ADNOC GAS

EPC FOR BALANCE OF PLANT (BOP) WORKS FOR HABSHAN P5 SHORT TERM FACILITIES PROJECT

ENGINEERING EXECUTION PLAN

أدنوك ADNOC

.: 4700025491

O.: 30201-50150-ST-HB

Document Number
DOD-30201-50150-LT-HE-GG-001-00-00-019

Revision A

Code 2-Comments as Noted

Sandeep Prabhakar - ADNOC Gas Operations & Marketing L.L.C

Apr 25, 2025, 12:19 PM GMT+4:00

As EPC Contractor, all documents shall be signed by RSME team as well.

REV.	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	ISSUED FOR REVIEW (IFR)	4-March-25	Hamza	Jayanth	Jayakumar

ROBT STONE

REVISION SUMMARY

Sr. No.	Rev. No.	Date of issue	Description of revision
1.	A	04-03-2025	ISSUED FOR REVIEW (IFR)

HOLD LIST

PARAGRAPHS HOLD IN THIS ISSUE			
Hold No.	Section / Para No.	Page No.	Holds Description

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Pls clarify this is for BOP or H5 or common accordingly update the sections.

1. INTRODUCTION

1.1 PROJECT BACKGROUND

The PROJECT OBJECTIVE is to interface and hook up the rental compressors to the main plant production from the ADNOC Gas including Civil, Instrument, Piping, HSE, Electrical, Mechanical and Corrosion Protection works.

1.2 BOP PROJECT OBJECTIVES

Short-term solutions (Rental Compressor and corresponding Balance of Plant BOP EPC works shall be executed for impacted COMPANY facilities i.e., Bu Hasa, Habshan, Das and Asab-0/3 plants, to accommodate peak gas flow and ensure bottlenecks in years 2024, 2025, 2026, and 2027 are mitigated. The strategy adopted by COMPANY to achieve the gas processing targets in years 2024, 2025, 2026, and 2027 is as follows:

BOP - the Balance of Plant (BOP) facility to interface and hook up the rental compressors to the main plant production stream including associated Civil, Instrument, Piping, HSE, Electrical, Mechanical and Corrosion discipline works.

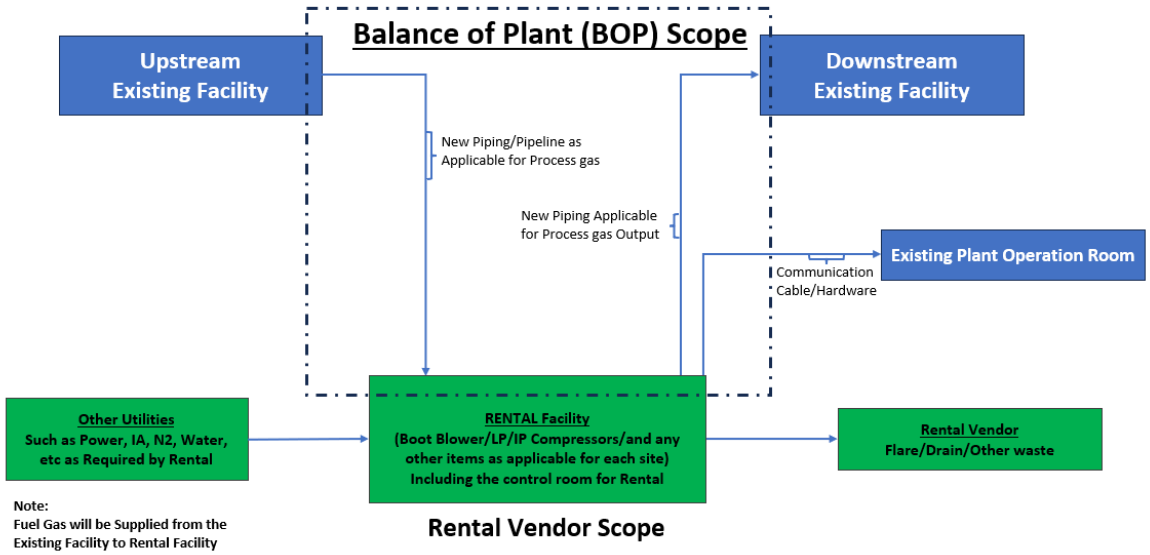


Figure 1-1: Rental Compressor facility along with the Balance of Plant facilities

2. PURPOSE OF THIS DOCUMENT

This Engineering Execution Plan (EEP) is owned by the ENGINEERING SUB-CONTRACTOR and will be executed at ENGINEERING SUB-CONTRACTOR facilities. Scope of this document is limited to "Engineering Execution" and shall apply to all engineering deliverables prepared by

BOP and H5 are different scope. Please clarify

CONTRACTOR through their ENGINEERING SUB-CONTRACTOR for BALANCE OF PLANT (BOP) WORKS FOR HABSHAN P5 SHORT TERM FACILITIES project.

This EEP will remain a live document for the life of the Contract. This means that where there is a significant change in the Execution Plan; the EEP will be revised and reissued.

3. ORDER OF DOCUMENT PRECEDENCE

In the event of any conflict between the applicable documents, the order of precedence shall be as follows:

1. National and / or Local Regulations and UAE laws
2. Design Basis
3. Data Sheet
4. Project Specifications and addendum to AGES & DGS
5. COMPANY Standards / Specifications and AGES & DGS
6. Other International Codes and Standards

However, in case of conflict between the various specifications, standards and the requisition, most stringent requirements shall govern. EPC CONTRACTOR/VENDOR shall refer any such conflict, and any other matter, which requires further interpretation, to the attention of COMPANY and COMPANY's interpretation shall be final. Resolution of any conflict shall be obtained from COMPANY in writing before proceeding.

Any deviation from COMPANY standard accepted in the existing facility design shall not be considered as basis for this PROJECT design and any deviations shall be submitted to COMPANY for approval before proceeding.

4. REFERENCE, CODES AND STANDARDS

4.1 PROJECT DOCUMENTS

Table-1: Reference Documents

Sl. No.	Document Number	Document Title
01	SOW-30001-50150H-H5-000-50-00-302	EPC Scope of Work for Habshan 5 Apr'25 AND Nov'25 Shut Down
02	SOW-30001-50150-GG-000-50-00-902	EPC Scope of Work – Habshan – Gas Injection & Rental Facility (Sustainable)

Include or clarify why these are not added- Project control procedure, Document control procedure, Project Interface register, Inter discipline checks matrix

Sl. No.	Document Number	Document Title
03	DOD-30201-50150-LT-HE-GG-001-00-00-010	Project Execution Plan
04	PLG-30201-50150-LT-HE-GG-001-00-00-002	Project HSE Plan
05	PLG-30201-50150-LT-HE-GG-001-00-00-004	Planning and Scheduling Procedure

Engineering quality plan

4.2 ADNOC STANDARDS

Table-2: ADNOC Standards

Sl. No.	Document Number	Document Title
01	AGES-GL-13-001 Rev.1	ADNOC Group Projects & Engineering CONTRACTORs QA/QC Requirements
02	AGES-SP-13-001 Rev 1	Criticality Rating Specification
03	AGES-GL-13-002 Rev 1	ADNOC Group Projects & Engineering Positive Material Identification of Equipment and Piping Guideline
04	AGES-SP-13-002 Rev 1	ADNOC Group Projects & Engineering Procurement inspection and Certification Requirements in Projects
05	AGES-SP-13-003 Rev 1	ADNOC Group Projects & Engineering Traceability of shop & Field Piping Materials Specification
06	AGES-SP-07-004 Rev 1	Painting & Coating Specification
07	AGES-SP-07-007 Rev 1	Welding & Non-Destructive Examination (NDE)
08	AGES-SP-09-002 Rev 1	Piping Materials Specification
09	AGES-SP-09-003 Rev 1	Specification of Manual Piping and Pipeline Valves

Include HSE related AGES

Sl. No.	Document Number	Document Title
10	AGES-SP-09-005 Rev 1	Specification for Fasteners and Gaskets
11	AGES-SP-09-006 Rev 1	Piping Support Specification
12	AGES-SP-09-013 Rev 1	Specification for Pipe Fittings and Flanges
13	AGES-SP-09-014 Rev 1	Glass Fiber Reinforced Plastic Piping and pipeline system
14	AGES-SP-09-015 Rev 1	Specification for Clad Pipes Fittings and Flanges
15	AGES-SP-09-016 Rev 1	Specification for Alloy Pipes Fittings and Flanges

Add All Applicable Exhibits

All AGES are applicable, no civil/structural AGES are listed. Kindly update.

4.3 INTERNATIONAL CODES AND STANDARDS

Table-3: International Codes and Standards

Sl. No.	Document Number	Document Title
01	ISO 9001:2015	Quality Managements System Requirements
02	ISO 9000:2015	Quality Management System-Fundamentals and Vocabulary
03	ISO 19011:2018	Guidelines for Auditing Management Systems
04	ISO 10006:2018	QMS-Guidelines for Quality Management in Projects.
05	ISO 10005:2018	QMS-Guidelines for Quality Plans
06	ISO/IEC 17020:2012	General criteria for the operation of various types of bodies performing inspection
07	ISO/IEC 17025:2017	General Requirement for the Competence of Testing and Calibration Laboratories
08	ISO 27001:2022	Information Security Management Systems

Sl. No.	Document Number	Document Title
09	ISO/TR 10013:2021	Guidelines for quality management system documentation.

5. DEFINITION & ABBREVIATIONS

5.1 DEFINITIONS

For this document, the following general definitions are applicable.

Table-4: General Definitions

DEFINITION	DESCRIPTION
CONTRACT NO.	4700025491
PROJECT NUMBER	30201-50150-ST-HB
PROJECT	EPC FOR BALANCE OF PLANT (BOP) WORKS FOR HABSHAN P5 SHORT TERM FACILITIES PROJECT
COMPANY	ADNOC GAS (AG) for whom the SERVICES are being performed by EPC CONTRACTOR.
ENGINEERING SUBCONTRACTOR (BOP)	**AVENIR International Engineers & Consultants** ENGINEERING SUBCONTRACTOR appointed by CONTACTOR to execute Home Office Services
EPC CONTRACTOR Balance of Plant (BOP)	**ROBT STONE MIDDLE EAST LLC (RSME)** CONTRACTOR appointed by COMPANY who shall be responsible for Engineering, Procurement and Construction (under EXECUTE phase) for Balance of Plant scope applicable for Short Term Solution of P5 Project.
MANUFACTURER/ VENDOR/ SUPPLIER	The Party (parties) which manufactures and/or supplies material, equipment, technical documents or drawings and/or services to perform the duties specified by the COMPANY

DEFINITION	DESCRIPTION
PMC	Project Management Consultant appointed by Company for the PROJECT
PMT	Project Management Team
Shall	Indicates a mandatory requirement
Should	Indicates a strong recommendation to comply with the requirements of this document
May	Indicate a possible course of an action

5.2 ABBREVIATIONS

ADNOC GAS(AG)	Abu Dhabi National Oil Company Gas Facilities
EPC	Engineering Procurement Construction
QMS	Quality Management System
HSE	Health, Safety and Environment
QA / QC	Quality Assurance / Quality Control
ISO	International Organization for Standardisation
MOC	Material of Construction
SOW	Scope of Work
ITP	Inspection & Test Plan
NCR	Non-Conformance Report
QCP	Quality Control Plan
TPI	Third Party Inspection
PIM	Pre-Inspection Meeting
CRS	Comment Resolution Sheet

Include / List all the abbreviations used in this

6. ENGINEERING SCOPE OF WORK

Is there any free issued items for BOP scope?

Scope shall include detail engineering as per the package scope of the following disciplines and prepare specification, data sheet and material requisition for the procurement of new materials other than ADNOC GAS free issue items. Pre-engineering survey will be carried out in order to collect the data and site related information to perform the engineering deliverables.

6.1 GENERAL

Include site survey inputs

This Project will be executed in accordance with established engineering standards and procurement and construction procedures, all in accordance within a Quality System complying to ISO 9001.

Engineering will execute Process Engineering, Piping, Instrumentation & Control, Electrical, Civil & Structural, Telecom, Corrosion, Loss prevention safety Design Engineering.

All the Engineering works shall be in accordance with COMPANY specifications and Standards. Detailed Engineering Deliverable shall be prepared as per COMPANY requirements/standards.

All the works shall be executed as per COMPANY approved procedures and specifications with full compliance to Quality and Safety requirements within the agreed project Schedule generally as follows:

- Preparation of all Engineering documentation required for the PROJECT execution for all disciplines involved, including Process, Material, Mechanical, Corrosion, Piping, Civil, Electrical, Instrumentation and Control, HSE, etc.

Telecom to be included.

- Endorsement and completion / integration of the Long Lead Items.
- Collection and verification of all required data as well as site information.
- To perform all necessary geotechnical, topographic and underground surveys relevant to scope of work, verification with available data, conduct all the Studies necessary for the proper execution of the WORKS.
- Detailed Design and Engineering to support procurement, fabrication, construction and pre-commissioning of the Works, as well as the design for temporary, ancillary and support Services required for the PROJECT.
- Criticality Rating and Inspection Classes, as per AGES, for equipment and packages will be considered in alignment with the project scope. It will be reflected in all relevant documentation and deliverables.
- Check, prepare and issue all detailed drawings, specifications, design reports and any other documentation required for PROJECT exec
- HSE Studies to be conducted and indicated

Include separate section for
1) 3D model development, administartion and management
2) Technical Query, DCAs, Site Technical Queries, Site Change notice, etc
3) Procurement Engineering
4) Vendor Document Review

Critical rating document applicable for this project

Incorporation of all recommended HSE Study.

- Prepare equipment data sheets / specifications and all other documentation required for procurement of materials.
- Preparation and issue of Materials Requisitions (MR) and Technical Bid Evaluation (TBE) reports.
- Documentation preparation including operating and m record books, schedules and reports
- Provide complete calculations including all input an format).
- Incorporate VENDOR information into the detail engin
- Coordinate the interfaces and tie-ins with running proj
- Issue all drawings and documents required for fabrication, construction, pre-commissioning, commiss the facilities, including procedures and manuals.
- Preparation of all necessary fabrication drawings, fa items, erection, inspection and testing.
- Review and approval of VENDOR documents and i comments on other Project documents / drawings, as
- ENGINEERING SUB CONTRACTOR shall follow COMPANY drawing office practice and numbering procedure for preparation / updating of drawing / documents.
- Resolve all HOLD items in the FEED documents based on Detailed engineering / VENDOR information with the approval of COMPANY.
- Facilities shall be designed to ensure that they can be constructed, commissioned, operated and maintained in a cost-effective manner. The facilities shall be stable in normal operation and be capable of accommodating transient operating conditions during start-up, shutdown and changes in throughput.
- ENGINEERING SUBCONTRACTOR shall start the engineering works with the engineering documentation and requirements set out in the Agreement and based on the observations / findings from the Site visits the EPC CONTRACTOR shall submit recommendations for COMPANY review and approval.

Contractor shall conduct all the design reviews and workshops required as per SoW. Refer Cl. 14.9.6. Include separate clause of the same in EEP.
1)P&ID Design Review
2) Plot Plan review.
3) PHA (HAZID / ENVID / OHID)
4) HAZOP,
5) SIL
6) Safety Layout Review
7) 30%, 60% & 90% 3D Model review
8) Constructability
9) SIMOPS
10) ISDR
11) Bow-Tie
12) PHASER
13) BAT Workshop

Pls provide the following sections.
a) Engineering KPI
b) Project Engg. Schedule
c) Engg Meeting strategy, (Weekly , with Company etc)
d) Engg team location and the scope for each location.
e) Software list with versions for each discipline
f) Workshops and safety studies planned

6.2 PROCESS

Scope of Process Engineering work shall include but not limited to the preparation / updating of following drawings / documents:

- Process Design Basis
- Process Simulation Report
- Heat and Material balance
- Process Flow Diagrams
- Utility Flow Diagram if any
- P&IDs (Construction & Demolition)
- P&IDs – Legend
- Process Data sheets – Equipment
- Process Data sheets – Instruments
- Philosophy Documents
- Cause & Effect Diagram
- Fluid List
- Line List
- Process Calculation Report
- Process Adequacy Report
- Design Review and closeout Report

Include all the documents required as per Scope of work under respective disciplines. Also, refer PMC comments on PDDR.

Please elobrate updating? Define stage document are only for reference

6.3 PIPING

Scope of Piping Engineering work shall include but not limited to the preparation / updating of following drawings / documents:

- Piping Design Basis
- Piping Material Specification
- Overall Plot Plan
- Tie-in Schedule
- Tie-in List

Unit Plot Plan

What is the difference?

Tie-in Key Plan

This is construction related document
Why it is included in Piping?

- Tie-in package
- Piping GA, Sections, & details for all sizes

Critical Line List

- Pipe Wall Thickness Calculation
- Piping Stress Analysis

Why 2 separate documents????

- Piping Preliminary MTO / Valve MTO
- Piping Final MTO / Valve MTO

What about AIV/FIV???
What about 3D Model related documents???

- Piping Isometrics
- Demolition Piping GA
- Demolition Piping Isometrics
- Valve Datasheet

MR for valves?????

Pipe Support Standard

- Valve Material Requisition
- Material Requisition for Piping Bulk items (Pipe, Fitting, Flanges, Gaskets and Bolts)
- Material Requisitions for Piping Specialty Items
- Piping Specialty Item Specification
- Piping Specialty Item Datasheet

Include 30%, 60% and 90% 3D Model Review Reports and Close out reports for each stage separately (total 6 documents)

- Technical Bid Evaluation for Piping Valves
- Technical Bid Evaluation for Piping Specialty Items
- Technical Bid Evaluation for Piping Bulk items (Pipe, Fittings, Flanges, Gaskets and Bolts)

6.4 CIVIL & STRUCTURAL

Scope of Civil & Structural Engineering work shall include but not limited to the preparation / updating of following drawings / documents:

- Civil & Structural Design Basis including Adequacy check of existing structures
- Civil & Structural MTO
- Piperack adequacy report
- Existing vessel modification details where req.
- Typical Steel Connections Details
- Modification drawings for Pipe Racks

Add MR & TBE for Structural Steel Supply & Fabrication
Also add SOW and TBE for Geotechnical & Topographical Surveys.

- Modification drawings for Pipe Rack Foundations
- Layouts and drawings for Pipe Supports & foundations / sleepers
- Drawings for new Piperack/bridges/structures and their foundations
- Drawings for Platforms & Crossovers and their foundations
- Design Calculations for Structural Adequacy of Existing Pipe Racks and Foundations
- Design Calculations for Pipe Supports and foundations
- Design Calculations for Platforms & Crossovers and foundations
- Design calculations for Piperack/bridges/structure and foundations
- Demolition drawings for Fence, Lighting poles, Road, Redundant structure and foundations, etc.
- General Notes for Concrete Works
- General Notes for Steel Works
- SOW for Existing concrete integrity check
- Road Crossing Duct Bank Details
- Traffic Signs and Road Marking Details
- Layout of Road and Paving including Standard drawing
- Fence and Gate Drawing
- Steel Crash Barrier, Protective Barrier and Height Barrier Details
- Bollard and RC Crash Barrier Details
- Ladder Details
- Stairway Details
- Handrail Details
- Grating and Chequered Plate Details
- Anchor Bolt Details
- Ladder and Stairway Concrete Foundation Details
- Typical E&I Cable Trenches in Paved Areas
- Typical Fire proof Details

- Typical Concrete reinforcement Details
- SOW for Soil ground improvement
- Typical Details of Protection Slab to Protect Exis UG Pipe at Road-Truck / Rig Crossing
- Civil GA drawings and layouts
- Road & Fence layouts and sections
- Grading Plans and sections
- Miscellaneous foundation details
- Signage Layout Plans

Mention software list used for all disciplines

6.5 ELECTRICAL

Scope of Electrical Engineering work shall include but not limited to the preparation / updating of following drawings / documents:

- Electrical Design Basis
- Specification for Lighting Fixtures/ Addendum to AGES
- Specification for Power, Control and Earthing Cables/ Addendum to AGES
- Specification for Electrical Bulk materials.
- Specification Field Commissioning of Electric Installation and Equipment/ Addendum to AGES.
- Data Sheet for Electrical Cables.
- Material Requisitions.
- Cable Sizing Calculations.
- Lighting Calculations.
- Electrical Cable Schedules.
- Electrical & Instrument Equipment List.
- Electrical Load Lists.
- Single Line Diagram for LV switchgear
- Single Line Diagram or load schedule for Outdoor Lighting
- Typical Electrical Installation Standards (Power, Lighting, Earthing).

, Bulk Items

Adequacy reports for UPS, SLD for UPS & PDPs, Space reservation requests in existing

, TBE

Solar panel demolition and relocation drawings, To be included

ADD:
- Solar Power unit related documentation (as applicable)
- Interface / tie-in , Shut-down , Changeover Schedule
- Earthing Calculation
- Site Visit Report
- Modification SOW
- IPCS/ ECMS related documentation
- Interconnection Schedule
- MTO
- Substation / Electrical Room related documentation

lightning Protection layout

- Electrical Cable routing, Lighting & Earthing Layouts for outdoor area.
- Electrical BOQ.
- ~~Earthing Pit Details~~

Kindly put a note that for list of I&C documents refer PDDL.

6.6 I&C

Scope of I&C Engineering work shall include but not limited to the preparation / updating of following drawings / documents:

- Instrumentation Design Basis
- Instrument Specifications / Addendums
- Scope of Work for DCS System Modifications
- Scope of Work for ESD System Modifications
- Scope of Work for FGS System Modifications
- Instrument Data Sheet for PG
- Instrument Data Sheet for PT
- Instrument Data Sheet for PDIT
- Instrument Data Sheet for TG/TW
- Instrument Data Sheet for TT/TW
- Instrument Data sheet for Control Valves
- Instrument Data Sheet for SDV
- Instrument Data Sheet for PSV
- Instrument Data Sheet for RO
- Instrument Data Sheet for FT/FE
- "F&G Devices and Detectors Data Sheets
- MR's and TBE's for all above-mentioned items
- System Architecture Diagrams Modification for DCS, ESD, FGS
- Instrument Index
- DCS IO list
- ESD IO list

- FGS IO list
- F&G Index
- Instrument Hook-up Drawings
- Instrument Installation Drawings
- Instrument Cable Block Diagram
- Instrument Location Layout
- Instrument/JB Locations
- Alarm and Trip Schedule
- Instrument Cable Routing Layouts
- Instrument Cable Schedule
- Instrument Interconnection / Wiring Drawings
- Instrument Loop Diagrams
- F&G Cable Block Diagram
- F&G Cable Schedule
- F&G Interconnection / Wiring Drawings.
- F&G Loop Diagrams
- F&G Cable Routing Layouts
- Instrumentation & Control MTO

Include telecom related deliverables.

Include General document like EQP
Add Addendum to AGES

6.7 MECHANICAL

Scope of Mechanical Engineering work shall include but not limited to the preparation / updating of following drawings / documents:

- Mechanical Adequacy Report for Pressure Vessels

MDS /PDS / affected Vendor documents ?

6.8 CORROSION & MATERIAL

Scope of Corrosion & Material work shall include but not limited to the preparation / updating of following drawings / documents:

- Material Selection report for the
- Material selection diagrams

Include following documents
1) Material Adequacy Check Report
2) Baseline Inspection Survey Procedure and reports
3) Scope of work for Risk Based Inspection (RBI) study
4) Include all other documents required as per Scope for Work including those for Cathodic protection (refer cl. 14.3.8)

- Dead Leg Register
- Painting and Coating Specification-Piping, Equipment (Project amendment)

6.9 HSE

Loss Prevention Engineering

6.9.1 HSE Studies / Reviews

Following HSE studies and applicable Close out Reports, shall be covered as per SOW as Minimum:

- HAZID-ENVID-OHID
- HAZOP
- SIL
- SIMOPS
- Constructability Review
- PHSER III, IV, V
- QRA including Fire and Explosion Risk Assessment (FERA)
- Escape Evacuation and Rescue Assessment (EERA)
- Emergency System Survivability Analysis (ESSA)
- Bowtie Development & HSECES Identification Register
- SRM Screening
- HSEIA Screening
- Environment Impact Assessment (EIA)
- F&G Detection Mapping Study

6.9.2 Loss Prevention Engineering

Following Engineering deliverables shall be submitted to COMPANY from Loss Prevention Discipline as minimum.

- HSE Plan
- HSE Philosophy
- Fire & Gas Detection and Protection Philosophy

- Scope of Work (SOW) for 3rd Party HSE Consultant Workshop and Studies
- HSE studies Terms of Reference, Assumption Register and reports by 3rd Party HSE Consultant
- HSE workshop/studies closeout reports by EPC Contractor
- HSE Action Tracking Register
- Specification & Datasheet for Fire Fighting & Safety Equipment
- MR for Fire Fighting & Safety Equipment
- TBE for Fire Fighting & Safety Equipment
- Hazardous Area Classification Schedule and Layout
- Fire Fighting & Safety Equipment Layout
- Escape Route & Safety Sign Equipment Layout
- Specification for Safety Sign
- Fire & Gas Detector Layout
- Fire & Gas Detector Cause and Effect Chart

Include TBE for Safety Studies, MR for Safety signs, HAC layout, PFP layout, PFP schedule.

6.9.3 HSE Management Plan

The objective of the safety management is to reduce the HSE risk to the acceptable low level by Inherent safety design and formal safety assessment program which aims at identifying and addressing the hazards associated with the facilities and implementing measures to reduce the risk to ALARP (As Low as Reasonably Practicable). This level represents the point, objectively assessed, at which time, trouble, difficulty and cost of further reduction measures become unreasonably disproportionate to the additional risk reduction obtained.

Risk Management

HSE risks shall be identified, assessed and understood, and shall be kept to an acceptably low level by design, by the method of construction, commissioning and operation. Furthermore, the HSE risks shall be subject to a program of continual improvement throughout the life cycle of the project:

Risk reduction shall follow the priority:

- Elimination / prevention of hazards as the preferred solution, and where this is not possible
- Provision of control measures as a second option only
- Provision of mitigating measures, as the very last option.

6.9.4 Inherent HSE Performance by Design

The following methods of risk reduction shall be used to ensure basic HSE aspects in the Residual Engineering Design stage of the Project:

- Optimization of Plot plan
- Keeping the design and intended operating activities effective
- Using well proven engineering controls for all high risks
- Minimizing human intervention requirements & manual activities in high risk operation & area zones
- Reduction or if possible, elimination of hazardous material inventories in the project.
- Attenuation i.e., using a hazardous material at less hazardous process conditions
- Limitation of effects i.e., limits the severity of failure.
- Risk Acceptability Criteria and Impairment Criteria

7. PROCUREMENT SUPPORT

7.1 PROCUREMENT AND MATERIAL MANAGEMENT

- The term “procurement” as used in this document shall include all activities to perform purchasing, expediting, inspection, quality assurance, transportation, payment, importation, customs, delivery to site, storage, material control and related activities in connection with goods, spare parts and Vendor specialist services required for the Project.
- The terms “Materials” and “Goods” as used in this document are synonymous.
- The term “SPIR” as used in this document means Spare Parts Interchangeability Record.
- EPC CONTRACTOR’s Procurement Team will also be responsible for all Expediting activities and, together with QA/QC personnel. Inspection visits will be conducted as per the Inspection &Test Plan requirements for scheduled inspection points and to witness Factory Acceptance Test at the relevant Vendor’s plant. Once any materials, good and equipment have become the object of an Inspection Release Note, EPC CONTRACTOR’s Transport/Logistics team will organize the logistics (Land/Sea/Air Transportation) for the timely delivery of the ordered goods within UAE and from outside of the UAE.
- EPC CONTRACTOR will procure all required materials, goods and equipment for the Project in full accordance with COMPANY Procurement Guidelines and Procedures, and shall purchase from those on the COMPANY Approved Vendor/Manufacturer List.

7.2 MATERIAL APPROVAL REQUESTS (MAR)

- MAR requirement shall be mutually discussed case by case with Company and Company approval to proceed with MAR shall be obtained prior to using MAR process. EPC CONTRACTOR shall submit MAR to COMPANY for approval prior to purchase of the material.
- The MAR Nos will be allocated and EPC CONTRACTOR will maintain the MAR in the register.
- Technical evaluation sheet, Material catalogues / brochures and /or samples will be forwarded to COMPANY along with MAR, as and when applicable, with a request to review and approve the MAR and Samples.
- COMPANY's AVL compliance shall be adhered strictly wherever applicable.

ENGINEERING SUB-CONTRACTOR will provide procurement support to EPC CONTRACTOR as outlined in the Division of Responsibilities Matrix given in Appendix 1. In summary, the level of input that ENGINEERING SUB-CONTRACTOR will have to the procurement scope for the Project is:

- Preparation of relevant engineering deliverables to support issuance of Material Requisitions (datasheets, specification etc.);
- Preparation of Material Requisitions;
- Review of Vendor bids and Technical Bid Evaluations;
- Review and approval of Vendor Data (post Purchase Order placement by EPC CONTRACTOR)
- Incorporation of Vendor Data into the design.

Procurement services, including issuing Material Requisitions / Request for Quotations, Commercial Bid Evaluations, Purchase Order Placement, Expediting, Delivery etc. will be by EPC CONTRACTOR.

7.3 PIPING TIE-IN

- Typical tie-in locations are identified on the engineering drawings developed. ENGINEERING SUBCONTRACTOR shall check the feasibility of the locations and fully design the tie-in details on layouts and isometrics. Final locations and details must be agreed with COMPANY and approved during detailed engineering phase.
- EPC-CONTRACTOR shall identify any other required Tie-Ins and develop and issue a detailed methodology for each Tie-In activity of this work for COMPANY’s review and

approval.

- All required tie-in material for the early tie-in like additional valves, blinds, spades, gaskets, fasteners, etc. shall be verified by EPC CONTRACTOR. Any missing items shall be identified and shall be supplied by the EPC CONTRACTOR.
- Tie-in drawings must show both new lines and existing line modifications required in order to complete the tie-in.

Most of the items for the project are free-issued items.

The EPC CONTRACTOR Long Lead Items (LLIs) for the Project have been identified and are given in the table below:

This is part of H5

7.3.1 Instrumentation & Control LLI

S. No.	Item	Discipline
1.	SHUTDOWN VALVES	I&C
2.	PRESSURE SAFETY VALVES	I&C
3.	CONTROL VALVES	I&C
4.	FLOWMETER	I&C
5.	ICSS (DCS, ESD & FGS) MODIFICATIONS FOR APRIL SHUTDOWN OEM: YOKOGAWA	I&C
6.	DC What is the definition of LLIs? B	I&C
7.	DCS MODIFICATIONS OEM: YOKOGAWA	I&C
8.	ESD MODIFICATIONS OEM: ROCKWELL	I&C
9.	FGS MODIFICATIONS OEM: TYCO	I&C
10.	FGS MODIFICATIONS OEM: YOKOGAWA	I&C

April Shutdown is for H5 Scope not BOP scope.

7.3.2 Piping LLI

S. No.	Item	Discipline
1.	MANUAL VALVES	Piping
2.	DBB VALVES	Piping
3.	PIPES FOR APRIL SHUTDOWN	Piping

What is teh differences between Sr. No. 3, 4 & 5?

4.	PIPES (UPTO 36")	Piping
5.	LARGE BORE PIPES	Piping

7.3.3 Mechanical LLI

S. No.	Item	Discipline
1.	VESSEL INTERNALS MODIFICATION FOR APRIL SHUTDOWN	Mechanical
2.	VESSEL AND COLUMNS MODIFICATION	Mechanical

8. INPUT FROM EPC CONTRACTOR / COMPANY

Include UPS PDP and integrated system of YOKOGAWA

The following data will be collected from the COMPANY through EPC CONTRACTOR.

1) Native files of Standard Engineering package
2) Drawing / Document serial numbers / Tag numbers as per ADNOC EP
3) Topographic / GIS / Geotechnical survey report
4) Sketches for topo & Geotech survey

9. EXECUTION STRATEGY

9.1 GENERAL

ENGINEERING SUB-CONTRACTOR has nominated Project Engineering Manager to the project who is supported by Project Engineer, Discipline Lead Engineers, Design Engineers and Designers / Draughts men will be deployed for this project at ENGINEERING SUB-CONTRACTOR's facilities shared between its Abu Dhabi & satellite office.

ENGINEERING SUB-CONTRACTOR's engineering team is carrying out the Project Engineering scope and deliverables in line with the project requirements, overall project objectives, priorities and criticality of EPC schedule from the Project offices.

EPC CONTRACTOR's Project Engineering Manager and his team shall be an interface between ENGINEERING SUB-CONTRACTOR and COMP

Please elaborate the work share / scope split between EPC Contractor and Engineering Sub-Contractor and the responsibilities of each party

9.2 PROJECT INITIATION & EARLY WORK

The early phase of a Project is critical in establishing the long-term success of the Project execution strategy. In order to properly execute the Project, ENGINEERING SUB-CONTRACTOR will place a strong emphasis on planning, communicating and executing the early work for the Project, which includes Project set-up, defining the execution strategy and implementing tangible

actions to drive this first "phase" of the Project.

The first steps taken to set up the new Project are as follows:

- The Project Engineering Manager reviews and understands the Contract Document and highlights those items requiring particular attention by the project team.
- The Project Engineering Manager hold an internal kick off meeting with the key team members to brief them on contract and scope requirements and to plan for the project initiation period. Key activities leading up to the Kick-off Meeting and the development of the Execution Plan were identified.
- The "30 Day Look aheadPlan," is developed and serves until the long-term project control tools are in place.
- The Project Delivery Systems are implemented and configured.
- Identifying the LLI and prepare the documents required for the procurement of LLIs.

9.3 KICK-OFF MEETING

Kick-off meeting was held on 21st Feb 2025, at which time the team members of EPC CONTRACTOR & ENGINEERING SUB-CONTRACTOR were inducted into the project and were given an overview presentation of the Scope of Work.

9.4 30 DAY EARLY WORK PLAN

An Engineering Document Deliverables Register (EDDR) will be prepared based on the deliverables included in the Contract. The EDDR will then be used to develop the Project Schedule.

ENGINEERING SUB-CONTRACTOR will develop a 30-Day Early Work Plan (or "Look-Ahead Plan") for the Project. This plan will drive the early work and initial activities for the Project, including project planning, mobilization planning, defining early engineering works, establishing key milestones and reviews and identifying the inputs required from EPC CONTRACTOR. This plan will be developed using Primavera P6 and will be presented as a complete Level 3 schedule, which will be distributed and explained to all Project Team members.

The plan will include identifying, scheduling and planning for the below key elements:

- Holding technical meetings.
- Mobilization of the Project Team.
- Issuance and approval of the EEP.
- Development and issuance of the resourced Level 3 Schedule.
- Finalization of the Basis of Design.

- Identification of the timing and duration of early critical design activities.
- Establishing and approving Project documentation templates and drafting standards.
- Establishing routine meetings and their agendas.
- Issuance and approval of the complete Project Planning Package.

Early progress will be tracked against the 30-Day Early Work Plan whilst the complete Project Planning Package is developed and approved.

9.5 PROJECT PLANNING

The Project planning requirements are covered in the project planning package

10. PROJECT ORGANISATION

The success of the project will be determined largely by the people involved and how closely they are working to common, aligned objectives.

All personnel involved in the project on a long-term basis will attend an induction upon commencement, whether an existing ENGINEERING SUB-CONTRACTOR resource or a new recruit, to facilitate quick integration into the team and to minimize the time taken to achieve maximum performance on the project.

To assist in this, the use of facilitated team building can provide the direction and challenge required to generate the openness and trust necessary between team members.

Effective communication within the workgroup is fundamental to the success of the project. Accordingly, we will ensure that regular communication is maintained up, down and across the organization and that all employees will actively take part in these processes.

10.1 ORGANIZATION STRUCTURE

ENGINEERING SUB-CONTRACTOR organization is outlined in the organization chart included in Appendix 2 and will interface with EPC CONTRACTOR at a Discipline Lead Engineer and Project Management level, including the Project/Engineering Manager, Planning and Project Engineers.

10.2 ROLES & RESPONSIBILITIES OF KEY PERSONNEL

Please explain the role and responsibility of EPC Contractor's Engineering Manager and Enginering Sub-Contractor Engineering manager. This is required for all key personnel

10.2.1 Project Engineering Manager

- Project Engineering Manager is the point of contact for all Engineering activities. He will be interacting with EPC CONTRACTOR Project Manager for all technical activities. He will ensure that the work is completed in accordance with the agreed scope of work, quality and schedule. He shall be responsible for the discipline Engineers output for this project.

- Project Engineer and Planning Engineer shall assist Project Engineering Manager in the day to day activities and Project group functions including timely deployment of manpower.

10.2.2 Project Engineer

The Project Engineer is the principal member of the Project team and, as such, assists the Project Engineering Manager in the management functions of the Project delegated to him. The primary responsibility for the Project Engineer is for the development, execution, supervision, and coordination of all aspects of the work within schedule and budget objectives. The Project Engineer also ensures that the Project criteria and scope of work are being met by all Engineering disciplines. The Project Engineer functionally report to the Project Engineering Manager.

10.2.3 Planning Engineer

Planning Engineer is responsible for ensuring the planning, scheduling, progress measurement and control procedures. He is responsible for preparation of project progress report, S curve against EDDR. He will prepare foresight deliverable list & circulate to discipline engineer. He will communicate to all lead engineers to expedite document submission to meet the planned progress. He will report the project status to Project Engineering manager & resolve if any issues related progress achievement.

Provide the role of the CONTRACTOR and Sub Contractor Leads

10.2.4 Discipline Lead Engineer

A Lead Engineer is the leader on the project for the specific discipline they represent. The Lead Engineer reports functionally to the assigned Engineering Manager and has technical quality, coordination, and production responsibility for all work in their discipline on the project. The Lead Engineer is administratively responsible to their Departmental Engineering Manager in the Engineering Department to ensure the technical adequacy and quality of all work produced by their staff. They are responsible for performing engineering on the project as required for their discipline; and for the supervision of personnel assigned to them and engaged in engineering, design, and other work pertinent to their assigned duties. These duties include proper coordination with other disciplines and on-schedule in-budget completion of all assigned work.

Check the Proposal/Approval status -typi

He/She-typi

10.2.5 Lead QA/ QC Manager

- Coordinates, monitors and audits ENGINEERING SUB-CONTRACTOR QMS requirements and QA documentations. Records, distributes and maintains internal audit records. Irrespective of his responsibilities, he has the organizational freedom, authority and responsibility to ensures that the requirements of QMS are implemented and maintained. Designated as Lead Auditor, he is responsible to coordinate and schedule the formal internal quality audits. Conducts engineering audits periodically to ensure all project specific requirements are met. Records all non-conformance(s) or dissatisfaction(s) through Corrective Action Report (CAR) form. Coordinates the routine of internal quality audit activities, documentation results and distributes audit reports to all Discipline Lead Engineers. Assists the Discipline Lead Engineer and the Project Engineer for the control of non-conforming product until the deficiency or unsatisfactory condition has been corrected.

Verifies the implementation of solutions in CAR. Completes follow up audits to verify that corrective action has been made and close-out. Determines COMPANY satisfaction and dissatisfaction when necessary;

- Processes COMPANY feedback and implement actions. Ensures awareness of COMPANY requirements. Continually monitor and measure the COMPANY's perception of whether ENGINEERING SUB-CONTRACTOR is meeting the requirements.

10.2.6 Designers

Designers shall be responsible for developing the drawings/documents under the guidance of lead designers. They shall develop the drawings based on the input provided by lead.

10.2.7 Document Controller

- Document controller is responsible for receiving and recording of EPC CONTRACTOR & COMPANY provided documents / drawings including in-house generated documents/ drawings.
- Control on issuance of documents / drawing numbers, including maintenance of proper register.
- Records engineering interface Technical Queries (TQ) in collaboration with Project Engineering Manager.

DCA?

11. DOCUMENT AND DATA MANAGEMENT

11.1 DOCUMENT / DRAWING SUBMISSION

- All drawings and documents produced by each discipline of the ENGINEERING SUB-CONTRACTOR will be subjected to Self-Discipline Checks (SDC), all multi-discipline drawings and documents will be subjected to Inter-Discipline Checks (IDC) based on the IDC matrix.
- IDC matrix will be prepared and maintained in project drive as a guideline to be followed for each ENGINEERING SUB-CONTRACTOR deliverable.
- LDE's are responsible to ensure that the deliverables have gone through the process of SDC and IDC before sending it to document controller (DC) for issuing. LDE's are responsible to ensure that the comments received during the SDC or IDC process have been incorporated.

and

- In case of any deliverable is reviewed in a joint meeting of all disciplines such as plot plan & P&ID's review etc, LDE should maintain a marked copy to record all comments made during such joint meetings. No IDC sheet is required in such cases. Refer Appendix-3 for Check print stamps.

Not acceptable. IDC is required Plot plan and P&IDs being critical documents.

Please include and explain the requirement of self-check and discipline check by Lead or nominated checker

- Lead QA/QC Manager shall be responsible to ensure that the requirements of QMS are implemented and maintained & shall Conducts engineering audits periodically to ensure all project specific requirements are met. He shall Records all non-conformance(s) or dissatisfaction(s) through Corrective Action Report (CAR) form; Completes follow up audits to verify that corrective action has been made and close-out.
- All drawings/documents will be signed by originator (as prepared), Checkers (as checked) and by Project Engineering Manager (as approved), further it will be approved by QA/QC and Project Manager before submitting to the COMPANY.

As EPC Contractor, all documents shall be signed by RSME team as well.

11.2 ISSUE OF DOCUMENTS

11.2.1 ENGINEERING SUB-CONTRACTOR Documents & Drawings

- The document and drawing format (shall) to be used for this project is based COMPANY formats provided.

11.2.2 Review and Approval by EPC CONTRACTOR

- ENGINEERING SUB-CONTRACTOR shall issue all deliverables to EPC CONTRACTOR through Document Transmittal. EPC CONTRACTOR's engineering coordinator with the help of discipline engineers shall review the documents on selective basis and returned to ENGINEERING SUB-CONTRACTOR with their comments. ENGINEERING SUB-CONTRACTOR shall issue the deliverables after incorporating the EPC CONTRACTOR comments and EPC CONTRACTOR shall issue the deliverables to COMPANY.

Time period for EPC review for each rev and Engg Subcon also to be updated

11.2.3 Review and Approval by COMPANY

- All deliverables shall be issued to COMPANY through EPC CONTRACTOR for COMPANY review. COMPANY shall return the documents along with their comments within fifteen (15) working days.
- COMPANY shall send the comments on a "Document Drawing Review Sheet" along with the native file of the comments sheet. DC will receive the comments along with Document Drawing Review Sheet (native files) through EPC CONTRACTOR, which shall be distributed to the respective Lead engineer by DC. Soft copy of all comments shall be maintained by DC at an appropriate location.
- SUB-CONTRATOR shall use "Document Drawing Review Sheet" received from COMPANY and prepare a Comments Resolution Sheet (CRS) with their replies against each point to address the COMPANY comments. The CRS along with the revised deliverable shall be submitted to COMPANY.
- Following codes shall be followed by COMPANY while forwarding comments

Company will provide the comments on the document / drawing itself. EPC Contractor shall compile and prepare the Comment Resolution sheet.

- Code 1 – Rejected
- Code 2 – Approved with comments
- Code 3 – Approved
- Code 4 – For Information

- Lead Engineers shall indicate the hold points (from) in the design, if any, in their document / drawing before the documents/drawings are issued for IFC.

11.3 DOCUMENTS NUMBERING & REVISION CONTROL

- The Engineering document/drawing numbering and tag numbering shall be as per ADNOC GAS Engineering Procedure, Drawing and Document Numbering System.

Add procedure no. here...

11.4 ENGINEERING DOCUMENT DELIVERABLES REGISTER (EDDR)

- The Engineering Document Deliverables Register shall be prepared for all engineering deliverables prepared by ENGINEERING SUB-CONTRACTOR. This will indicate the COMPANY document numbers, revisions numbers and date of Issue/Actual, forecast etc.
- Refer to Comprehensive Project Document List for all deliverables mentioned in EDDR, it is the responsibility of the individual Engineer/ Sr. Engineer or Designer to check first the correct document number written on the documents/drawings as mentioned in the EDDR.
- Responsibility of maintaining a latest EDDR copy shall be with ENGINEERING SUB-CONTRACTOR Planning Engineer.
- In case of any changes to be made in the EDDR with respect to naming of the document, number of sheets, drawings Title etc, concerned engineer shall inform by email about the change to Planning engineer who will make necessary changes and inform to document controller.
- Planning Engineer shall ensure that the EDDR copy is circulated to all disciplines after updating.

11.5 TRANSMITTALS

- Transmittals will be used to transfer PROJECT documents and drawings.

11.6 PROGRESS REPORTING

- Progress Reports will be prepared on weekly and monthly basis and all such reports will be issued to EPC CONTRACTOR via Transmittal.

11.7 WEEKLY PROGRESS REPORT

- The draft of the weekly progress report will be submitted to EPC CONTRACTOR representative by every Wednesday of the following week. The cut off day for the weekly report will be Friday of every week. If Monday is a non-working day, the report shall be submitted on the next working day.

11.8 MONTHLY PROGRESS REPORT

- The Cut-off date for monthly report shall be last Friday of every month. Monthly report shall be submitted to EPC CONTRACTOR not later than 10th of every month.

11.9 MEETINGS

- The following meetings will be carried out regularly during the entire duration of the PROJECT and keep the PROJECT list updated:

11.9.1 Monthly Management Meetings

- A Monthly Progress review meeting between key members of the EPC CONTRACTOR and ENGINEERING SUB-CONTRACTOR will be held within 1 week after the submission of Monthly Progress report via face to face or via MS team to review the PROJECT status and identify any corrective actions. A detailed agenda with relevant Project Action List will be provided one day before the meeting for EPC CONTRACTOR's review and information.

11.9.2 Weekly Management Meetings

- A Weekly Progress review meeting between EPC CONTRACTOR and ENGINEERING SUB-CONTRACTOR for status and identify corrective actions required.

11.9.3 Technical Meetings

- Technical meetings will be held as dee
  a smooth execution of the PROJECT.

Also add - Weekly Engineering Review meeting:
Weekly Engineering Review meeting between EPC Contractor and Company to be held to review the status of engineering and identify the actions required.

11.10 HSE

- The governing HSE regulations on the project shall be as per COMPANY HSE rules and

regulation as mentioned in Project HSE Plan.

11.11 QUALITY

- AVENIR quality management system (QMS) is ISO 9001-2015 certified and will enhance the control product and service quality, to better monitor and improve process capability, and to meet CLIENT requirements and expectations the first time.
- The quality manual and procedures establish QC organization structure and responsibilities, training requirements, documentation procedures, ENGINEERING SUB-CONTRACTOR oversight, inspection systems, auditing processes, performance metrics, management review, corrective and actions and continuous improvement processes for better delivery of products and services to our CLIENTS.

SDC/IDC

- The Quality Management System implemented on this project will be in accordance with the COMPANY requirements defined in COMPANY quality requirements and AVENIR's quality management system. A project Engineering quality plan is prepared to establish the quality management system. Engineering shall follow Engineering Quality Plan and ensure effective implementation of Project QMS.
- Engineering shall follow Engineering Quality Plan and ensure effective implementation of Project QMS.

11.12 ENGINEERING AND DRAFTING

- The Lead Discipline Engineers will be directly responsible for the quality, efficiency and integrity of the work provided by their respective disciplines.
- All technical documentation will be reviewed and verified for technical compliance by the discipline engineers before they are issued to COMPANY for review or approval.

11.13 DRAWINGS / DOCUMENT REVIEWS

- Documents / Drawings will be issued to COMPANY through EPC CONTRACTOR as per the Engineering Design Deliverables Register (EDDR) and Schedule. This will be reviewed by COMPANY and any comments will be checked & incorporated.

Evidence of review/checking of Avenir documents by RSME engineers shall be maintained and made available if requested by Company engineers.

12. APPENDICES

12.1 Appendix 1. – SCOPE MATRIX

Workshare / scope matrix between EPC Contractor and Engineering Sub-Contractor for each Discipline shall be prepared and included here.

Scope Matrix

Description	EPC CONTRACTOR	ENGINEERING SUB-CONTRACTOR	Remarks
Overall Project management	✓		As EPC Contractor, RSME is responsible for overall Engineering and managment
Engineering Project management	✓	✓	
Planning	✓	✓	For Engineering activities by ENGINEERING SUB-CONTRACTOR (Includes weekly basis, look ahead plan, recovery plan, and any other reports as requested by EPC CONTRACTOR/COMPANY shall be in ENGINEERING SUB-CONTRACTOR scope)
EDDR		✓	
Engineering Execution plan		✓	
Engr. Progress reporting (Weekly/Monthly)		✓	
Interface with other projects	✓		
Procurement Support	✓	??	ENGINEERING SUB-CONTRACTOR shall perform all vendor offer review, MR, TBE
Coordination with vendors	✓		ENGINEERING SUB-CONTRACTOR shall attend the technical meetings only through online or ENGINEERING SUB-CONTRACTOR Abu Dhabi facilities

CONTRACTOR should be responsible

Provide discipline wise work matrix between contractor and sub contractor

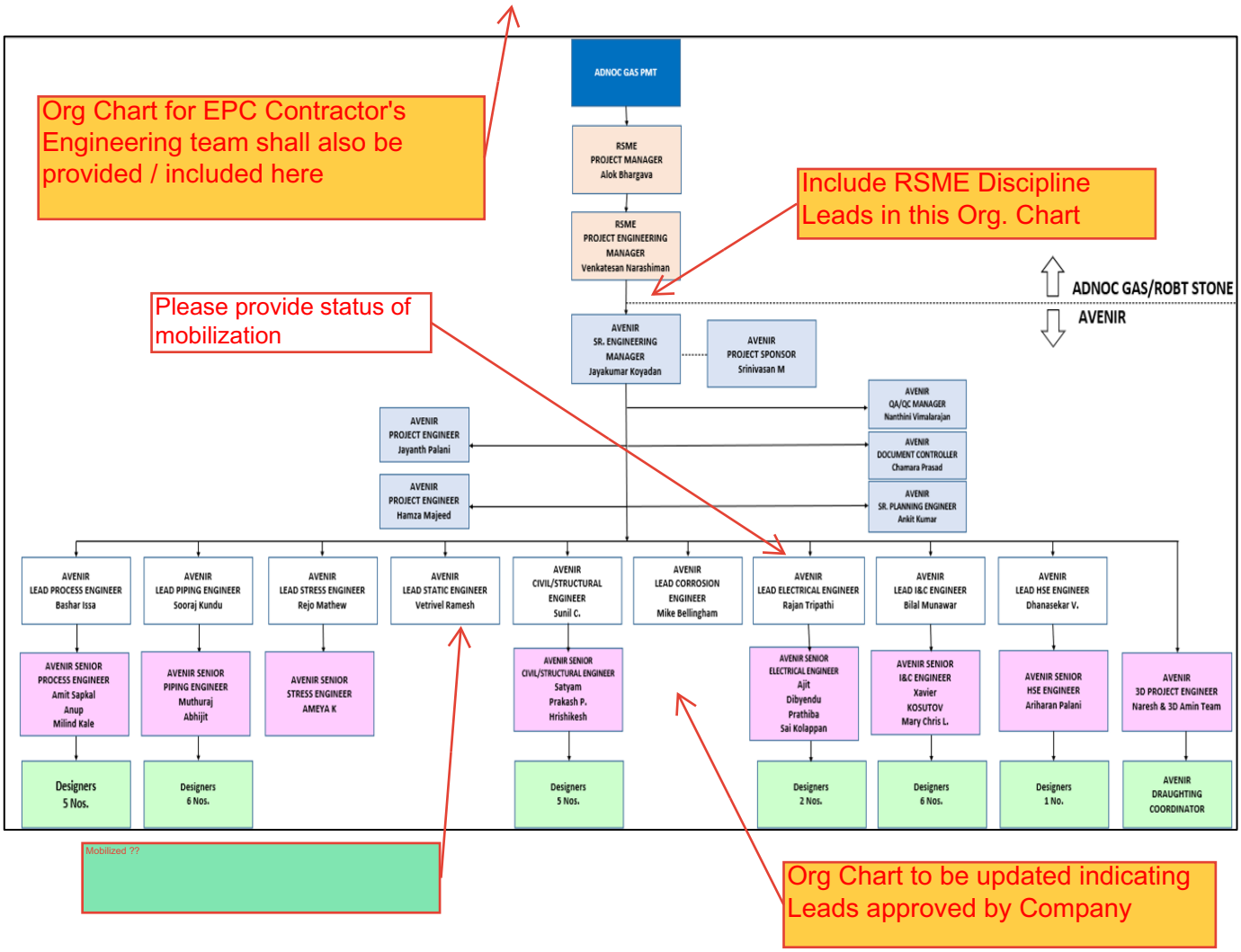
Include site survey data retrival, base drawing collection include accordingly

What is scope split of FAT, Inspection & Testing participation of Engineers and Engg support for Construction & commissioning

Topographical survey, Geotechnical survey, Cathodic protection	✓		ENGINEERING SUB-CONTRACTOR shall prepare the SOW & perform the review of vendor package

Many items are missing in this matrix eg. Material Procurement, Vendor Drawing Review, Site Visits, 3D Modelling, 3D model administration, Engineering documents, etc.

12.2 Appendix 2. – ENGINEERING SUB-CONTRACTOR ORGANIZATION CHART



12.3 Appendix 3. – STAMPS FOR CHECK PRINTS

SELF DISCIPLINE CHECK (SDC)

AVENIR
CHECK PRINT

DISTRIBUTION	SIGN	DATE
ORIGINATOR		
CHECKED BY		
BACK DRAFT		
BACK CHECK		
APPROVED BY		

INTER-DISCIPLINE CHECK (IDC)

AVENIR
INTERDISCIPLINE CHECK

SEQUENTIAL ACTIVITY ☐	PARALLEL ACTIVITY ☐		
DISTRIBUTION	REQ.	SIGN	DATE
IDC ISSUED BY			
PROCESS			
PIPING			
PIPELINE			
MECHANICAL			
CIVIL/STRUCTURAL			
ELECTRICAL			
INSTRUMENT			
TELECOMMUNICATION			
MATERIAL/CORROSION			
HSE			
QA/QC			
PROJECTS			
TO BE COMPLETED BY			