisfied accordingly, then the Absolute Guarantees shall be 95% of these figures provided.)

26.6.2.2 The quality of the urea shall conform to the criteria expressed in Annexure XVI.

26.6.3 Notwithstanding the provisions of Articles 26.6.1.1 and 26.6.2.1 above the Absolute Guarantees for the Ammonia and Urea Plants shall be deemed to have been met if such Plant(s) produces 95% of the capacity of ammonia and urea respectively, provided that the CONTRACTOR conforms with the requirements of Article 26.5.

26.6.4 In the event that the CONTRACTOR does not conform with the requirement of Article 26.5, the CONTRACTOR shall be obliged to modify the Works and/or the Plant pursuant to Article 18.18.

26.6.5 Power Plant

26.6.5.1 The capacity of the Power Plant shall be (____)KW when operating at a power factor of (____). The steam and power plant shall also produce the quantities of steam given below for use outside the Power Station: (steam quantities and pressures to be stated).

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

26.7.1 Ammonia Plant

26.7.1.1 The Penaltiable Guarantees for the Ammonia Plant shall be as given below:

	Units	Units per metric ton of ammonia
(a) Consumptions		
- Natural gas (1)*	Millions of Kcal	
- HP Steam	Metric tons	
- Electric Power (2)*	Kwh	
- Cooling water (32°C)	m ³	
- Boiler Feed water (110°C, 120 Kg/cm ²)	Metric tons	
(b) Output		
- MP Steam	Metric tons	
- LP Steam	Metric tons	
- Purge gas	Millions of Kcal	
- Boiler Feed water Preheating	Millions of Kcal	
- Condensates	Metric tons	

26.7.2 Urea Plant

26.7.2.1 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	
- HP Steam	Metric tons	
- Electric Power (2)*	Kwh	
- Cooling Water (32°C)	m ³	
(b) Productions		
- LP Steam	Metric tons	
- Condensate	Metric tons	

* (1) Natural Gas consumption includes requirements as feedstock and direct fuel

(2) Electric Power consumption is for the Plant only and excludes lighting, instrumentation and air-conditioning.

26.7.3 Power Plant and Steam Plant

26.7.3.1 The consumption of (specify fuel with LCV)
for the production of _____ Kwh of power
and an associated amount of ____ Tons/hv
steam at pressure and _____ Tons/hv steam
at pressure shall be _____.

26.8 Performance Guarantee Test Procedures

26.8.1 Ammonia Plant

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

- 26.8.1.1 A minimum twenty (20) day sustained continuous test under normal operating conditions in order to demonstrate the capability for continuous steady operation and capacity at an average of 90% of capacity of the Ammonia Plant, together with the capability to produce specification grade ammonia and carbon dioxide, followed immediately by:
- 26.8.1.2 A ten (10) day uninterrupted continuous test (as specified in Article 26.3.5) 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 shall be applicable 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 shall be corrected for any increase in strength. For consumption of the raw materials and utilities the test period will be seven (7) days.

26.8.2 Urea Plant

Performance Guarantees on the Urea Plant shall be proven by means of the following Performance Guarantee Tests:

- 26.8.2.1 A minimum twenty (20) day sustained continuous test under normal operating conditions in order to demonstrate the capability for continuous steady operation and capacity at an average rate of 90% of the Urea Plant together with the capability to produce urea of specification grade, to be followed immediately by:
- 26.8.2.2 A ten (10) day uninterrupted continuous test (as specified in Article 26.8.5) under normal operating conditions in which the operation of the Urea Plant at 100% capacity, and the consumption of raw materials and utilities shall be demonstrated while producing specification grade urea. The tests for capacity and quality will be applicable for all ten (10) days, and the test for consumption shall be for seven (7) days within the ten (10) day test period. 100% capacity of the Urea Plant shall be (17,250) metric tons of specification grade Product and shall be corrected for any increase in strength.
- 26.8.2.3 During the operations of the Urea Plant under Article 26.8.2.2, the Ammonia in the Ammonia storage at the beginning and end of the test shall be unchanged.

26.8.3 The ten (10) day simultaneous Guarantee Test(s) of the Ammonia and Urea Plant(s) shall run immediately after the successful completion of the relevant twenty (20) days test(s), concurrently with the operation of the Power Plant as stated below.

26.8.4 Power Plant

The Power Plant shall be operated at capacity (as soon as load permits) for the said period of seven (7) consecutive days to prove its guarantee of capacity for both power and steam, and its guarantee for consumption of fuel.

26.8.5 During the specified ten (10) day period under Article 26.8.2.2 (unless as otherwise agreed) the Ammonia and Urea Plants shall be run simultaneously at capacity for any seven (7) days (within the ten (10) day period) to prove that the Power Plant and utilities are adequate for the continuous and uninterrupted operation of the Ammonia and Urea Plants and utilities together.

26.9 The procedures to be followed for the execution of the Guarantee Tests shall be agreed upon between the parties three (3) months before the commencement of the above tests.^{1/} Instruments tolerances shall be warranted by the CONTRACTOR. The PURCHASER shall have the right to specify instruments with low margin of tolerance for measurement of the Plant capacity and consumptions.

26.10 The Performance Guarantee Tests of the Plants shall be run under the direction and supervision of the CONTRACTOR's personnel but all measurements will be taken jointly by the PURCHASER and the CONTRACTOR and in the event of any dispute relating only to the correctness, sufficiency and/or adequacy

^{1/} The procedures for such tests may be agreed between the parties prior to the Effective Date of Contract if necessary.

of the tests and/or in the manner in which the tests were conducted, the provisions of Article 37 shall apply. The provisions of Article 18.18 shall apply notwithstanding, with reference to the proving and demonstration of the capability of the Plants by means of the said Tests, and/or in connection with only modifications or rectifications required to enable the PURCHASER to receive a completed Plant and Works in accordance with the CONTRACT.

- 26.10.1 The first twenty (20) day test of Ammonia and/or Urea Plant shall commence within ninety (90) days from the Start-up of the Plant(s), provided that the PURCHASER fulfills his obligations for the supply of feedstock etc. under Article 5.8. Subject to the provisions of Article 26.10.2 this ninety (90) day period shall be extended if the Plant(s) is unable to operate normally and in the event of failure of this test the CONTRACTOR shall be permitted not more than two (2) other tests to be run within six (6) months immediately thereafter subject however to the provisions of Article 18.17.
- 26.10.2 If, for reasons ascribable to mistake(s) and/or error(s) in process and/or detailed engineering or for any other reasons related to the work and services provided or performed by the CONTRACTOR, and/or mistake(s) and error(s) in the Contractual Specifications and instructions, the CONTRACTOR is not able to perform the test(s) within the period(s) stated in Article 26.10.1 above, the provisions of Article 26.11 shall apply.
- 26.10.3 The CONTRACTOR shall have the right to have the Plant(s) operated in accordance with its requirements at its own risk during the period permitted to the CONTRACTOR to perform the test(s) and the PURCHASER's personnel.

shall work under the directions and technical instructions of the CONTRACTOR. The PURCHASER shall have the right to operate the Plants as and when such operation shall not interfere with the CONTRACTOR's work.

26.11 In the event that the CONTRACTOR does not complete or is unable to complete any or all of the Performance Tests and Guarantees of the Plant(s) for reasons directly or indirectly attributable to the CONTRACTOR within the nine (9) months after Start-up of the Plant(s) the PURCHASER shall in addition to the remedies under the Contract have the right to stop all payments due to the CONTRACTOR and the CONTRACTOR shall be required to undertake the work specified in Article 18.17 as required by Article 18.18 without delay and the validity of the Bank Guarantee shall be extended. The foregoing notwithstanding, the CONTRACTOR shall if necessary, commence the said modifications prior to the expiry of the nine (9) months period after Start-up of the Plants. It is agreed that the period during which the Plant(s) cannot be operated normally by the CONTRACTOR due to circumstances outside his control or fault of the PURCHASER shall not be counted in computing the said nine (9) months or subsequent extended periods granted pursuant to Article 29.10. The CONTRACTOR shall diligently and expeditiously undertake the necessary modifications and/or rectifications to ensure that the Plant(s) shall be capable of demonstrating the tests as required by Article 18.12 and this Article, and on completion of all such necessary work (upon the terms herein), the CONTRACTOR shall prove by the specified Guarantee and Performance Tests (as required by this Article) the capability of the Plant(s) in accordance with the conditions of this Contract. The undertaking of such work by the CONTRACTOR shall not prejudice the contractual rights of the PURCHASER referred to in Articles 18.29 and 27.3, and as elsewhere expressed in this Contract.

- 26.12 If the ten (10) days capacity Performance Test(s) is 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 immediately thereafter. 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 already in fact been operated for a minimum ten (10) day period continuously and without interruption in the manner stated in Article 26.8.5.
- 26.13 After the successful completion of any Performance Test, in accordance with the Contract (which the PURCHASER and CONTRACTOR accept as being a successful test) the CONTRACTOR shall prepare a Performance Test Report which shall be signed by the CONTRACTOR and submitted to the PURCHASER for approval.
- 26.13.1 If the said Report is satisfactory, the PURCHASER shall issue within thirty (30) days from the receipt of the CONTRACTOR's Report an Acceptance Certificate or shall inform the CONTRACTOR's Site representative within the same period the reasons for non-acceptance.
- 26.13.2 Provided Article 26.13 has been complied with, in the event of the PURCHASER failing to issue the Acceptance Certificate or to inform the CONTRACTOR as provided in Article 26.13.1, the CONTRACTOR shall request the PURCHASER for an explanation for the delay and if the PURCHASER fails to respond within another thirty (30) days the Acceptance of the Plant for which the Performance Test was conducted shall be deemed to have taken place, on the date that the test was successfully completed.

- 26.14 The obligations of the CONTRACTOR (subject to Articles 18, 28, 29 and 32) shall be deemed to have been fulfilled if for reasons attributable solely to the PURCHASER, the first Guarantee Test cannot be carried out within eighteen (18) months from the Mechanical Completion of the Plant. In the event of a dispute as to the fulfillment of the CONTRACTOR's obligations and as to the entitlement for payment, the parties shall resort to Arbitration.
- 26.15 The Acceptance of the Plants under Articles 26.13 and 26.14 and the issue of Provisional Acceptance Certificates thereof, shall be subject to Articles 4.31, 25 and 28 until all the obligations of the CONTRACTOR under this Contract shall have been met, and a Final Acceptance Certificate issued. The issue of these Provisional Acceptance Certificates shall (subject however to the provisions of Article 18.13), entitle the CONTRACTOR to receive due payments on completion of the Performance Guarantees and Acceptance of the Plant in accordance with Article 20.
- 26.16 In the event the Performance and Guarantee Tests cannot be made within the period stipulated in Article 26.14 above, the CONTRACTOR shall be obligated to send personnel to Site to start-up the Plant and to undertake tests on the Plant provided however that the PURCHASER shall pay additional fees and travel expenses for this service as may be agreed between PURCHASER and CONTRACTOR.

ARTICLE 27

LIQUIDATED DAMAGES

- 27.1 The CONTRACTOR shall be liable to the payment of Liquidated Damages for default of the several responsibilities under provisions of Articles 12, 18, 25, 26 and 28 and as detailed elsewhere in the Contract, as follows:
- 27.1.1 Except where any delay is caused by any act or omission on the part of the PURCHASER for the delay in the delivery of the technical documents stipulated in Annexure XV the agreed Liquidated Damages shall be as follows: For each week in delay in the submission of a required document an amount of (amount) subject to an overall maximum liability of (amount) under this Article.
- 27.1.2 For delay in Mechanical Completion of the Work(s) beyond the period of thirty-two (32) months after Effective Date of the Contract for each week of delay an amount of () of the Contract Price.
- 27.1.3 For delay in obtaining Commercial Production as defined in Article 18.11 beyond a period of seventy-five (75) days after Mechanical Completion of the Plant(s), an amount of () for each one week (7 days) of delay, subject to a maximum of weeks.
- 27.1.4 For non-fulfilment of Absolute Guarantees at 100% capacity but subject to fulfilment of Absolute Guarantees at 95% of capacity, a sum of 1% of the total Contract Price (give amount) as stated in Article 20.1 for each 1% of lower production than of the 100% capacity of Urea.
- 27.2 In the event that the Absolute Guarantees have been successfully demonstrated and proved but the Penaltiable Guarantees are not met, the CONTRACTOR shall immediately thereafter proceed to

execute the required modifications to the Plant(s) as required by Articles 18.17 and 18.18, and the provisions of those Articles referred to therein and Article 30 shall apply, without prejudice however to the election by the CONTRACTOR to pay by way of Liquidated Damages, in consideration of any and all claims in connection with the fulfilment of Penaltiable Guarantees only (but subject nevertheless to the provisions of Articles 18, 26 and 29.12) as follows:

- 27.2.1 For the Ammonia Plant: for each full 0.5% (zero point five percent) exceeding the daily guaranteed cost of manufacture as given in Article 27.2.4 below, an amount of _____ up to a maximum of _____.
- 27.2.2 For the Urea Plant: for each full 0.5% (zero point five percent) exceeding the daily guaranteed cost of manufacture as given in Article 27.2.4 below, an amount of _____ up to a maximum of _____.
- 27.2.3 For the Power Plant: for each additional ____ Kcals of fuel (alternatively Nm³ of gas or tons of fuel oil) per Kwh of power generated and the guaranteed auxiliary quantities of steam) over and above the guaranteed consumption, an amount of _____ up to a maximum of _____.
- 27.2.4 The daily guaranteed cost of manufacture referred to in Article 26.5 shall be computed by calculating the guaranteed daily cost of inputs of raw materials 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 ³
Boiled Feed Water	(Value) per m ³
Purge Gas of Ammonia Plant	(Value) per million Kcal.
Condensate	(Value) per ton
Ammonia	(Value) per metric ton

- 27.2.5 By virtue of the application of Article 27.2 the obligations of the CONTRACTOR solely in connection with the performance of the Penaltiable Guarantees (only) shall be considered as fulfilled.
- 27.2.6 In the event that the CONTRACTOR does not elect to pay the Liquidated Damages for the non-fulfilment of the Penaltiable Guarantees the CONTRACTOR shall be liable to complete the necessary work and services pertaining to the required modifications, referred to in Article 29, within nine (9) months from the date of Start-up of the Plant(s).
- 27.3 In the event that the CONTRACTOR does not or is unable to complete the Performance Guarantee Tests within forty-three (43) months from the Effective Date or nine (9) months after Start-up of the Plant as provided in Article 26.11 (whichever is the earlier), except where an extension has been granted due to circumstances outside the control of the CONTRACTOR or fault of the PURCHASER as provided therein, the CONTRACTOR shall pay Liquidated Damages to the PURCHASER in the amount of one (1) percent of the Contract Price for each month of delay subject to a maximum of nine (9) percent.
- 27.4 Should the CONTRACTOR be unable or unwilling to fulfill the Absolute Guarantees within fifty-two (52) months of the Effective Date or eighteen (18) months after Start-up (whichever

is the earlier), extended by such time as provided in Article 26.11, the PURCHASER shall (at his option) have the right to recover the full costs necessary to correct the Plant or shall have the right to proceed to modify the Work(s) through engagement of such parties as the PURCHASER may deem fit, and the provisions of Articles 30 shall apply. The determination of costs incurred by the PURCHASER shall be made by mutual agreement or through Arbitration procedures or court action.

27.5 If the CONTRACTOR should fail to complete the Work(s) thereof within the limits of time guaranteed in the Contract (Annexure XV) and within the authorized extension(s) of time (governed by Article 29), the CONTRACTOR in addition to the Liquidated Damages stated to be payable in Article 27.3, shall be liable for fundamental breach of Contract.

27.6 The PURCHASER without prejudice to any other method of recovery may deduct the amount of such Liquidated Damage payments from any payments due or which may become due to the CONTRACTOR. The payment of or deduction of such Liquidated Damages shall not relieve the CONTRACTOR from its total obligations to complete the Work(s) or from any other of its obligations and liabilities under the Contract.

ARTICLE 28

WARRANTIES

- 28.1 The CONTRACTOR warrants that the Plant, equipment, materials, tools and supplies incorporated in the Works pursuant to this Contract conform with the specifications, plans and all of the contractual criteria, and that the work in every particular is free from defects in design, engineering, processes, materials, workmanship and construction.
- 28.2 The CONTRACTOR shall be responsible for the quality, duration, and effect of the warranties (and guarantees) for the Plant, equipment and the Works and sections and/or parts thereof, and the fitness of the work for the particular purpose. The CONTRACTOR also warrants as to the correctness and completeness of the plans, all technical data and documents supplied by him as well as to the technical criteria of the equipment fabricated in accordance with his plans and instructions under the present Contract.
- 28.3 The CONTRACTOR shall be responsible for the design and quality of the goods and equipment in accordance with this Article, and as to the workmanship and materials pursuant to Article 25, and for the satisfactory continuous operation of the Plant and equipment supplied, pursuant to Article 26, and shall provide specific information as to warranties as required by Article 18.14.2. The CONTRACTOR warrants the Plant and Works for twelve (12) months, commencing from the date of Provisional Acceptance as defined in Article 18. This period shall not exceed thirty (30) months from the Mechanical Completion of Plant and Equipment under this Contract, if for reasons only attributable to the PURCHASER the plants cannot be started up or brought into commercial production (within the said thirty (30) months period), subject however to the governing provisions of Article 18.17 and 18.18.

- 28.4 If within the period specified in Article 28.3 or the date of Final Acceptance by the PURCHASER whichever is the later, the work or any part thereof becomes defective or broken or fails due to faulty or improper design, workmanship, material, manufacture, fabrication, shipment or delivery, or fails to meet the requirements of the Contract, then the CONTRACTOR upon notification in writing from the PURCHASER, shall forthwith make good every such defect, breakage or failure without cost (including without limitation, transportation cost) to the PURCHASER. If after such notification, the CONTRACTOR shall make default or delay in diligently commencing, continuing and completing the making good of such defect, breakage or failure in a manner satisfactory to the PURCHASER, the PURCHASER may proceed to do so independently and to place the work in good operating condition in accordance with the Contract, and the CONTRACTOR shall be liable for all costs, charges and expenses incurred by the PURCHASER in connection therewith and shall forthwith pay the PURCHASER an amount equal to such costs, charges and expenses upon receipt of invoices certified correct by the PURCHASER.
- 28.5 Pursuant to Article 28.4 above, should the removal of the defect require replacement of the equipment, the replacement shall be accomplished in minimal time, plus the shortest possible erection time for this equipment in the CONTRACTOR's country. Subject to prior approval by the CONTRACTOR (which shall not be unreasonably withheld) the PURCHASER shall have the right to repair minor defects at the CONTRACTOR's cost.
- 28.6 If any part(s) of the Work(s) are repaired or replaced, pursuant to this Article and/or Article 29, the warranty period for repaired or replaced items shall begin anew for another

twelve (12) months after bringing into satisfactory operation of the repaired and/or replaced part(s) of the Work(s), irrespective of any portion of the original warranty period relating to the same having expired. In relation to such other equipment which could not be operated due to the necessity of repair or replacement of the defective part(s) of the Work(s) referred to herein, the warranty period shall be extended by a time equivalent to their periods of non-operation.

28.7 The CONTRACTOR's warranty shall not be deemed to cover:

28.7.1 Damage arising through disregard of the CONTRACTOR's written instructions after Provisional Acceptance by the PURCHASER.

28.7.2 Normal wear and tear.

28.8 The CONTRACTOR shall:

28.8.1 Warrant all Civil Engineering structures for a period of * _____ years after Mechanical Completion, and in particular for the foundations for all buildings, plant and equipment.

28.8.2 Warrant that all Civil Engineering has been constructed in accordance with accepted codes and standards, or standards laid down elsewhere in the Contract and particularly in Annexure XXVIII. The CONTRACTOR warrants that he is fully aware of local codes and practices which may modify international codes, however, the CONTRACTOR shall sustain in his work the more rigid and superior criteria of such of the codes and in any event promises to undertake all construction accordingly.

* The period of warranty for civil engineering work is often governed by national laws and the applicable criteria shall apply on a case by case basis.

- 28.9 The CONTRACTOR warrants that the erection of all Plant and equipment has been accomplished by him in accordance with standard erection codes or as specified in the Annexure XXIV (whichever is superior) and in the event of any erection defect found within the period specified in Article 28.3 or twelve (12) months of take over (whichever is the later) of the Plant by the PURCHASER, the CONTRACTOR shall eliminate the defect without any cost to the PURCHASER.
- 28.10 In the event that any defects are found in the equipment, erection or civil structures within their warranty period, the PURCHASER will immediately inform the CONTRACTOR by telegram/telex. If the CONTRACTOR's personnel are not on Site, the PURCHASER shall have the right to institute remedial measures at the CONTRACTOR's cost immediately in accordance with the Contract.

ARTICLE 29

RECTIFICATION OF DEFECTS AND
MODIFICATIONS TO THE WORKS

- 29.1 In the event that due to mistakes, negligence, omissions or errors in the processes and/or in the construction, erection, engineering, manufacturing and/or fabrication performed by the CONTRACTOR and/or in the CONTRACTOR's supply and procurement, or specifications instructions and inspection, or for whatever reason falling within the CONTRACTOR's obligations, the CONTRACTOR is unable to demonstrate any of the Guarantees, Performance Guarantee Tests or complete the Work(s), whether or not arising out of or due to the matters or subjects covered by Articles 14, 25 and 26 and this Article or any one of them, the CONTRACTOR shall proceed to effect the rectifications, additions and/or changes which are necessary to eliminate the defects and/or faults and thereby to achieve the specified guarantees and criteria referred to in the aforementioned Articles. The CONTRACTOR shall provide free of charge to the PURCHASER all necessary work and services as required to complete the Works. In the event that the PURCHASER performs any and all of the modifications and rectifications and other work referred to herein and/or as required pursuant to Article 18.18, the CONTRACTOR shall be liable to the PURCHASER for such costs and expenses as are due.
- 29.2 If the CONTRACTOR shall neglect or refuse to take the necessary measures to ensure the elimination of the defects and/or faults expeditiously, then the PURCHASER may take such remedial steps to rectify, modify, correct and replace any equipment, part(s) or section(s) thereof and/or erect new equipment and/or undertake repair and/or replacement of used equipment to eliminate the defects and correct all associated problems, and the cost of such remedial steps taken by the PURCHASER shall be recoverable in any manner at the discretion of the PURCHASER in accordance with the provisions of this Contract and applicable laws.

- 29.3 The PURCHASER, will in every case keep such contemporary and accurate records of the costs of making good any defect(s) in pursuance of this Contract and as may be required under Article 29.2 and the CONTRACTOR shall be entitled to receive copies in the appropriate cases.
- 29.4 The provisions of Articles 14 and 25 shall apply with regard to defects found during inspection (before despatch) of equipment, machinery or materials or defects materialising during erection or pre-commissioning tests at the Site or in the Plant or Work(s) and the CONTRACTOR shall immediately advise the PURCHASER as to the action proposed to be taken to replace or repair the defective equipment, defective parts, or inadequate material in the shortest possible time. The CONTRACTOR and PURCHASER agree that the procedure specified in Article 29.8 shall thereafter apply to facilitate such repair and/or replacement. In the procurement of spare parts pursuant to Article 10, if any defect is found in the Vendor's supply within the period during the valid guarantee period, the CONTRACTOR shall assist the PURCHASER in immediately undertaking the necessary measures to have the Vendor(s) replace the defective supplies within the shortest possible time, including the air freighting of the equipment or parts etc. at Vendor's cost.
- 29.5 The provisions of Articles 28 and 30 shall apply mutatis mutandis as regards the liabilities and obligations of the parties herein, in the circumstances envisaged in Article 29.4 and Article 29.8.
- 29.6 The CONTRACTOR shall assume complete responsibility for any failure of the equipment process(es), materials or poor workmanship due to improper: engineering, basic design, procurement specifications, and quality of workmanship; and the CONTRACTOR shall be liable to take the necessary corrective measures under this Article and shall be subject to the liabilities contained in Articles 27 and 30.

- 29.7 Until all defective or faulty work has been made good, altered or eliminated through replacement or otherwise as provided in this Contract, the PURCHASER shall have the right to use any such faulty or defective work at the CONTRACTOR's sole risk and without thereby affecting the PURCHASER's rights under this Contract, unless however, the CONTRACTOR shall notify the PURCHASER in writing that, in his opinion, the faulty or defective work cannot be so used without undue risk to the work or persons operating or working in the vicinity of the Work.
- 29.8 Whenever any of the defects referred to in Article 29.4 appear, the CONTRACTOR shall immediately thereafter advise the PURCHASER, and the procedure specified hereunder shall apply in connection with any repair and/or replacement as also referred to in Article 12.4.3. The defective material, machinery and/or equipment shall be examined by the CONTRACTOR and PURCHASER (or their duly authorized representatives).
- 29.8.1 In the event that the defect and/or damage is agreed to be minor the CONTRACTOR shall satisfactorily rectify the same through the most expeditious means.
- 29.8.2 In the case of a serious or extensive defect or damage the CONTRACTOR shall state the method of making good the defect or damage in any event at his own cost, and one of the following methods shall be adopted, subject however to the considerations of efficiency, speed and the contractual time schedules:
- 29.8.2.1 The undertaking of repair/rectification work or alteration at Site.
- 29.8.2.2 Removal of the defective material or equipment from the Site and the undertaking of repair or rectification away from the Site.

- 29.8.2.3 The removal of defective material, machinery or equipment and replacement by new and unused materials, machines or equipment.
- 29.8.3 The CONTRACTOR shall embody the most efficient means to be recommended in a report indicating the method proposed to be adopted and the detailed reasons for the course of action intended to be taken, and shall submit such report as early as possible to the PURCHASER. If the PURCHASER has no objection, the CONTRACTOR shall undertake such repair and/or replacement immediately. The provisions as to warranties, guarantee requirements as elsewhere expressed in this Contract shall apply with equal force and effect.
- 29.8.4 Upon completion of such repair or replacement, the PURCHASER may require the CONTRACTOR to carry out necessary additional tests required under the Contract prior to accepting the repair or replacement.
- 29.9 For the purposes of this Contract, the responsibilities and obligations contained in this Article and Article 30 shall be deemed to be complementary to each other.
- 29.10 In the event that the CONTRACTOR is unable to prove and demonstrate any of the Guarantee Tests as required by Articles 18.12 and 26, and if any one and/or other of the factors or reasons referred to in Article 18.18 (or matters related thereto) affect, impair or prevent the proper operations of the Plant(s), their capacity, performance, production and/or their capability under the terms of the Contract, and/or any condition(s) in the Work(s) (within the responsibility of the CONTRACTOR) adversely affects the said operations, whether due to any discrepancies or mistakes in design, process, engineering, instructions, specifications, inspections, procurement, fabrication and supply, civil engineering, erection, and errors and/or omissions

(as the case may be), which require modification(s), corrections, rectifications and/or equipment replacement pursuant inter alia to this Article and Articles 18.17, 18.18, 25 and 26.11, so as to correct and remove the defects related thereto, with or without replacement of any equipment, parts, and/or materials, the PURCHASER may at his discretion require the CONTRACTOR to undertake such modifications, rectifications, corrections or equipment replacement and the CONTRACTOR shall submit a detailed report to the PURCHASER specifying the extent, nature, degree and effect of the discrepancies and/or mistakes etc. above-referred to in relation to the Work(s). The PURCHASER shall assess the full impact of such report, and following consultations with the CONTRACTOR and with any other person, firm or corporation he may deem expedient (with or without the presence of the CONTRACTOR) he shall provide the CONTRACTOR with an allotted time upon specified conditions (notwithstanding the payment in any event of the additional Liquidated Damages for delay pursuant to Article 27.3) for the undertaking of such modifications, rectification(s), replacement(s), corrective engineering pursuant to the aforementioned Articles and (if applicable) the making good of faulty workmanship and defective materials pursuant to Article 25.4. The extension and time allowed to the CONTRACTOR hereby shall not in any way absolve him of any liabilities for the period of delay and/or the application of Articles 27 and 30 as the case may be, and/or the effect of any one and/or other of Articles 14 and/or 28. The CONTRACTOR shall complete the work in conformity with the requirements of the Contract and shall (at the discretion of the PURCHASER) be granted such further extensions as may be necessary without prejudice to any of the PURCHASER's rights as aforementioned. The CONTRACTOR shall extend the period(s) of validity of the Bank Guarantee(s) and Performance Bond(s) commensurate with the period of extension(s) granted by the PURCHASER.

- 29.11 Subject to the PURCHASER's right to hire assistance from any other CONTRACTOR (at his sole discretion), the CONTRACTOR's obligation to modify the Plant and rectify the defects and to take corrective steps including the replacement of equipment and/or materials shall be continuous and unabated, for the successive periods authorized by the PURCHASER in writing referred to in Article 29.10 above and the CONTRACTOR shall continue in his endeavours at his own cost to modify and/or rectify the defects, replace equipment and take such corrective measures to fulfil his obligations under the terms of the Contract. Notwithstanding, the exercise by the PURCHASER of his rights to hire external assistance, and/or other remedies pursuant to this Contract, the obligations of the CONTRACTOR herein shall not end until all of the proper and necessary changes are made, the work completed, the Plant corrected and the Performance Guarantees and tests of the Plant(s) are successfully demonstrated.
- 29.12 The CONTRACTOR's obligations to execute the modifications, corrections, rectifications and replacement of equipment pursuant to Articles 29.10 and 29.11 shall not be restricted.
- 29.13 Any extension of time granted to the CONTRACTOR under the provisions of Article 29.10 shall be without prejudice to any rights or remedies of the PURCHASER whatsoever under this Contract, should the CONTRACTOR fail to accomplish work within the extended time so allowed.
- 29.14 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 30

LIABILITIES, SET-OFF AND WAIVER

- 30.1 The CONTRACTOR shall be subject to liabilities and damages for default of his contractual responsibilities, and shall be duty-bound to fulfill all the obligations as expressed more particularly in each of the Articles of the Contract.
- 30.2 The CONTRACTOR shall be liable for the satisfactory fulfillment of the guarantee requirements, pre-commissioning and commissioning tests and performance guarantee tests; for the adequacy of warranties, sufficiency of inspections, guarantee of workmanship and materials; and, shall be obligated to undertake necessary modifications to the Plant(s), and rectify and repair defective parts of the Work(s) and/or sections thereof, and shall be accountable for the completion of the workscope and objects of the Contract as expressly specified.
- 30.3 The CONTRACTOR shall be liable for any damage or loss to property or equipment of the PURCHASER during transportation, erection, start-up, during Guarantee Tests and for any other cause before Take-Over by the PURCHASER and in any event during the period thereafter until Final Acceptance where such loss or damage has occurred due to the negligence, errors, omissions or instructions attributable to or falling within the responsibility of the CONTRACTOR within the scope of work and services in the Contract.
- 30.4 The CONTRACTOR shall reimburse the PURCHASER as to those amounts received by the CONTRACTOR under any insurance policies held by the CONTRACTOR pursuant to Article 24 as well as through those others required to be held or which should have been specifically taken out in any event for the purposes of this Contract, and the CONTRACTOR shall be liable to the PURCHASER under the provisions of Article 24.9.2 and 24.9.3 in the applicable case.

- 30.5 The total liability of the CONTRACTOR under the Contract shall not exceed ___% of the total Project Cost, or, (state amount) whichever is the greater, with the exception of the CONTRACTOR's unlimited liability for the fulfillment of warranties, Absolute Guarantees, modifications, rectifications and completion of the Work(s) as well as the reimbursement to the PURCHASER of any amount(s) received by the CONTRACTOR under any Insurance Policies held by the CONTRACTOR as well as through those other specifically taken out for the purposes of this Contract.
- 30.6 The CONTRACTOR shall not be liable under the Contract for loss of anticipated profits or for any consequential loss of damage arising from any cause, except to the extent of repaying to the PURCHASER any amount receivable under Article 24 and/or pursuant to other insurance policies held by the CONTRACTOR solely in connection with the types of losses referred to in this Article 30.6.
- 30.7 Without restricting any liability or obligation of the CONTRACTOR and/or right in the PURCHASER imposed, conferred or contemplated by any of the other Articles of this Contract, it is expressly agreed that, if the CONTRACTOR has failed within a reasonable time after being required by the PURCHASER to make good any loss or damage for which the CONTRACTOR is liable under this Contract, the PURCHASER may cause the loss or damage to be made good as he deems fit, and the CONTRACTOR shall thereupon be liable to the PURCHASER for such costs, expenses and charges thereof and shall on demand compensate the PURCHASER for such losses and damages sustained.
- 30.8 No bond, undertaking or payment given, supplied or offered 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, undertaking or

payment 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.

30.9 Right of Set-Off

30.9.1 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 affected 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 inter alia Articles 11, 12, 28, 29 and 40) any sum so deemed payable or retainable to or by the PURCHASER by virtue of any 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. Should the PURCHASER exercise any such right of set-off as envisaged herein, 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 by the PURCHASER shall constitute such notification to the CONTRACTOR unless the said letter or other communication so stipulates. At any time up to sixty (60) days after the receipt of the notification contemplated 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 sixty (60) days the CONTRACTOR shall be deemed to have acknowledged the validity, both as regards quantum and otherwise of the aforesaid claim of the PURCHASER. Should the amount of the above mentioned claim of the PURCHASER exceed the amount or value of the set-off 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.

30.10 Waiver

30.10.1 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.

ARTICLE 31

TAXES AND LEVIES

- 31.1 Except as otherwise specified in this Contract, each and every price cited in or contemplated by this Contract as described in Articles 20.2 to 20.8, includes and covers all patent royalties, and all taxes, rates, charges and assessments of any kind whatsoever (whether Federal, State or Municipal, and whether or not in the nature of excise taxes/duties, customs tariffs, sales taxes, land taxes, license fees or otherwise) outside the PURCHASER's country pertinent to the equipment and material and CONTRACTOR's services provided with respect to the Works pursuant to this Contract, and/or to the performance of the work, and all other costs and charges whatsoever relevant to such equipment, material, services and/or to such performance of the work by the CONTRACTOR.
- 31.2 Subject to national laws in the PURCHASER's country, the amounts to be paid to the CONTRACTOR under the Contract shall be net and free of any Income Taxes or other taxes, duties, or imposts or levies in (PURCHASER's country).

ARTICLE 32

SUSPENSION OF WORK

- 32.1 The PURCHASER may, when in the PURCHASER's opinion it is deemed necessary, require the CONTRACTOR to suspend execution of the work, or part of the work, either for a specified or unspecified period by communicating notice to that effect to the CONTRACTOR. If the period is unspecified, the PURCHASER shall specify the period of suspension within forty-five (45) days thereafter.
- 32.2 The CONTRACTOR, upon receiving notice of the PURCHASER's requirement pursuant to Article 32.1 above, shall suspend all operations except those which, in the PURCHASER's and CONTRACTOR's opinion, are necessary for the care or preservation of the Works.
- 32.3 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 PURCHASER.
- 32.4 If the period of suspension is ninety (90) days or less, the CONTRACTOR, upon the expiration of the period of suspension, shall resume the execution of the Contract in accordance with an extension of time granted by the PURCHASER reasonably commensurate with the period during which the execution of the Work or part of the Work was suspended and payments due upon Suspension of Work in the relevant case shall be determined in accordance with the provisions of Article 19.2.
- 32.5 If the period of suspension is more than ninety (90) days, upon the expiration of the period of suspension, the CONTRACTOR shall resume operations and fulfill the Contract in accordance with the terms and conditions of this Contract, subject to any further amendments to the Contract made pursuant to Article 19.3 that may be required by virtue of prior non-completion of work. Payments to the CONTRACTOR shall be governed by Article 19.2.

- 32.6 If the period of suspension exceeds one hundred and eighty (180) days and if the PURCHASER requests the CONTRACTOR to recommence the work upon amended terms (to be agreed mutually) and the PURCHASER and CONTRACTOR are unable to reach agreement on the completion of the Contract by the CONTRACTOR, or the CONTRACTOR is unwilling in any event to undertake further work, the parties shall resort to Arbitration pursuant to Article 37.
- 32.7 Nothing herein shall affect the validity of the Contract. Both the PURCHASER and CONTRACTOR shall make bona fide endeavours to resume the work as expeditiously as possible.
- 32.8 Payments if any made under this Article shall be governed by the provisions of Article 19.2.

ARTICLE 33

TERMINATION OR CANCELLATION OF THE CONTRACT

- 33.1 In the event that the PURCHASER is subject to any circumstances which are wholly unavoidable and/or beyond his control (but not including occurrences which are covered by Article 34) then the PURCHASER may at any time by giving notice in writing to that effect terminate this Contract.
- 33.2 The CONTRACTOR shall upon receipt of a notice pursuant to Article 33.1 above cease all operations forthwith.
- 33.3 If the Contract is terminated pursuant to Article 33.1 the PURCHASER will pay to the CONTRACTOR an amount equal to the greater of:
- 33.3.1 The cost of the Works properly supplied or done by the CONTRACTOR as at the date of the termination less all amounts already paid to the CONTRACTOR by the PURCHASER, and less all amounts which the CONTRACTOR is liable under the Contract to pay to the PURCHASER or owing to the PURCHASER, or which the PURCHASER claims is due as damages pursuant to other Articles herein, and
- 33.3.2 The amount calculated in accordance with the Terms of Payment which would have been legitimately payable to the CONTRACTOR up to the date of Termination provided the CONTRACTOR had in fact fulfilled his contractual obligations to such date, without prejudice to PURCHASER-rights as expressly provided for in this Contract.
- 33.4 In the event that the CONTRACTOR and the PURCHASER are unable to agree upon the amount of payments then the aggrieved party may resort to Arbitration as provided for in Article 37.

33.5 In the event of a termination of this Contract pursuant to this Article, the following rights shall accrue to the PURCHASER:

- 33.5.1 To the extent that the PURCHASER has made payments pursuant to Article 20.2 (subject to recovery or deduction of other monies by the PURCHASER under Contract terms) the PURCHASER shall have the right to obtain from the CONTRACTOR where he is also the Process Licensor the documentation for know-how and basic engineering (unless already supplied by the CONTRACTOR; To the extent that the PURCHASER has made payments to the CONTRACTOR pursuant to Article 20.2, the PURCHASER shall have the right to directly obtain from the Process Licensor (where the CONTRACTOR is not the Process Licensor) the documentation referred to above unless already supplied through the CONTRACTOR.
- 33.5.2 The PURCHASER shall be entitled to receive all detailed engineering documents, calculations, computer printouts and other materials related thereto as completed up to the date of the Termination.
- 33.5.3 The PURCHASER shall be entitled to receive lists of all equipment for which orders have been placed, together with all copies of Purchase Orders for plant supplied and not supplied.
- 33.5.4 The PURCHASER shall be entitled to take delivery and receive the shipping papers for all equipment for which whole or partial payment(s) have been made by the CONTRACTOR.

- 33.5.5 The PURCHASER shall be provided with all procurement documentation for purchases under Article 10 including copies of all tenders issued or prepared, bids received, bid tabulations completed or under preparation and CONTRACTOR's recommendations completed and Purchase Orders prepared and issued up to the date of Termination.
- 33.5.6 The PURCHASER shall be provided with all inspection reports, reports on visits to the factories of the CONTRACTOR's suppliers and copies of test certificates received from them up to the date of Termination.
- 33.5.7 The PURCHASER shall be entitled to receive all completed or incomplete documentation pertaining to work and services to be provided by the CONTRACTOR pursuant to Article 4 (as detailed in Annexure VI and in particular to the technical documentation specified in Annexure XV).
- 33.5.8 In circumstances where Article 33 applies, the PURCHASER shall have the right to establish the direct contractual arrangements with the Process Licensor as provided under Article 7.2.2.
- 33.5.9 The PURCHASER shall have the right to take over the Works including all work done to date on the Site.
- 33.5.10 The PURCHASER shall be entitled to receive copies of all detailed Civil Engineering, Piping, Instrumentation, lay-out and erection drawings.
- 33.6 Nothing herein shall invalidate the rights of the PURCHASER as to contractual grounds of action (in relation to damages or costs due to the PURCHASER) whether through litigation or arbitral procedures, and, notwithstanding the Termination of the Contract herein, the parties to this Contract shall be subject to the courts of competent jurisdiction.

- 33.7 In any of the following cases, the PURCHASER may, without any other authorization, cancel the Contract and take all or any part of the Contract and/or of the work to be undertaken by the CONTRACTOR out of the CONTRACTOR's hands and may employ such means as the PURCHASER sees fit to complete this Contract and/or the Works:
- 33.7.1 Where the CONTRACTOR has made default or delayed in commencing or in executing, completing or delivering the work or any portion thereof to the reasonable satisfaction of the PURCHASER, and the PURCHASER 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 a period of _____ after such notice was given;
 - 33.7.2 Where the CONTRACTOR has become insolvent and/or made an assignment of the Contract without the approval of the PURCHASER;
 - 33.7.3 Where the CONTRACTOR has committed an act of bankruptcy;
 - 33.7.4 Where the CONTRACTOR has abandoned the work;
 - 33.7.5 Where the CONTRACTOR has failed to make proper disclosures as referred to in Article 40.
- 33.8 Where this Contract or any portion or portions thereof has or have been taken out of the CONTRACTOR's hands under Article 33.7, the CONTRACTOR shall not, except as provided in Article 33.9 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 settle costs and/or damages under the Contract pursuant to Articles 18, 24 and 30 and the PURCHASER (at its option) may decline to proceed to Arbitration for the recovery of damages and may instead institute actions in the courts of competent jurisdiction.

- 33.9 Where this Contract, or any portion or portions thereof has or have been taken out of the CONTRACTOR's hands under Article 33.7 and is subsequently completed by the PURCHASER, subject to the rights of the PURCHASER specified in Articles 27 and 30 and the provisions therein, the PURCHASER may at its option determine the amount, if any, of retention monies and progress claims of the CONTRACTOR unpaid at the time of taking the work out of the CONTRACTOR's hands that, in the PURCHASER's opinion, are not required by the PURCHASER for the purposes of the Contract and subject to any actions already instituted or proposed to be commenced in courts, the PURCHASER shall, if of the opinion that no financial prejudice to the PURCHASER will result, authorise payment of that amount to the CONTRACTOR.
- 33.10 The taking of this Contract, 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 the obligations imposed upon the CONTRACTOR by this Contract and by law.
- 33.11 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 and in particular, but without affecting 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, utilize the equipment or sell or otherwise dispose of, 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 consider reasonable 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.

- 33.12 Subject to Article 33.11 above, if the PURCHASER considers that any PURCHASER property-interest possessed by virtue of the application of Article 33.11 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 34

FORCE MAJEURE

34.1 In this 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, impedes or delays the due performance of the Contract by the obligated party and which, by due diligence, the affected party is unable to control, despite the making of all reasonable efforts to overcome the delay, impediment or cause.

Force Majeure may include, but shall not be limited to anyone or other of the following:

- any war or hostilities
- any riot or civil commotion
- any earthquake, flood, tempest, lightening, unusual weather or other natural physical disaster. Impossibility in the use of any railway, port, airport, shipping-service or other means of transportation (occurring concurrently and to be proven to the satisfaction of the PURCHASER)
- any accident, fire or explosion
- any strike, lock-out or concerted acts of workmen (except where it is within the power of the party involving the Force Majeure to prevent)
- shortages or unavailability of materials (compounded by the same shortage or unavailability from alternate sources) if beyond the CONTRACTOR's control, to be proven to the satisfaction of the PURCHASER.

34.2 If either party is prevented or delayed in the performance of any of its obligations under this Contract by circumstances of Force Majeure, and if the affected party has given written notice thereof to the other party within ten (10) days of the happening of such event, specifying the details constituting Force Majeure, with necessary evidence that a contractual obligation is thereby prevented or delayed, and that the

anticipated period (estimated) during which such prevention, interruption or delay may continue, then the affected or obligated party shall be excused from 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 endeavouring to prevent or remove the cause of Force Majeure. Either party upon receipt of the Notice of Force Majeure under Article 34.2 shall confer promptly with the other and agree upon a course of action to remove or alleviate such cause(s), and shall seek reasonable alternative methods of achieving the same performance objectives under the Contract.
- 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 to seek agreement as to the required action that should be taken in the circumstances and as to the necessary amendments that should be made to the terms of the Contract.
- 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 nine (9) months for one or more causes and if the consultations referred to in the preceding Article 34.4 have not resulted in mutual agreement (or have not taken place because the parties have been unable to communicate with one another), the parties shall thereupon agree to amend the terms of this Contract by virtue of the prevailing Force Majeure circumstances and shall determine the course of further action. If the parties are unable to reach an agreement to amend the terms of this Contract by virtue of the prevailing and continuous Force Majeure, then the parties shall resort to Arbitration pursuant to Article 37 in the event of a dispute as to any justification for termination.

- 34.6 The PURCHASER acknowledges that any eventual inability on its part to make bona fide payments to the CONTRACTOR under this Contract, shall not be claimed or deemed to constitute Force Majeure. In the event of a dispute as to the bona fide payments due, payments shall be determined by the provisions of Article 19.2 in like manner as suspension of the work, failing which the parties shall have recourse to the provisions of Article 37.
- 34.7 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

LANGUAGE GOVERNING THE CONTRACT

- 35.1 The governing language of the Contract shall be _____, and the definitions in such language shall be final in the use and interpretation of the terms of the Contract.
- 35.2 All correspondence, information, literature, data, manuals, etc. required under the Contract shall be in the _____ language.
- 35.3 All expatriates sent by the CONTRACTOR to the Site, and all personnel sent by the PURCHASER for training shall be conversant in the _____ language.

ARTICLE 36

APPLICABLE LAWS AND CONFORMITY WITH
LOCAL STATUTES

- 36.1 The laws applicable to the Contract shall be the laws of (neutral country) or 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.
- 36.2 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 are enacted after the Effective Date of the Contract, (which are proven to the satisfaction of the PURCHASER) to have adverse effect on the CONTRACTOR's obligations, scope of work, prices and/or time schedules under this Contract, the PURCHASER shall either
- 36.2.1 Obtain appropriate exemption(s) from the relevant authorities on the CONTRACTOR's behalf, or
- 36.2.2 Negotiate with the CONTRACTOR for commensurate change(s) in the scope of the work to be performed under the Contract, together with such changes in price as properly reflect the actual increased costs that are anticipated. The increased amount shall be subject to full audit by the PURCHASER in accordance with Article 23.2.
- 36.3 Nothing herein shall in any manner affect the validity of the Contract or derogate from the specified obligations of the CONTRACTOR, and his liabilities under the Contract and law.

ARTICLE 37

SETTLEMENT OF DISPUTES AND ARBITRATION

- 37.1 In the event of any dispute, difference or contention in the interpretation or meaning of any of the Articles to this Contract or reasonable inference therefrom, 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 each nominate a person to negotiate and reconcile the dispute or differences to resolve thereby the matter of contention between the parties arising out of the Contract. In the event that these two persons referred to cannot agree, they shall nominate a third neutral person to reconcile the dispute or difference. 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 as provided for herein.
- 37.2 Pending resolution of any such claim or dispute, the CONTRACTOR shall perform in accordance with the Contract without prejudice to any claim by the CONTRACTOR for additional compensation and/or time to complete the work if such instructions (are in his opinion) above and beyond the requirements of the Contract.
- 37.3 Notwithstanding the existence of a dispute, the CONTRACTOR and PURCHASER shall continue to carry out their obligations under the Contract, and payment(s) to the CONTRACTOR shall continue to be made in accordance with the Contract that in the appropriate cases qualify for such payment(s).

37.4 Subject to the provisions of this Article, either the PURCHASER or the CONTRACTOR may demand arbitration with respect to any claim, dispute or other matter that has arisen between the parties.

37.4.1 However, no demand for arbitration of any such claim, dispute or other matter shall be made until the later of (a) the date of which the PURCHASER or the CONTRACTOR, as the case may be, has indicated its final position on such claim, dispute or matter, or (b) the twentieth day after the CONTRACTOR or PURCHASER, as the case may be, has presented its grievance in written form to the other, and no written reply has been received within twenty days after such presentation of the grievance.

37.4.2 No demand for arbitration shall be made after the ninetieth (90) day following the date on which the PURCHASER has rendered his written final decision in respect of the claim, dispute or other matter as to which arbitration is sought. The PURCHASER shall be obliged to specify that the written decision is in fact the final decision within the meaning of this Subarticle. Failure to demand arbitration within said ninety (90) days period shall result in the PURCHASER's decision being final and binding upon the CONTRACTOR.

37.5 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 shall be decided by arbitration in accordance with the terms contained in Annexure _____^{1/} attached hereto. This agreement so to arbitrate shall be enforceable under the prevailing

^{1/} To be drafted by the UNIDO Secretariat

arbitration law. The award rendered by the arbitrator shall be final, and judgements may be entered upon it in any court having jurisdiction thereof.

- 37.6 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 37.5 above. The demand for arbitration shall be made within the period specified in Article 37.4 and in all other cases, within the time specified in Annexure _____, after the claim, dispute or other matter in question has arisen, and in no event shall the demand for arbitration be made after institution of legal or equitable proceedings based on such claim, dispute or other matter in question if it would be barred by the applicable statute of limitations.
- 37.7 The CONTRACTOR shall continue the work and undertake his obligations under the Contract and maintain the progress schedule during any arbitration proceedings, unless otherwise agreed by the PURCHASER in writing.
- 37.8 In the event of Arbitration, the CONTRACTOR and PURCHASER agree that the Arbitrator(s) shall have unrestricted access to the Plant (notwithstanding the secrecy provisions of Articles 7.8 to 7.13 inclusive) for the purpose of the said Arbitration.
- 37.9 Arbitration shall be at (Town) and all proceedings will be in _____ language. The Governing Law shall be in accordance with Article 36.

ARTICLE 38

GENERAL PROVISIONS

- 38.1 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 The express covenants and agreements herein contained and made by the PURCHASER and the CONTRACTOR are and shall be the only covenants and agreements upon which any rights against the PURCHASER or the CONTRACTOR are to be founded.
- 38.3 The provisions of the Articles of this Contract and the contents of the Technical Annexures shall be complementary to each other, but in the event of any conflict, the provisions of the Articles shall prevail.
- 38.4 The invalidity of a portion of this Contract shall not affect the validity of the remainder of the Contract unless such remaining portion should be thereby rendered meaningless or impracticable.
- 38.5 Article headings appearing herein are included for convenience only and shall not be deemed to be a part of this Contract.
- 38.6 Protection of Work and Documents
- 38.6.1 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.
- 38.7 Sales Territory
- 38.7.1 The PURCHASER shall have the right to sell the products and intermediates in the international markets without any restriction imposed by the CONTRACTOR.

ARTICLE 39

NOTICES AND APPROVALS

39.1 Notices to be given to or served upon either party under this Contract shall be deemed to have been properly served in the following circumstances:

39.1.1 Provided that:

39.1.1.1 Any notice to be given to the CONTRACTOR is conveyed by registered air mail post, 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 office at (Town).

(CONTRACTOR's address, cable address and telex number) (marked for the attention of (Designation)).

39.1.1.2 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) (marked for the attention of (Designation)).

39.1.1.3 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 is delivered to the respective Site offices at (Town).

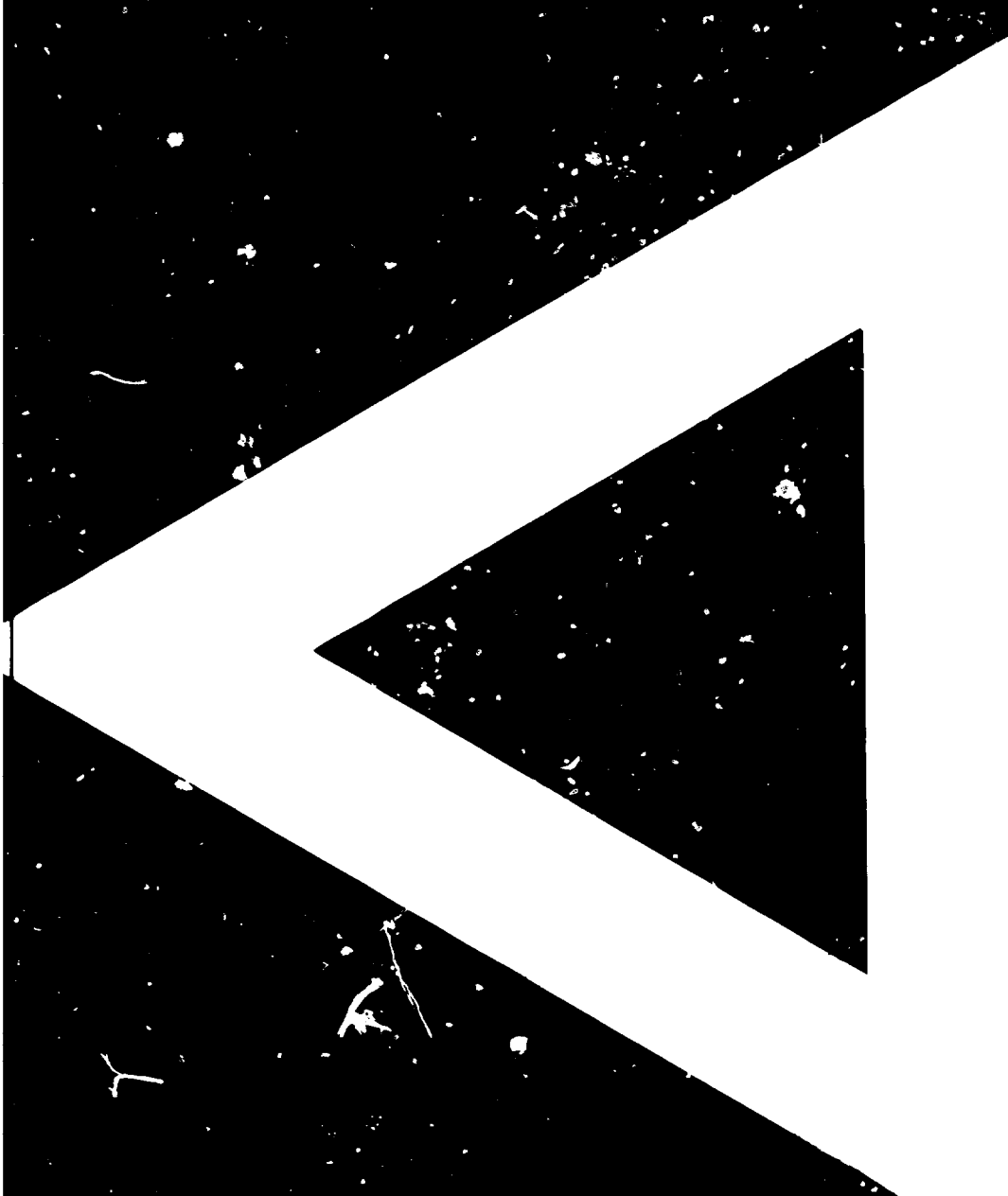
- 39.1.2 When any such notice is sent by registered mail post it shall be deemed to have been duly served following the expiration of ten (10) days following the date of posting and in proving such services it shall be sufficient to show that the letter containing the notice was properly addressed and conveyed to the postal authorities for transmission by registered air mail.
- 39.2 Either party may, by notice to the other party in writing, change its postal address, cable address or telex address for receiving and/or forwarding such notices.
- 39.3 For the purposes of this Contract "Approval" shall be deemed to mean approval in writing. Decisions requiring approval shall also be deemed to encompass modifications or rejections, all of which shall be in writing. Any and all approval(s) which amend, modify or vary the Contract and/or involve an increase in payment(s) shall be forwarded in like manner as the procedure specified for the notices under this Article.

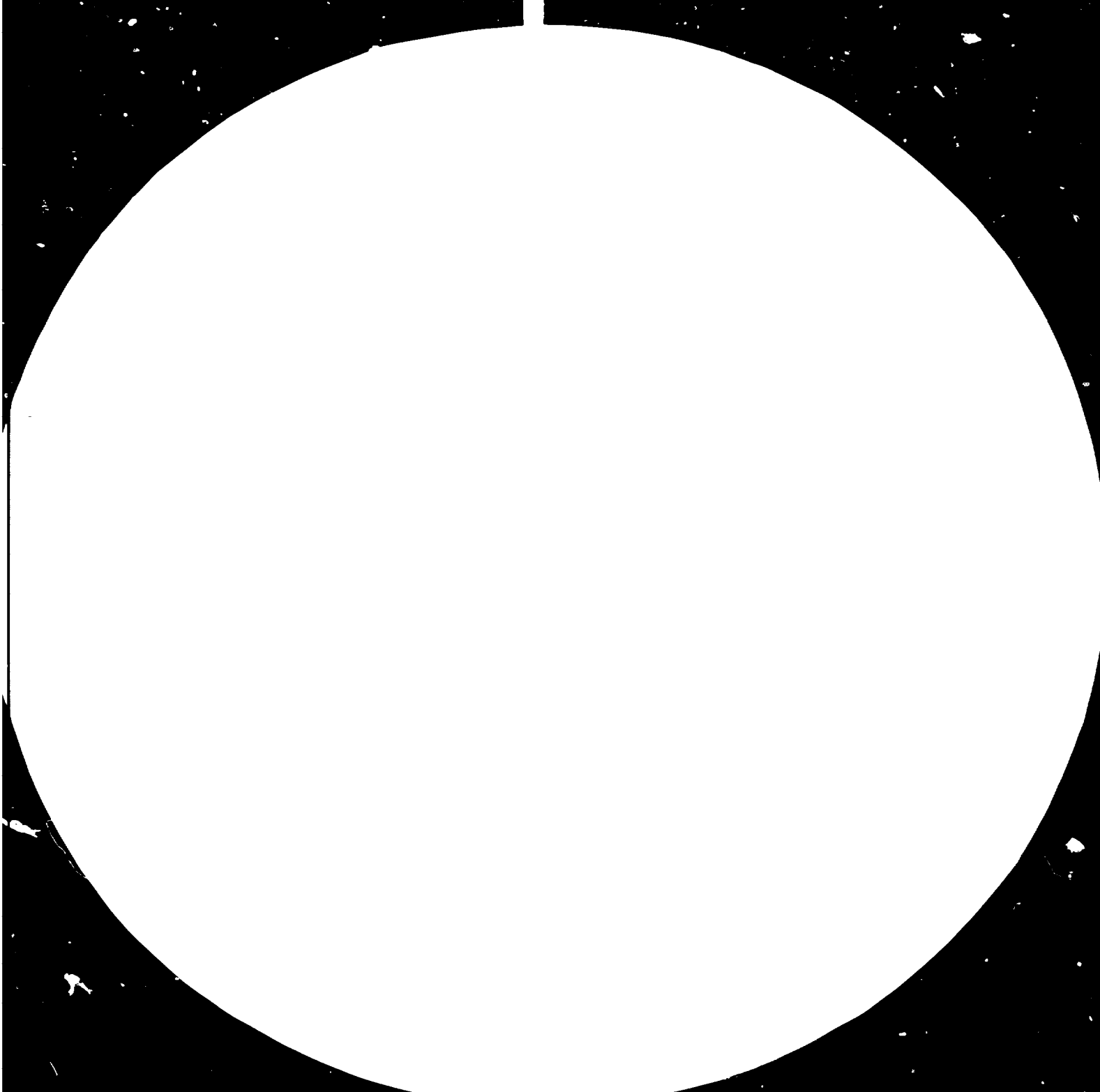
ARTICLE 40

DISCLOSURES

- 40.1 The CONTRACTOR shall not solicit, request or tolerate any commission, fee, discount or other payments whenever he is acting on behalf of the PURCHASER with respect to any procurement and/or services relating to the acquisition of spare parts or otherwise from any Vendor. Should the CONTRACTOR receive any such payment (whether directly or indirectly) the CONTRACTOR shall forthwith disclose and reimburse the same without any deduction whatsoever to the PURCHASER.
- 40.2 The CONTRACTOR shall not pay fees, discount or other commissions in relation to the award to him of this Contract. If any agent's fees are payable to agents in (PURCHASER's country) by virtue of legal agency agreement(s) made before the award of this Contract, then the CONTRACTOR shall (before the award of this Contract) make full disclosure to the PURCHASER the name of the agent and quantum of fees that were or are to be paid.









3.2



3.6



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ID/WG.318/1/Add.1
10 April 1980
ENGLISH

Third Consultation on the Fertilizer Industry
São Paulo, Brazil, 29 September - 3 October 1980

TECHNICAL ANNEXURES
FOR
SECOND DRAFT OF THE
UNIDO MODEL FORM OF TURN-KEY LUMP-SUM CONTRACT
FOR THE CONSTRUCTION OF A FERTILIZER PLANT*

by the UNIDO Secretariat

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INTRODUCTION

1. This document is an addendum to the Second Draft of the UNIDO Model Form of Turn-Key Lump-Sum Contract for the Construction of a Fertilizer Plant. It contains the Technical Annexures which form part of the Contract. Many of the Technical Annexures require further elaboration for a specific project before inclusion in the Contract, and are more in the nature of a check list.
2. The Annexures covering (a) Civil Works and (b) Erection of the Plant, are an important part of a Turn-Key Lump-Sum Contract. They may be elaborated to an extensive or lesser degree depending on the wishes of the Purchaser and the Contractor.
3. The Annexures covering civil engineering specifications are also important. The approach adopted in the present document is to list the specifications that need to be considered and to provide one exhibit to illustrate the contents of the detailed specifications that may need to be included in a specific contract.
4. A list of critical items of equipment is identified in Annexure XII, but the names of experienced suppliers of this equipment have not been given. These names would need to be included in a contract for a specific plant using a specific manufacturing process.
5. It is not easy to prepare Technical Annexures with a view to their use in many different countries. For example, regarding standards and codes, each country will make its own choice. The Consultation Meeting is invited to advise whether specific standards and codes should be given by way of example, as in the present version of Annex II.
6. The Technical Annexures included in this document have been prepared for an ammonia/urea complex, comprising an ammonia plant with a capacity of 1,000 tons a day and a urea plant with a capacity of 1,720 tons per day. But they could be adapted to similar plants of other capacities.

7. A separate set of Technical Annexures is being prepared by UNIDO for a phosphoric acid/NPK complex.

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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 Plants shall 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, CO₂ 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:
(Insert here a brief description of the urea process).

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

All utilities and off-sites including Workshops and Laboratory facilities shall also be provided as laid down in the Contract.

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

1/ This is only an indicative check list of the contents of Technical Annexures, and should be used as such.

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.

The scope of services of the CONTRACTOR includes (but is not limited to) the supply of all know-how and basic engineering, the delivery of all plant and equipment, materials and spare parts, the construction of all Civil Engineering Works, the erection of the plant and equipment, the mechanical testing, pre-commissioning and start-up of the plant, and the demonstration of guarantee tests.

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.^{1/}
- (iii) Analysis of the gas, including, to the extent possible, the following :

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

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.

^{1/}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 load bearing capacity, in the area.

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^{1/}

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 structure	BS	449	
Steel chimneys	BS	4076	
Steam boilers, superheaters and coils	ASME boiler and pressure code sect.I		

^{1/}The agreed upon British and American standards for one particular plant are given as examples. Other standards such as German DIN, Japanese JIS etc. should be specified accordingly if required or envisaged as alternates. Where national standards or codes exist these should be clearly stated.

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- CP 321, 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.
Standards for Civil Engineering and Erection	See Annexures XXVIII and XXIX

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. Characteristics of utilities and services and limits of supply:

7.1 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).

7.2 Water

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

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

ANNEXURE I (I)

BATTERY LIMITS OF THE PLANT

1. Definition of battery limits

The battery limits of the area of plant design should be clearly stated and indicated on the preliminary plot plan (attached) 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 _____ m³ 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.

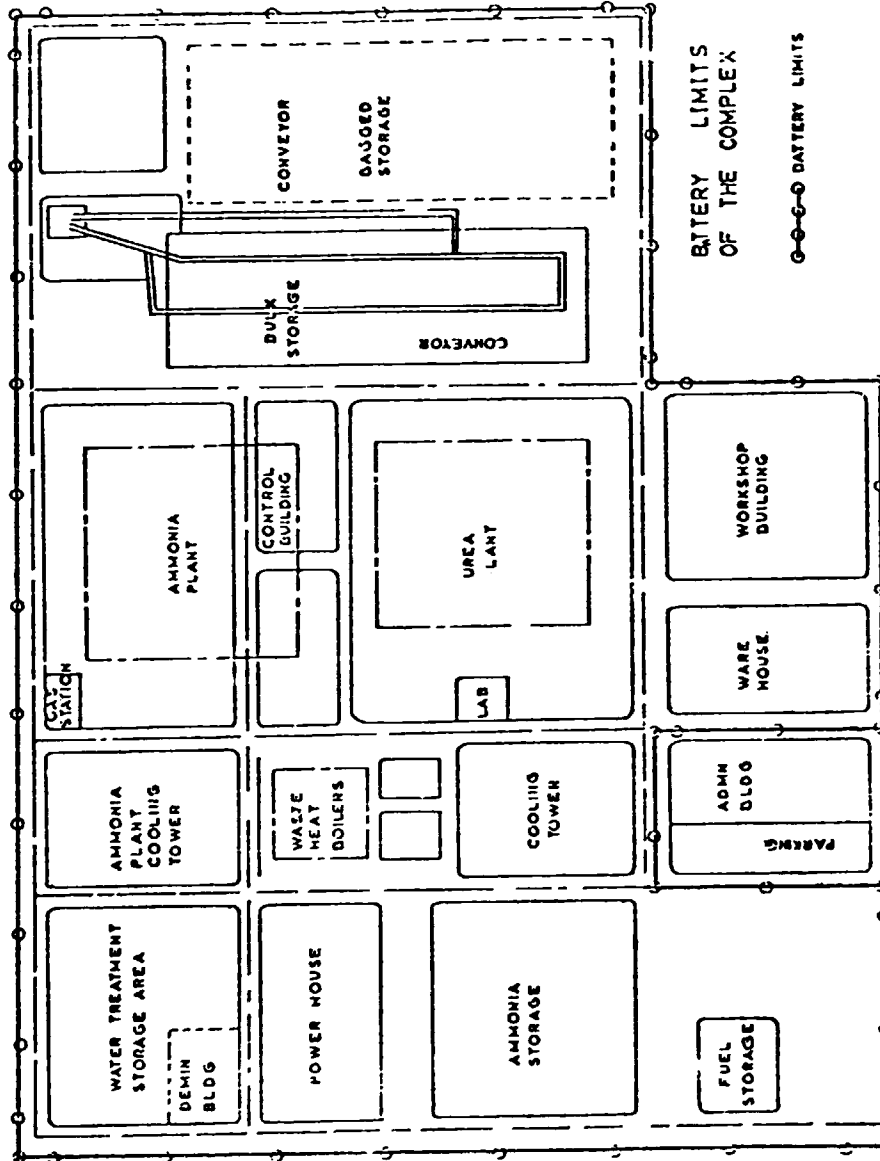
Rail/truck locations will be indicated by the CONTRACTOR but will be finalized after discussions with the PURCHASER and the national rail authorities.

Effluents will be disposed of to _____.

2. Scope of supply

Within the above battery limits, the entire plants and structures (including the utilities and off-sites) contained in Annexure VIII and in the Contract, other than the exclusions in Annexures VII and VIII to be provided by the PURCHASER shall be designed, supplied and constructed 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 limit or 250 mm above ground/floor level, flanged, with the cut-off valves included in the scope of deliveries under this Contract.

ANNEXURE III



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 air temperature of _____^oC. (Suggest equivalent to extreme recorded).
- (ii) The plant and equipment, particularly piping shall be designed for a minimum emperature of _____^oC. Water piping (shall/shall not) be designed for freezing conditions. (Suggest temperature is 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 _____^oC, and dry bulb of _____^oC, and will be designed to give cooling water of (32^oC). (This is the suggested maximum for tropical countries. It can rise to 34^oC in such areas as Bangladesh).
- (v) The Barometric pressure, when corrected to sea level can reach a minimum of _____ millibars, (can be low 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 Annexures 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 _____ Kg/cm² at the battery limits of the entire works.
(Refer to maximum pressure or standard design pressure of supply).
- (iv) Design temperature of natural gas at the battery limits shall vary between _____^oC and _____^oC.

(d) Water:

- (i) The analysis of make-up water used for design shall be the extreme conditions contained in Annexure II.
- (ii) Make-up 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 _____^oC, (for use of certain alloys, should not exceed 38^oC).
- (iv) The cooling water circuit shall be designed for a maximum ΔT of _____^oC. (Suggested max. 10^oC 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) Kg/cm² 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, subject to the further tests as laid down in the Contract.

(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 of _____ Kw generated by a (Diesel set) 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. 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/cm²g
- Quality Dew point below minus 20^oC (for tropical countries otherwise minus 40^oC)
- Free of oil.

1/ This could be a gas generation set, for instance.

(h) Inert Gas

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

- Pressure 6 Kg/cm² 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: ^{1/}

	<u>Pressure</u> Kg/cm ² g	<u>Temperature</u> °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)		(155/133)

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 (sewage or cooling water system)
- Flushed and piped to _____ (indicate place of utilization, or hot process water tank etc.)

(j) Primary Reformer Furnace

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

(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).

^{1/} The figures given in brackets refer to one system. However, the H.P. steam should not be too high in pressure.

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 _____ Kgm/cm^2 at the intake of the Synthesis Gas loop. (Indicate standard design pressure if higher).

4. Design criteria for concrete and steel structures (incl. anti-corrosion protection, prilling tower storage, flooring etc.) are as given in Annexure XXVIII and for erection in Annexure XIX.

(1) Effluent Disposals and Emission Standards

See Annexure XVII.

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 Lay-out and Piping:
 - (a) General Layout of the works
 - (b) Plot Plan for each of the Plants indicating machinery lay-out within the Plant.
 - (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.

1.7 Any other document marked for PURCHASER'S approval in Annexure XV.

2. As-built Documentation:

(These do not require PURCHASER'S approval but the PURCHASER shall have the right to check them if desired):

- (a) Complete Civil Engineering drawings for all buildings including foundation details, steel details, and all structural details.
- (b) Complete as-built dequipment 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

LIST OF TECHNICAL SERVICES TO BE PERFORMED
BY THE CONTRACTOR 1/

In addition or amplification to the services to be performed by the CONTRACTOR as detailed in Article 3, 4 and 6 of the Contract as elsewhere specified in the CONTRACTOR, the services performed by the CONTRACTOR shall include but not be limited to :-

1. Licences and Know-how1.1 Supply of the Licences know-how 2/ 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 Designing2.1 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 overall 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 complete specifications and recommendations for the plant and equipment, tools and materials to be procured and supplied.

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

1/ This is only a check-list of the CONTRACTOR's responsibilities.

2/ "Know-how" includes confidential or secret information, operation manuals etc.

- 2.13 Prepare a list of reliable international suppliers of Equipment, for determining the final list of possible suppliers for agreed critical items of equipment (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 XXVIII

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 and its effect on the time schedule.

5. Planning and Training

- 5.1 Prepare detailed works schedule and critical path printouts showing monthly progress.
- 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, Operation and Guarantee Tests

- 6.1 Undertake all management and supervision of the civil engineering, erection, commissioning, start-up and all operations at site.
- 6.2 Perform the entire erection, in accordance with Article 4 and 10 and Annexure XXVIII
- 6.3 Undertake the installation of the Equipment and field fabrication, and provide all erection equipment for this purpose
- 6.4 Recommend an organization structure for the Works including manpower requirements, operators and technical personnel
- 6.5 Obtain, compile and draw-up operating manuals including analytical procedures and maintenance instructions, as per Annexure XXI
- 6.6 Recommend inventory requirements for Chemicals, catalysts and supplies and assist in preparation of spare parts list and inventories
- 6.7(a) Complete mechanical Testing of the Plant
- 6.7(b) Establish precommissioning and start-up programme
- 6.8 Undertake the commissioning of machinery in co-operation with suppliers
- 6.9 Undertake pressure testing (acceptance tests) of boilers and pressure vessels falling under the jurisdiction of local technical inspection and supervisory authorities
- 6.10 Undertake, using PURCHASER's operators, the precommissioning and start-up of the Utilities and the Plants
- 6.11 Using the Plant Operators of the PURCHASER, operate the Plant until Commercial Production has been reached.
- 6.12 Using the Plant Operators of the PURCHASER, and subject to the PURCHASER's right to specify levels of Production, operate the plant until the guarantee tests commencement
- 6.13 After discussions with the PURCHASER, to draw up the procedure for the performance of guarantee tests
- 6.14 Perform guarantee tests according to the Contract

7. Time Schedule for the Works and Reporting

- 7.1 Set up effective procedure 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 shall undertake all other work and services required for the turn-key establishment of the Works, except those to be specifically arranged by the PURCHASER.

Reserved for additions to the Annexures

ANNEXURE VII

DETAILED DESCRIPTION OF SERVICES TO BE
SUPPLIED 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 land for the Works at the proposed site.
3. The PURCHASER may if he so desires, may 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 the type and quality 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.
7. The PURCHASER shall provide all the personnel needed for the start-up, commissioning and operation of the Plant, other than the Supervisory Personnel.

ANNEXURE VIII

PROCESS DESCRIPTION, SUPPLY OF
EQUIPMENT AND SERVICES1. Process Description

(The Process Description, as finally agreed upon the award of the Contract between the CONTRACTOR and PURCHASER should be inserted here. In the process description, equipment referred to, should be given the same distinguishing numbers, as contained in a flow sheet which should be attached).

2. Preliminary Lay-out

2.1 The preliminary lay-out of the plant/s), utility buildings and off-sites are shown in the attached drawing No.

2.2 This lay-out is preliminary and will be further discussed at the First Consultation Meeting contemplated under Article 6 of the main Contract.

3. Plant and Equipment Lay-out and Inter-Connection

3.1 The Plant and Equipment Lay-out in the Ammonia and Urea Plant is indicated in Drawings No. and No.

3.2 The generalised lay-out of equipment in each plant, in the power station and sub-stations and all auxiliary buildings will be discussed and finalised at the 4-monthly meeting contemplated under Article 6.8.

3.3 The lay-out of roads, railways sidings and other civil engineering works is indicated on drawing Nos. and this will be finalized at the 4-monthly meeting.

3.4 The piping and instrumentation proposed is indicated on the attached P and I Drawing Nos.
This is tentative only and will be further discussed along with the equipment lay-out.

3.5 A one-line electrical diagram showing the electrical design is attached as Drawing No. . This shall be amplified at the meeting contemplated under Article 6.

4. Equipment List^{1/}

4.1 The list of equipment to be supplied under the Contract is given below.^{2/} This list is not exhaustive. The equipment to be supplied will include all the Plant and equipment within the battery limits (Annexure III) to produce the required quantities of Ammonia and Urea and to meet the guarantees contained in the Contract, as laid down in the relevant articles of the Contract.

(Each piece of equipment should now be detailed under the plant sections suggested below. The details for each piece of equipment should contain :-

- (a) Name of equipment
- (b) Number on flow sheet
- (c) Size and other technical data
(e.g. Heat transfer area for heat exchangers).
- (d) Approx. weight. (This could be total for a section as a whole)
- (e) Material of Construction (complete details should be given e.g. Stainless steel is not enough, it should specify type of stainless steel)

(An example is given below :-

- (a) Urea Plant - Carbamate Stripper
- (b) Number H-306 in flow sheet for Urea Plant
- (c) Area - 1650 square metres
- (d) (Not applicable in this case)
- (e) Stainless steel 25 - 22 - 2.

4.1.1. At the meeting contemplated under Article 6.8, the CONTRACTOR shall give an exhaustive list of equipment for approval by the PURCHASER.

4.2 The plant sections suggested are :
(The following list may be expanded as appropriate).

4.2.1 Ammonia Plant

- (a) Desulphurization, reforming and conversion
- (b) Carbon Dioxide removal and methanation
- (c) Compressors and drivers

^{1/} The necessity of an exhaustive list giving all details of each piece of equipment being supplied must be emphasized. The detailed check of this list by the Purchaser is extremely important.

^{2/} Since this is voluminous, it is often contained in a separate volume of the Annexures.

- (d) Ammonia synthesis
- (e) Purge gas absorption
- (f) Ammonia storage

Note: Equipment within the sections may be categorized as for the urea plant using similar code numbers.

4.2.2. Urea Plant

- (a) Reactors
- (b) Towers and vessels
- (c) Heat exchangers
- (d) Separators
- (e) Tanks
- (f) Ejectors
- (g) Compressors
- (h) Turbines
- (i) Pumps
- (j) Miscellaneous equipment

4.2.3. Product handling, bagging and storage

- (a) Urea handling equipment to the 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 machines or bag sealing or valve bag filling machines and 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 or valve) and for (50 kg) net contents.

5. Utilities

- 5.1. The services that shall be designed and procured in the complex are: (Supplement as appropriate).

- 5.1.1. Cooling water system
- 5.1.2. Raw water treatment
- 5.1.3. Demineralized water system
- 5.1.4. Fire-fighting and fire alarm system
- 5.1.5. Plant and instrument air system
- 5.1.6. Natural gas distribution system
- 5.1.7. Inert gas system
- 5.1.8. Effluents collection and disposal system
- 5.1.9. Steam generation, distribution and condensate recovery system
- 5.1.10 Interconnection (piping) system within the complex
- 5.1.11 Electric power generation and distribution system, lighting system, earthing system, emergency power generation and distribution system.

(Equipment for such services should also be detailed under each item)

6. Off-sites

- 6.1. The off-sites facilities that shall be supplied in complex are :
 - 6.1.1 Workshops for mechanical, electrical and instrumentation, maintenance and motor garage
 - 6.1.2 Control laboratory
 - 6.1.3 Warehouses for spare parts, stores, chemicals and lubricants
 - 6.1.4 Administrative and community buildings
 - 6.1.5 Telephone and plant intercommunication system
 - 6.1.6 Erection equipment
 - 6.1.7 Fire-fighting equipment and health security appliances.

(Details should be provided)

7. 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 complex are included in the scope of design and supply of the equipment.

8. Critical Items

- 8.1 The items contained under 8.2 represent critical items for the process and shall only be purchased from the suppliers stated under Annexure XII.

8.2 (The suggested critical items are as given below:)

8.2.1 Ammonia

- (i) Primary reforming furnace, including reformer tubes
- (ii) Waste heat boiler
- (iii) Ammonia synthesis convertor
- (iv) Ammonia chillers
- (v) Air compressor with turbine
- (vi) Refrigerating ammonia compressor with turbine
- (vii) Synthesis gas compressor
- (viii) Other steam turbines

8.2.2. Urea

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

8.2.3 Power Plant

- (i) Boilers
- (ii) Turbo-generators

ANNEXURE IX

CATALYSTS

The following catalysts are proposed for the Ammonia Plant^{2/}

Duties	Particle size (mm)	Bulk Density (Kg/L)	Expected life (year)	Quantity ^{1/} to be supplied
<u>Desulphurisation</u>				
1. Hydrogenation of Natural Gas	2 - 5	0.85	4	
2. H ₂ S absorption	4 x 6	1.38	1/2/5	
3. Activated Carbon				
<u>Reforming</u>				
4. Primary Reforming	-	1.66	3	
5. Secondary "	-	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 Removal</u>				
8. Methanation	5 - 10	0.90	5	
<u>Synthesis</u>				
9. NH ₃ Synthesis	3 - 6	2.12	5	
	1½ - 3	2.7	5	

^{1/} Quantity depends on the process to be used. The quantity should be for one charge plus one replacement charge.

^{2/} All the figures are only indicative from one contract.

ANNEXURE X

SPARE PARTS

1. Within 12 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 also include spare parts of a proprietary nature which will be purchased from vendors, along with the main equipment.
3. For the spare parts of critical items, orders will be placed along with the order for critical items, and such spares need not be included in the list under item 1 above.
4. Following the supply of lists for spares, CONTRACTOR and PURCHASER will scrutinise such lists and will decide on the spare parts to be procured, and the estimated costs, thereof ^{1/}.
5. The spare parts will thereafter be purchased in accordance with the Contract, and Annexure XXVI.
6. The CONTRACTOR is required to ensure that the quantity of spare parts used by him until he completes his guarantee tests are replaced by him at his own cost. In the event that the guarantee tests are not completed (for whatever reason) the value of spare parts used by him until his responsibility ceases is required to be compensated to the PURCHASER by way of deductions from any points due to him and/or his Performance Bonds or other securities.

^{1/} Recommended overall spare part purchase for 2 years operation is 8% of the C and F cost of equipment.

ANNEXURE XI

LIST OF CHEMICALS ^{1/}

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

(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 and quantities to be kept on stock for replacement in emergency cases should be stated for each item).

3. The quantities of the chemicals to be supplied by the CONTRACTOR under the Contract are as follows:

(Quantities are dependant on the process. They should include a first filling plus 6 months requirements, as a minimum).

^{1/} This should include Refrigerants.

ANNEXURE XII

LIST OF PREQUALIFIED VENDORS FOR
CRITICAL EQUIPMENT

1. The Critical Items specified in Annexure VIII Section 8 shall be procured only from the prequalified vendors stated below; unless otherwise agreed between PURCHASER and CONTRACTOR.

Critical ItemList of Vendors Prequalified

Name

Country

ANNEXURE XIII

EXCLUSIONS FROM THE SCOPE OF SERVICES
(not required in turn-key contract)

ANNEXURE XIV

SCOPE OF DELIVERY OF EQUIPMENT AND
MATERIALS BY THE PURCHASER

(Not applicable to turn-key contract as everything in equipment and materials is supplied by the CONTRACTOR. However if some locally purchased equipment is to be supplied by the PURCHASER it should be detailed here).

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 complex has been shown in the bar-chart attached hereafter as part of this Annexure and is based on the following considerations:

- 1.1 All dates and/or periods referred to start from the Effective Date.
- 1.2 Delivery FOB of the equipment (with the exclusion of critical items) shall start from the - month and end (95% of the value) by the (24th) month. Some critical items (these are time critical items and should be specified) may be delivered as in 1.3 below.
- 1.3 Delivery FOB of critical items shall end by (26th) month.^{1/}
- 1.4 The average estimated duration of transport from F.O.B. deliveries to site is approximately two months.
- 1.5 Civil work construction beginning in the 10th month.
- 1.6 The Mechanical completion of the Plant will be by the 32nd month.
- 1.7 The plant will start-up in the 33rd month (but in any case not later than 2 months after 1.6) and shall be in commercial production by the 36th month.

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 enable the PURCHASER to establish the source of the equipment and spare parts. The technical documentation shall be in (name of language) and shall include but not be limited to the following items, which shall be supplied normally

^{1/} The reasons for longer periods for critical items is due to the long deliveries for such items as the Synthesis Gas Compressors in 1977-78. However currently deliveries are much better.

within the time indicated against each item (the indicated items are in months and referred to the final issue of the documents as starting from the effective date). The documents marked as penaltiable documents (p) shall be supplied on or before the date indicated.

2.1.1. <u>Process Documentation</u>	<u>Delivery within (months)</u>
(a) Process flow sheets	
- for the plants	5
- for the utilities	8
(b) P and 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	18
(f) Specification of raw materials, utilities and chemicals	4
(g) Consumption of raw materials and utilities and chemicals	9
(h) Peak and average requirements of utilities for use in engineering of utilities	6
(i) Properties of effluents (gaseous, liquid and solid)	6(p)
(j) Details concerning quantities, frequency of discharge, temperatures etc. of effluents and waste materials	9(p)
(k) Preliminary list of Operating personnel required and their duties	12(p)

2.1.2	<u>Equipment and machines documentation</u>	
	(a) Detailed specifications for all equipment and machinery	12
	(b) Manufactures catalogues	24
	(c) Manufacture's drawings for all equipment and machinery	24
	(d) Requirements for installation and start-up for all equipment and machinery including specifications for insulation	24
	(e) Assembly drawings for equipment which requires assembling at site	15
	(f) *List of recommended spare parts	12 (p)
	(g) Manufacture's certificates and documents concerning workshop testing, pressure testing and acceptance by authorized inspection or official inspection authorities in the manufacture's countries	25
	(h) Preliminary lubrication schedules and summary list of types and grades of lubricants as recommended by equipment manufacturers	18
2.1.3	<u>Piping documentation</u>	
	(a) Detailed P and I diagrams	18
	(b) *General layout of the complex	6
	(c) *Plants plot plans	9
	(d) *Terminal point drawings for the inter-connection of pipes, going in and coming out of the complex	6(p)
	(e) Model of the process plants and utilities	18
2.1.4	<u>Instrumentation documentation</u>	
	(a) *General description of the process with regard to instrumentation	8(p)
	(b) *General description of the control system and proposed types of instrumentation	12
	(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) Manufactures 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	<u>Electrical documentation</u>	
	(a) *Electrical power balance	6
	(b) Electrical diagrams	
	*- Revised and final one line diagram	6(p)
	- general and detailed diagrams	12
	(c) Electrical layouts and cable routing	18
	(d) Electrical equipment specifications and list	15
	(e) Operation and maintenance instructions	24
	(f) Plant Lighting Proposals and Lists of Equipment	16
2.1.6	<u>Civil Engineering</u>	
	(a) * General plot plan	4(p)
	(b) * Foundations layout with foundation location and above ground dimensions	6
	(c) * Layout for underground installations, Plans showing trenches, pipes and cables sewerage disposal etc.	6(p)
	(d) * Preliminary profile drawings of the buildings with location of equipment and details of loads including anticipated loads and stresses from heavy piping supports	6

(e) * Additional information on profile and loading drawings not affecting the overall civil engineering programme (slopes, wet areas, anticorrosion protection of structures and floors, maintenance access areas and apertures)	9
(f) Details of lightening protection required for the plant	10
(g) Recommendations on air-conditioning and ventilation	10
(h) Detailed Civil Engineering Drawings of all buildings and Civil Engineering Works including foundations	24
(i) Detailed lay-out of roads	24
(j) Detailed lay-out of rail-road sidings	24
(k) Detailed lay-out of all underground works including sewage, piping, cable tranches etc	24
2.1.7 <u>General documentation</u>	
(a) All documentation supplied by the Process Licensors	12(p)
(b) 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 the raw materials and utilities. Emergency instructions	24(p)
(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(p)
(d) Instructions for the maintenance of the complex with drawings	24(p)
(e) Final Recommendations for the personnel number and qualifications necessary to properly operate and maintain the complex	20(p)
(f) Final recommendations for quality, quantity, frequency and points of lubrication preferably on internationally available and acceptable products. This will cover initial and current requirements	24
(g) All other documentation required, particularly for off-sites and facilities, containing final lists of equipment, including the following:	

Recommended list and general specifications of:

- | | |
|----------------------------------------------|------|
| 1. Maintenance workshop equipment | 9 |
| 2. Laboratory equipment | 9 |
| 3. Mobile fire fighting and safety equipment | 9 |
| 4. Warehouse materials handling equipment | |
| 5. Erection equipment | 4(p) |

2.1.8 Procurement documentation

- | | |
|-------------------------------------------------------------|-------|
| (a) Detailed list of Spare Parts (95%) | 18(p) |
| (b)* List of prequalified Vendors for Spare Parts | 8(p) |
| (c) Itemised list of remaining Spare Parts | 24(p) |
| (d) Procurement documentation in accordance with Article 40 | 18(p) |

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 the PURCHASER by air-way bill on a freight pre-paid basis and the 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 Vendors).

2.3 The items of technical documentation marked (p) are the documents liable to penalty as mentioned in Articles 20 and 27 of the Contract.

2.4 Approval of PURCHASER shall be obtained for documents marked with an asterisk (*).

ANNEXURE XVI

QUALITY OF PRODUCTS ^{1/}
(typical example)

1. AMMONIA

NH ₃ 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 ² g)

2. CO₂ GAS ON DUTY BASIS

CO ₂ 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 ² g)

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.

^{1/} These are suggested figures. Requirements of Urea for Agricultural Usage may vary from country to country.

ANNEXURE XVII

QUALITY AND QUANTITY OF EFFLUENTS
EFFLUENTS AND EMISSION STANDARDS

The quantity of effluents from the Complex shall not exceed the following under normal operating conditions: ^{1/}

(1) From Ammonia Plant (Benfield Section)

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

(2) From Urea Plant

- Flow rate	39 t/hr condensate at 55°C containing approx. 200 ppm NH ₃ and 400 ppm Urea
-------------	----------------------------------------------------------------------------------------------

Note: In some cases in compliance with local standards the process condensate may require further treatment within the Battery Limits Plant so that under (2) the effluent from the waste water desorber unit should be specified.

(3) Cooling Tower System

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

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

^{1/} The figures given are typical for one particular process in each case.

ANNEXURE XVIII

TRAINING OF PURCHASER'S PERSONNEL

1. The training of the PURCHASER's personnel shall consist of training at site and abroad. Training at site shall be given by the CONTRACTOR's personnel and training abroad shall be entirely arranged by the CONTRACTOR, and shall include operational experience at factories using the same or similar processes.

2. The PURCHASER and CONTRACTOR have agreed that training abroad shall be at the following operational factories^{1/}

(names of factories and location)

3. The CONTRACTOR will provide technical training for the PURCHASER's personnel in accordance with Article 4 and 16 of the Contract for the following personnel and for the time stated against each personnel.^{2/}

<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	5	6 months 1 month	Ammonia Plant Urea Plant
	5	6 months 1 month	Urea Plant Ammonia Plant

^{1/} It is suggested that a list should be given here and final selection made after the meeting contemplated under Article 6.8.

^{2/} These are typical for a country where chemical plants already exist.

<u>Designation</u>	<u>Number</u>	<u>Time</u>	<u>Training Units</u>
(d) Electrical Engineer	(1) ^{3/}	3 months	Power Station
(e) Instruments Engineers	2	6 months	Instruments. Course Plant Instrument Main- tenance
(f) Maintenance Engineers	2	3 months	Maintenance of Plants Workshop
(g) Chemists	2	3 months	Laboratory and Field Analysis
(h) Chief Chemist	1	3 months	Laboratory and Field Analysis. Research

4. The training given to the PURCHASER's personnel will specifically involve the operation for periods of time of the Plant sections concerning them, (under the direction and control of the CONTRACTOR), and for maintenance staff in actually operating maintenance equipment.
5. The CONTRACTOR shall appoint a Training Officer for the PURCHASER's trainees abroad, who shall send a monthly Progress Report on each trainee to the PURCHASER.
6. In addition to the training given abroad, the CONTRACTOR will supervise a training programme at site. For this purpose, the CONTRACTOR shall provide books and manuals and the CONTRACTOR and PURCHASER have agreed to purchase a Simulator (or similar equipment) for this purpose on a cost re-imbursable basis (as per Article 10). Both parties will agree on a detailed site training programme as early as possible, but not later than the twelfth (12th) month after effective date.

^{3/} May be increased to 4 if required.

ANNEXURE XIX

PROCEDURES FOR VARIATIONS, ADDITIONS AND CHANGES

1. A variation, change or addition (hereafter called Variation) may be initiated by either the CONTRACTOR or PURCHASER by a written letter sent through their respective Project Managers. In the event that the CONTRACTOR wishes to make Variations, or changes and in particular any Variation in the materials of Construction, he shall obtain the Approval of the PURCHASER.
2. All changes and Variations (without exception) agreed to by the PURCHASER and the CONTRACTOR shall be incorporated in a Change Order which shall be signed by the authorized representatives (authorized in writing) of the PURCHASER and CONTRACTOR. It shall be understood, however, that no Change Order may modify or affect the Contractual Obligations of the two parties under the Contract unless it is approved in writing by the PURCHASER and CONTRACTOR or their authorized representatives.
3. At the meeting contemplated under Article 6.8 of the main Contract, the format of the Change Order, and the distribution of copies of the Change Order and the authorized representatives competent for signing such Change Orders shall be agreed upon.
4. Any Variation initiated by the CONTRACTOR must be accompanied by full details of the Variation, along with details of any changes in the anticipated life of the plant, its technical performance, or any improvements in the Contractual modifications of the CONTRACTOR which may arise from such change.
5. In the event that the CONTRACTOR proposes a Variation arising from new experience of the CONTRACTOR and/or the Process Licensor, or by technological improvements which have occurred after the cut-off dates contemplated in Article 7.2, the CONTRACTOR shall prepare a report, outlining the Variations, and stating the benefits to the PURCHASER in detail. The CONTRACTOR will also indicate the change in Project Cost (increase or decrease) and fees of the CONTRACTOR which will result from such Variation and the modifications in the consumptions of raw materials and utilities, if any, and the improvements in the Contractual Guarantees, if any, which would result from the adoption of such Variations. The

PURCHASER at his sole discretion may accept or reject the proposal, or with the concurrence of the CONTRACTOR, accept the proposal in a modified form.

6. Should the PURCHASER desire any Variation in the Plant or the Works, he shall, through his authorized representative give details of such Variations to the CONTRACTOR, in accordance with the Contract.

ANNEXURE XX

MECHANICAL COMPLETION AND PRE-COMMISSIONING
PROCEDURES1. 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, or manufacturer's instructions.
- 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 CO₂ 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 connections and check-out circuits.
- 2.11 Remove all loose material from vessels and load all internals and packing materials. Close up vessels 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 for operability.
- 2.15 Conduct preliminary tightness tests and purge the unit.
- 2.16 Conduct pre-operation pressure testing and acceptance tests including those required by local technical inspection authorities and issue relevant documents.
- 2.17 Conduct a simulated operation of sections of the plant using air, water and steam where 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 period following special instructions worked out for this purpose.

ANNEXURE XXI

MANUALS

1. As part of his Contract Services, the CONTRACTOR shall provide to the PURCHASER 6 copies each of the following Manuals:
- (a) Operating Manual, with complete details of the operation at capacity under all conditions of the Ammonia and Urea Plants to produce specification 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 Vendor'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 on-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 Equipment manufacturers and sub-Contractors of the CONTRACTOR and where required shall identify the equipment to which such instructions refer.

ANNEXURE XXII

FORM OF PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

(here insert full name and address or legal title of contractor)

as Principal, hereinafter called Contractor, and,

(here insert full name and address or legal title of surety)

as Surety, hereinafter called Surety, are held and firmly bound unto

(here insert full name and address or legal title of OWNER) 1/

as Obligee, hereinafter called Owner, in the amount of for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

Contractor has by written agreement dated 19.., entered into a contract with Owner for in accordance with Drawings and Specifications prepared by

(here insert full name and address or legal title of CONTRACTOR)

which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Contractor shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

1/ The word PURCHASER rather than OWNER is used in the Model Contract.

The Surety hereby waives notice of any alteration or extension of time made by the Owner.

Whenever Contractor shall be, and declared by Owner to be in default under the Contract, the Owner having performed Owner's obligations thereunder, the Surety may promptly remedy the default, or shall promptly
1. Complete the Contract in accordance with its terms and conditions, or
2. Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or, if the Owner elects, upon determination by the Owner and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Owner, and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the contract price", as used in this paragraph, shall mean the total amount payable by Owner to Contractor under the Contract and any amendments thereto, less the amount properly paid by Owner to Contractor.

Any suit under this bond must be instituted before the expiration of two (2) years from the date on which final payment under the Contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators or successors of the Owner.

Signed and sealed this day of 19....

.....
witness

{
principal seal
.....
title

.....
witness

{
principal seal
.....
title

FORM OF BANK GUARANTEES

A. Bank Guarantee for Advance Payment under Article 21.2

This Guarantee No.....made this day....between (_____) a Company incorporated and having its Registered Office at....(hereinafter called BANK^{1/} which expression shall unless repugnant to the context or contrary to the meaning thereof include its successors and assigns) of the one part, and.....(hereinafter called PURCHASER which expression shall unless repugnant to the context or contrary to the meaning thereof, include its successors and assigns) of the other part.

1. WHEREAS in Article 12.2 of the Contract dated....(hereinafter called CONTRACT, between PURCHASER and.....a Company incorporated in(hereinafter called CONTRACTOR which expression shall unless repugnant to the context or contrary to the meaning thereof include its successors and assigns) for supply of a Turn-key Ammonia and Urea Plant, as envisaged in the CONTRACT it is stipulated that the sum of....will be paid by....as advance payment against a Bank Guarantee of equal amount to the issued by the BANK.
2. WHEREAS in fulfilment of the said CONTRACT and against receipt of said advance by (name of CONTRACTOR), the CONTRACTOR has agreed to furnish a Bank Guarantee as hereinafter contained.
3. In consideration of the above, the BANK hereby guarantees as a direct responsibility, to pay to PURCHASER any amount up to a total sum of
4. The BANK shall effect payment under this letter of guarantee immediately upon PURCHASER's written request stating that CONTRACTOR did not fulfil his Contractual obligations without being entitled to enquire whether this payment is lawfully asked for or not.
5. In any case, however, the BANK's responsibility under this letter of guarantee comes into force as soon as and as far as the advance payment of.....has been received by the BANK in favour of CONTRACTOR.
6. This letter of guarantee shall be initially valid for a period of.... months from the EFFECTIVE date and shall be extended by suitable periods in accordance with CONTRACT (but not more than 6 (six) months at a time). This guarantee shall be returned to the BANK after its expiry unless extended beyond this period for any reason whatsoever.

^{1/} This could be a Binding Company and this could then be a Bond.

7. In the event of force-majeure or in the event of recourse to arbitration according to the CONTRACT, the validity of the present guarantee shall be extended for a period to be mutually agreed upon.
8. This guarantee shall be in addition to and shall not affect or be affected by any other security now or hereafter held by PURCHASER, and PURCHASER at his discretion, and without any further consent from the BANK and PURCHASER's right against the BANK may, compound with or give time or other indulgence to or make any other arrangement with CONTRACTOR and nothing done or omitted to be done by PURCHASER in pursuance of any authority contained in this guarantee shall affect or discharge the liability of the BANK.

(Bank)

B. Bank Guarantee under Article 21.3

At the request of (Name and Address of CONTRACTOR) (hereinafter called CONTRACTOR), we hereby open our irrevocable guarantee No. _____ for an amount of maximum _____ (Amount) _____. In consideration of the CONTRACTOR having entered into a Turn-key Contract dated _____ (hereinafter called "Contract") with _____

(Name and Address of PURCHASER), (hereinafter called PURCHASER) for the grant of licences and technical know-how and for the supply of plant and equipment, the construction and erection and for other services for the Ammonia and Urea and Auxiliary Plants to be built by PURCHASER, we (Bank) do hereby agree and undertake to pay forthwith to PURCHASER in repatriable _____ currency on demand by PURCHASER and without prior recourse to CONTRACTOR such sum or sums not exceeding _____ (Amount) _____ as may be demanded by PURCHASER stating that CONTRACTOR has failed to fulfil its obligations relevant to performance guarantees and for other guarantees and warranties under the Contract for reasons for which CONTRACTOR is liable under the Contract.

It is understood and agreed that any demand made hereunder by PURCHASER shall be conclusive evidence of CONTRACTOR's failure to comply with its obligations relevant to guarantees and warranties under the Contract for reasons for which CONTRACTOR is liable 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 6 (six) months periods, in accordance with the Contract, up to the date of Final 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 PURCHASER the amount guaranteed hereof, PROVIDED that the amount of the Bank Guarantee mentioned above shall be reduced to _____ (Amount) _____ on the date of Provisional Acceptance by the PURCHASER of the Plants in accordance with the provisions of the Contract.

(Bank)

ANNEXURE XXIV

PACKING AND SHIPPING

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. Where FOB procurement is involved, 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 to his sub-Contractors.
4. In the event that due to late deliveries, shipment has to be made by air instead of by sea, CONTRACTOR will advise PURCHASER on packing and give appropriate instructions to the Suppliers.
5. During Inspection the CONTRACTOR shall ensure that:
 - (a) A packing list is enclosed with all closed packages;
 - (b) The packages are marked as given in Annexure XXV; and
 - (c) 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 Article 12 of the Contract.

STORAGE AT SITE, GENERAL AND MARKING INSTRUCTIONS

The CONTRACTOR shall review the instructions below 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 shall be:
 - (i) At a distance from fuel oil storages
 - (ii) Near the points of erection, also near rail sidings
 - (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 are stored in so that a package is reached from one side by 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 which the CONTRACTOR shall provide later
 - (iv) All heavy/large packages may be stored outdoors but, where required, protected.
 - (v) All very large/heavy equipment (viz. boilers/reactors etc.) should be properly unloaded and stored as close to the place of their erection as possible
 - (vi) A package should be stored, so that all marking instructions on it are on front side and also upright
 - (vii) Lighter packages should not be stored under heavy packages/ loads
 - (viii) Packages containing instruments, control valves, smaller packages should be stored in proper stores, air-conditioned where necessary
 - (ix) Packages liable to be affected by rain/dust should be covered with tarpaulins.

3. Marking instructions

- (i) The packages should carry markings (in _____ and _____ languages) as follows:
 - (a) on top and three sides, and arrow indicating top of equipment
 - (b) name of the PURCHASER and country, and PURCHASER's mark
 - (c) package number (same as equipment number given by the CONTRACTOR, part number and number of pieces. The markings should be in indelible ink/paint and easily readable).
- (ii) Fragile packings should be clearly so marked
- (iii) Packages for the same plant should have one common number followed by equipment number (in series)
- (iv) All other marking instructions given by the PURCHASER^{1/} from time to time.

^{1/} Some countries require special markings such as Import Licence Numbers.

PROCUREMENT PROCEDURES

1. Procurement procedures for Spare Parts have been outlined in Article 10 of the Contract, and will be followed. In addition details of the mode of procurement is given in this Annexure.
2. The CONTRACTOR will issue pre-qualifying notices^{1/} for all groups of spare parts (other than proprietary equipment spare parts) inviting potential vendors for prequalification. All documents required for this purpose shall be mentioned in this notice. The PURCHASER and the CONTRACTOR will agree on the newspapers in which such notices are to appear in the first design meeting after effective date.
3. The CONTRACTOR will give to the PURCHASER a list of companies pre-qualified by him for purchase of different types of spare parts, indicating reasons for rejection of any vendor. The PURCHASER shall have the right to add or subtract from such list of prequalified vendors. All cost of the CONTRACTOR satisfying himself on the competence of any bidders will be borne by the CONTRACTOR.
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 for the 4th month after effective date.
5. The CONTRACTOR shall thereafter issue tender specifications for each type of spare part, modifying or extending the general format as the need may arise. Where the PURCHASER's representatives are available at the CONTRACTOR's offices, the PURCHASER's representatives shall approve such specifications.
6. The CONTRACTOR shall receive bids in two parts - technical specifications and prices, and will open the price tenders in accordance with the procedure laid down between the PURCHASER and the CONTRACTOR.

Any clarification requested from bidders shall be undertaken in writing or in the presence of the representatives of the PURCHASER. Where representatives of the PURCHASER are not present, complete minutes of such meetings will be sent to the PURCHASER.

^{1/} These may not be required for Spare Parts, but some Governments and Agencies require pre-qualification.

^{2/} The procedure may also need to comply with that of a financing agency.

7. The CONTRACTOR shall prepare bid tabulations in ample detail to enable the PURCHASER to select the final bidder, and will make recommendations to the PURCHASER on the selection of the vendor. Should this vendor not be the lowest bidder, full details will be supplied on reasons for rejection of such vendors. The actual selection of bidder shall be in accordance with Article 10 of the Contract.
8. The CONTRACTOR will prepare the final purchase orders, fully safeguarding the PURCHASER's interest, for signature of the PURCHASER or his representative at CONTRACTOR's offices, or as otherwise agreed between PURCHASER and CONTRACTOR in writing.
9. The PURCHASER shall thereafter open letters of credit, or in the case of reimbursable procedures (such as those of the IBRD or others), 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, and in an orderly manner for use at site. The PURCHASER shall ensure payment in accordance with the purchase orders.
11. Purchase of spare parts for proprietary items of equipment, for which quotation shall be obtained by the CONTRACTOR at the time of purchase by him of the equipment and purchase of spare parts, shall be in accordance with a separate protocol between the PURCHASER and the CONTRACTOR, (but in all cases where procedures of the financing agency are required these shall be followed).
12. In addition to Spare Parts, other equipment (e.g. a simulator for training purposes) may also be purchased by the CONTRACTOR for and on behalf of the PURCHASER, if agreed by PURCHASER and CONTRACTOR. In such cases also the provisions of Article 10 and this Annex will apply unless other procurement methods are agreed between CONTRACTOR and PURCHASER.

ANNEXURE XXVII

RATES AND CHARGES AND PERSONNEL SERVICES

1. Home Office charges

The Home Office charges of the CONTRACTOR for work undertaken in accordance with Article 15 on a cost-plus basis, shall be computed as follows:

1.1 Direct cost of personnel

<u>Designation</u>	<u>Direct costs per hour</u>
x x x	x x x x x x
x x x	x x x x x x

1.2 The direct personnel costs shall be multiplied by the hours worked by each category of staff to arrive at the overall direct costs. The CONTRACTOR will prepare time logs specifying the name of the person undertaking the work, the dates and hours worked, and where the PURCHASER's site representatives are present these will be approved by them on a weekly basis.

1.3 To the direct personnel costs shall be added _____% to cover the CONTRACTOR's overheads and profits.

1.4 To the above charges shall be added direct expenses e.g. travel etc. at actuals to arrive at the total amount payable by the PURCHASER for such work.

2. CONTRACTOR's expatriate personnel

2.1 The charges for the CONTRACTOR's expatriate personnel in foreign exchange for deputation to (PURCHASER's country), for whom PURCHASER requests in writing

to pay shall be as follows:

For each day of absence from home office:

<u>Personnel</u>	<u>Rates per day</u>
Construction Manager	
Start-up Manager	
Specialist Engineers	
Erection Specialists	
Assistant for erection and start-up	
(Other may be specified)	

2.2 (It is recommended that these rates should not have an escalation clause. However in some cases this may be required. This escalation in such cases should be based on an index specified in this clause, which index should be an officially published index

of the CONTRACTOR's Government agencies).

2.3 In addition the CONTRACTOR's expatriate personnel shall be entitled to tourist class air travel tickets for themselves.

3. Overtime charges

3.1 Overtime charges in accordance with Article 11.11 of the Contract shall be paid as follows:

Up to 54 hours/week	(100%) of normal rates
Above 54 hours/week	(130%) of normal rates
For weekly and public holidays	(130%) of normal rates

3.2 No additional payments will be made in local currency for overtime.

4. Personnel to be deputed by the CONTRACTOR

4.1 The PURCHASER may at any time before the Final Acceptance of the Plant, require the services of any of the Engineers/Specialists of the CONTRACTOR who have been in (PURCHASER's country) for returning to (PURCHASER's country) for periods to be mutually agreed upon.

5. Terms and conditions of personnel services

5.1 If any of the CONTRACTOR's personnel is guilty of misconduct, the PURCHASER shall have the right, after giving reasons thereof to the CONTRACTOR in writing, to send him back to his home office country, and ask for and obtain an adequate replacement at the CONTRACTOR's expense.

5.2 In consideration of the services to be rendered by the CONTRACTOR's personnel under this Annexure, the PURCHASER shall provide, in addition to what is specified under Annexure XXVII, Clauses 1, 2 and 3 above, the following allowances, services and facilities to the CONTRACTOR's personnel engaged in work at site.

5.2.1 Local Allowance

The PURCHASER shall pay to each of the expatriate personnel engaged in the work a living allowance at the rate of (amount in local currency) for each calendar day of presence to site.

5.2.2 Travelling

5.2.2.1 Tourist class return air fare for each assignment for each expatriate from the expatriate home office to site by (air carrier) or an IATA carrier at the discretion of the PURCHASER.

- 5.2.2.2 At the beginning and end of assignments, the CONTRACTOR's expatriate personnel shall each be entitled to 20 Kgs. baggage allowance in addition to those provided free with the cost of air tickets.
- 5.2.2.3 Transport within (PURCHASER's country) by plane (economy class) or rail (air conditioned class) on the rail route for the expatriate personnel on their travel in and departure and for expatriate personnel travelling on official work.
- 5.2.3 The PURCHASER shall also provide free of cost (or give an allowance in lieu thereof) to the CONTRACTOR's expatriate personnel the following:
- 5.2.3.1 Furnished residential accommodation, adequate for a single expatriate, as well as water, electricity and gas for domestic use.
- 5.2.3.2 Furnished office accommodation, as well as secretarial assistance and facilities for official communications including telephone and telex services.
- 5.2.3.4 Medical assistance to the personnel and other facilities to the extent available at the PURCHASER's own or nominated medical centre(s).
- 5.2.4 Holidays, vacation leaves
- 5.2.4.1 For every completed month of his stay in (PURCHASER's country) the CONTRACTOR's expatriate personnel shall be entitled to a paid holiday of one day.
- 5.2.4.2 The expatriate shall avail of his vacation leave only at the end of the period when he can be conveniently spared. This is, however, subject to his not being required to stay beyond (18) months continuously in which case at his opinion, he can avail of the vacation leave.

CIVIL ENGINEERING SPECIFICATIONS

1. List of Civil Engineering Works

A complete list of all buildings with their names (e.g. Urea Storage) as well as all other civil engineering works including:

- roads
- railway sidings
- drainage work
- underground sewerage
- underground pipe and cable trenches
- foundations for machinery at ground level
- any other civil works

should be given so as to identify them later.

2. General Specifications:

2.1 Each building should be detailed as follows:

- (a) Dimensions of the buildings
- (b) Location of floors, interfloors etc.
- (c) Details of the type of:
 - (i) Foundations
 - (ii) Frame structure
 - (iii) Walls
 - (iv) Roof
 - (v) Doors and windows
 - (vi) Flooring of each floor
 - (vii) Other structural and architectural details (e.g. spans, etc.)
 - (viii) Protection coatings (type and where applied)
- (d) If possible, line drawings of each building should be provided.

2.2 Each road should be detailed including:

- level and slope
- type of earthwork
- width of road
- width of beams
- type of soling etc.
- specifications of the road (tarred, concrete etc.) A drawing should be provided for all road layout.

2.3 Railway sidings:

(These should follow national patterns.) A drawing should be provided for all railway sidings.

2.4 Site Drainage Work

- A line drawing of drainage work
 - type of drainage works (e.g. Brick drains etc.)
- (Details can be discussed at the 4-month design meeting).

2.5 Underground Works

(These can be discussed at the 4-month design meeting).

2.6 Foundations for Machinery

These should be given in as much detail as possible so that if load bearing conditions are later found to be different adjustment could be made.

3. Design codes, material specifications, individual specifications of Civil Engineering items

This should be detailed, preferably in a separate volume of specifications, ^{1/} and should follow national specifications for each type, for example:

- structural steel
- reinforced concrete
- brick walls
- concrete flooring (Exhibit I provides illustrative details).
- terazzo flooring
- etc.

^{1/} Such a volume may extend to 60 pages.

ERECTION CODES AND SPECIFICATIONS

These are generally based upon the country of origin of the CONTRACTOR and/or the Erection Company undertaking the erection. Complete specifications are available, for instance in the DIN Code.

These specifications are often detailed in a separate volume. An example is provided as Exhibit II.

EXHIBIT I - Example of Civil Engineering Specifications1. Cement Concrete Floors1.1 Scope

This Section of work includes flooring and paving at the places shown on drawings, and consists of furnishing all plant, labour, equipment, appliances, materials and the performance of all operations required in connection with the laying of cement concrete floors.

1.2 Standard

Flooring work shall conform to British Standard C.P. 204 as applicable to the work shown on drawings, and specified.

1.3 Material

Cement, sand, aggregate and water shall be in conformity with the specifications laid down under the Section "Concrete Work".

Bricks and Tiles where needed shall be as specified under "Brickwork".

1.4 Samples

All the material used shall be approved by the Engineer and same type of material shall be used throughout the work. If the Engineer desires to get the material tested this will be done by the CONTRACTOR at his own expense from a laboratory approved by the Engineer.

1.5 Workmanship

Method of mixing and laying of cement concrete floors shall be as specified for cement concrete under "Concrete Work". Cement concrete shall be laid as per B.S. Code of Practice 204 and specified in the "Concrete Work". Unless otherwise specified cement concrete used for topping shall have minimum crushing strength of 210 Kgs/sq. cm. Before laying concrete the base surface shall be cleaned and wetted so that it is well bounded. The concrete after laying shall be finished by tamping the concrete with straight edges to bring the surface to the required smooth, even, impervious finish level with no coarse aggregate visible and free from trowel or other such marks. While the concrete is still green it shall be roughened where topping is to be laid directly on concrete. When the concrete is sufficiently hardened to bear a man's weight without deep imprint, it shall be wood floated to a true even plane with no coarse aggregate visible. Just

so much pressure shall be used on the wood floats as to bring moisture to the surface. After the surface moisture has disappeared surface shall be steel trowelled to a smooth even, impervious finish free from trowel marks. After the cement has set enough to ring the trowel, the surface shall be given a second steel trowelling to a furnished finish. The use of additional mortar or neat cement for giving a smooth finish is definitely prohibited. The surface over which topping is to be laid shall be divided into square or rectangular panels not exceeding 1.5 sq. metres and the exact size will be decided by the Engineer. The symmetrical panels shall be formed by placing glass screeds of 5 mm thickness and of a depth equal to the thickness of the floor concrete and mosaic or terrazo to be laid where specified in drawings or directed by the Engineer. The top of these glass screeds shall be laid at the exact and true level of the finished floor. Alternate panels be laid on alternate days. The surface shall be tested with a straight edge and 10 inch spirit level to detect high and low spots which shall be eliminated.

Concrete shall be left undisturbed for 24 hours after laying. During laying and 14 days hereafter the concrete shall be kept wet and protected from weather and extreme temperatures. In no case shall hammering be allowed on a finished surface.

Where expansion joints or construction joints are shown on drawings or specified by the Engineer. these shall be 15 mm thick filled in with approved bitumastic filler as directed by the Engineer unless otherwise provided in the Drawings.

EXHIBIT 2 -- Sample of Erection Specifications2. Structural Steel Work2.1 Scope of Work

This Section of Work covers the erection of "Structural Steel Work" of the Project including fabrication of certain items or part of items where required, assembly of the parts of structure already fabricated, putting and fastening in position by welding and bolting as required in accordance with the drawings and instructions by the Engineer.

The work in this section consists of the following items:

- (a) Assembly and erection of steel components already fabricated
- (b) Fabrication, assembly and fixture in position of steel structures manufactured from mill size steel sections
- (c) Fabrication, assembly and erection of embedded pieces from mill size steel sections and pipes
- (d) Manufacturing lugs from M.S. bars supplied by the CONTRACTOR and subsequently welded to the embedded pieces
- (e) Steel components to be held in concrete at place of openings and at other places where some fixtures have to be anchored are defined as Embedded Pieces.

2.2 Material

The material to be supplied by the CONTRACTOR shall conform to the following:

<u>Material</u>	<u>Standard</u>
Structural Steel	BS 4 ASTM A-7 ASTM A-373 BS 449 BS 2008
Steel Plates	ASTM A-245
Galvanized Steel	ASTM A-123 to A-153 A-385 A-475

<u>Material</u>	<u>Standard</u>
Welding Electrodes	ASTM A-233 BS 1856, 639
Rivets and Bolts	ASTM A-320 BS 910, BS 3139, BS 3294
M. S. Bar	P. S. 231 (1962)

The CONTRACTOR shall prepare and get approval from the Engineer of detailed shop drawings for all items of manufacture, fabrication and assembly required for the proper and satisfactory completion of the work before its commencement. The detailed procedure for the same shall be indicated by the Engineer.

2.3 Fabrication

All material before assembly shall be straightened unless curved form is required.

Cutting may be effected by shearing cropping or sawing, gas cutting when permitted by the Engineer, but loads shall not be transmitted through a gas cut surface. Sheared edges shall be dressed to a neat and workman-like finish and free of distortion.

Holes through more than one thickness of material shall be drilled after the members are assembled and tightly clamped or bolted together. Punch holes when permitted by the Engineer shall be 3 mm (1/8 inch) less than the required size and reamed to full diameter. Punching shall not be allowed in material thicker than 15 mm (5/8 inch). Burrs shall be removed after drilling.

All matching holes for black bolts shall be only 2 mm more than the required size of black bolt which shall pass freely through the assembled members in a direction at right angles to such members.

Holes for turned bolts shall be drilled with a clearance of not more than 0.25 mm. If required the holes, after assembly of the parts, shall be reamed throughout the thickness of all the parts and square to the axis of the member. Holes for bolts shall not be formed by burning process.

The threaded portion of each bolt shall project through the nut at least two threads. In all cases where the full bearing area of the bolt is to be developed, the bolt shall be provided with a washer of sufficient thickness under the nut so as to avoid any threaded portion of the bolt being within the thickness of the parts bolted together.

Fabrication for building shall be according to BS 449. The CONTRACTOR shall supply all nuts and bolts for the efficient erection of the structure. Washers shall be provided at slotted holes and at other places where required and shall be of the type to give the heads and nuts of bolts a satisfactory bearing.

2.4 Welding

Welding Plant (including instruments and cables) as specified in ASTM A-371 or equivalent British Standard, shall be used. All electrodes conforming to ASTM A-371 shall be arranged by the CONTRACTOR for welding of special alloy steel if any. Welding procedure shall be as directed by the Engineer according to B.S. or ASTM Standards. The capacity of the welding plant shall be adequate for the job and the means of measuring the current shall be available either as a part of the same or by the provision of a portable Ammeter.

Electrodes shall be stored in a reasonably dry place properly protected from weather effects. If they become affected by dampness but are not damaged, the electrodes may be used only after being dried out as directed by the Engineer. Any electrode which has the area of flux-covering broken away or damaged, shall not be used. The welding procedure shall be such as to ensure full and satisfactory deposit of weld metal throughout the length and thickness of all joints so that there are almost nil distortion and shrinkage stresses.

The fusion faces shall be prepared by shearing, chipping, machining, gas cutting or flame gouging. These faces shall be free from irregularities that would interfere with the deposition of the specified size of weld or be the cause of defect. Fusion faces and surrounding surfaces shall be free from heavy slag and reasonably free from oil, paint or any substance which might affect the quality of weld. Where hand gas cutting or hand flame gouging is allowed by the Engineer, the cutting blow pipe or gouging blow pipe shall be adequately guided. The parts to be welded shall be maintained in their current relative positions during welding.

Welding shall not be commenced on fusion faces having temperatures lesser than 0°C for parts thinner than 40 mm and 10°C for parts thicker than 40 mm. In such cases preheating shall be applied to meet the requirements.

For fillet welding the parts shall be brought into close contact so that the gap due to faulty workmanship or incorrect fit up shall not exceed 2 mm. If greater separation occurs locally, the size of fillet weld shall be increased at such local positions by the amount of gap. The minimum leg length of a fillet weld as deposited shall not be less than the specified size. The throat thickness as deposited shall not be less than that specified or indicated by the Engineer. In no case shall a concave weld be deposited.

In case of butt welds the joint shall be welded by the use of extension pieces so as to provide the full throat thickness. Weld faces where out of line with the surface shall be dressed off.

The weld metal as deposited shall be free from cracks, slag inclusions, gross porosity, cavities and other deposit in faults and in the case of such defect or overlapping of the weld over the parent metal or defective fusion, the welds shall have to be cut or gauged and replaced by new weld to the satisfaction of the Engineer.

As and when desired by the Engineer the welded connections shall have to be got tested by the CONTRACTOR at his own cost by any one of the approved methods acceptable to the Engineer. The positioning of welded structure shall be carried out after such tests.

2.5 Shop Painting

Steel Structures fabricated by the CONTRACTOR in his workshop at Site shall be painted or oiled before sending to Site of work for positioning unless otherwise directed by the Engineer.

Welds and adjacent parent metal shall be painted or oiled after the same are dry, clean, free from scale and rust and approved by the Engineer. Parts to be encased in concrete shall not be painted or oiled. All paints shall be of the best quality available and approved by the Engineer before its procurement. Preparation of surfaces, paints and its application shall conform to the Section "Painting".

The steel surfaces to be welded shall not be painted or metal coated if the paint specified or the metal coating would be harmful to welders or impair the quality of the welds.

Plant and equipment, storing handling, setting out and security during erection shall be to the satisfaction and directions of the Engineer. When the steel delivered and used at work is unpainted, shall be painted at Site. All bolt heads and site welds after deslagging shall be cleaned and bare surfaces made good before application of the paint at Site.



