Base Load Power Hub (BLPH)

CONSTRUCTION READINESS REPORT APPROVED FOR CONSTRUCTION REPORT

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 PROJECT LOCATION

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

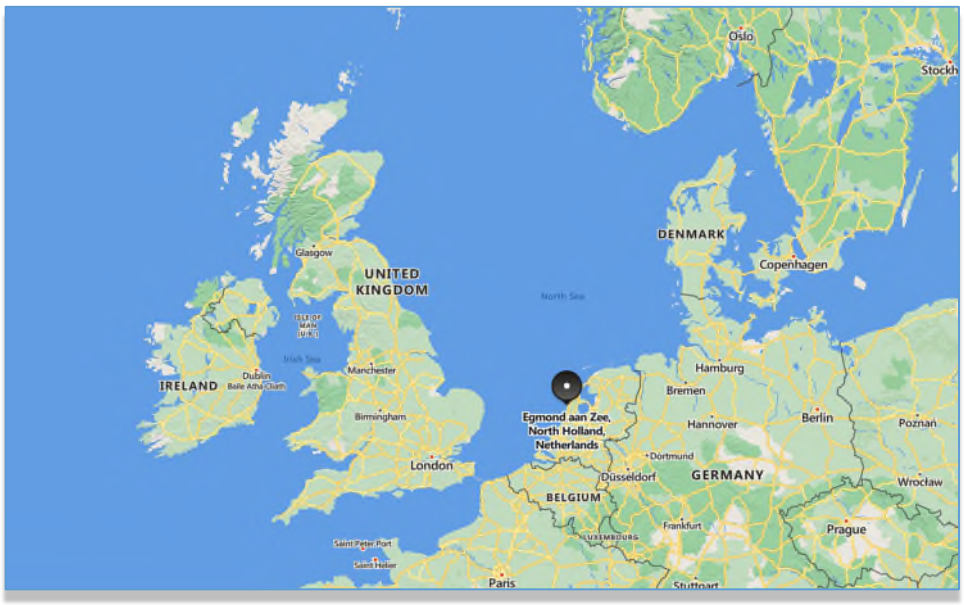


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

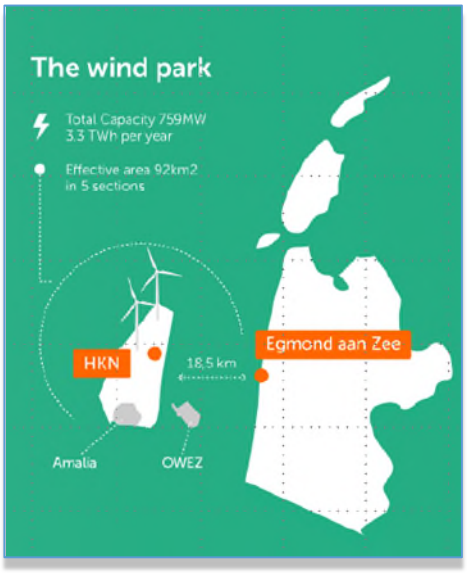


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 PROJECT CONCEPT

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

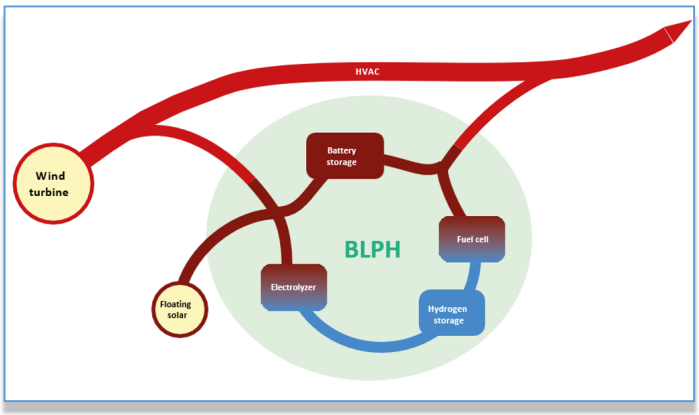


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

Scope of the Construction Readiness Report (CRR) is to identify and define the main activities required prior the starting date of same activity planned during the construction phase from all the main disciplines part of the project as Project Management Team, Fabrication, Project Control, Procurement, Logistic and Materials, Safety and Quality. Engineering is not mentioned but is capture transversally across all discipline mentioned above.

The main reference to support the Construction Readiness Report is the CONSTRUCTION READINESS REVIEW MATRIX where thru dedicated workshop between CTR and CPY are evaluating the status for each gate foreseen.

The STATUS is divided in G (Green) when description as completed, Y (Yellow) when it is ongoing and R (Red) when description is not yet started.

The GATES identified are 4, one for each major "start-up" dates in the project as below:

Construction Gate Timing

Gate 1 → Items required for Prefab Start up [16 November '23]

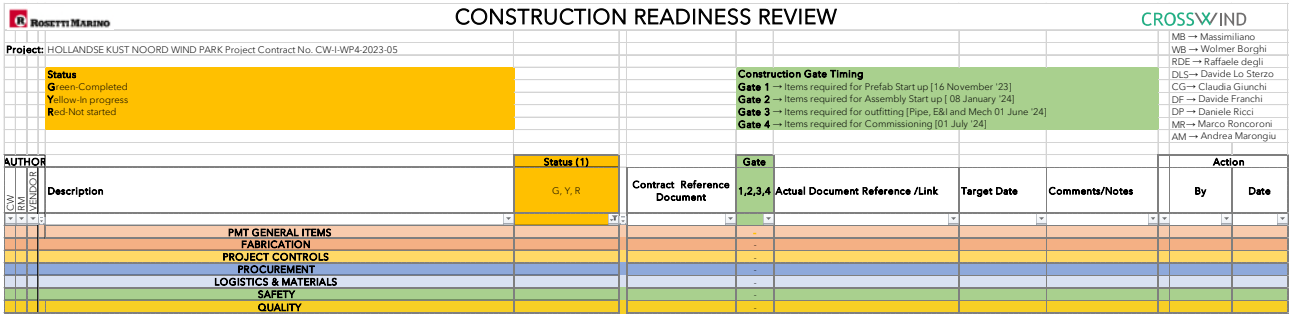
Gate 2 → Items required for Assembly Start up [08 January '24]

Gate 3 → Items required for outfitting [Pipe, E&I and Mech 01 June '24]

Gate 4 → Items required for Commissioning [01 July '24]

Construction Readiness Review (CRR) will be the master document to how review the Construction Readiness Report in details for all gates defined and part of the project.

Here below the "mask" used during the WorkShop, where all the descriptions are collected.



ROSETTI MARINO — CONSTRUCTION READINESS REVIEW — CROSSWIND

Project: HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05

Status
Green-Completed
Yellow-In progress
Red-Not started

Construction Gate Timing
Gate 1 → Items required for Prefab Start up [16 November '23]
Gate 2 → Items required for Assembly Start up [08 January '24]
Gate 3 → Items required for outfitting [Pipe, E&I and Mech 01 June '24]
Gate 4 → Items required for Commissioning [01 July '24]

MB → Massimiliano
WB → Wolmer Borghi
RDE → Raffaele degli
DLS→ Davide Lo Sterzo
CG→ Claudia Giunchi
DF → Davide Franchi
DP → Daniele Ricci
MR→ Marco Roncoroni
AM → Andrea Marongiu

AUTHOR CW / RM / WINDOR	Description	Status (1) G, Y, R	Contract Reference Document	Gate 1,2,3,4	Actual Document Reference /Link	Target Date	Comments/Notes	Action By	Action Date
	PMT GENERAL ITEMS								
	FABRICATION								
	PROJECT CONTROLS								
	PROCUREMENT								
	LOGISTICS & MATERIALS								
	SAFETY								
	QUALITY								

2.1 REFERENCES

Doc. No.	Description
123A90- PML-PM-PL-00001	Project Execution Plan
123A90-PML-CON-PL-4000	Construction Execution Plan

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

3 ROLES AND RESPONSIBILITIES

The CONTRACTOR herein identifies the Project's key persons that will be part of the Project Management Team (hereinafter PMT) and that will be the principal responsible for the success of the Project.

3.1 Project Manager

The CONTRACTOR's Project Manager has direct line responsibility for the safe and timely performance of all WORKS under the Contract in accordance with the applicable specifications.

The Project Manager responsibilities include but are not limited to:

Continuous management, reporting and control of the Works in accordance with the

Project Execution Plan and all other requirements of the Contract.

Interface with the other Company's contractors involved in the Project.

Contractor internal coordination between Contractor departments involved in the Project execution.

Contractor management and coordination of all its subcontractors and vendors providing services and/or materials for the Project.

Implementation of an effective Quality Management System in accordance with the requirements of the Contract.

Implementation of an effective Health, Safety & Environmental Management System in accordance with the requirements of the Contract.

Encourages co-operation organization within his organisation and towards the other functions and Group Companies.

3.2 Project Control Manager

The CONTRACTOR's Project Control Manager is responsible to guarantee a high level of Project Control by way of effective planning using various established techniques, proper monitoring of the various activities through controlled feedback and predefined communication procedures, with the purpose of improving the latest development techniques.

The aim of the Project Control function is to monitor all identified Project targets within pre-defined limits of the schedule, budget costs and quality and inform the management about its current status and expected development.

The mission and responsibilities of the Project Control Manager are, but not limited to:

Draw Project weekly and monthly reports

Collect progress documents related subcontracting activities

Control work progress status reports

Take part and co-operate with the Project Manager in the arrangement of the Kick-off meeting

Co-operate with the Project Manager as to the preparation of Project initial plans, as far as the following is concerned:

Initial planning;

Procurement Plan;

Take part in the most significant project meetings

Propose and arrange possible re-scheduling upon instruction of the Project Manager

Co-operate with the Project Manager in preparing the Close-Out Report

Prepare the Work Packages considering the relevant physical quantities involved, and gather the progress data to fill in Work Packages.

A dedicated Project Control Plan will be issued in order to define a consistent method of planning, measuring and reporting work progress in line with CLIENT project control management.

3.3 Project Quality Manager

The CONTRACTOR's Project Quality Manager and its Team are fully committed to:

Ensure that the Quality System procedures and all the documents issued are in compliance with the project;

Ensure that the organization on-site complies with the Quality System and the project;

Prepare the Project Quality Plan and the quality related project procedures and work instructions.

Liaise with the Client and subcontractors, together with the Project Manager as to all quality-related aspects.

Prepare and/or to verify the quality-related documents to be included in the material requisition of supply.

Verify, comment and approve supplier's quality-related documents.

Develop an internal audits plan as well as a plan of eventual audits to be carried out on the main Project Processes and at subcontractors' and vendors' premises.

Verify that the Quality Plan is implemented and effective in all the work sites.

Request any possible corrective actions; follow the relevant implementation by cooperating with the Project Manager (PM) and the Project Engineering Manager (PEM) in the resolution of contractual nonconformities, deviation and concession requests.

Handle the project quality control reporting to the PM, highlighting criticalities whenever quality-related problems arise.

Verify, during the different work phases, the execution of inspections as required by the ITP.

Interface with and supervise the quality control inspectors' activities both at yard and at vendors' and subcontractors' premises.

Co-ordinate, all the activities needed for products final testing.

Liaise with the Client Quality Rep, Inspectors, the CVA (Certified Verification Agent) as to all Quality Assurance and Quality Control-related activities.

Ensure that Client's Inspectors, the CVA Representatives are duly notified in advance to witness those specific operations and test according to the approved Inspection and Test Plans.

Make sure that the quality record books and the final dossier are prepared in compliance with the project requirements and the corporate standard.

3.4 Project HSE Manager

The CONTRACTOR's Project HSE Manager and its Team are fully committed to:

Facilitate implementation of the Project HSE plans, project specific procedures and to revise them when necessary.

Identify and evaluate risks and propose preventive measures.

Review and approve Subcontractors HSE plans when such plans must comply with the Project HSE plan; perform Subcontractors HSE audits and inspections.

Ensure HSE program is comprehensive and effective in communication of hazards and preventive measures to be taken to ensure safe construction and actions to be taken in an emergency.

Review the organization and implementation of information and training on HSE relative to the site activities (such as toolbox talks, work permits etc.).

Supervise the installation in respect of all safety and environmental protection measures.

Ensure regular monitoring and inspections to detect potential hazards.

Stop any work whose execution is deemed dangerous or likely to imperil the health and safety of personnel.

Perform reporting and investigation (or assist with) of accidents, incidents and near misses and ensure that all accidents, incidents, and near misses are reported.

Maintain records of all accident reports and investigations on site and monitor remedial actions being implemented because of accident investigation.

Participate in the weekly coordination meetings with all construction supervisory staff and subcontractors representatives to discuss safety.

Conduct the induction meeting for all new employees (including subcontractors).

3.5 Project Engineering Manager

The CONTRACTOR's Project Engineering Manager will be responsible of the design of the Project.

Project Engineering Manager will be responsible to ensure all project needs are effectively and timely and result in a pro-active and added value cooperation to confirm an integrated engineering team.

Unless agreed otherwise, Project Engineering Manager is the point of contact for CLIENT and all other contractors and/or third parties selected by CLIENT for all kind of engineering support is may needed.

The CONTRACTOR's Project Engineering Manager and its Team are fully committed to:

Manage the scope of contract relevant to Engineering, ensuring the performance of the activities in compliance with contractual and legal requirements, engineering best practices, timing, QHSE requirements and budget.

Ensure the respect of the global engineering budget, to manage with the support of Engineering Project Controlling, the definition of the estimation to completion and to verify the correct structure of the engineering team workforce; to report promptly any potential gap from the budget, suggesting corrective actions to the Project Manager.

To promote alternative technical solutions that can generate advantages for both CLIENT and CONTRACTOR.

Co-ordinate the resources in the execution of the Engineering and to manage the relationship with Client and other external parties; to ensure the integration with other services/department involved to the Project;

Ensure the management and the approval of incoming and outgoing engineering documentation, and to co-ordinate the Document Controller in filing, communication and transmission to the personnel involved, keeping proper records through documents lists;

Ensure and co-ordinate design review, verification and validation CONTRACTOR's Project Engineering Manager liaise with CONTRACTOR's Construction Manager and CONTRACTOR's Q-HSE Manager to guarantee the best in class services in full respect of the Q-HSE rules.

The Project Engineering Team shall support the Construction Team during fabrication, construction, mechanical completion and commissioning phases.

The main objectives of the Project Engineering Teams are:

Assess CLIENT documentation and/or perform a site survey to understand the existing scenario

Define the engineering requirements prior to commencing the fabrication works

Define the assembly areas, assembly sequences, lifting and handling Engineering, load out studies, and erection

Develop the standards, procedures, and method statements to perform the fabrication Activities

Develop all documentation to perform the fabrication activities, i.e.

- Workshop spools drawings, structural drawings, piping supports, shop drawings, piping isometrics
- calculations; structural analyses; stress analyses
- pre-fabrication feasibility and piping assembly;
- Constructability and erection sequence
- Load-out and transportation and installation requirements;

Issue as-built documentation

Support the Project Team during the process for selection of the best sub-contractors for fabrication activities

Support the Project Manager, the PQM, and the Construction Manager in solving nonconformities identified during the construction phase proposing and carrying out suitable actions for their resolution

Encourage cooperation and teamwork within his organization and towards the other functions and Group Companies

The CONTRACTOR's Project Engineering Manager shall also manage changes and shall be involved timely in the decision-making process.

3.6 Project Procurement Manager

The CONTRACTOR's Project Procurement Manager and its Team will be responsible of the Procurement activities for the Project.

The CONTRACTOR's Project Procurement Manager and its Team are fully committed to:

Collaborate with the Project Manager based on contractual requirements of the Clients, in elaborating the project procedures and project documents (Purchase Order and other forms) that are needed to manage the procurement activities, in compliance with the project requirements;

Prepare the project's vendor list, interacting with the Suppliers Qualification & Evaluation Function, starting from the contractual vendor list. Submit it to the Project Manager and to the Procurement Manager for approval;

Ensure the execution of the criticality rating process for materials by collaborating with the Project Team Members according to their responsibilities;

Collaborate with the Project Team in defining the strategy and planning of the procurement activities taking part in the compiling of the relative works program (Project Procurement Plan and Contract Master Schedule). Prepare, with the collaboration of functional responsible, the estimation of necessary man-hours for procurement, subcontracting, expediting and logistic activities, submitting them to Procurement & Logistics Service Director;

Collaborate in the elaboration of the Subcontracting Plan supporting the Project Team (especially PEM and CM) in the definition of the main subcontracts and acting as an interface with the Subcontract Responsible with regard to PO issuing, criticalities and budgets.

Collaborate with the Project Manager and PCM in defining the Project Budget for material purchasing and Procurement, subcontracting, expediting and logistics activities (manhours).

Act as interface, within the Project Team, with the Procurement & Logistics Service and the relative Functions, for the coordination of all procurement activities (from the issue of Material Requisition up to the delivery at site) notifying the Project Manager about possible criticalities and proposing alternative solutions;

Monitor and approve the issuing of the project Request for Quotation on Athena and sign the final Economical Bid Evaluation, before submitting them to the PM for approval;

Support the Project Manager during Project Coordination Meetings with the Client acting as an interface for all the aspects related to Procurement;

Giving priority to the management activities, can cover also the role of buyer. In this case, the final EBE relevant to those bids that have been followed by him, shall be signed by the Procurement Manager.

Collaborate with the Project Manager in compiling claims and/or formulating proposals relevant to the variations to be submitted to the Client, for all the aspects that concern procurements, subcontracting, expediting and logistic, in collaboration with the Procurement & Logistics Service Functional Managers, if needed;

Collaborate with the Procurement Manager and Project Manager in defining strategies to manage the relationship with project suppliers in terms of changes to the order, penalties on deliveries, possible charges to supplies, resolution of controversies.

Ensure the updating of the Project Procurement Plan/Subcontracting Plan by collecting information about criticalities and delays from suppliers and other Team Members;

Monitor and solicit the progress of the bidding phase, ensuring the transmission of the information to the Project Team and helping in re-planning the activities when needed;

Monitor and solicit the expediting activities, ensuring the transmission of the information to the Project Team and helping in re-planning the activities when needed;

Revise the estimation for the Procurement & Logistic Service man-hours, submitting them to the Procurement & Logistic Director and to the PM and PCM, on monthly bases;

Support the Project Manager in the compilation of the Close Out Report.

3.7 Construction Manager

The CONTRACTOR's Construction Manager will direct, coordinate and control all construction activities related to the project, according to CLIENT rules, corporate standards and contractual conditions as far as Quality and HSE are concerned and to ensure that scheduled targets relevant to delivery terms and costs are met.

The mission and responsibilities of the Construction Manager are but not limited to:

Liaise with CLIENT's organization at yard as to aspects related to construction activities and to keep the PM informed

Supervise the construction activities, carried out both from internal staff and subcontractors, ensuring the coordination among prefabrication, erection, commissioning, yard logistic, guaranteeing an efficient and effective use of human resources and equipment given to him;

Verify that workers employed by both the Company and any Subcontractor are informed and trained in order to carry out the jobs in a safety way

Monitor the Construction progress, informing permanently the Project Manager upon it, upon the possible problems detected and to propose preventive, corrective and improvement actions

Support the Project Manager and the PQM in solving non-conformities identified during construction phase proposing and carrying out suitable actions for their resolution

Co-operate with Company HSE Function in the implementation of Company HSE-related rules

Implementation of an effective Quality Management System in accordance with the requirements of the Contract

Implementation of an effective Health, Safety & Environmental Management System in accordance with the requirements of the Contract

3.8 Project Commissioning Manager

The CONTRACTOR's Project Commissioning Manager and its Team, are fully committed to:

Take part, during the Project Execution Plan drafting phase, in the definition of the Project strategy, by becoming the reference as to all the aspects related to Mechanical Completion, Precommissioning and Commissioning activities;

Arrange, together with the Project Team, the Project overall planning as to every aspect dealing with Mechanical Completion, Precommissioning and Commissioning activities;

Prepare, together with Project Specialist Leaders, subcontract specifications by defining the scope of work of the different companies as to Mechanical Completion, Precommissioning and Commissioning activities;

Prepare, together with the Project Engineering Manager, the Design Documents List of documents related to Mechanical Completion and Commissioning activities, including the definition of the relevant milestones;

Define the plan and sequences of commissioning activities, by identifying internal and/or external resources (contracting companies and Vendors' personnel) and/or assets necessary for the execution of activities in compliance with contractual requirements and with the project plan;

Define, together with the Project Engineering Manager, the list of critical supplies for which the Commissioning Manager is required to witness the Factory Acceptance Test;

Take part in engineering, either developed internally or supplied by Client, from the very first steps, by liaising with the Project Engineering Manager and the Engineering Service as to explanations, changes and/or optimizations aimed at the definition of increasingly correct commissioning sequences;

Take part in Constructability Meetings so as to highlight, since the very first stages of the Project up to the construction phase, the obligations to be fulfilled as to commissioning activities, in order to optimize activities themselves, prevent any operational problems and foster a safe execution; said obligations shall be acknowledged starting from the engineering phases;

Define, together with Project Specialist Leaders, the list of materials needed for the execution of commissioning activities, and to prepare the relevant purchase request in accordance with the commissioning activities schedule;

Support, from a technical/operational and HSE point of view, the Construction Manager during Mechanical Completion, Pre-commissioning and Commissioning activities, by previously notifying any possible criticalities;

Keep informed, with the support of the Construction Manager, the Project Engineering Manager and/or the Project Specialist Leader of the Engineering Service as to any technical issues possibly arising;

Co-operate with the Project Quality Manager in liaising with the Client, by becoming the main technical reference as to all Commissioning-related and product performance problems;

Prepare the Close Out Report, with reference to the Mechanical Completion,

Pre-commissioning and Commissioning sections, by cooperating with the Project Quality Manager and the Construction Manager.

3.9 Project Interface Manager

The CONTRACTOR will appoint a Project Interface Manager to facilitate and improve the communication with Client and all other Contractors selected by Client as well as third parties involved into the Project.

The mission and responsibilities of the Project Interface Manager are but not limited to:

Develop the Project Interface Management Plan

Play an active role in managing and keeping updated the interface management tools

Support the Project Manager to identify the map of the stakeholders and the associated communication workflow

Define, communicate and monitor the communication work process and tools to the CONTRACTOR's Project Team and the Project's stakeholders to ensure a fair, active and effective communication

Avoid potential disputes between various project stakeholders.

Provide an escalation route for issues that cannot be closed between the direct parties involved.

Highlight any potential implications of interface issues such as schedule delays etc. to the Project Management team.

Reduce risk by minimizing the possibility of miscommunication along with use of incorrect data and assumptions.

Provide a tracking and recording mechanism for Issues occurs and help ensure a robust audit trail for the Project.

3.10 Onboarding new project team members

The integration process of new project team members is considered of primary importance to the CONTRACTOR. CONTRACTOR shall implement a new team member induction program for each execution site and phase. The induction program is an important process for bringing staff into an organization. Personnel introduction includes information on the working environment and the set-up of the employee within the organization and will include the following:

A safety briefing, including: office layout and facilities local to place of work, Medical emergency, evacuation, environmental and Hazard and near miss reporting;

introduction to project team members – CONTRACTOR's, Principle Subcontractor's and Company personnel as necessary;

Project briefing: Scope of Work, project status, IT systems, etc.

4 MECHANICAL COMPLETION, PRE-COMMISSIONING, COMMISSIONING

This section defines the strategy to plan and execute successful the Mechanical Completion and Pre-Commissioning activities.

A key objective is the safe and efficient planning and execution of the activities, including the process of handing over the completed assets to the operator with the assurance of technical integrity and full operation ability after Commissioning.

The main objective is to maximize onshore Mechanical Completion, Pre-Commissioning and punch list closure and leaving only minimal necessary for hook up phase. To achieve that, it is mandatory to establish an interface and excellent interaction between Engineering, Construction, Commissioning and Operations.

Meeting schedule will be defined with occurrences relative to project phase and criticality. The Pre-Commissioning Team will prepare and issue the minutes of interface meetings for all the interfaces that will be held on the Project (Conference calls and face to face meetings).

4.1 BOUNDARIES

4.1.1 MECHANICAL COMPLETION

This is the verification of the construction phase. Completion is the process used to log and record the technical data and verification information for equipment and plant that will be pre-commissioned and commissioned.

It is the inspection and testing of the workmanship to prove and validate the complete and correct execution of the construction in accordance with the scope and specification for the work. It is documented by the completion of the check sheets. These work instructions define the mechanical completion testing and inspections to be undertaken, depending upon the equipment items contained within a system/sub-system.

The Discipline Acceptance Certificates (DAC) and the System/Sub-system Completion Certificate, with associated punch list and outstanding work list, will be raised by the Construction Manager with verification of QC inspector.

It is commissioning representative responsibility to accept the subsystem and transfer if from construction into commissioning.

4.1.2 PRE-COMMISSIONING

This is the activity to prove and validate the correct functionality of equipment. The nature of the testing to be undertaken is defined on a series of check sheets, with each item of equipment having a number of tests identified against it.

The Pre-Commissioning Certificate, and associated punch list, will be raised by the commissioning representative with verification by the QC inspector.

It will be responsibility of the CONTRACTOR Commissioning Manager issues for each system or subsystem the RFCC.

4.1.3 COMMISSIONING

Commissioning covers the testing and verification activities carried out to ensure that equipment and systems perform in accordance with specified requirements, bringing them safely into operation. Aim of Commissioning is to verify dynamically the functionality of the equipment and facilities by bringing grouped systems/sub-systems into operation in readiness for handover to the operations group.

Furthermore, the commissioning team is responsible for undertaking all preparation and execution of Commissioning scope of work. Commissioning team will be responsible for the successful Handover of all systems and sub-systems to the COMPANY. It will be responsibility of the CONTRACTOR Commissioning Manager asking for Company signature of the relevant RFSUC.

Scope of commissioning is constantly reviewed and challenged where necessary, in order to keep a clear focus on the overall project in accordance with the project schedule.

5 ATTACHMENTS

5.1 Construction Readiness Review 1, Already held last 7th November 2023

5.2 Construction Readiness Review 2, Planned on beginning of January 2024

5.3 Construction Readiness Review 3, Planned on beginning of June 2024

5.4 Construction Readiness Review 4, Planned on beginning of July 2024