



Tarh Farayand Andishan Consulting Engineers

TFA Co.

The Execution Plan

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INTRODUCTION

The main activities which considered to be performed by Tarh farayad Andishan Consulting Engineers (TFA Co.) for the said project based on Client's requirements, from bid stage up to Contract sign can be summarized as follows:

- Perusing Client existing technical documents and preparation project technical documents based on Client requirements
- Taking into consideration changing capacity of the Plant in view points of procurement, construction, buildings, civil works, cost effect, etc
- Preparation and gathering geographical and climatic information to used in to used in tender documents
- Specifying basic and required potentiality based on existing information in the Plant
- Preparation tender documents including Instruction to Bidders (ITB), technical appendixes, Contract draft , etc based on Client requirements
- Identifying capable and reputable international Contractors
- Establishing bid thru identified Contractors
- Technical and commercial evaluation of received proposals
- Clarification negotiations and/or meetings with bidders
- Selection of first, second and third bidders based on technical and commercial evaluations and negotiations
- Final technical and commercial negotiations with selected bidder
- Finalizing technical and commercial points of the work with selected bidder
- Contract signing

1. Purpose of Project Execution Plan

The purpose of the Project Execution Plan is to state the minimum key activities which shall be carried out properly by chosen Contactor to execute the project objectives and requirements during Contract period up to Issue Final Acceptance Certificate(FAC) by Client for the project.

2. Project Objectives

The Project objectives which shall be done by Contractor are as follows:

- To design and construct the Plant for Client which can produce the required product quantities with the require efficiency.
- To ensure that the Plant is designed, procured and constructed to permit safe, efficient and environmentally acceptable operation.
- To design, procured and construct the Plan, in compliance with the Project specifications and upholding good engineering practices and within the agreed budget.
- To aim in all aspects for an incident free project execution.

3. Project Organization

Contractor shall be submitted his Organization Chart for correct execution of the Plan for Client review and approval.

4. Project Management Plan

4.1. Purpose

The purpose of the Contractor Project Management Plan is to establish the basic project management framework of the Project, including reference documentation and general project information.

4.2. Organization and Responsibilities

The Project Manager is responsible for the development of the Project Management Plan and its implementation.

The prime responsibilities of the Project Manager comprise the following key activities:

- Maintain effective relations with Client and National/Government Authorities relevant to Contractor's works
- Manage interfaces between the technical disciplines, third parties, and National/Government Authorities relevant to Contractor's works, and Client to

ensure overall consistency in the design process and that the Project objectives are met.

- Pro-actively assuring quality and following-up on corrective actions.
- Establishing specific project procedures as required
- Ensuring that key HSE and permit objectives for the Project are met.
- Assignment of adequate personnel
- Project reporting
- Change control
- Drawing and document control
- Material control

The regular meetings with Client are intended to support the Project Management activities.

Project reporting will be carried out with the issue of the following reports:

- Monthly Progress Report including Procurement Status Report
- Shop Inspection Report (as soon as received form shop inspector)
- Daily Construction Manpower Report

Other than these regular reporting, Contractor shall report to Client when necessary.

5. Project Controls Plan

5.1. General

Contractor's Project Control Manager will set up policy/procedures to ensure that the Project is executed as Planned and in a timely manner. The procedures provide strict guidelines for the overall Project administration and the necessary flow of communications for Project control and progress reporting.

5.2. Overall Methodology

Upon Notice to Proceed, Contractor will establish a "baseline planning" covering the Project requirements for the following essential activities:

- Schedule Control
- Cost Control

- Quality Control (By Project QA/QC Manager)
- Document Control
- Material Control
- Man-hour Control

The Project Control Manager will take a leading role in establishing the baseline Planning. Once the Planning has been specified, the Project Control Manager will monitor the Project variances against the baseline. If a variance is assessed to be beyond the allowable limit, corrective/ remedial actions must be taken to maintain the overall Project in line with the basic requirements by the Project Manager.

The Project Planning and control will be based on the "Work Breakdown Structure" (WBS), i.e. the Project activities broken-down-by function or area - into 6 to 7 levels to the control level of elements. The last WBS element is assigned a cost and time duration for control purposes. Once the Project WBS is formulated, a computer-based Management System is utilized to process the data throughout the Project and to produce progress reports at certain cut-off dates.

5.3. Schedule Control

1) Purpose of Schedule Control

The purpose of schedule control is to complete the Project within the scheduled completion date.

Most important factor to keep the schedule is that all the Project members (including Sub-Contractors) have common understanding and consciousness to achieve the target of each milestone. Any potential problems must be found as early as possible to take early and quick corrective actions so as not to jeopardize the Planned Project schedule.

In the scheduling, smooth landing at the final stage of the construction is important so that system-by-system Planning in accordance with the Plant start-up sequence is considered not only construction completion but also procurement.

To ensure that the Project completes within the scheduled completion date, the following activities are performed:

- Preparation of schedules
- Monitor of schedules
- Measurement of progress

- Forecast of schedules
- Planning of corrective actions

2) Policy on Schedule Control

To ensure that the Project is completed on time, Contractor has a three-point policy on schedule control.

Point one is systematic control based on the control level. This enables the scheduling instructions of the Project Manager to be informed to all members involved, from the Project team managers, such as the Engineering Manager and the Procurement Manager, down to members of the functional departments.

Depending on the control levels, schedule control is carried out by the members involved, such as Project Manager, Project Control Managers, Engineering Manager, Procurement Manager, Home Office Construction Engineer, Schedule Engineer, Project Engineers, departmental heads, Lead Engineers, and others.

Point two entails close monitoring and control of the progress in order to catch schedule slippage as soon as possible.

Early identification and control of Project slippage enables corrective actions to be taken, and to compensate for loss of time or deviations from the schedule by rearranging and adjusting schedules to overcome schedule slippage.

Progress is measured by the computer system, the Progress Monitoring System, and always clearly defined and available to Project core members.

Point three is to supply schedule information in time for corrective action to be taken as quickly as possible to recover any slippage. Scheduling information and timely reports are provided regularly to the Project Manager, Project core members and, if necessary, the top management.

Schedule slippage can be predicted or found and optimum preventive or corrective actions taken quickly. Since priority in Client's management philosophy demands completion of the Project within scheduled completion date, schedule control is fundamental for Project execution.

3) Schedule Control Levels

Depending on control responsibilities, the schedule control is classified into three levels as illustrated in Chart 1-1:

- PROJECT management level
- PROJECT control level

- Task control level

- a) Project management level

Schedules at Project management level are mainly for use by the Top Management and the Project Manager, and for reporting to Client. Important milestones, as the schedule target, are specified in these schedules, which form the basis of schedule control. They are the overall schedules for engineering, procurement, transportation and construction.

Two schedules are prepared for the Project management level:

- Project Master Schedule
- Project Summary Schedule

These are the basic schedules prepared during the overall Project Planning stage, and are not modified but remain as the original Plan.

But the progress status is added each month to these schedules to provide comparison. It should be noted that the front-end schedule is prepared in the overall Project Planning stage at Project management level, as well as at Project control level.

- b) Project control level

Schedules at Project control level, such as Project control schedule and Detailed Schedule, are mainly for the use of Project team managers (Project Manager, Engineering Manager, Procurement Manager, Home Office Construction Engineer, QA/QC Manager, etc.). In these schedules, the functions are broken down into lower levels and specified in detail.

- c) Task control level

Schedules at task control level are mainly for the use of the Lead Engineers and discipline engineers in each functional department in charge of actual tasks. They have a comparatively short time frame, e.g. three month schedule, weekly task schedule, and specify in detail actual tasks to be executed in well-defined areas.

5.4. Progress Measurement

- 1) General

The base of progress measurement is to identify the stages of completion of small divided elements of activities.

The easily measurable activities and completion stages are selected to calculate the physical progress using the weighted value system as described herein.

The weights used in this system are based on the budgeted man-hours or costs, in principle.

The parts marked with "***" means that figures will be determined during the Project Planning stage after Notice to Proceed.

2) Level of WBS (Work Breakdown Structure)

WBS levels used for the progress measurement of this Project are summarized as below:

a) Office Services, Equipment & Materials

LEVEL

I	Plant
II	Primary Category
III	Functional Category
IV	Work Category
V	Work Package
VI	Task (Milestone)

b) Field Construction Work

LEVEL

I	Plant
II	Primary Category
III	Block
IV	Field Functional Category
V	Field Work Category
VI	Work Package
VII	Task (Milestone)

3) Overall Progress

The overall progress (LEVEL I) is divided into the following primary categories (LEVEL II).

Primary Category	Weight Percent
Engineering	**
Procurement	**
Construction Work	**
Total 100	

** To be finalized after Notice to Proceed.

Progress of each primary category is calculated in percent, multiplied by the weight percent and complete percent and then integrated to give the overall progress in percent.

4) Engineering

The Home Office Service progress (LEVEL II) is divided into the following functional categories (LEVEL III).

Primary Category	Weight Percent
Process	**
Equipment	**
Piping	**
Instrument	**
Electrical	**
Civil/Building	**
Total 100	

** To be finalized after Notice to Proceed.

Progress of each functional category is calculated in percent, multiplied by the weight percent and complete percent and then integrated to give the home office service progress in percent.

Engineering progress is measured on document completion basis, in general.

Major documents and milestones are selected for Engineering/Design and weighted on planned man-hour basis so that the total becomes to be 100%.

For each of them, completion milestone in percent is considered as engineering/design progresses.

The completion milestone is checked for each document and milestone and summarized to give engineering/design in percent.

The estimated number of "Work Volume" is used for progress calculation at first stage. When the actual "Work Volume" is fixed, the necessary adjustment will be done.

5) Procurement

The Procurement progresses (LEVEL II) are divided into the following functional categories (LEVEL III).

Primary Category	Weight Percent
Equipment	**
Piping	**
Instrument	**
Electrical	**
Civil/Building	**
Miscellaneous	**
Total 100	

** To be finalized after Notice to Proceed.

Progress of each functional category is calculated in percent, multiplied by the weight percent and complete percent and then integrated to give Equipment & Materials progress in percent.

Major requisitions of equipment and materials are selected as measurement basis. They are weighted on budget cost basis, giving 100% in total respectively.

For each requisition, progress is assessed in accordance with the completion milestone in percent.

Summarizing requisition weights multiplied by completion milestone % will give the Equipment & Materials progress.

6) Field Construction Work

a) The Field Construction work (Level II) is divided into the following two major Block (Level III):

Block	Weight Percent
PROCESS UNIT	*
OTHER	*
Total 100	

* Weight percent for major area are determined based on estimated construction cost.

b) Each major Block (Level III) is divided into the following Field Functional Categories (FFC: Level IV):

FFC	Weight Percent
Civil work	**
Structural work	**

Building work	**
Equipment Erection work	**
Piping Erection work	**
Instrumentation work	**
Electrical work	**
Insulation work	**
Painting work	**
Miscellaneous work	**

Total 100

c) FFC's (Level IV) are divided into Field Work Categories (FWC: Level V) by grouping the same nature of work type.

d) FWC's (Level V) are divided into work item such as each equipment number.

- Work volume for each work item is assigned based on Engineering data such as weight ton for equipment, concrete volume (m³) for foundations, etc.
- Weight percentage for work steps are assigned for each FWC through Contractor's past experience for construction productivity.

The weighted values for each work package are calculated as follows:

(Work Volume for Each Work package) x (% for Task (Milestone))

The figure of percent complete for each FWC is obtained as follows:

Percent Complete = (Summary of weighted value for all work package) divided by (Summary work volume for all work package)

e) Progress Calculation

Progress of each FFC is calculated in percent as follows:

Weight percent for each FWC are multiplied by the weight percent and complete percent for FWC, and then integrated to give the progress percent for each FFC and each Block.

5.5. Progress Reporting

Contractor shall issue a Monthly Progress Report indicating the current progress of the Work within 10 days of the end of the monthly reporting period.

The format of the Report shall be such as to identify and facilitate the resolution of any corrective measures to be undertaken.

A General Report shall briefly describe the following:

- 1) Major and/or significant work items achieved during the report period.
- 2) Current status of the Work

Project progress information shall be provided on graphs and/or tables showing actual progress and scheduled progress for:

- a) Overall project
 - b) Engineering
 - c) Procurement
 - d) Field construction
- 3) Problems encountered or anticipated together with proposals of resolution.
 - 4) Major and/or significant work items anticipated to be completed in the succeeding month.

A Categorized Report shall be prepared in accordance with the following phases:

- 1) Engineering Status

Status of:

- a) All major drawing, specifications and engineering activities
- b) A description of any major and/or significant work items achieved during the report period.

- c) A description of major activities to be undertaken during the succeeding month.
- 2) Procurement Status of the Current and Succeeding Month Status of procurement for all equipment and materials such as:
 - a) Enquiries
 - b) Requisitions, specifications and phase orders
 - c) Expediting
 - d) Inspections
 - e) Shipping
 - f) Deliveries
- 3) Construction Status of the Current and Succeeding Month

Status of construction items with all major items specifically mentioned including:

- a) Foundations poured
- b) Equipment and pumps installed
- c) Equipment and materials receiving reports
- d) Fabrication and prefabrication schedules
- e) Erection status
- f) Fabrication and construction equipment status
- g) Manpower status
- h) Quality control
- i) Safety reports

Additional Reports for critical work areas may be required and shall be produced by mutual agreement between Client and Contractor. The purpose of these Additional Reports shall be to provide a current overall assessment of the Contract Schedule to indicate any deviations or trends in order to highlight any urgent and effective corrective actions to be implemented.

5.6. Material Control

- 1) General

For controlling the materials during fabrication, storage and construction, proper identification has to be applied to each type of materials.

The following equipment and materials shall have their own item numbers or tag numbers, therefore, identification shall be simplified:

- All equipment items including electrical equipment
- Control valves including remote operated on-off valves
- All instruments, local panels and junction boxes
- Pressure relief valves
- In-line components such as steam traps, filters, strainers

A proper identification procedure shall be developed and applied to other type of materials, which include:

- Piping bulk materials, such as valves, pipes, pipe fittings, gaskets, bolts and nuts Instrument bulk materials, such as piping/tubing materials, valves,
- instrument cables and wires, gaskets, bolts and nuts Electrical bulk materials, such as control stations, receptacles, cables, lamps, lighting fixtures
- Insulation materials
- Painting materials
- Structural steel materials

2) Equipment and Materials Having Item No. or Tag No.

This type of equipment and materials shall be controlled and identified with their own item numbers or tag numbers throughout the Project, i.e. in all engineering/design drawings and specifications, procurement documents, test and inspection documents/reports, shipping documents, during warehousing and construction.

Material control can be achieved for these items by confirming the materials of construction, specified part by part, through design checks and inspections.

3) Materials Having Coding System

Among the various materials, considerable efforts have to be made to identify and control piping materials, which need to be handled in large quantities with various types, ratings and materials. All piping materials, other than tagged items, shall have their own code numbers per type, rating and material of

construction. By adding the size information to these code numbers, each group of piping materials can be identified and controlled.

Material take-off shall be performed from the code numbers, and requisitions for purchase shall be grouped for the same type of materials, so that material control can be easily performed during fabrication, inspection, transportation, receipt, storage and issuance at the construction site. Bill of materials shall show net quantities taken from design drawings and construction spares separately. During the design development, additional purchase (or in some case cancellation) are separate columns of bills of materials (2nd take-off, 3rd take-off, ---) including revision to the construction spare quantities, if necessary. A blanket order shall be applied to the purchase of additional quantities.

Other materials having code numbers shall be controlled and identified in a similar manner.

Material control during fabrication, including expediting and inspection shall be carried out as per requisition/PO. Packing for transportation shall be made, as far as practical, for each requisition/PO number, which shall be clearly marked on the outside of the package. Packing lists, therefore, shall be prepared for the same type of materials. Exceptions may be for small quantities of additional purchases, however, even in this case, the vendor shall be instructed to provide internal parcels containing materials of each requisition and to prepare packing lists per requisition/PO number. A copy of the packing lists shall be forwarded to the on-site material control group by rapid courier for arrangement of receipt and preparation of storage space.

4) Material Having No Coding System

The following type of materials, which have no coding system, shall be identified by designation of applicable industrial standards, such as ASTM, AISI or manufacturer's brand name, where applicable:

- Structural steel
- Electrical and instrumentation bulk materials such as conduits, terminal materials, stanchions
- Insulation materials
- Paints

A similar approach to that for code numbered materials shall be applied to the procurement of these materials; material take-off, preparation of requisitions and purchase orders, transportation, etc.

5) On-site Material Control

Upon receiving cargoes at the site, the on-site material control group shall first perform overall damage examination of cargoes, then carry out detailed unpacking inspection, in which they confirm the received materials against the detailed packing lists. Assistance from the field engineers shall be available if any clarifications on received materials are required.

They shall also confirm each piece of material is properly identified. Any damage or discrepancies found during unpacking inspection shall be reported to the home office procurement group on an overage, shortage and damage (OS&D) report. Confirmed materials shall be stored either in the warehouse or open yard depending on the type of materials.

5.7. Document Control System

This Paragraph covers the system for controlling and distributing drawings and related documents required for the Project. Contractor have own computerized document control system.

The computer-based document control system established by Contractor shall be applied to the Project for the control of engineering documents together with management and control documents.

The following information for engineering documents including drawings and vendor prints, management and control documents are registered in the System and maintained when issued or received by each discipline engineer:

- Document title
- Document number
- Revision number
- Issue date
- Issue purpose (for approval, for construction, etc.)

This register enables to provide, at any time, accurate and up-to-date information on the current status of registered documents and ensures effective control of preparation, revision and timely delivery of documents. Document submission and receiving to/from Client, shall be also controlled by document control specialists.

5.8. Document Numbering System

5.8.1. Document Numbering

Contractor's Document Numbering System shall be applied to the Project with Client's Document Number written each document.

5.8.2. Filing System

1) Traceability

Since the computer-based document control system shall be applied to the filing system, anyone can trace accurate and up-to-date information on the current status of registered documents at any time.

2) Filing of Project Document Issued by Contractor

In the course of project execution, original documents and reproducible of Project documents shall be concentrated and filed in the floor service to control the document quality, execute work efficiently and reduce the numbers of Project documents through unified information.

After the completion of the project, as a general rule, all originals of Project documents shall be delivered on Compact Disk, and CDs shall be central controlled in the engineering service center which issues documents.

As a general rule, all original documents and reproducible of project documents shall be discarded after delivered on CD.

a) The floor service files originals and reproducible of project documents according to project number and document number. Double filed reproducible are allowed if reproducible are frequently used, however, the number of double filed reproducible shall be minimum. To avoid double filed reproducible, reproducible distributed to the each department shall not filed in the floor service.

b) Reproducible filed in the floor service shall be discarded after revised documents are issued.

c) At the time of issuing revised documents, in case of only revised or added sheets are issued, not all sheets, document author writes "Replacement" or "Addition" at a side of revision number "Rev."

In such a case, obsolete documents shall be filed in the floor service until revised documents including all sheets are issued.

d) Document number and document title registered in the document control system, as a general rule, shall not modified. However, if modification should be made, user shall modify such data on the document control system by himself and inform an official in charge of the floor service of the fact he modified the data.

e) During executing the Project, personnel in charge of the Project has minimum project documents for his own use, and borrows and uses originals or reproducible filed in the floor service according to his needs.

f) Originals and reproducible borrowed from the floor service shall be returned promptly after their use is over so that other personnel can use them.

6. Engineering Plan

6.1. Engineering Execution Offices

The whole engineering of the Project will be directed, managed and controlled in and from the Contractor's office.

Further Contractor engineering team will generally undertake Basic Engineering and Detailed Engineering.

6.2. Engineering Execution Plan

The engineering for the Contractor responsible facilities will be carried out and necessary drawings and specifications will be prepared in accordance with engineering standards, practices, and procedures of Contractor, taking Client's, Licensor's and/or other legal requirements into consideration.

Critical delivery items that require early engineering and procurement are carefully controlled and monitored to avoid the need for later modification of the detailed engineering, which would have a detrimental effect on the efficiency of the Project execution.

A piping study meeting, one of the design review meetings in the detailed engineering, is held to review the piping layout drawings from the viewpoints of construction, operability, maintainability, safety, etc.

The documents prepared during the Engineering stage are issued after review by the Lead Engineer and approval by a senior engineer (e.g., the departmental head).

Under expediting and coordination of the Engineering Manager the major part of the detailed engineering is handled in the engineering departments of the following disciplines:

- Process
- Civil and Architectural
- Equipment
- Piping

- Instrumentation
- Electrical

Each department exercises a discrete technical function for the Project, each being responsible for the completeness and quality of its own work. The Lead Engineer of each engineering discipline is responsible for all work done in his design discipline.

The different engineering disciplines perform the following main work:

Major works are shown as follows:

- Preparing and issuing specifications and drawings for procurement and construction
- Bulk materials take-off
- Technical evaluation of bid documents
- Reviewing and approving Vendor documents
- Conducting design review and document control

[Equipment Design]

Equipment Design discipline consists of two design groups: vessel and machinery. Vessel engineers undertake the mechanical design of vessels, heat exchangers and tanks. Machinery engineers do the mechanical design for rotating equipment such as pumps, compressors, turbines, mechanical handling equipment, etc., and for package units. Both design groups require much effort and time for the work relating to the procurement of equipment, including the preparation of requisitions and bid evaluation sheets, and the check and review of Vendor documents. Field test/inspection schedules, summary sheets of design and test features will also be prepared by Contractor.

[Piping Design]

Contractor shall design and draw up the complete piping system required for process and utilities. Piping assembly drawings are made on a geographical basis with any attendant details required to clarify assembly drawings. Lists of all piping materials will be prepared by Contractor with appropriate breakdown.

Piping engineers undertake the piping design, including the preparation of piping specifications, layouts, arrangements, isometrics and requisitions for all piping materials, and pipe stress analysis.

[Instrumentation Design]

Instrumentation engineers perform the design of process control systems, including computers, control boards, instruments and control valves. They prepare specifications for instruments and control boards, control logic diagrams, drawings for cable layout and instrument hook-up, and requisitions for all instrumentation equipment and materials.

[Electrical Design]

Electrical engineers perform the design of the power distribution system, power control system, lighting system, grounding system and communication system. They prepare power control logic diagrams, specifications for electrical equipment and materials, layout drawings for cables, and requisitions for all electrical equipment and materials.

[Civil and Architectural Design]

Civil and architectural engineers provide the necessary drawings for buildings, structures and civil work, and prepare requisitions for equipment and materials and design calculations when necessary.

This design includes the preparation of the following drawings and documents:

- General arrangement drawing
- Equipment foundation drawing
- Grading and piling drawing
- Structure drawing
- Pipe rack drawing
- Building drawing

[Insulation Design]

Contractor will prepare schedule of insulation, typical details and lists of materials to cover insulation of vessels, exchangers, pumps and piping. Piping insulation requirements are indicated on a suitable line table.

[Painting Design]

Painting design includes the preparation of the following drawing and documents:

- Specification of paint
- Instruction of painting work

- Instruction of repair work
- Color code and sample
- Bill of materials

6.3. Engineering Application Software

The application software and systems which shall be proposed by Contractor for the Project and need to be finalized through discussion with Client should be minimum as listed in the following tables:

Discipline Deliverable	Application	Supplier *
PROCESS		
PFD's	AutoCAD	
CIVIL-/STRUCTURAL		
Structural Analysis	STAAD III STAAD PRO	
Civil Engineering	AutoCAD MEDUSA/AutoCAD	
ARCHITECTURAL		
Building Floor Plans & Details	AutoCAD MEDUSA/AutoCAD	
VESSELS		
Outline Drawings, Internals, Details	Micro station AutoCAD MEDUSA/AutoCAD	
PIPING		
P& Ids	AutoCAD MEDUSA/AutoCAD	
Line List	Excel	
Plot Plans, Key Plans, Equipment Layouts	AutoCAD MEDUSA/AutoCAD	
3D Piping and Equipment Model	PDMS	
Piping GA's	AutoCAD,	

Discipline Deliverable	Application	Supplier *
	PDMS	
Piping Isometrics	AutoCAD, PDMS	
MTO's	PDMS	
3D Model Review	Review Reality	
Piping Stress Analysis	AutoPIPE	
ELECTRICAL		
Electrical User List	Excel	
Area Classification Layouts	AutoCAD MEDUSA/AutoCAD	
Substation Layouts	AutoCAD MEDUSA/AutoCAD	
Power & Earthing Layouts	AutoCAD MEDUSA/AutoCAD	
Cable sizing study	Excel	
Earthing study	ETAP Power Station	
Load flow and short circuit calculation	ETAP Power Station	
Relay coordination and selectivity study	ETAP Power Station	
Motor Starting	ETAP Power Station	
INSTRUMENTATION AND CONTROL SYSTEMS		
Instrument List, data sheets	INTools Excel	
MTO's	INTools Excel	

Discipline Deliverable	Application	Supplier *
3D Model of Instrumental installations	AutoCAD	
Cabinet & Rack Layouts	AutoCAD MEDUSA/AutoCAD	
Wiring Drawings (J-Box, Marshalling Racks, DCS, PLC, TMR)	AutoCAD MEDUSA/AutoCAD	
Instrument Loop Drawings	AutoCAD MEDUSA/AutoCAD	
Instrument Logic Drawings	AutoCAD MEDUSA/AutoCAD	
Instrument Cable Run Layout	AutoCAD MEDUSA/AutoCAD	
CONSTRUCTION		
Site material management	Excel, Access	

* Please specify Supplier

7. Procurement Plan

7.1. Procurement Service Execution Offices

Contractor shall carry out overall procurement management for the Project.

Further, Contractor procurement team within Contractor Office will carry out the offshore procurement service for the Plant, supervising all phases of activities such as; solicitation of quotation, purchase order, expediting, inspection and shipping.

Contractor Plans to use his specialized Procurement Department to perform the major part of procurement activities. The Department is staffed with experienced buyers, expeditors, Vendor print controllers, shipping coordinators, etc. who will fully support the Project team, under the coordination of the Procurement Manager.

Contractor will also call upon its worldwide offices for support of procurement effort, including communications with Vendors, inspection, expediting and traffic.

After the Contract award, Contractor will propose additional qualified local Vendors if Contractor has found more suitable Vendors for goods and services,

including construction Sub-Contractors. Inquiries will be sent to these pre-selected suppliers, and Contractor will purchase from them if goods and services meet project requirements in terms of quality, schedule and cost.

Contractor procurement team within in Tehran Office will carry out the onshore procurement service for the PLANT, supervising all phases of activities such as; solicitation of quotation, purchase order, expediting, inspection and shipping.

In order to ensure smooth and efficient procurement activities in Iran for onshore equipment and materials, the following special provisions will be made:

- Contractor will supervise and control onshore vendors and suppliers from the initial stage of procurement activities. Thereafter, Contractor representative, will monitor all procurement activities of inquiry, bid collection, bid clarification, final vendor selection, expediting and inspection / acceptance.

7.2. Execution Plan for Procurement Service

Contractor shall develop the procurement services in compliance with Contract requirements and the procedures set forth for inquiry, evaluation, requisitioning, purchase order placement and purchase order administration. Contractor's procedures for procurement of equipment and materials cover the following activities:

1) Vendor Selection

Contractor shall select Vendors from the "Vendor List" duly approved by Client.

2) Procurement Work

Procurement activities such as inquiry, bid tabulation, evaluation, clarification/negotiation, purchase order placement and shipping coordination will be performed mainly in Tehran Office.

Detailed procurement procedures will be developed to ensure delivery of equipment and materials to the Site responding to quality requirements and on schedule.

Client approvals per Contract will be timely submitted to Contractor. Due to the very tight project schedule, Client is expected to review and approve Contractor's submittals in the shortest time possible.

3) Procurement Procedures

Contractor procurement Procedures cover all aspects, including:

- a) Issue of Inquiry Documents with General Terms and Conditions, Technical Documents, Quality Control and Inspection, Packing and Shipping,

required delivery dates, Assistance for commissioning, start-up and operation, required documents and drawings, special transportation arrangements for exceptional equipment, etc.

For bulk materials (Piping, Electrical, Instrumentation), the inquiry will specify preliminary quantities (that can be adjusted upon final design) and will cover the entire range of sizes and types.

b) Bid receipt and Technical evaluation

Contractor will review and tabulate the bids to ensure adequacy with the technical specification requirements.

c) Vendor Selection/Purchase Order Placement

Upon bid analysis, the Technical/Commercial recommendation will be signed by the Engineering Manager and the Procurement Manager and submitted to the Project Manager for his approval. As required by the Contract, Client review will be requested before purchase finalization of the Key Equipment.

d) Issue of Purchase Orders which shall include:

- Description of material or equipment together with reference to applicable specifications
- Purchase order number and job number, account code, sizes,
- type, quantity and relevant descriptions
- Total price and payment terms
- Delivery date, place and conditions
- Inspection requirements, including local government
- requirements, where necessary
- Details of progress reports, if any, to be submitted by Vendors
- Installation and start-up assistance statement, where required.

Vendors will be requested to return promptly the signed acknowledgment of the purchase order, confirming the acceptance of all terms and conditions thereof.

e) Purchase Order Revisions

In the event of any scope or price change due to design revisions or other reasons, amendments to purchase orders will be issued to Vendors.

Amendments to purchase orders covering changes in specifications, quality, delivery, cancellation, payment terms or other important conditions shall be made in the following cases:

- Changes in bulk material quantities;
- Changes foreseen in the Purchase Order terms for which the price or other basis is clearly established in the Purchase Order.

The above categories include, for example, nozzle changes, support clips for pressure vessels, etc.

f) Spare Parts Procurement

Contractor shall provide within its Lump Sum Bid Price the spare parts, based on Contractor's experience and ITB requirements.

7.3. Expediting Approach

Contractor shall provide a complete expediting service from the placement of a purchase order until arrival of equipment or materials at the SITE. The purpose of expediting is to assure on-time delivery of equipment and materials to meet the construction schedule. Expediting continues until replacements, if required, have been received and Vendor's invoices have been certified as correct. Expediting includes:

- Expediting all purchase orders and Vendor's suborders when critical, plus transportation arrangements of these orders
- Expediting Vendor documents
- Anticipating problem areas and taking appropriate actions before delays occur
- Pressing Vendors, if necessary, to ensure maintenance of schedule
- Constant review of status of all orders until acceptance.

Expediting does not depend only on the word of the Vendor. The Expeditors visit the Vendor shop floor to see the materials on hand and progress of the work.

Contractor shall be paid special attention to:

- Using priority levels for expediting work, which allows the work to be adjusted according to the rate of Vendor progress
- Requiring the Vendor to submit regular progress reports
- Taking corrective actions in advance to avoid schedule slippage in Vendor activities

- Monitoring both Vendor and Sub-vendor activities for critical equipment to see that appropriate progress is maintained
- Supporting the Vendor as much as possible when a schedule slippage is anticipated, e.g., by supplying critical materials, etc.

Expediting efforts will be incorporated into the Procurement Status Report.

7.4. Shop Inspection

Shop inspection activities are carried out to assure manufacturing quality of equipment and materials.

To confirm that the manufacture of equipment and materials is in accordance with the requirements in the Contract, specifications and drawings, Contractor performs inspections on the basis of shop inspection procedures, including nonconformance control.

1) Inspection Policy

Contractor has a three-point policy for inspection of equipment and materials.

Point one is to sufficiently inspect equipment and materials at the VENDOR shop to discover any defects and rectify them to ensure delivery of non-defective equipment and materials.

Point two is that the corrective actions to avoid recurrence of any nonconformance are made by an inspection group under the direction of QA/QC Manager.

Point three is to give priority in inspection to major or critical equipment and materials.

2) Basic Inspection Concept

Inspection is done in accordance with the following basic concepts:

- The inspection is done under the responsibility of Contractor. Client's inspectors and a designated third party can witness the inspection, as defined in the Contract.
- The inspection is done in strict accordance with the applicable Contract requirements.
- Contractor shall have minimum four inspection levels:

Level 0 Submit test and inspection certificate to Client

Level 1 Final inspection prior to shipment only

Level 2 Witness and hold points established in fabrication process.

Inspection occurs at these established points.

Level 3 Full in progress shop inspection of fabrication process.

- The inspection level selected depends on the types and specifications of the equipment and materials, the tests and inspection items, and the Vendor's own quality control system.
- Client has the right of free entry to the Vendor shop where tests and inspection are carried out.
- Client has the right to reject any equipment or material that is unacceptable in either quality or workmanship, or does not comply with the requirements of the Contract, specifications and drawings.
- For major or critical equipment and materials with a long lead time or requiring special quality control because of process design requirements, the Inspectors carefully review all quality requirements in the requisitions to ensure that tests and inspection needs have been met.
- A pre-inspection meeting with the Vendor for major or critical equipment and materials is initiated by Contractor to establish distribution and routing of all communications and resolve any questions. If necessary, an inspection coordination meeting is also held to ensure complete understanding of the requirements and basic procedures relating to inspection.

Third party inspection agencies will be utilized as required by the Contract or relevant laws and/or regulations.

Contractor shall inform Client of the schedules for shop inspection and testing as agreed upon in the Job Procedures.

Contractor shall establish the technical specifications, inspection specifications, and procurement specifications to transfer all applicable Contract requirements and Contractor's requirements to Vendors. These requirements are reflected into Vendor's documents, including the inspection procedure, and submitted to Contractor and Client for approval. Then, the approved Vendor's inspection procedure and other documents will be used by Contractor's inspectors during the shop inspection.

3) Execution of Inspection

Contractor shall have its own QA department with competent QC engineers and inspectors at the head offices, and branch offices/subsidiaries in various part of the world to perform shop inspection. QC engineers and inspectors of these

offices execute the shop inspection. When required, Contractor employs local inspection agencies.

7.5. Level of Shop Inspection

Contractor shall define the level of shop inspection to be utilized for Contractor responsible equipment and materials at the stage of the Project implementation.

8. Construction Execution Plan

8.1. General

It should be the philosophy of Contractor on the project to ensure that the overall Contract scope is completed on time and to the specified standards of the Contract, without prejudicing safety and quality requirement.

At all stages of the Project, Client shall be kept fully informed of all aspects of the work. The following execution Plan describes the key elements of our construction approach. Immediately after receiving LOI, the Home Office Construction Manager shall join the Project team and begin all necessary construction Planning to ensure that field construction activities are kept on schedule as described below.

8.2. Planning

Contractor shall establish construction schedule based on the overall project schedule.

The following key events shall be monitored closely for immediate corrective action.

- 1) Early determination of capable sub-Contractors.
- 2) Early mobilization of temporary facility, construction equipment and manpower.
- 3) Early issue of MTO for procurement
- 4) Early set up of transportation requirement.
- 5) Early identification of field work in existing operation Plant incorporating shutdown requirement.
- 6) Early set up for turn over and commissioning.

8.3. Site Administration

Contractor's Plan to ensure the following administration activities are properly implemented in the field incorporating the experience of the former similar Project managed by Contractor.

Contractor shall establish and maintain proper coordination system with Client, Contractor home office, Sub-Contractor, Vendors and local authorities to administrate various field activities as listed below.

- Field construction work
- Meeting Plan
- Reporting / Correspondence
- Security control (gate control & ID card)
- Discharge of equipment and material
- Government Contact
- Custom clearance
- Traffic control
- Safety control
- Interface control with sub-Contractors
- Temporary Utility Supply
- Legal issue matters
- Visa arrangement
- Vendor representative arrangement
- Hygiene control
- Transportation
- Labor law
- Working day / hours control
- Fire fighting

8.4. Construction Plan

[A] Construction Equipment

Contractor shall ensure all necessary construction equipment are available on the Site by closely monitoring the Sub-Contractor's schedule and performance in dispatch from the point of origin to the SITE including custom clearance and temporary import requirement.

[B] Scheduling & Monitoring

Overall detailed Construction Schedule shall be developed with key milestones to be kept by Sub-Contractor.

Sub-Contractor shall utilize this schedule to develop their weekly schedule showing further detailed activities.

Current progress shall be always monitored and marked up on original schedule to show differences from original Plan. This data shall be presented at the weekly meeting to be held among Client, Contractor and sub-Contractor.

Any activity delayed from original Plan shall be reviewed and analyzed in detail for immediate corrective actions.

[C] Existing Facility Protection Plan

Contractor Plan to ensure the protection of existing facilities shall address the following areas.

1) Preventive Actions to Fire

Contractor will ensure Client's Safety requirements. Especially work permit system shall be maintained strictly.

In addition to the above, the following points shall always be considered during Hot Work to avoid fires:

- Availability of fire-water hydrants and monitors
- Provision of portable fire extinguishers
- Provision of sand buckets
- Provision of temporary combustible gas detector
- Provision of fire watch
- Necessity for fire protective blanket
- Necessity for fire protective wall
- Prohibition of smoking

- Provision of catch pot for falling welding spatter during hot cutting
- Removal of combustible materials such as wood, cardboard, vinyl, paper, etc.
- Immediate containment and cleaning of oil spillage
- Emergency services phone numbers
- Use of pneumatic circular pipe cutters
- Use of hydro-cutting

2) Protection from Vibration

Construction work which can cause vibrations shall be closely monitored, to prevent possible damage to adjacent Facilities.

[D] Subcontracting

All construction work shall be done on a sub-Contract basis.

The construction may be divided into several packages as follows:

- Civil, Structural and Building
- Mechanical (Piping and Equipment Installation)
- Electrical & Instrumentation
- Insulation and Painting

[E] Material Management

Material control and warehousing at the construction site shall be performed.

[F] Vendor Supervision during Construction

Contractor shall mobilize vendor supervision for installation, calibration, or running test.

[G] Field Engineering

Contractor's field engineering shall consist of the following tasks:

- 1) Interpretation of Contractor's construction specifications and drawings.
- 2) Field design changes

Field design changes shall be justified and checked by Field Engineer. Significant or complex changes which relate more than one discipline or basic design criteria shall be reported to the Engineering Manager or Project Manager respectively for review and approval.

Changes in basic design shall be formally documented and approved by Client.

Field changes shall be recorded on a master set of design documents so that the changes can be correctly incorporated into As-built drawings.

3) Coordination/Supervision of Pre-commissioning Activities

8.5. Temporary Facility Plan

Contractor shall ensure that the required proper temporary facilities are installed, to execute the Project, at the location allocated by Client. The steps for obtaining approval, including Plans, land use permits and inspections shall be in accordance with Client's requirements.

The following temporary facilities shall be erected.

- Contractor's Field office
- Sub-Contractor's Field office
- Work shop / Maintenance shop
- Material storage with warehouse
- Toilets
- Utility system for water, power and sewer
- Telephone system
- Septic tanks for sanitary wastes

Contractor shall provide janitorial services for the facilities and ensure they are well maintained and secured in accordance with Client's rules and regulations for sanitation, fire fighting, safety and security.

8.6. Safety

One of Contractor's major considerations both domestically and internationally on any construction project is its Safety Management Program.

It is Contractor's safety education policy to ensure that all employees, whatever their craft or discipline are made aware that their first and foremost responsibility, is safety.

1) Certification of Crane and Heavy Equipment Operators

It is Contractor's policy, for international projects, to ensure that all personnel employed by ourselves or sub-Contractors as crane or heavy equipment operators are fully qualified to operate the specific equipment to which they are assigned.

For this Project this policy shall be enforced by the following steps:

- a) Ensure operator holds a valid operators license.
- b) Ensure operator completes a successful medical.
- c) Log all details of license and certification to expedite renewal of documents as required.
- d) Suspend license if operator is involved in an accident, pending investigation.

2) Education and Training of Personnel for Maintaining the Site in a Safe Condition

For the initial induction safety training course all employees shall attend safety education and training. Daily tool box safety meetings shall be held, at which craft supervisors shall discuss specific job related hazards and update procedures to prevent accidents.

a) Safety Training Courses

The following general subjects shall be addressed during the induction courses:

- Details of Contractor's Safety Organization Chart
- Acquaint employees with the Site, the nature of the work, the actual and potential hazards that may be encountered during the work and the equipment and practices that must be used to minimize the possibility of accidents.

The following specific subjects shall be covered during the induction courses:

- Permit system; its purpose, procedures and types of permits
- Importance of good housekeeping and sanitation practices
- Personnel Protective Equipment
- Purpose of Tool box meetings
- Emergency Response
- Correct use and maintenance of personal protective equipment

Craft Safety Training courses shall be given for each craft, i.e., Civil, Mechanical, Electrical, Scaffolding, etc. to cover safety procedures peculiar to that discipline.

b) Tool box Meetings

To highlight hazards, update procedures and prevent accidents, all craft/crew supervisors shall hold a daily ten-minute Tool box meeting and as needed with their assigned crew. These meetings shall be documented and the documents shall be available for review at the Site office.

c) Loss Prevention Literature

Along with Contractor's own safety literature, Contractor shall request Client's Loss Prevention Department to provide Loss Prevention Posters for display in strategic locations.

d) Site Safety Committee

Contractor shall form a Safety Committee consisting of:

Site Manager

Sub-Contractor's Project Manager

Sub-Contractor's Safety Officer

The purpose of this committee shall be:

- To perform safety audits and surveys
- To review accidents, near misses and violations of Safety Procedures and take corrective actions
- Hold a weekly Safety Meeting

Client's loss prevention representative shall be invited to attend all meetings and provide guidance on good safety practices.

e) Site Inspections

Site safety inspections shall be carried out by all members of the safety committee to ensure correct safe work practices are being adhered to.

f) Ongoing Safety Education and Training

Safety education and training for all employees shall continue throughout the life of the Project.

Special attention shall be given to subjects which are a cause for concern or which have been highlighted during inspection tours and meetings, or are a result of accidents or mishaps.

8.7. Site Security

1) Overall the Site Security

a) Overall the Site

Contractor will provide the following facilities for overall the Site security within the Site.

i) Temporary fence separating the Site

ii) Gates and gate houses

iii) Security lighting

b) Gate Control for the Site

i) Gate Pass for Personnel

Contractor, all Sub-Contractor personnel, their Sub-Contractors and visitors shall have proper identification issued by Contractor for entering the Site.

Contractor shall prepare and submit application forms together with copy of IDs, working VISA, photos, etc. required to apply gate pass to Client.

ii) Gate Pass for Vehicle

All vehicles entering the Site shall obtain a vehicle pass issued by Client.

The Gate Passes for vehicles will be issued only for essential vehicles and these vehicles are to be maintained in acceptable working condition. The drivers of the vehicles shall obtain separate personnel Gate Passes. The same rules in the case of personnel Gate Passes shall be applied for the Vehicle Gate Passes as well.

iii) Gate Pass for Material in the Site

Deliveries to the Site shall be restricted within scheduled working hours unless Contractor accepts entry and unload.

2) Others

Contractor shall coordinate with sub-Contractors to ensure site security. The following requirements shall be reflected on subcontracts.

a) Sub-Contractors' normal work hour shall be in compliance with Contractor's regulation. Any change in the specified work hours will require Contractor's approval or concurrence in advance.

For security reasons any overtime work by Sub-Contractors' personnel must be approved by Contractor. Contractor shall not withhold its approval for occasional spot overtime such as that required to complete a concrete pour or to leave the Site in a safe condition.

Sub-Contractors shall fill out the form "Application for Overtime Work" and submit to Contractor for approval a day before commencement of the Overtime Work.

b) All after hour, Contractor will patrol the area as deemed necessary.

Sub-Contractors are required to take reasonable security measures such as:

i) Locking tools, safeguarding materials, equipment, building, etc., with substantial locks;

ii) Eliminating easy access to inside building;

iii) Installing outside lights if building is in a dark area; and

iv) Keeping a night light on inside buildings where appropriate.

c) The initial entry and final exit of all Sub-Contractors employees to the Site each day shall be through assigned gates only. Sub-Contractors employees should confine their activities to their assigned the Site only. If necessary to move between the Sites, such movement shall be restricted to established roadways and walkways. Movement through operating unit areas, loitering or visiting other Sub-Contractors' the Sites is prohibited.

d) Sub-Contractors employees and their visitors will not be allowed to enter the Site with cameras. There are specific requirements regarding the use of camera equipment in the Site. Consult Contractor's Representative for any photographic work required in the Site.

8.8. Quality Inspection during Site Work

8.8.1. General

It is the quality policy of Contractor to provide services, materials, and equipment that meet all contractual requirements for assuring performance, safety, and reliable operation of Plants.

To ensure that Contractor's Quality Management Program is fully implemented for construction phases of the Project, Contractor shall undertake the following measures:

- 1) Contractor shall prepare Quality Plans for Fabrication/Construction in accordance with Contract requirement. The Plan shall also be reviewed and approved by Contractor's QA Department Manager.
- 2) All Sub-Contractors shall be evaluated in accordance with Contractor's qualification procedure of Sub-Contractor and selected for each construction work. These selected Sub-Contractors shall be required to prepare and submit QA/QC procedure which specifically address their scope of work and project requirement. These QA/QC procedures shall be approved by Contractor Field QC Engineer before performing work.
- 3) Contractor's Field Quality Control Organization, under Site Manager, shall perform all quality assurance requirements for field design, field procurement, fabrication, construction, and pre-commissioning activities.
- 4) Contractor's field QC team shall provide sufficient QC inspectors to monitor, inspect, test and report all Sub-Contractors fabrication and construction activities.
- 5) Contractor shall ensure that all Sub-Contractor's welders, riggers and cable splices are certified in accordance with applicable specifications before performing any related activity.
- 6) Contractor Field QC Management shall ensure close coordination is maintained between Contractor's field organization, sub-Contractors and Client.
- 7) Contractor Field QC Engineer shall ensure that all QA certification, record and correspondence are correctly maintained, compiled and distributed.

8.8.2. Field Inspection and Testing

Contractor shall carry out the field inspections and tests necessary to comply with the specification and shall prepare inspection Plans for all types of work to achieve this:

- 1) Welding Inspection
- 2) Field Inspection of Mechanical Equipment
 - Columns, Reactors, Vessels, Heat Exchangers, Fired Equipment, etc.
 - Valves
 - Rotating Equipment

- Piping
- 3) Field Inspection of Civil Work and Materials
 - Sewer Systems
 - Concrete Materials Batch Plan Inspection prior to Start of Concrete
 - Works
 - Earthwork
 - Roads
 - Tank-pads and Bund walls
 - Inspection of Painting
 - Inspection of Insulation
 - Inspection of Refractory
 - 4) Field Inspection of Electrical Equipment
 - 5) Testing and Calibration of Instruments

Client may wish to witness certain of these tests and inspections. Contractor shall therefore inform Client at least 24 hours before such testing is scheduled to occur.

Contractor shall provide the necessary testing, measuring and calibration facilities and tools.

Contractor shall provide proof of proper construction, with routine checks on the quality of the work and by means of samples of construction work, radiographs of welds, hydraulic tests, leak tests, earth fault tests, etc., in accordance with the Project Specification.

If the Work is deemed to be unsatisfactory during testing, Contractor shall remedy the defects immediately.

Final inspection and final bolting-up of equipment shall, at Client's option, be witnessed and certified by Client, and/or members of Client's permanent organizations.

Contractor shall provide reports of necessary inspections/tests in accordance with statutory, insurance party and/or Project Specification.

8.9. Progress Reporting

Contractor shall issue a Monthly Progress Report indicating the current progress of the Work within 10 days of the end of the monthly reporting period.

The format of the Report shall be such as to identify and facilitate the resolution of any corrective measures to be undertaken.

A General Report shall briefly describe the following:

- 1) Major and/or significant work items achieved during the report period.
- 2) Current status of the Work

Project progress information shall be provided on graphs and/or tables showing actual progress and scheduled progress for:

- a) Overall project
 - b) Engineering
 - c) Procurement
 - d) Field construction
- 3) Problems encountered or anticipated together with proposals of resolution.
 - 4) Major and/or significant work items anticipated to be completed in the succeeding month.

A Categorized Report shall be prepared in accordance with the following phases:

- 1) Engineering Status

Status of:

- a) All major drawing, specifications and engineering activities
- b) A description of any major and/or significant work items achieved during the report period.
- c) A description of major activities to be undertaken during the succeeding month.

- 2) Procurement Status of the Current and Succeeding Month

Status of procurement for all equipment and materials such as:

- a) Inquiries
- b) Requisitions, specifications and phase orders

- c) Expediting
- d) Inspections
- e) Shipping
- f) Deliveries
- 3) Construction Status of the Current and Succeeding Month

Status of construction items with all major items specifically mentioned including:

- a) Foundations poured
- b) Equipment and pumps installed
- c) Equipment and materials receiving reports
- d) Fabrication and prefabrication schedules
- e) Erection status
- f) Fabrication and construction equipment status
- g) Manpower status
- h) Quality control
- i) Safety reports

Additional Reports for critical work areas may be required and shall be produced by mutual agreement between Client and Contractor. The purpose of these Additional Reports shall be to provide a current overall assessment of the Contract Schedule to indicate any deviations or trends in order to highlight any urgent and effective corrective actions to be implemented.

8.10. Work Site Log Book

The Site Organization will prepare, maintain and issue the following reports at the required time and frequency agreed for the Project.

- Receiving Status Report and Record of Delivery Note
- Shortage, Overage and Damage (OS&D) Report
- Stock Log Book
- Material Issue Slip Record

- Material Forecast Report
- Inventory Status Report
- Loss and Damage Report
- Surplus Material Report

8.11. Preparation and Procedures of Pre-commissioning Activities

8.11.1. General

At the final stages of construction, a considerable amount of preparatory work has to be carried out by Contractor. The work shall be carefully Planned and executed in close consultation with Construction Team and Client.

The preparatory work for Mechanical Completion, Pre-commissioning, Commissioning and Initial Operation of the Plant require-highly sophisticated techniques and procedures in order to realize the successful operation of the entire Plant. In this respect, due and sufficient consideration to the roles and responsibilities of the relationship among the parties concerned are essential.

The critical point and target on this preparatory Works is that the both parties of Client and Contractor efficiently proceed with the series of Works with cooperation so that the stable commercial operation of the PLANT is ensured on schedule.

8.11.2. System Turn-over Procedure

The Plant is divided into some parts.

When the construction of "Each part of the Plant ("System")" has been substantially completed and requirements of the Mechanical Completion have been completed according to the Job Specification, except for the Punch-list items, Contractor shall turn the System over to Client after completion of rectification work for the said punch-list items.

After the Mechanical Completion of each part of the Plant, the custody, care, control and risk of the part of the PLANT shall pass from Contractor to Client. And, the Commissioning of the part of the Plant shall be started.

When the last part of the Plant has reached or shall be deemed to have reached the Mechanical Completion, the whole Plant shall be deemed to have reached the Mechanical Completion of the Plant and Client shall issue the "Taking Over Certificate" of the Plant.

The definition of the parts will be decided between Client and Contractor at construction stage of the Project.

[1] Finalizing of Punch List

1) When Contractor anticipates that a part of the Plant will soon reach Mechanical Completion, Contractor shall submit **Preliminary Punch List** accompanied with **Preliminary Remaining Work List** to Client as Preliminary ones.

The Punch List is showing the works pertinent to the part to be completed prior and subsequent to the Mechanical Completion, and the works found out through the construction implementation. The Remaining Work List is showing the originally scheduled works pertinent to the part to be completed subsequent to the Mechanical Completion.

2) The Preliminary Punch List will be submitted to Client about ten (10) calendar days before anticipated date of Notice of Mechanical Completion of the part.

3) In the Preliminary Punch List, Contractor will formally categorize the items of the List as **essential ones (Category "A")** or **non-essential ones (Category "B")** for Commissioning in the Contractor's opinion.

4) Within five (5) calendar days after the Contractor's submission of Preliminary Punch List and the Remaining Work List, Client shall check whether Client makes comments or not, inform Contractor of it.

5) When Client would make comment(s) of any defect or deficiency (except the said Punch-list items) to be corrected, prior to the Mechanical Completion according to Job Specification, Client informs Contractor of its comments.

6) When Client would make comment(s) to the Remaining Work List, Client informs Contractor of its comments.

7) Immediately after receiving the Contractor's information, Client and Contractor hold meeting for discussion on the comments of above Item 5) and agree on the items essential to Ready for Commissioning and finalize the Punch List (**Final Punch List**). Further the Remaining Work List shall be finalized if necessary (**Final Remaining Work List**).

[2] Rectification Works

Based on the agreement of above Item 7) of [1], Contractor shall remove defect and deficiency related to the essential work items on the finalized Punch List, which shall be corrected prior to Mechanical Completion.

[3] Notice of Mechanical Completion of Part

1) When Contractor considers that the construction of each part of the [1] has been substantially completed and requirements of the Mechanical Completion according to the Job Specification, Contractor shall send **Notice of Mechanical Completion of Part** to Client in writing that Contractor believes that the part of the Plant concerned is mechanically completed.

2) The Notice shall include the information of completion of Rectification works for essential work items on the Final Punch List.

3) The Notice of Mechanical Completion of Part shall be accompanied by the **finalized Punch List** and **finalized Remaining Work List**.

[4] Issue of Interim Mechanical Completion Certificate

1) Within **ten** (10) calendar days after the Contractor's notice, Client shall issue **Interim Mechanical Completion Certificate** for such part of the Plant to Contractor.

2) The date of the Mechanical Completion of Part shall be the date of the said Contractor's notice.

3) It is understood that each Interim Mechanical Completion Certificate shall constitute the turnover of the relevant part of the Plant from Contractor to Client.

By virtue of the fact of turnover of such part of the Plant, the risk, care, custody and control of such part of the Plant shall pass from Contractor to Client.

[5] Mechanical Completion

1) With respect to the Mechanical Completion of the last part of the Plant, the same procedure as the one described in above Paragraphs shall be applied, provided that Notice of Mechanical Completion of Final Part shall be given by Contractor instead of Notice of Mechanical Completion of Part and Mechanical Completion Certificate shall be issued by Client instead of Interim Mechanical Completion Certificate.

2) Mechanical Completion date shall be the date of the Notice of Mechanical Completion of Final Part.

[6] Remaining Works after Mechanical Completion of Part

1) The remaining works after each Mechanical Completion of Part, which shall be identified in the Final Punch List and the Final Remaining Work List, shall be completed by Contractor on Contractor's responsibility.

2) Immediately after the completion, Contractor shall send Notice of Completion of Remaining Work with a copy of the relevant Final Punch List and Remaining Work List which show the completion dates of the remaining works.

3) If Client would make comment(s) to them, Client would inform Contractor of them within two (2) calendar days after the Contractor's submission of the notice.

9. Quality Assurance and Plan

9.1. Overall Philosophy

Quality Manual was prepared and is updated by Contractor's QA Department in consistency with ISO9001.

Quality Manual shall be applied to QA activities throughout the Project by all participants, and ensure a high quality project implementation.

9.2. QA/QC Procedures

It is the Contractor's quality policy to provide services, materials, and equipment that meet all customers' contractual requirements for assuring performance, safety, and reliable operation of Plants.

To implement the quality policy, quality assurance is systematically executed according to the following procedures.

- 1) Quality Assurance System in compliance with ISO 9001
- 2) Project Quality Plan

9.3. Quality Standard

Contractor's Quality Standard is based on "ISO 9001".

9.4. Quality Assurance System

All Engineering, Procurement and Construction Service have to be executed in accordance with Quality Manual and supporting procedure to Quality manual.

9.5. Quality Manual with Quality Policy

To meet the requirements of ISO 9001 and Quality Policy instructed by the Contractor's General Manager, Quality Manual is drawn up by the QA department and authorized by the Contractor's General Manager.

Quality Manual includes the following contents:

- 1) Management responsibility



- 2) Requirements for documentation
- 3) Resource management
- 4) Project realization
- 5) Measurement, analysis and improvement