2 Summary

The Operations Implementation Plan for the Operations Team is designed on the basis of clear and concise Operational activities. The plan will provide an overview and summary of all the activities that need to be done prior to the production and transfer of RLNG to ensure a successful commissioning, start-up and initial operation of the facility. The main activities of the Operations Team are:

- Assist TEPL RLNG Construction Team and EPC Contractor in the commissioning and start-up of the facility;
- Receive RLNG from FSRU;
- Send RLNG to customers via Onshore Receiving Facility (RLNG Metering Facility);
- Load LNG onto FSRU according to an agreed TEPL marketing delivery program;
- Prepare equipment for maintenance and
- Generate electricity for the facility using backup diesel generator in the event the primary electric supply is not available.

This document is developed along the lines of the above identified activities. Focal points and timeline are provided for the development of the procedures that will support the above activities. Attached to this document is the planning schedule of all activities to be carried out as well as the Operations team manning.

3 Introduction

The organizational structure and all procedures and operating instructions will be in place before the commissioning activities at the site begin. This will ensure that there is no discrepancy and misunderstanding of the roles of individuals or various teams and to facilitate training.

Commissioning of the facilities will be the responsibility of the EPC Contractor, along with the TEPL Operations Management Team. Individuals from the Operations Team will work under EPC contractor direction during commissioning and start-up based on Role and Responsibility Matrix plan captured in FEED document. Coordination between the groups will be crucial to the success of the project.

4 Operations Organization

The set-up of the organization of the Operations Team is influenced by the complexity of the facility and the available skill pools. Each section of a shift will operate and be responsible for a distinct section of the site.

Site operations will be split into 2 distinct sections; The Jetty and Onshore Receiving Facility (ORF). During day shift each section would be manned by 2 operations staff, i.e. a Shift Supervisor

responsible for overseeing the operations and an operator. The Shift Supervisor will be responsible for implementing the daily instructions for the operations team during their shift. The Shift Supervisors report to the Operations Superintendent stations either in Head Office Karachi or at site pending operations requirement. During night shift only one operator will be on duty at the jetty and ORF facility.

The Shift Supervisors recruited must have oil and gas manufacturing experience (preferably LNG or RLNG, LNG loading, or Refinery experience). The Shift supervisor will provide the necessary operational expertise on shift during start-up and to direct the on-the-job training effort required to expedite operating knowledge of young Pakistan Operators.

All site operators will receive basic firefighting training and be part of the site firefighting support at the Jetty. At the ORF, Professional firefighters will be called during emergency. In case of fire emergency, the site operators would be the first intervention members to tackle the fire with installed fire protection equipment such as fire extinguishers or fire water provided at the Jetty.

A TEPL Production Planner or Scheduler will be part of the Karachi Operations Team to coordinate and track LNG inventory in the FSRU and production and delivery of RLNG to the customers. The planner will also participate in coordinating shutdown activities of the FSRU, Customers and other gas suppliers in order to provide Annual Delivery Plan (ADP) and monthly gas nomination plan for the customers.

A Marine Superintendent will be part of the Operations Team in TEPL Karachi Head Office. His role is to coordinate the movement of tankers into and out of the RLNG jetty terminal. He will be responsible for administering the assist tugs and support vessels charter (from PQA) or liaising with the TELP Scheduler/Planner for scheduling LNG carriers. PQA Pilots will coordinate with the Marine Superintendent to assist as needed with the piloting the LNG carriers and FSRU for berthing and unberthing operations. Oil spill response activity with PQA, sea front patrol by security and any operations activities that requires movement of ship/work barge will be coordinated by the Marine Superintendent.

Manpower

For the start-up and initial operation period, shift there will be manned by experienced Operators. Each site per shift during day hours there will be manned by 1 Shift Supervisor and 1 Plant Operator. (During night, Jetty and ORF site will only be manned by one site operator and security staff). 24 Pakistani operators will be recruited and join the shift to gain startup experience. Out of these 24 operators, 12 operators must have 7 – 10 years of Oil & Gas, or Refinery, or LNG experience. The rest of 12 recruits can be locals with technical background or high leavers with Physic/Chemistry background at diploma level and with 5 years of oil and gas experience. A 2X12 hour shift system will be utilized. In total, there will be 24 shift staff in rotation. All staff will be undergoing on the Job training (OJT) training and will participate in the commissioning activities. Operations Organization structure will consist of Operations and Maintenance Manager, and reporting to him will be a) Operations Superintendent, b) Planner /Scheduler c) Marine Superintendent.

There will be no differentiation between Jetty or ORF Operators / Supervisor job grade. When the site is mature typically after 3 to 4 years, Jetty operators or Shift Supervisor may be rotated in order to gain experience. Operators. Note: In the event experienced Pakistani Shift Supervisors are not available, expat Shift Supervisors will be recruited.

Emphasis will be placed from start-up onwards on the rapid development of the local Pakistani staff through on-the-job training, and attendance to carefully selected relevant courses.

The organization will gradually change as Pakistani staff replaces expats. It is anticipated that a full transition to the new organization will commence within 3 years after start-up and be complete within a of 3-5-year period.

Local Empowerment

The basic objective for TEPL RLNG is to recruit a Pakistan operator for each position whenever a suitable candidate is identified.

Pakistan has a little oil and gas technically educated workforce but a majority of the population speaks little English. Since RLNG is a technically sophisticated business requiring unique skills, vigorous training efforts for Pakistanis personnel started as soon as site construction activities start. Training effort which includes intensive English language skills, will continue in order to ensure that enough Pakistani staff are trained to replace the expatriates as soon as feasible.

In order to achieve localization in the shortest practical time, Pakistanis who will eventually fill the positions in the mature organization will continue to be recruited prior to and post start-up.

To help in this process and to ensure transfer of technology, it is expected that each and every Pakistani operation staff who is employed to work in the Operations Team will spend some time helping in the commissioning of the facility. The nature of activities during commissioning will be geared towards learning intimately about the RLNG facility, the equipment, and the process. Due to the hands-on nature of commissioning, an individual will gain maximum benefit from this type of training. Experienced operations team members will be required to help train the Pakistani operation staff.

The training received during commissioning will be complemented with further classroom training and on-the-job training to ensure all Pakistanis receive a well-balanced education. This is seen as the most efficient and effective way to impart knowledge in the shortest time possible. The rest will come through experience.

5 Technical Reviews and Studies

The following technical reviews and activities have been done during Prefeed and FEED or will be completed by various members of TEPL staff during EPC phase.

5.1 Operation and Maintainability Review

TEPL project team members will continue to participate in P&ID reviews using 3 D approach during detail engineering design phase completion. Special attention will be paid to operability and maintainability of the equipment and the facilities in general.

5.2 P&ID Review

TEPL project team members will continue to review design modifications to ensure the operability and maintainability of the facilities as part of the Process Safety Management process. One HAZOP review should be carried out during the EPC stage when detail construction is more or less finalized.

5.3 DCS Configuration

A factory acceptance test (FAT) for DCS system, including the Safety Instrumented System (SIS) will be performed in 6-9 months before RFSU. The complete DCS system will be wired and tested at vendor office. Where possible, Operations staff should take part in the review.

5.4 Development of Safety Systems

The EPC Contractor, as part of the detailed engineering activities, has developed a Safety Instrumented System for the facility. This is a standalone system, but is tightly integrated with the distributed control system, to achieve transparency for the operators. The system is designed to prevent uncontrolled loss of containment, to bring the sites to a safe, shutdown condition in case of an emergency, to provide emergency site isolation via HIPPS and depressuring, if necessary, to prevent over-pressurize the equipment/piping during prolonged box-in condition.

5.5 Logistics, Supply of Chemicals and Solids Handling

The EPC Contractor will develop an inventory of site chemicals. This list will form the basis for the sites Chemicals Inventory Worksheet. The Operations Manager will interface with the Procurement to ensure that consumables, chemicals, and lube oils are identified and ordered. A delivery system will also be identified and minimum stock levels and quantities will be entered into the CMMS system to be automatically reordered.

5.6 Pre-Startup Safety Review

The Pre-Startup Safety Review (PSSR) will be conducted to assure that the as-built facilities are in accordance with the design, that safety, operating, and maintenance procedures are in place, and that training of each employee involved in operating the process has been completed.

6 Commissioning Interface

Commissioning starts after Mechanical Completion (MC). At this stage, any discrete plant unit or system within the facility will be handover from the EPC construction department to the EPC commissioning / TEPL startup up group. Post commissioning, "Ready for Start of Operations" (RSO) will be approved by TEPL. All piping, power, control and ancillary systems would have been completed commissioning. Punch list 'B' items have been completed and commissioning procedures have been finalized and approved.

The EPC Contractor's commissioning team along with the TEPL Operations team will prepare and establish the commissioning plans and issue commissioning and operations manuals. The TEPL Operations Team will oversee and review the preparation of manuals and schedules in close cooperation with the EPC Commissioning team.
In preparation for the commissioning and startup of the facilities, a joint Integrated Team for Startup will be headed by EPC Contractor Startup Manager.

Reporting to the Integrated Team for Commissioning and Start-up Team will be the TEPL Operations Superintendent, Shift Supervisors, and Specialists from various TEPL Engineering disciplines. During the startup phase, all staff from TEPL startup team will have dotted line reporting relationship to their TEPL line managers.

EPC is fully responsible for the commissioning and startup of the facilities until handover (FSRU is not under EPC scope). To ensure all sites requirements and safety requirements are met and fulfilled by the EPC contractor during the start-up and initial operations, Operations Department Assurance Team will monitor and report to the TEPL General Manager any gaps reported.

Planning and Procedures for all systems testing and commissioning activities will be discussed and agreed between the EPC contractor and the Operations / Maintenance Team (OMT) well in advance. The EPC contractor will be responsible for all systems testing and commissioning as part of the EPC contract.

During commissioning, the Operations team will provide personnel and technical support to the EPC commissioning team who will execute the many activities identified in the commissioning checklist and commissioning manual. These activities include:

- Air blowing
- Flushing with water and/or nitrogen
- Drying
- Tightness testing
- Functional loop testing

- Simulation runs
- Starting/stopping equipment
- Checks on safeguarding

It is, therefore, expected that the operational staff become fully familiar with all of the above elements.

Just prior to the introduction of natural gas into the Jetty, a strict and comprehensive Safe Work Permit system will be implemented. The EPC Contractor will comply with the TEPL Safe Work Permit system (PTW), which will specify the conditions under which work can be undertaken and stipulates the necessary precautions that need to be taken and enforced. Due to relatively small sites, paper PTW will be used instead.

There will be an interim period of three to four months of site operations between first RLNG production and Facilities Acceptance. The contractor will continue in its leadership role during this Phase and the OMT will progressively take a more active role until Facility Acceptance. At Facility Acceptance, the contractor will pass control of the facility over to Operations. (OMT)

The following procedures and documents are planned to be in place prior to the Commissioning and Start-up of the plant.

6.1 Operations Manuals

The Operations Manual will provide the proposed schedules and procedures for Commissioning activities. It will include recommendations from the EPC Contractors and Vendors for commissioning of major equipment. Appendix 1 show list of Operations Procedures/Work Instructions / Standing Order.

Special procedures for air blowing, pipeline drying, calibration and testing of equipment will be included.

A "FOCUS" commissioning programme (Focus on Commissioning) will be put in place to achieve a "Clean Build" approach and ensure a systematic approach to pre-commissioning and commissioning activities in order to mitigate potential problems inherent in startup process.

6.2 Commissioning Checklists

Commissioning checklists will be prepared for the Operators who are assisting the EPC Contractor to help in the Commissioning activities of the plant.

6.3 Development of Punch lists

Punch lists will be developed by the EPC commissioning team with the assistance of the Operations team. These will ensure that all outstanding work gets completed prior to plant commissioning activities.

6.4 Commissioning HSE Critical Equipment

Certain equipment will have to be operated or "run-in" during the commissioning phase to check on the operability, the integrity of the system and to set the operating parameters. In the Jetty, the Backup Diesel General sets would be put in service to supply power the facility prior to the arrival of FSRU. Diesel fire water pumps and remote operated fire water monitor at the Jetty would be commissioned before the arrival of FSRU.

7 Start-Up

Prior to start-up, certain checks must be performed to confirm that the site (plant) is "fit for purpose" and that the plant has been constructed as per the project documentation, namely the as-built P&ID's and the project specification. A Plant Performance test which includes RLNG unloading Rate Test, and Plant Reliability Test will also be required before Operations will sign off on the plant.

7.1 As-Built Checks

Equipment and piping need to be checked prior to start-up. These checks will incorporate an "as-built" check to ensure that the plant and equipment has been built to the P&ID's and is constructed per the project specification. Any deviation to this will be documented and corrected by the EPC Contractor.

7.2 Performance Testing

Prior to acceptance of the plant by Operations, a performance test will be carried out by EPC contractor and witnessed by Operations. The performance test will need to demonstrate the performance of individual equipment as required by the project specification.

The criterion for testing is specified in the project specification and the testing will be conducted to verify the following:

- The RLNG Deliver Capacity Guarantee
- Backup Diesel Generator performance test
- Diesel fire water performance test
- The supply chain (Sites) Plant Reliability Guarantee

8 Training of Operators in Safeguarding and Integrated Control and Safety System

8.1 Integrated Control and Safety System

During EPC stage, operations team will be involved in Integrated Control System (ICS) graphic design, the panel console set up. During commissioning, operation team will take part in the function test of each ICS that interface with safety system such as Fire Protection, High Integrity Pressure Protection System (HIPPS) at the ORF.

The control system of the plant includes the following main sub-systems:

- Integrated Control and Safety System (ICSS) – Preferably Yokogawa System;
- Safety Interlock System (SIS)
- Emergency Shutdown System (ESD)

8.2 Hazards and Effects Register

The development of a Hazard and Effect Register during EPC phase by operations will allow TEPL to demonstrate that all necessary actions are being implemented to prevent major accidents, to prepare contingency plans and response measures. The QHSE department from TEPL will provide assistance in the development of Hazards & Effects register.

8.3 Berth Scheduling

Forward planning of LNG carrier movements will be an essential part of the Operations Scheduler/Planner and Marketing Department's work. Scheduling of an incoming tanker must start some days before arrival and will initially be done by the TEPL Marketing (or Commercial) section who will advise Operations of LNG carrier schedules. As the tanker approaches the berth, the Marine Superintendent will work with Operations Planner/Scheduler to ensure the availability of the services required to support the vessel on its arrival at the jetty (Tugs, Pilots, Customs, Immigration, etc.).

The Marine Superintendent will ensure that the Master of LNGC and FSRU is fully informed as to port requirements and berthing arrangements. A system will be put in place to ensure that LNG loading scheduling requirements are fully met.

9 QHSSE Management System

9.1 QHSSE Systems

TEPL RLNG is committed to conducting business in a manner that protects the safety and health of employees, its contractors, its customers, and the public in its operations. Furthermore, TEPL is committed to operating in a manner that assures public and stakeholder confidence and is compatible with the balanced environmental and economic needs of the communities in which we operate. These values require facilities to be operated to accepted standards, in compliance with all applicable laws and regulations, with systematic identification and management of quality, health, safety and environmental risks. This commitment forms the basis for the Quality, Health, Safety and Environment Management System (QHSE MS) which is the framework that provides the necessary systematic approach of our operations.

TEPL RLNG is also committed to the concept of balancing the need for safety and security while respecting the human rights in compliance with the Voluntary Principles on Security and Human Rights. The security plans for TEPL RLNG facilities utilize a risk-based approach and strives to maintain positive relations with the public and community resources. Extensive use of technology-based security devices and passive security measures are employed to reduce the vulnerability of the site's assets and its personnel. It is critical that these measures be deployed in manners that are fully compliant with VPSHR principles.

9.1 QHSE Management System Framework

The TEPL RLNG QHSE Management System consists of ten (10) Elements and a number of Expectations. The Elements define the strategic areas addressed by the System; the Expectations define specific tactics to achieve the strategy. The QHSE Management System is periodically reviewed and modified by Corporate QHSE to meet the changing needs, challenges and expectations of the Company. The ten Elements are:

1. **Leadership & Culture:** Management provides the vision, sets the expectations and provides the resources for implementation of this QHSE Management System. Successful implementation requires understanding, active involvement, and commitment by all employees.
2. **Personnel & Training:** TEPL believes that all incidents are preventable. Our employees hold the key to prevention because most incidents are a result of unsafe action of individuals. Careful selection, placement, training, development and assessment of employees are necessary for achieving our QHSE expectations.
3. **Contractors:** Third parties provide materials and services on behalf of TEPL and have an effect on TEPL operations. It is essential that these contractor services be monitored and held to standards consistent with TEPL policies and objectives.
4. **Risk Management:** Comprehensive risk management reduces operating hazards and the potential for quality, health, safety and environmental incidents and liabilities. Hazard identification and risk mitigation is a key component of all activities to make certain that risks to employees, the public, to quality, or the environment are effectively controlled within TEPL's tolerance for risk.
5. **New Projects & Modifications:** Use of accepted standards, procedures and specifications for facility design, construction and startup activities is essential for achieving QHSE Expectations.

6. **Operations:** Operation within established parameters is essential to achieving the values of TEPL. This requires operating, inspection, and maintenance procedures, and information on the processes, facilities, and materials handled.
7. **Management of Change:** Hazards associated with changes in organization, operations, procedures, design criteria, facilities, regulatory or permit requirements are evaluated and managed.
8. **Incident Investigation:** Effective, reporting, investigation, and follow-up of incidents and near misses are necessary to achieve our mission.
9. **Crisis & Continuity Management:** Planning and preparedness help ensure that in the event of an incident effective actions are taken for the protection of employees, contractors, the public, the environment and stakeholder assets.
10. **Assessment:** A process which assesses performance relative to expectations is essential to improving performance.

All TEPL personnel receive induction-level training in the QHSE Management System that is commensurate with their position. The Expectations deal with specific objectives necessary to achieving the overall intent of the management system. Detailed training in specific Expectations depends on the individual's job duties. A few of the Elements, Expectations and key deliverables are discussed below.

9.2 QHSE Handbook

This handbook is intended for the use of TEPL employees, visitors and contractors and captures the important aspects of the QHSE Management System. It also includes considerations for legislation, industry recognized best practices, and how TEPL controls hazards – both physical and process-related associated with performing every day activities. All workers receive an orientation in basic QHSE expectations in their basic induction training and a copy of this handbook for future reference. This handbook is a summary of the TEPL approach to managing QHSE matters and addresses the following procedures:

- Policy and the QHSE Management System
- Quality, Health & Environmental Management Systems
- Procedures, Plans and Practices
- Process Safety & Personal Safety
- Personal Protective Equipment
- Hazardous Material Handling
- Waste Management
- Contractor Management
- Incident Reporting
- Crisis Management
- Inspections and Audits

9.3 Contractor Safety Management

The Contractor Safety Management System (CSMS) provides the means to assure contractors perform their work in compliance with applicable TEPL quality, health, safety, and environmental performance standards and requirements. The procedure applies to all contractors, including subcontractors, performing work at or for any TEPL facility or activity. Contractor management is a risk-based program. The application of CSMS depends on the type of work to be performed and the potential risks associated with the work in terms of potential for impact to employees, contract workers, customers, the environment and the community. This potential for harm is determined prior to award of a contract and is based on the scope of the proposed work. Consequently, the greater the potential for harm, the greater the control required by CSMS.

9.4 Environmental Management System

The Environmental Management System implemented within the TEPL operations is a component of the overall QHSE Management System. It is a structured system which ensures conformance with legislation and regulations (and the ISO 14001 process – Hold). The EMS Manual provides a guideline for organizing and managing plant activities in a manner that protects the environment. The key elements of this EMS are as follows:

- Policy – Establishes the TEPL environmental policy.
- Planning – Sets out the planning processes of identifying the aspects, regulatory requirement, objectives and the environmental programs with the sub-section as follows:
- Environmental aspects
- Regulatory requirements
- Objectives and targets, and environmental program
- TEPL will implement an ISO 14001 style of EMS (HOLD). The preparation phase will begin after TEPL starts operations and stable. Certification is planned 2 years after the operation is handed over from EPC contractor.

The following stages of development are expected:

I. Identification of aspects and impacts. Develop the objectives, targets and program.
II. Develop documentation, familiarize document, implementation, awareness/ internal training and plan socialization campaigns - banners, stickers, slogans.
III. Conduct internal audit, define corrective actions and initiate periodic management reviews.
IV. Conduct initial certification process/surveillance and final certification process
V. Maintain ISO 14001 system with a structured organization and defined responsibilities

9.5 Safe Work Permit System

The safe work permit system is required to maintain a high level of plant safety by reducing the chances of misunderstanding and conjecture when non-routine activities are to be performed. Non-routine activities are defined as anything other than the normal operation of the plant.

The objective of the safe work permit system is to ensure that authorization has been obtained for non-routine work and that persons carrying out that work is aware of the potential risks involved and precautions necessary to minimize those risks.

The safe work permit system consists of:

- Guidelines on isolation and purging
- Hot Work procedures
- Confined Space Entry procedures
- Excavation procedures
- Lockout/Tag out procedures

9.6 Process Safety Management

The Process Safety Management Plan (PSMP) details the means to prevent the occurrence, and minimize the consequences, of significant releases of toxic substances as well as fires, explosions, and other types of catastrophic accidents. The purpose of the PSMP is to prevent unwanted releases of hazardous chemicals into locations that could expose employees and the public to serious hazards. This program specifies a systematic approach to managing all process components of the LNG and RLNG plant. This approach involves all aspects of process management: process design, process technology, process changes, operational and maintenance activities and procedures, non-routine activities and procedures, emergency preparedness plans and procedures, training programs, and other elements that may affect the process. The TEPL PSMP is applicable to the entire Jetty Area, the 23.1 KM Pipe line and the Onshore Receiving Facility - ORF. The fourteen elements of the PSM Plan are:

1. Employee Involvement
2. Process Safety Information
3. Process Hazard Analysis
4. Operating Procedures
5. Training
6. Contractors
7. Pre-Startup Safety Review
8. Mechanical Integrity
9. Hot Work Permit
10. Management of Change
11. Incident Investigation
12. Emergency Planning and Response
13. Compliance Audits
14. Trade Secrets

The PSM Coordinator oversees the implementation and continuous improvement of the PSMP. This individual ensures compliance with OSHA's Process Safety Management (PSM) Standard and drives implementation for each of the 14 Elements of PSM. This involves such activities as:

- Maintaining proper documentation of all PSM activities

- Writing procedures and training personnel in PSM-related operating and maintenance procedures
- Assisting in Incident Investigations, Process Hazard Analysis, and Compliance Audits
- Gathering data relative to KPI and providing analysis of trends to improve the PMS program
- Manages the bi-monthly PSM Steering Team meetings

9.7 Quality Management System

TEPL is committed to meeting the requirements and expectations of our customers. This commitment underpins our core values of Quality of our RLNG Products and the Service of our RLNG facility. The products and services as part of the TEPL site operations consistently exceed these requirements. We strive to continually improve the quality of our product and services through compliance with ISO 9001:2015 (HOLD), customer feedback, regular review of quality objectives and periodic audits. TEPL will achieve this quality framework (2 years after RFSU) by adhering to:

- The QHSE Management System.
- Effective integrated project management based on the TEPL governances' processes and the project quality plans of TEPL and our contractors.
- Our core business processes, supporting processes and procedures.
- A commitment to technical integrity while listening to customers and meeting all reasonable requirements.

All Project staff and Operating staff play key roles in quality performance. Ownership of the quality system is encouraged through training, communication and leadership.

9.8 Management of Change (MOC)

The Management of Change process ensures that change throughout the Company occurs in a systematic manner. This process not only ensures the integrity and safety of the plant is maintained as per the design intent due to any plant modifications but will assure organizations evolve in a controlled manner and that regulatory changes are communicated consistently. The MOC procedure is structured to:

- Define the scope of activities impacted by changes to procedures
- Define roles and responsibilities within the change process
- Specify guidelines for temporary and emergency changes
- Ensure communication system is in place to inform employees of changes
- Within TEPL technical department, all MOC requests will be initiated as MOC notifications in either the CMMS or the AIMS. They will then be routed as MOC work orders to the Engineering Department. All documents and resources then can be traced back to the MOC request when following the CMMS work order trail.

9.9 Journey Management

The Journey Management program provides a systematic approach to control and monitor all TEPL road and sea transport activities. Its primary purpose is to reduce the risk and number of incidents that might occur during road transport activities and enable suitable emergency response. The requirements

include designation of qualified drivers, pre-departure planning, authorization of travel, monitoring during the journey and close out of the journey. For any trip there must be a plan for mitigation of any identified hazards related to health, safety and the environment. An emergency response plan must also be identified and included in the trip plan.

9.10 Incident Investigation and Reporting Procedure

The Incident Reporting procedure covers the mandatory reporting of incidents, injuries, and near misses within the sites, on the jetty and anywhere TEPL operates. The procedure addresses:

- Reporting System
- Incident Classification and Record Keeping
- Action Tracking and Corrective Action
- Close-Out

9.11 Crisis Management

The response to a crisis is managed in a two-tiered approach:

- Tier 1 – An Emergency that can be handling by site First Intervention Team – FIT. The FIT is led by a designated-On Scene Commander (The Shift Supervisor) and consists of trained individuals (Duty and off duty Operators at the Jetty) with expertise in a wide range of specific response measures. There are number of site **Emergency Response Procedures** describe how Tier 1 emergency is managed. (Note: For ORF, the FIT is the duty Shift Operators back up by local fire brigade). Pending agreement and emergency situation, FSRU staff may be requested to assist Jetty staff in handling fire emergency provided the emergency have no impact/risk to the FSRU.

- Tier 2 – An Emergency that requires the support of Crisis Management Team (CMT) from Karachi office. The CMT is based at Karachi office and provides operational, planning, and logistical support to the Tier 1 Team. **The Crisis Management Plan** defines the integration of facilities, equipment, personnel, procedures, and communications, operating within a common organizational structure for effective Tier 2 incident response. The Tier 2 team is typically led by the TEPL GM and is staffed by designated personnel from within the local TEPL Karachi organization. Tier 2 Crisis Management Team (CMT) leader (GM) maintains oversight of incident response efforts, provides support and technical expertise as required, and focuses on strategic issues relating to corporate reputation, external communications with media and stakeholders, provides legal advice, and support from human resources. CMT team leader will keep TEPL stakeholders informed.

The Emergency Response Manual addresses firefighting, safety and security for specific crisis scenarios. These procedures describe in detail the various accountabilities and responsibilities of the individuals in the incident command structure and provide action plans and tactics to handle situations such as:

- Fire
- Gas Releases (ref to Pre-incident Planning)
- Marine Diesel and lube oil spills
- Environmental releases such as unauthorized venting of RLNG
- Explosion
- Medical Evacuation
- Terrorist Attacks
- Pre-Incident Planning (Pre-fire plan)
- Marine Emergency Response including:
  - Collision
  - Grounding
  - Mooring Failure
  - Fire Onboard FSRU or LNGC

9.12 Security Management

The TEPL approach to managing Security is structured to detect, deter, delay and respond to intrusions at all TEPL assets. This integrated approach is embedded across the business – at our worksites, upon our personnel, along the supply chain, and integrated throughout our information/cyber systems. Our objective is to ensure that TEPL physical and electronic facilities, our supply-chains and our communities are protected from security threats so we may safely provide RLNG to our customers in a reliable manner. While enforcing a strict Security Program we shall continue to treat all individuals with respect and with full recognition of human rights consistent with the Voluntary Principles on Security and Human Rights. We regularly assess security risks and the effectiveness of our implemented security measures with the goal to assure:

- Zero loss of property and assets through theft
- No harm shall come to the workforce while conducting TEPL business
- No unauthorized entry to our physical or cyber-based worksites
- Minimize potential damage to the assets from external influences
- ISPS requirements for the RLNG Jetty area

These objectives are achieved through the following measures:

- Individual involvement of all workers to be sufficiently trained and have adequate awareness of security issues
- Site Security Organization with professional contract staff and leadership and trained uniformed
  guards providing 24X7 coverage
- GPS tracking of all TEPL vehicles / vessel and designated drivers
- Security Risk Assessment to identify potential threats and effective counter measures
- Partnerships and communications between our Security Organization and external parties,
  including police, military, and community resources

- Installation and operation of Security Control Measures (such as fences, lighting, gates, CCTV, detectors, ID tags, patrols, barricades, administrative controls with designated signatories, radios, log books, etc.) consistent with the Risk Assessment
- Radio, satellite and telephone communication

9.13 Terminal Manual & Ship/Shore Safety Checklists

The TEPL Jetty terminal will provide a written, comprehensive, and up-to-date Marine Terminal Operating Manual. The Terminal Operating Manual is a working document and includes procedures, practices, and drawings. The Manual is available to all appropriate personnel in English. The Terminal Operating Manual includes the roles and responsibilities of the berth operating personnel and procedures associated with emergencies such as fire, product spillage or medical emergency. The Terminal Operating Manual shall include but not be limited to the following:

- Unloading Procedure
- Exposure to Toxic Vapors
- Cargo Transfer Equipment Procedures
- Vessel Acceptance Criteria (Role of FSRU or TEPL Marine?)
- Berth Limitations
- Control and Shutdown Procedures
- Fire & Safety Measures
- Operating Environmental Limits
- Fire & Emergency Procedures
- Mooring Guidelines
- Gauging and Sampling Procedures (FSRU and LNGC by Nominates FSRU or TEPL Commercial)
- Terminal Plan Layout Drawings
- Static Electricity Precautions
- Environmental Protection Procedures

When a LNGC is at the jetty, no cargo operations will commence until the TEPL & FSRU Marine Ship/Shore Safety Check List has been completed by the ship and the terminal and it has been confirmed that operations can be safely carried out. Procedures and practices ensure that the checklist is completed in the proper manner and that items on the checklist are re-visited annually to ensure continued compliance during loading.

9.14 Leading & Lagging QHSE Indicators

Element 10 of the TEPL QHSE Management System requires, in part, that performance indicators, both leading and lagging, are established, communicated and understood throughout the organization. The primary purpose of having these indicators is to strengthen risk control barriers and prevent a major incident. Examples of leading indicators are hours dedicated to QHSE training compared to total man-hours worked, the number of safety inspections conducted and the number of emergency drills

conducted, the number of Process Safety Management Audit carried out and its finding. These types of activities promote a safe work place and help prevent future incidents. Lagging indicators are measures of incidents – Days Away from Work Cases, Injury & Illness Frequency, Man-Hours Worked Without DAFWC, Tier one and Tier two Loss of Primary Containment based on Process Safety Guild line, etc. These measures are based on the occurrence of an incident. Lagging indicators are generally reactive or retrospective and backward-looking whereas leading indicators are forward-looking and input based. The QHSE Indicators monitored by TEPL are jointly selected by TEPL GM and QHSE to provide a meaningful snap shot of performance and provide a basis for determining effectiveness of improvement measures. These indicators are reported company-wide on a monthly basis.

10 Operations Systems

10.1 Operating Manuals

The EPC contractor will supply the Operating Manuals for all process units, utility systems, and loading facilities. However, TEPL involvement in the development, writing and formatting of these manuals is essential to ensure that the manuals reflect sufficient operational information and is written by staff with adequate operational expertise. These manuals will include procedures for normal start-up, normal and emergency shutdown, maintenance, testing, and quality control. The procedures will cover both normal and emergency operations.

10.2 Feedstock Manual

The feedstock manual will contain feedstock specifications as well as quantities of gas to be delivered. The manual will also establish the formal communications protocol with LNG provider via TEPL Commercial.

10.3 Product Manual

The product manual will contain RLNG export & LNG import specifications and quality information. It will also include sections on shipping procedures, stock requirements, and information on storage and loading from LNGC to FSRU. Special precautions to avoid roll-over and stratification of LNG inside FSRU will also be provided by FSRU.

10.4 Plant Integrity Manual

The safeguarding system for the protection and shutdown of equipment and the process is described extensively in the operating manuals. However, the testing requirements, testing schedule and frequency of testing will be identified in this manual.

Procedures to allow for on-line testing and recording will be established. The manual will include all safeguarding equipment and should jointly be prepared by Operations and Engineering. It will include information on testing of HIPPS valves, the ESD system, emergency equipment, fire mains and firefighting equipment, etc.

The manual will be comprised of:

- Testing Procedures
- Frequency of Testing
- Function Testing
- Relief System Checks (When provided – There is no Pressure Relief Valves installed at the process system at the Jetty and ORF)
- Interlock System Checks
- Test Running of Emergency Equipment
- Fire Hydrant Checks
- Fire Fighting Equipment Checks

The plant integrity manual will be implemented in the Asset Integrity Management system (AIMS).

10.5 Marine Interface Manual

The Marine Interface manual describes the marine interface and instrumentation installed at the jetty to assist safe berthing and unloading of LNG carriers to FSRU.

In managing jetty operations, the objective is to ensure that LNGC berth safely, within operational limits, and that once berthed they are ready in all respects to discharge cargo to FSRU. While unloading from LNGC, the objective is to expedite the vessel's safe loading operation and minimize the duration of stay alongside FSRU.

The manual will address and cover the following requirements:

- Scheduling
- Establishment and documentation of limits for berthing and unberthing and ensuring that these are understood by pilots, jetty operators, and arriving shipmasters
- Establishing and documenting mooring plans
- Establishing and maintaining clear and satisfactory lines of communication between vessels, tugs, pilots, mooring boats, and jetty operators. Also ensuring that back-up lines of communication are in place
- Ensuring that procedures are in place for completing ship/shore operational safety checklists

- Loading procedures
- Operational checks to be carried out while cargo is being transferred
- Establishment and documentation of procedures for departure
- Metering and Manifestation

10.6 Operating Procedures

The facility operating procedures will provide operations personnel with the detailed instructions and step-by-step actions to safely and successfully operate the RLNG jetty and ORF site. The initial procedures will be prepared by the EPC contractor and incorporate the recommended operating procedures from major vendors and suppliers of equipment. These procedures will be modified, as required, during and post start-up to reflect the actual behavior of plant systems. The initial procedures to be developed will include:

- Initial start-up: The procedure for starting the Jetty/ORF/Pipeline from a hydrocarbon-free condition.
- Normal start-up: The procedure for re-starting the facility after a controlled shutdown.
- Black start: The procedure for re-starting the Jetty/ORF after a total power outage.
- Start-up following an emergency shutdown: The procedure for re-starting the site after an uncontrolled (emergency) shutdown.
- Startup following a turnaround: The procedure for re-starting the jetty /ORF after a long period of outage of FSRU that may include vessel entry and major maintenance of equipment such as the unloading arms.
- Normal shutdown from FSRU: The procedure for taking the facility from a state of producing RLNG to a state of no throughput and zero RLNG production in a safe and controlled manner. Normal shutdown will also include procedures for isolation and de-pressuring of equipment for maintenance.
- Emergency shutdown at the Jetty: The procedure to bring the plant to a safe condition after a shutdown initiated automatically by the DCS, the fire and gas detection system, or a manual ESD station.
- Part load operation: Procedures for operating the plant at reduced throughput conditions.
- Specialized vendor equipment procedures: Documentation for equipment packages detailing the requirements for placing the equipment on line and removing it from service in a safe manner.
- Steps required to avoid or correct deviation from design parameters

10.7 Trip Reporting Procedures

Procedures will be put in place to ensure that all facilities and equipment trips (Including trip initiated at the FSRU) are properly captured, reported, analyzed and solutions identified. A procedure that comprises the following will be developed:

- Reporting format and procedure
- Collection of data
- Analysis – if when / where operating conditions exceeded design envelope

- Cost of outage
- Recommendations and implementation

10.8 Communications Procedures

These procedures will identify how communication is to be used including radios, telephones and email. It will include communications with the TEPL Karachi Head Office.

10.9 Operating Instructions

Open and efficient communication is vital to ensure that all personnel involved in the safe operation of the facility have the information they need to make decisions based on current and accurate information. Procedures will be developed for collecting, controlling, storing and distributing information concerning the day to day operation of the facility.

To ensure all members of the team are kept up to date with facility operations, the following logs or reports will be developed:

- Operations Daily Report: Will provide daily totals of RLNG received and delivered. Number of LNGC loading to the FSRU, waste measurements, and equipment failures and requirements.
- Supervisor's Daily Shift Log: To include facility throughput, product purity, waste processing, process bottlenecks, process override, and maintenance issues.
- Operator Log: Maintained in the Jetty and ORF control room. Information of importance to the oncoming shift will be recorded i.e. an overview of the tour's major events, equipment on Override during shift.

10.10 Measurement, Metering and Allocation Procedures

The procedures will specify how the metering systems used in the calculation of the various fluids and gases will be tested and calibrated within a specific time period and specify how meter calibration, test equipment certification and verification of results will be done. Maintenance and calibration activities related to these meters will be input into the computerized maintenance management system (CMMS) to ensure high reliability and quality.

In order to perform a facility material balance, the daily quantity of stock from FSRU, RLNG to customer via and Gas Metering System at the ORF, fuel, FSRU boil-off (losses), and product loaded on FSRU from the LNGC will be measured. The procedure will provide for reports stating the daily quantities, discrepancy reports and mitigation of variations in daily usage and throughput.

The quantities of chemicals and other consumables will be monitored, measured, and recorded to ensure facility integrity and efficiency is maintained. In cases where a fluid is not metered, procedures will be developed to account for usage through the quantity purchased.

Facility effluents (sea water discharge) from the FSRU will be measured and sampled for accurate reporting to the relevant authorities may be required.

10.11 Laboratory Testing

The laboratory equipment that need for the certification of RLNG product will be sourced and procured to outfit the lab. Procedures will be developed for the daily, weekly, and monthly tests required for ensuring that RLNG product meets quality specifications and that the methods for sampling the various streams are identified. The procedures will include step-by-step actions to ensure the samples are collected according to best industry practice.

11 Work Requests and Instructions

11.1 Work Orders

A procedure that enables Operations to issue work orders for carrying out repairs and breakdown maintenance on the plant will be developed. This will be part of the CMMS system.

11.2 Maintenance Procedures

The day to day maintenance procedures will be available for reference and information to the Operations staff. Location of vendor manuals, which may have certain operational tasks and procedures, will also be accessible.

12 Marine Terminal Operations

Jetty and Port procedures for LNG carriers will be developed. These procedures will comply with relevant maritime laws and conventions, such as the IMO and SIGTTO, as well as the regulations of the government of Pakistan (PQA). TEPL will continue to use internal and third-party expertise for input. These procedures will also be reviewed by TEPL Marine Superintendent, our Marine consultant and the Marine Vessel Services Provider (PQA). TEPL will require four assist tugs, one Pilot launch and will appoint two PQA marine pilots for servicing the LNG carriers. Additional tugs and ancillary marine craft will be sourced through PQA or the Marine Vessel Service Provider as necessary.

The main objective of the Marine Organization is to provide and maintain a safe berth for the LNG carriers that call at the jetty FSRU. In order to meet those requirements, the following will be provided:

- Aids to navigation (buoys and beacons) sufficient to allow ships safe transit by day or night
- Support resources such as assist tugs, mooring boats, and a pilot vessel
- Fully trained Pilots familiar with the maneuvering characteristics of large LNG carriers/FSRU
- Well defined procedures for operations at the ship/shore interface and Port safety regulations

12.1 Assist Tug Acquisition

TEPL will require four assist 70- 80 T BP tugs, (two-line handling boats- Hold pending PQA requirements) and one Pilot Launch to support its marine operations. The Marine Superintendent will administer the Charter Party and ensure the contractor performs according to the Contract terms and conditions.

12.2 Patrol Boat Activities

A security boat will be required to assist in protecting the jetty and LNG carriers from potential security threats. Specific security duties of the security boat will include:

- Random and/or regular patrols of the offshore exclusion zones when there is no ship on the berth and continuous patrols while a ship is at the berth alongside FSRU.
- Intercept actual waterborne intruders, search offshore areas for possible intruders, and evacuate personnel

The day to day operation will be coordinated through the Marine Superintendent.

12.3 Pilot Training Simulator

Up to 4 PQA Pilots will be sent for simulator training to familiarize themselves with the handling of large LNG carriers. The Pilots will spend one week on the ship simulator, which will be programmed to accurately reflect the handling characteristics of an LNG carrier and environmental and hydrographic conditions of the Jetty facility.

12.4 Port Information Book

A Port Information book (May be provided by PQA) will be developed as a means of passing on relevant information to arriving ships. The contents for a basis for ship/shore operational procedures and provide details of emergency arrangements as they affect the tanker. It will also be used to promulgate statutory requirements and port regulations.
Contents will include:

- Emergency Procedures
- Pre-Arrival Communications
- Port Controls
- Information on Terminal Facilities
- Ship/Shore Safety Policies
- Communications in Port
- Notices and Safety Documentation
- Cargo Transfer Procedures
- Safety Requirements for LNGC or FSRU Visitors

12.5 TEPL Port Facility Security (ISPS) Compliance

TEPL, as designated operator of the port, will meet ISPS requirements reflected in the port security plan for the RLNG terminal. The PQA will review the assessment for compliance with Pakistan maritime requirements. The Marine Superintendent will verify that the RLNG terminal is ISPS compliant to ensure that LNGC cargoes are allowed to be offloaded to the FSRU.

The ISPS code specifies 3 different levels of security:

- Level 1 - The level for which minimum appropriate protective security measures shall be maintained at all times.
- Level 2 - The level for which appropriate additional protective security measures shall be maintained for a period of time as a result of heightened risk.
- Level 3 - The level for which further specific protective security measures shall be maintained for a limited period of time when a security incident is probable or imminent although it may not be possible to identify the specific target.

13 Key Performance Indicators

Various key performance indicators (KPI's) will be developed for the Operations Department. KPI's are essential to ensure the business process can be fairly judged on whether it is being effective.

The following KPI's will be developed:

- Safety and Environmental Performance
- Performance Measurements
- RLNG Loss - Efficiency Indicators (e.g., fuel consumption for Supply Chain from FSRU to ORF)
- Chemical Consumption
- Facility (Jetty/Pipeline/ORF) Availability
- Facility Reliability including FSRU
- Incidents, near misses

14 Human Resources

14.1 Recruitment

Recruitment of experienced Operators is to be given a higher priority. The recruitment of the first set of 16 Pakistani Operators (Note: In the event Pakistani operators are not available, 8 experienced expat senior operators should be recruited together with 8-10 local operators) should be carried out as soon as EPC contract is awarded. 6 to 9 months of training programme should be prepared to provide extensive English language training as well as basic math, science skills, QRA of RLNG facility, process safety management, package units such as unloading arms operations and maintenance,

Jetty back-up generator, fire protection at the jetty and ORF, DCS operation, basic plant process technology related to RLNG/FSRU. On completion of training, these operators will be requested, under the guidance of the operations superintendent to develop Operations Procedures and Standing Orders based on FEED document. Six months before RFSU, the operators will be at site to assist the pre-commission and commission of equipment and package units under the supervision of EPC contractor and vendors. Further training requirements will then be determined.

14.2 Progression Scheme

An operator progression scheme will be developed, which will identify the training needs and progression of the operators from Trainee to Senior Operator. The progression scheme will incorporate a system of written objective competency testing. It is expected that supervisory positions selection and above will be done by TEPL management selection process.

14.3 Job Descriptions

To ensure that every individual is aware of their responsibilities, a job description for every position will be developed. Additionally, yearly tasks and targets identifying objectives and accountabilities of the individuals will be provided and reviewed on a regular basis.

14.4 Shift Roster

A shift roster system encompassing four 12-hour shifts x 14 days for the Jetty and ORF will be developed. Training if required will be conducted during the off-days unless it is on the job Training at site, training will be conducted during duty shift days. Procedures in the event of absence of shift members due to illness will also be covered. Accommodation for the Jetty staff are provided by TEPL operations staff.

14.5 Transition Plan

Transition to the plant site is dependent on the success of the recruitment effort and the availability of accommodations cabins at the Jetty site. Currently, the plan is for the Operations Team to move to the site 6 months before RFSU.

15 Agreements

TEPL has in place various agreements, but the following are of direct relevance to the Operations / Commercial Department:

- Gas (RLNG) Supply Agreement (GSA)
- LNG Import and Purchase Agreement (SPA)
- FSRU Agreement
- Assist Tug and Supply Vessels Contract

Additional agreements to be developed prior to Facility Acceptance:

- Unloading Arm Service Agreement (Including Hydraulic Power Pack)
- DCS (Yokogawa) Service Agreement
- Jetty Fire water pump, Back-up Diesel Generator Service Agreement
- Jetty Mooring equipment Service Agreement
- Jetty Mooring Hooks and Load Cell Service Agreement
- Third Party Laboratory Agreement for non-routine Samples Analysis

III Maintenance & Technical Integrity OIP

1 Objectives

- Compliance: Maintenance will ensure the technical integrity (compliance) and reliability of the RLNG Jetty, The Pipeline and the ORF facility, the accommodation, support, and its equipment;
- Effectiveness: Maintenance will plan work routines to ensure high reliability of equipment and implement a high reliability organization (risk-based decision making, continuous improvement, fit for purpose work procedures and systems, competent workforce);
- Efficiency: Maintenance will plan and execute preventive and corrective activities to achieve RLNG delivery availability above target (Preventive Maintenance will deliver higher availability, reliability, at lower costs);
- Continuous Improvement: Maintenance will review performance of equipment and work execution periodically, identify root causes and eliminate defects, and review procedures / systems / organization periodically to achieve flexibility and operational excellence. Appendix 2 indicates list of maintenance procedures.
  Note: Maintenance could be from FSRU or out sourced third party contract.

2 Strategy

- Technical integrity is a non-negotiable. It demonstrates compliance with regulations and policies
- Reliability if seen as measurement of efficiency for equipment and organization
- Implement organization (procedures, systems, resources and people) capable of supporting the strategy and flexible to adjust to changing-workload and continuous improvement
- Develop and implement preventive work routines ensuring technical integrity and reliability
- Plan and Execute all work in a work management system ensuring safety and efficiency of maintenance operations

- Apply Reliability Management techniques to ensure risk-based decision making and continuous improvement
- Implement performance management using key performance indicators, continuous improvement techniques, and organization
- Support Commissioning and Start-Up with systems and resources

3 Maintenance Engineering and CMMS Plan

The EPC contract contains many deliverables of the maintenance OIP. Others will be developed in separate contracts by TEPL and merged after CMMS handover by TEPL.

- EPC Contractor will develop the Computerized Maintenance Management system (Asset Register, Maintenance / Inspection Plans, Work Management System, Material Catalogues, Materials Management System)
- Asset Register listing all maintainable items and ranking them by HSE and business criticality (1, 2, 3). Safety Critical Equipment is part of the asset register and is identified by criticality '1'
- All work routines (Maintenance and Inspection plans) and Spares Catalogue.
- TEPL Engineering will review the work and approve spares for 2 years
- TEPL will review the Asset register before Handover by EPC contractor
- TEPL will catalogue all Maintenance plans (MP) and inspection plans (IP) on a per system basis for future review (and potential future optimization using RCM / RBI / IPF methodology)
- TEPL will catalogue all EPC Contractor SPIR lists, review, and approve 2-year spare levels for EPC Contractor procure under EPC contract
- EPC Contractor is building the material catalogue (MATCAT) based on the vendor SPIR lists and link the materials to equipment in the asset register (associated materials)
- TEPL will code all materials using MESC methodology, assign min/max levels and stores / bin locations. This data will be loaded later into the CMMS solution (from EPC Contractor) and maintained before in an MS Excel-list by warehouse supervisor.
- TEPL (Maintenance Discipline supervisors M E I) will develop standard work procedures before RFC.
- TEPL will agree with EPC Contractor the Warranty process including duration of EPC support after the handover.
- TEPL and EPC contractor will agree to use TEPL Root Cause Analysis process and MOC used during RFSU.

4 Maintenance Resources

- EPC Contractor will provide a workshop cum warehouse, equipment room, DCS control room and accommodation as part of the EPC contract at the Jetty. EPC Contractor will furnish this with the workshop machinery to provide on-site maintenance works and equipment testing facilities for minor maintenance. The workshop should be functional and competent staffed for support of EPC Contractor Commissioning work.
- A workshop supervisor will manage all workshop activities and ensure that all workshop equipment is loaded into the CMMS.

- A Maintenance Supervisor will manage all warehouse activities and oversee the EPC Contractor warehouse works.
- The Maintenance Supervisor will manage the TEPL spares management work - as listed in section (1).
- The Maintenance Supervisor will manage the consumables list, receipt into the warehouse and warehouse operations.
- Tools and mobile equipment will be registered in the CMMS. Tools management as well as mobile equipment and overhead crane falls under the Maintenance Supervisor.
- Lifting equipment will be registered in the CMMS and falls under responsibility of the Maintenance Supervisor.
- Long-term services agreement for the Unloading Arm, Hydraulic Package, Jetty mooring equipment, DSC, SIS, Diesel Driven Equipment at the Jetty and ORF will be set up to cover all breakdown, major maintenance, remote machine monitoring and inspection work for the covered units where necessary.
- Vendor support contracts will be set up for specialized equipment with the vendor / OEM / local rep.
- Maintenance support contract: a labor support contract will be implemented to provide flexibility in skilled and support maintenance manpower supply (From FSRU or Third-Party contractor). The core (staff) maintenance team is supported by some discipline technicians – the number will be increased during periods of abnormal work, e.g. Unloading arms major maintenance, General maintenance support like scaffolding, rigging, lifting, general manpower support will be provided through support contracts.

5 Organization and People

A maintenance department will be set up in reporting to the GM. The organization covers the three disciplines mechanical (which includes static & rotating, SD Planning, Support section management), electrical, and instrumentation. Support sections are planning (work management and CMMS), site workshop, warehouse, and maintenance support services. Maintenance organization structure will consist of a Maintenance Manager. Reporting to him will be Electrical Supervisor, Instrument supervisor, Mechanical Supervisor. The maintenance sections are led by an experienced supervisor and consist a Technicians. Technicians should be competent to lead the work through all steps of execution and coach junior and trainee technicians if required.

Local staff development: local maintenance staff has been hired as trainees or technicians. They are trained in technical and language skills. Initially the training is classroom based, and then hands-on workshop training in their discipline and the last step is on-the-job training at site.

Competence management: each position will have a detailed job description and competence profile. Experienced technicians will be recruited to comply with the profile from day one, while local trainee technicians will develop to full competence on the job. For all technicians a competence assurance

process with initial assessment, gap analysis, on the job training, ongoing assessment and development will be applied. It is envisioned that not all technicians will be fully competent during early operations and therefore on-the-job-trainers (Line Supervisor) will ensure fast development towards the competence profile. Training on the job is the fastest and most effective way of building a competent workforce. Trainee technicians will go through initial classroom and workshop training before they join the maintenance sections for full competence development. The competence will be regularly assessed and improved.

All technicians will receive special equipment maintenance training before commissioning. Then they will join the EPC contractor commissioning and start-up activities to witness and learn hands-on maintenance.

Recruitment

Expat / non-Pakistanis staff: TEPL will recruit fully competence supervisors and technicians for the initial period of RLNG plant operations. Likely many of those will be expatriates as the Pakistan labor market for RLNG/LNG/Refinery experience staff is tight. Local staff: local staff is recruited via the trainee route.

Recruitment should follow a staged approach in line with the project schedule in stages

(1) Initially the maintenance leadership staff will be hired: Maintenance Manager, Mechanical / Electrical / Instrument supervisor.

(2) back to back supervisors and senior technicians (Back to back Maintenance Manager may not be required)

(3) Junior technicians

6 Maintenance during Commissioning and Start-Up (CSU)

CSU is part of the EPC activities. All TEPL staff however will closely watch and witness those activities. Maintenance staff will be seconded into the EPC CSU organization to gain technical and operational insight and familiarize themselves with the plant. The supervisor will report to CSU Manager and dotted line back into TEPL Maintenance Manager. All CSU test and maintenance work history will be loaded into the CMMS for future history analysis. Inspection test record sheets, test reports, and baseline survey data will be loaded into the CMMS. The planning section will load the data into the CMMS as retrospective 'dummy' work orders; the discipline supervisors will verify that information and technically approve the 'dummy' work orders.

Every equipment failure during CSU is an opportunity to learn. Failures will be recorded in the CMMS and depending on their criticality (equipment type 1 or 2) a root cause analysis will be carried out.

IV Performance Management

The performance of the maintenance department will be assessed during project and operations phase.

Project phase

- Review of the CMMS delivered by EPC Contractor
- Deliver the (additional) materials management work before handover
- Develop standard work procedures
- Functional workshop before RFSU
- Functional site workshop/warehouse before RFC
- All spares and consumable received in warehouse before RFSU
- LTSA in place before handover
- Vendor support contracts in place before handover
- Job descriptions in competence profiles in place before RFC
- All technicians completed equipment training before RFC
- All CSU activities loaded into CMMS before handover

Operations phase

- Plant (RLNG production system) availability as per target
- Plant reliability (per unit) as per target
- No maintenance / inspection work without work order
- Work order completion > 80% for all safety and production critical work
- Planned Turnarounds (FSRU/Unloading arms) in time and budget
- No materials or consumables shortage stopping work order execution
- Zero incidents, minimum 1 Safety Visit card per employee / contractor per month, toolbox talk held for all maintenance work, monthly safety and performance meeting
- Budget compliance
- Compliance with competence assurance framework

IV Technical Services OIP

1. Objectives

The Technical Services Department OIP defines the key activities and tasks that need to be in place prior to plant start-up and in order to achieve the following specific objectives.

- To support the recruitment process for the requisite personnel for the Engineering organization needed to support plant commissioning and handover prior to start-up.
- To establish the development route for the training and competence assessment of Locals graduate engineers and technical staff when recruited.
- To actively form part of the start-up team, participating in an integrated start-up plan, providing comprehensive engineering and process control support through tuning, testing, inspection and monitoring performance of the entire RLNG plant facility.

- To develop and implement Engineering policies, strategies, procedures and systems to facilitate the safe commissioning and ongoing operation of the RLNG plant.
- To provide a frame work for the development of procedures which provides for the integrity, reliability and high availability of the plant assets:
- To provide a time frame for these key activities to be defined and executed.
- To identify the focal points who will be responsible for implementing and executing the activities.
- To check final RLNG product quality assurance to customers through laboratory QA and QC certification of RLNG from the FSRU and LNG transfer from LNGC to the FSRU.
- To comply with local Governmental and statutory requirements and international standards for all engineering and Inspection activities.
- The Inspection Section to be certified in accordance with international standards, Pakistan Regulatory requirements and QMS ISO 9001 (HOLD) certification, and requirements as in-house inspection body.
- To agree on processes and procedures for handover of documents and data from the Contractor to TEPL Technical / Operations Group.
- To identify and arrange third party engineering specialists for Engineering support.
- To provide a frame work for the development of the roles and responsibilities of the Engineering Sections, Technical Services will consist of:

1. Inspection, Reliability and Integrity Engineer
2. Electrical & Instrumentation Engineering
3. Process Technology
4. Procurement (To be confirmed if it is under Manager Support Services)

2. Summary

The Technical Services Department OIP sets out to establish the organizational structure and manpower requirements for both the startup and normal operation. It defines the key strategies, procedures, activities and tasks which need to be in place prior to commissioning activities and addresses the development route for the Pakistani personnel. The plan will also address the support and resource requirements for the needs of the startup team to:

- Ensure that the integrity of the plant systems and equipment is maintained and that it is operated within design limits and parameters.
- Provide Mechanical, Civil, Inspection, Electrical, Instrumentation, Process Engineering Services, Procurement and Contracting support of all operational activities.
- Provide technical advice in the techniques and execution of maintenance activities.
- Ensure that the plant safeguarding systems; Mechanical, Instrumentation and Electrical systems are correctly installed, configured, handled, tested, inspected and updated to keep pace with developments which enhance the efficiency and integrity of the systems.

- Provide a comprehensive Design, Engineering and Construction Service for minor and major plant modifications and changes.
- Develop technological and Engineering improvements and innovations and manage the technical interface between plant modifications and expansion projects.
- Establish a Management of Change (MOC) and minor Plant Engineering Change procedures and systems for all plant equipment and documentation.
- Manages front-end design of Plant Minor and Major Capex projects.
- Ensure full implementation of CMMS modules or other appropriate data management systems for all Engineering work processes including, Inspection, Projects, Contracts and Documentation.
- Establish, operate and maintain an Asset Management system all field instruments and all instruments, and engineering documents in (INTools or other tool selected by TEPL)
- Maintain (delegated) custodianship and responsibility for system management and operation of the DCS, SIS, Fire & Gas.
- To provide comprehensive process control support through control application tuning, testing and monitoring, and troubleshooting/improvement of the entire RLNG plant in support of a safe, reliable, high capacity and efficient operation.
- To provide day to day technical support, trouble shooting and advice on all process and engineering related plant operability, equipment performance/reliability and integrity issues.
- Establishment of an environmental technology plan for controls of emissions and discharges and models for reporting these effluents. The overall goal is to minimize the impact of plant activities on the environment.
- Check RLNG product quality-assurance of technical services to customers, including laboratory Quality Assurance and product quality Certificate for LNG cargoes imported and RLNG deliver to customer.
- To ensure that the site facilities/ equipment is professionally inspected and that their technical integrity is fully safeguarded under all operational conditions.
- To Provide Commercial and Contracting Advisory Services, to the Operations Division, for the procurement of third-party contracting services.
- Maintain direct custodianship and responsibility for the operation of the High Voltage electrical power installations if any.
- Hold company authority to nominate (Electrical) authorized persons.
- Manage the handover of the documentation and verify the 'as built' status from the Contractor and assets upon completion of the work in similar manner as used for the project (i.e. IN Tools for Instrumentation)
- Ensure that the policies and procedures are developed in line with the operational needs and supports the maintenance of the integrity of the plant.
- Implement training and development programmers for local staff based on needs assessments and evaluate effect of training received.

The philosophy for the Technical Services Department is to participate fully in the plant start up and commissioning activities and work with EPC Contractor to provide support resources and necessary procedures operating standards. This process will ensure that there is a very rapid familiarization and uptake of the Engineering issues and problems related to the plant by the Technical Services Department personnel. It will also ensure a seamless process of hand over from the Start up Team to the Operations team, post commissioning activities. The interface with the EPC Team will essentially be with the Operations Team and it is expected that substantial resources will also be forthcoming from Operations team to supplement the EPC start up commissioning team.

3. Organization

The Engineering organization is structured in a traditional discipline hierarchy. It is however intended to move towards a more integrated and a flat organization once plant and organizational stability has been attained. It is considered that the organization needs initially to be very robust due to the difficult operational and environmental conditions which prevail in TEPL. Technical Services Organization will consist of a Technical Service Manager and reporting to him will be Electrical cum Instrument Engineer, Mechanical Engineer (with static and rotating equipment knowledge), Inspection Reliability and Integrity Engineer, Process Engineer and Contract and Procedure Engineer.

The key responsibilities for each of the sections are given below. Their responsibilities and activities will be covered under the umbrella of the Technical Services Department Procedures, which will focus on the delivery of services and support for the operation of the plant.

3.1 Electrical & Instrumentation Engineering Section (E&I)

The key role is to provide a comprehensive Electrical Engineering / Instrumentation (E&I) support service to ensure the integrity and operation of the plant E&I equipment and systems. E&I Engineering design and plant modifications will be the section's task through in-house and contracted staff in close coordination with the Projects Section.

The E&I Engineer will be responsible for the following activities:

- To act as TEPL Authorized Electrical Responsible Person ensuring TEPL meets Regulatory electrical legislation, if any, and applicable governmental regulations are also adhered to.
- Ensure Company meets Pakistan electrical engineering standards and best practices in design, operation and maintenance.
- Develop and maintain custodianship over Company Electrical Safety Rules (ESR) and Electrical Safe-Operational Instructions (ESOP).
- Evaluate and Authorize Electrical Staff for Electrical operational activities as detailed in the Company Electrical Safety Rules (ESR)
- Mentorship, training and development of all Electrical Local Staff.
- Maintain industry best practice in the E&I discipline through contacts with global LNG and RLNG operators to optimize production and lower unit costs.

- Electrical Power supply interfaces and distribution management to third parties.
- Initiate Electrical and HVAC Technical audits on TEPL installations and at Contractor premises.
- Contribute to technical and HSE evaluation of Contractor, vendors and manufacturers as required.
- To advise Maintenance Supervisors on content and jointly approve all electrical maintenance procedures for all electrical equipment, generating and distribution systems, sub-stations and switch gear.
- Ensure support for the maintenance management systems across TEPL by providing technical advice to effectively support the maintenance effort. Assist in the project spare parts review for ensuring equipment maintainability and availability.
- Monitor the company's electrical load forecast in relation to available generating capacity and timely initiate plans for corrective action when necessary.
- Implement monitoring and reporting system for the stability and protection of the electrical systems. Develop Electrical Distributions Systems SMART team (Specialist Measurements, Analysis, Recording and Troubleshooting) with related site facilities
- Ensure electrical /instrument installations meet Area Classification requirements
- To authorize plant electrical / instrument design changes and modifications.

  Ensure adequate design and performance of critical systems including Electrical generating and distribution systems, Stability and protection of electrical systems, Lightning Protection Systems, HVAC installations, Electrical Cathodic Protection, Earthing and bonding for electrical system earthing, protection against electrostatic charge, personnel protection, including clean earth provision for instruments systems. Instruments electricity supply systems up to the point where Instrument Engineering takes over and Renewable energy sources.
- Contribute to TEPLs pursuit of operational excellence by the design and implementation of a reliability improvement program for all electrical components and distribution system at 'TEPL.
- Section KPI business controls - establish best in class targets (KPI's) for Section activities
- Development and custodianship of the Electrical Engineer Section's Quality System.

- To act as TEPL authorized instrument engineer, ensuring TEPL meets statutory requirements and regulations and adheres to Company engineering standards.
- Initiate technical audits at TEPL installation and instrument contractor's facilities.
- Periodic testing of the safety protective systems.
- System Management of DCS, SIS, Fire & Gas, HIPPS systems.
- Set-up and management of databases for control buildings and field instruments / analyzers.
- Development and management of instrument procedures.
- Maintain Best Practice in the discipline through contacts with global RLNG operators.
- Contribute to evaluation of Contractors, Vendors and Manufacturers and development of all the Sections required contracts.
- Ensure instrument / electrical installations meet Area Classification requirements.

- Ensure support for the maintenance management system by providing technical support information, data to effectively support the maintenance effort. Assist in the project spare parts review for ensuring equipment maintainability and availability.
- Acceptance of new installations – instrument / system part – and updating of drawings / databases.
- Ensure adequate design and performance of critical systems including - Control and Auxiliary Rooms

  On plot instrumentation, DCS, Safeguarding Systems, Instrument Workshop if provided, CMM instruments systems implementation and daily work planning
- Section KPI business controls - establish best in class targets (KPI's) for Section activities

3.2 Inspection, Reliability & Integrity Management Section

The role of the Inspection, Reliability & Integrity Section is to provide an independent advisory service without constraints to time or resource pressure that will ensure that the integrity of the plant is safeguarded at all times. The section is to monitor all activities with regards to Operations, Technical, Maintenance and Engineering activities and ensure that the plant equipment operates within its design limits and operating parameters.

Through the application of a system of preventive inspection the Inspection Section is to ensure that the Company's assets remain in a satisfactory, fit for purpose (continued operation) condition consistent with the requirements of safety, assurance of acceptable mechanical integrity and reliability, compliance with statutory and Company requirements.

- The Inspection / Reliability / Integrity (Call Inspection Engineer) will be responsible for the following activities and processes.
- Preparation of pro-active inspection programmes, services and procedures.
- To support Operations and the EPC Team during the Plant start up and hand-over in all plant and equipment inspection requirements and activities.
- To check and advise on design specifications of the new plant and equipment, the correct selection and application of materials and design cases to ensure their safety and integrity.
- Advise on any repairs and modifications to ensure they are executed to statutory and Company requirements.
- Monitor that equipment is being operated within design parameters and highlight cases of deviation.
- Provide Certification services on equipment as legally required (e.g. Lifting equipment).
- Provide Shop and Inspection Services and assist Procurement in setting up local goods inspection services.
- Provide Supplier/Vendor Quality Managements System (ISO 9000 -HOLD)) evaluation services.
- Custodian of the NDT, Certification, Shop Inspection and Supplier evaluation contract services.

- Custodian of the CMM inspection module and the specialist Inspection data base management systems.
- Development and maintenance of Risk Based Inspection (RBI) systems, Corrosion System Manuals (CMS) and Inspection records.
- Projects and Vendor QA/QCS services on-site and 3rd party inspection services off-site.
- Development of all Inspection 3rd Part Contract services.
- Establishment of the Section's Quality System as per NCSIIB (National Certification Scheme for In Service Inspection Bodies -UK) requirements.
- Development of Inspection engineering reporting system as per legal and Company requirements, and Section KPI business controls - establish best in class targets (KPI's) for Section activities.
- Development and training of local Inspection Engineers in line with Company requirements.
- Nomination, training and competence of Authorized Inspectors as per the legal and Company requirements
- Custodian of the Radiation Safety Module and Chairman of TEPL's Radiation Committee.

3.3 Projects and Office Engineering (Role of Process Engineer)

The key roles of the Projects Section (Note: Due to relatively small site and simple operations, the role of Projects and Office Engineering will be taken over by the Process Engineer) are to establish the Company's document management system and commence with the acceptance, registration and storage of documents being handed over by the Contractor and to establish the Company's Engineering Change and Project Management systems, and its full implementation

The Projects Engineer will be responsible for the following activities and processes:

- To act as TEPL's authorized engineer, ensuring TEPL meets Pakistan statutory requirements and regulations and adheres to Company engineering standards;
- To manage the handover of all documentation and verify the 'as built' status from Contractor upon completion of the construction project and ongoing modification and plant change work.
- Provision of Civil Engineering related services and advise on the Maintenance of the Plant buildings and access roads, and managing the maintenance of the site's insulation installations i.e. AC ducting etc.
- Providing foundation settlement monitoring systems and advise on any remedial actions.
- Provide a comprehensive design, engineering and construction service for minor and major plant modifications and changes.
- To establish Plant Engineering Change procedures and systems for all plant equipment and documentation.
- Manage the Electronic Data Management System (EDMS) for Engineering data and documents.

- Custodian of Design Services Contracts.
- Complete /remedial work co-ordination of the EPC project activities after departure of the Contractor from site.
- Development of the Sections Quality System and Section KPI business controls - establish best in class targets (KPI's) for Section activities
- To establish and implement procedures for effective control of the contracting process in full compliance with Company requirements.
- Ensure the quality and timely preparation of all commercial, ITT, Tender evaluation and contracts documentation.
- Review and respond to all contract queries in support of contract owners and for all preparations for tender Boards.
- Provide contracts management advice and assistance to all Managers, Supervisors and their staff.
- Contribute to the development and management of the Company approved contractor and vendor listing.
- Implement training and development programmers for the local staff based on needs assessments and evaluate effect of training received.

3.4 Procurement

The role of the Procurement section is to establish the organizational structure and recruit experienced personnel to provide an integrated procurement service in support to TEPL RLNG plant.

The objectives are to create, procure and implement the processes, facilities and tools, techniques and process required to support stable warehouse management for the TEPL Plant.

Interfaces with local vendors have to be developed to encourage the development of local purchases for commodities and spares which meet the company's technical specifications. The management of all aspects of the inventory for the plant, spares, chemical and other consumables for both normal and shutdown requirements whilst following a policy of minimum stocking levels.

A comprehensive review of all spare parts, chemicals, lubricants, hydraulic oil and bulk spares for normal operation, involving the EPC contractors' recommendations and the TEPL subject matter specialists, will be carried out. Material Stock levels in the warehouse will be based on RLNG production philosophy, maintenance strategies of FSRU and the Unloading arms and the spare part recommendations given by subject matter specialists.

For process materials, chemicals, lubricants, other consumables and safety equipment a similar review is carried out based on the information given by the contractor.

The CMMS (MM) will be configured to provide the portal to all approved users to access data on spare parts and their related technical specifications.

Objectives:

- To provide a frame work for the development of the Procurement Organization in Operations Warehouse and Inventory Control and Purchasing;
- To comply with all company procedures and Government laws during the commissioning, start up and initial operation of the facility;
- To support the recruitment process, develop an experienced and well-trained personnel staff and ensure that staffing levels of XX employees is achieved prior to start up;
- To assist the Project Management Team during the different stages to steady run the RLNG plant, from procurement point of view;
- To develop key performance indicators for operations activities in the warehouse and purchasing organization;
- To establish the training plan for the Local staff and to ensure all receive the appropriate education on the job;
- To appoint shipping agents local and international for freight forwarding and customs clearance activities;
- To code and inventory set up for all materials including insurance items, spare parts, consumables and chemicals;
- To develop procedures for preservation of materials on site;
- To complete the physical facilities and equipment and tools for the warehouse and
- To manage Section KPI business controls - establish best in class targets (KPI's) for Section activities.

3.5 Process Engineering

The Process Engineering Section joint objectives and responsibilities for plant start-up, normal operations and plant performance assessment are described below. The activities also list the critical procedures, models and systems required to support Plant Operation and TEPL management.

Objectives:

The main objectives for the Process Technology Section are:

- Prepare and implement models and procedures for the Process / Utility and Environmental Technology areas and for the Laboratory Services in line with the operational needs of the RLNG plant.
- Participate fully in the commissioning, start-up and normal operation of the RLNG Plant.
- Provide technical support, troubleshooting and advice on all process related plant operability and reliability issues.
- Jointly develop and conduct Plant Performance Testing and Reliability Testing.

- Give Process Control support to ensure safe, reliable and efficient plant operation.
- Undertake all analytical (laboratory) services for the plant and provide product quality Certificates for RLNG deliver to customers.
- Participate in the start-up & operation of the environmental management systems and establish monitoring and reporting procedures for all RLNG sites / plant discharges.
- Provide process design information for facility modification projects.
- Conduct /or participate in Hazop and safety reviews as required by the MOC and PSM programs.
- Conduct RBI review for failure scenarios.
- Set up development programs for Local Staff working in the Process Engineering Section.
- To establish best in class targets (KPI's) for Section activities.

3.6 RLNG Technology Responsibilities:

- The RLNG Technologist Plans directs and participates in all process technology related services for the plant.
- To work with Plant (The Jetty, ORF) Operations on a day-to-day basis to assist and advise Plant Operations to maintain smooth operation, ensure RLNG product quality and to liaise with FSRU to achieve RLNG target specification when necessary.
- To conducts Plant performance (Including material balance from FSRU till ORF Gas Metering) and capacity tests and recommend process control strategies and optimization techniques to reduce loss.
- To initiate studies, conducts PSM audits and recommends plant/field modifications to improve efficiency, productivity, safety, cost savings and technology updates.
- The provision of process design and engineering support for plant modification projects.
- In conjunction with the Plant Operations and HSE Department, conduct Hazop and other safety reviews for any modifications at the assets.

3.7 Environmental Technology Responsibilities (Role of Process Technologist):

- The establishment of the environmental technology plan for the control and reduction of emissions and discharges to prepare models for reporting these effluents if necessary. The overall goal is to minimize the impact of plant activities on the environment in accordance with permit requirements.
- Custodian of all necessary environmental Permits and Licenses which are required for the start-up and normal operation of TEPL facilities.
- Reporting the daily discharges of gas, liquid and solid waste to the environment. Preparation of comprehensive list of environmental issues in the plant and liaison with the authorities and neighboring communities about environmental issue.

- To advise & assists operations on environmental limits. The Environmental technologist prepares daily, quarterly and yearly reports on environmental issues.

3.8 Process Control Technology Responsibilities (Role of Instrument / Electrical Engineer)

- The Specification development of the Plant Information system and to be integrated DCS system.

- To works very closely with instrument and DCS and plant operations to ensure proper process control of unit operations.
- To study the control philosophy of each section of the RLNG plant and works to optimize each unit, to ensure that all control loops are tuned and the control systems are working efficiently
- To advise on periodic tuning of the control loops and the suitability of implementing Advanced Process Control in the future if required.

3.9 Laboratory Services Responsibilities: (Role of Trained Operator)

The laboratory equipment will be supplied by EPC. Contractor will have the responsibility to purchase, install and commission the laboratory equipment. TEPL will own all equipment in the laboratory. In addition, the Contractor will operate the laboratory until the end of handover period. The laboratory is required to be fully operational at the time commissioning and start-up. The following will be prepared:

- The purchase of a Laboratory Information Management System (LIMS) and its software is will be considered later. LIMS shall interface with major laboratory instrumentation but not with the process facility's Distributed Control System(s) (DCS).
- The services provided by the laboratory shall meet ISO 17025 standards (HOLD) and cover all the analysis required for TEPL operation, LNG product from FSRU, RLNG at jetty or ORF and environmental stream analysis.
- TEPL operation staff employed by the Company will be selected and trained to eventually staff the laboratory.
- The preparation of the laboratory procedures and review of the Contractor's procedures which will be used for the first year.

V Process Technology Operational Readiness Activities

The critical Process models and procedures are shown in the Table below:

Models & Procedures

No	Subject	Required	Format	Expected Completion
1	Mass & Energy Balances Procedure	A document that contains all streams from Jetty to ORF (with instrument tag numbers) Compare to discharge stream from FSRU to the jetty Required for plant mass and energy balance.	Excel sheet	
2	RLNG procedure	Procedure detailing RLNG gas composition, Component Heating Values and methods for determining Total HHV value for accounting purposes in accordance with RLNG Gas Contract	Procedure	
3	Plant Performance Test Procedure for performance monitoring and analysis	Procedure detailing how to measure minimum & Maximum flow via Unloading Arm(s) & Gas Metering at the ORF, pressure drop across each section of the facility. Noise, vibration of each section and at utilities unit i.e. IA, Back-up Diesel Generator, re Water pump (Can be carried out separately) to meet Process & Equipment guarantees shall be Included in the procedure.	Detailed Procedure	
4	Emissions Reporting procedure to satisfy Governmental and Environmental permits	Procedure for Environmental Reporting - Venting losses, Hydrocarbon emissions, Wastewater discharges from the Jetty and ORF. FSRU emissions for NOX, SOX, and CO2 is not included in TEPL emissions reporting. A summary of gas emissions and liquid discharge limits will be given in this procedure.	Procedure	
5	Waste Reduction & Monitoring	Procedure for reducing spillage, bio-hazard and waste.	Procedure	
6	Laboratory Procedure & Analytical schedule	Laboratory Procedure and plant analytical schedule for routine work.	Procedure / schedule	
7	IA Molecular Sieve change-out & Monitoring	Loading / unloading procedure, base data for breakthroughs an monitoring charts	- Procedure - Excel	

8	Trends on the Plant Information system (PI system *)	Charts & Trends on the PI system Jetty, and ORF unit monitoring and operating data analysis	Charts & Trends	

VI Technical Training OIP

1 Introduction

The overall Training plan has to ensure that all the required training is implemented in the most effective, efficient and economic manner and addresses all operational needs of the organization. This training covers the needs of both the expatriate and Local staff as it relates to pre-commissioning, commissioning, plant Start Up and the long-term operational training needs. The plan will provide a Local staff scheme that not only addresses locals being trained for the first substantive post but also longer-term development opportunities that, where possible, maximize the potential of the Pakistanis workforce.

The Training section of the Operations Implementation plan establishes the training activities that are required for successful facility pre-commissioning, commissioning, start-up and for on-going operations. The plan has five major elements, Local technician level training and development, Local graduate training and development, vendor and equipment specific training, operations simulator training and a TEPL wide structured soft skills/equipment/system upgrade training.

The overall training plan will include all the required policies and procedures required to support the implementation and long-term sustainability. Key Performance Indicators (KPIs) will be established that will provide measurable success factors. The KPIs will set performance standards in term of training effectiveness, efficiency and economic value.

2 Objectives

- Review and agree with Operations, Maintenance and Technical Services managers the training plans and course content for Local trainees enrolled on the Operations & Engineering Technician Training Program (OETTP).
- Agree and implement with the Operations Management Team the long-term certificated Training Model (e.g. Based on the NVQ Model) with an ongoing Competency Development System with career development path for the TEPL operations employees. Pakistani staff recruited for Technical/Operations shall be fluent in English language with standard up to a TOFEL 520 level and have attained technical course in Mathematics, Physics and Chemistry to an equivalent GCSE level B or equivalent. The 6-9 months of training programme shall provide development in the following areas:
- A Basic Introduction to the RLNG Process and Related Equipment and control systems.
- On the Job Training in Discipline Specific specialization under the Line Supervisors/Trainers.
- Manage the development and verification of job competency profiles for all local trainee target positions.

- Implement, Monitor and report on the OJT Phase of the OETTP including the pre-commissioning, commissioning & start-up On Job Training phase.
- Develop with the Operations Management Team a Pakistani Professional Graduate Training & Development scheme.
- Develop and maintain a training record database and provide a monthly Management Training Reports.
- Coordinate with the Management Team the delivery of all vendor and equipment specific training.
- Implement a plant wide structured soft skills and equipment/system upgrade training plan
- Develop and publish KPI to measure their effectiveness of the Training programmers and value of training deliveries.

3 Organization

The initial training organization will consist of a Training Manager, who will have overall responsibility for delivering the training plan. A Training Coordinator (One of the Operations Supervisors), who will, in particular, have day to day supervisory control of the Local technician training scheme, assist the training manager in the implementation of the local graduate training scheme and liaise with the Operations Management Team to ensure that the training given is structured, monitored, directed and meets the target manning dates.

They will be augmented by four ORF Shift Supervisors and four Jetty Shift Supervisors for (OJT) assigned to the Operations team. These supervisors will be responsible for the actual OJT training of the local workforce and as such, have a reporting function into the training manager.

Other specific training requirements, soft skills, equipment/system specific upgrade training will be provided by, where available, in-house resources and if not available, by experienced and qualified third-party providers.
Technical Training Organization structure will have a Training Manager, reporting to the OM.

4 Pre-com/Com & Start-up Vendor & Bechtel provided Training

An EPC vendor training plan will be developed that will detail who and when specific training is delivered. The vendor training delivered and completed by the individual will be registered in the Training database.

Appendix 1 shows list of documents that RLNG site (RLNG site excludes the FSRU process system) should have in order to ensure the facilities can operate in a safe, reliable and efficient manner while protect the environment and meeting the Laws of the Country.

1. Appendix 1 Operations Procedures List

NO	Document No.	Title	Status	
			Complete	Target date for completion
	General Procedure			
1	OPS-MO-PRO-xxxx	Shift Handover Protocol		
2		Field log sheets		
3		Start-up HV motor precautions		
4		Venting and Blowdowns		
5		Correct operation of Dew point equipment		
6		Test Run of stand by running equipment.		
7		Minor maintenance operations		
9		Control and reporting of off specification LNG product		
10		Annual delivery program development (FSRU capacity, availability and robustness)		
11		Verification of sales purchase agreement, energy deliver calculation		
12		General Procedure of Pump Change Over		
13		Reporting of equipment malfunction		
14		Operational incident follow-up		

15		By-pass/override of trip or safeguard systems		
16		Pressure test procedure		
17		Pipeline & Plant Daily Summary Report		
18		Use of service hoses & coupling		
19		Alarm Management Procedure		
20		Guidelines to avoid gas detectors nuisance alarms during maintenance of hydrocarbon contained equipment		
21		Pig launcher operations		
22		Condition monitoring Equipment		
23		Operator Training & Competency Matrix		
24		RLNG Product manual/ procedure		
25		Plant integrity manual		
26		Emergency Communications procedure		
27		Measurement, Metering and gas allocation procedure		
28		Trip reporting procedure		
29		Operation Documentation Numbering		
30		ADP Planning Assumptions		
31		Fire and gas event report		
32		Emergency alarms announcement		
Emergency Preparedness Procedure				
1	OPS-MO-SO-0xxx	Loss of UPS		
2		Loss of Radio Communications		
3		Loss of RLNG supply to Customers		
4		Loss of Instrument Air		
5		Loss of Nitrogen		
6		Loss of One or Both Diesel Fire Water Pumps at the Jetty		
7		Loss of Power from FSRU - Jetty		
8		Loss of Power from Grid - ORF		
Safe Working Procedure				
1	OPS-MO-PRO-xxxx	Pre startup Safety review (PSSR)		
2		Register of protective devices procedure		
3		Process, mechanical and electrical isolation Procedure		
4		Process override procedure		
5		Permit to Work Procedure		
6		Non-Standard Operation Procedure		
7		Control and Use of Override on Safeguarding		
8		Simultaneous Operations SIMPOS		
9		Safe Isolation & Re-Instatement of Plant		

10		Safe Aerial Lift Operations Program		
11		Safe Transport and Handling of Dangerous Substances		
12		Safe Working with Radioactive Material		
13		Safe Storage, Handling and Use of Gas Cylinders		
14		Facilities Chemical Spill Procedure		
15		Manual Handling Procedure		
16		Vessel and Confined Space Entry		
17		Authorize Gas Testers		
18		Safe Scaffold Procedure		
19		Mechanical Equipment Safety		
20		Hot and Odd Bolting Procedure		
21		Pressure of Leak Testing for Operational Service		
22		Personnel Protective Equipment		
23		Excavation and Trenching		
24		Work at Height		
25		Gas and Vapor Freeing of Equipment		
26		Breaking of Containment		
27		Welding and Hot Tapping on Equipment Containing Flammable Material		
28		Control of Ignition Sources		
29		HP Water jetting		
30		Cutting and Welding		
31		Test Equipment Calibration and Registration		
32		Potable and temporary equipment		
33		Site emergency response management		
34		Chemical handling procedure		
35		Registering as Competent and Qualified Person for handling PTW		
36		Process Safety Management Plan		
Operation Procedure				
1		Inerting RLNG system		
2		Emergency Depressurization of Jetty Equipment/Pipeline /GMS		
3		Backup Diesel Generator start-up procedure		
4		Total Power Failure		
5		Instrument air compressor operations		
6		Safe and economic use of Nitrogen Procedure		
7		Flushing fire water network system (legionnaire bacteria)		
8		Isolation & commissioning of Fire water network sections		
9		Spare Unloading arm utilization		
10		LNG berth mooring hook release system* with Marine input		
11		Pre check list for LNG ship loading *with Marine input		

12		Managing warm FSRU ex dry-dock		
13		LNG volume on FSRU * with commercial input		
	Marine Procedure			
1	OPS-MO-PRO-xxxxx	Marine Emergency Response Procedure		
2		Passenger Boat Procedure		
3		Ship/Berth Compatibility Criteria		
4		Ship Vetting and Acceptance for FSRU and LNGC		
5		Pre-Arrival Communications and Exchange of Information between Terminal and Ship		
6		Passage Planning		
7		Exchange of Information between Master and Pilot		
8		Standard Tug Commands		
9		Mooring Procedures		
10		Pilotage Procedure		
11		Personal Transfer Procedure		
12		Small Craft Procedure		
13		Pre-Transfer Procedure including Ship/Shore Safety Checklist		
14		Terminal Information and Condition of Use		
15		Marine interface procedure		
16		Terminal Operating Manual		
17		LNGC and FSRU Berthing Guideline		
	Pre-Fire Scenario			
1		Fire at the ORF		
2		Fire at LNG Jetty		
3		Fire at Laboratory		
4		Fire at Main Substation / Substation		
5		Fire at LER-1 / 2 & MCR		
	TOTAL NO OF PROCEDURES			
OPERATING MANUAL				
1		OPERATION MANUAL JETTY		
2		OPERATION MANUAL ORF		
3		OPERATION MANUAL BACKUP GENERATOR POWER GENERATION		
4		OPERATION MANUAL DIESEL FIREWATER PUMP SYSTEM		
5		OPERATION MANUAL ORF INSTRUMENT AIR SYSTEM		

6		OPERATION MANUAL HIPPS AT ORF		
7		OPERATION MANUAL FIRE PROTECTION AT THE JETTY		
8		OPERATION MANUAL FIRE PROTECTION SYSTEM		
COMMISIONING PROCEDURE				
1		DETAILED PROCEDURE FOR AIR BLOWING		
2		DETAILED PROCEDURE FOR SYSTEM DRYING / INERTING		
3		DETAILED PROCEDURE FOR SYSTEM TIGHTNESS TEST		
4		DETAILED PROCEDURE FOR MECHANICAL RUN-IN OF DIESEL GENERATOR AND FIRE WATER PUMPS		
5		DETAILED PROCEDURE FOR PIPELINE DEWATERING, PIGGING, DRYING, INERTING AND OPERATION TIGHTNESS TESTING		
6		DETAILED PROCEDURE FOR SYSTEM TIGHTNESS TEST / SYSTEM DRYING UNLOADING ARMS AND MANIFOLD		
7		DETAILED PROCEDURE FOR AIR BLOWING AT GMS AT ORF		
8		DETAILED PROCEDURE FOR SYSTEM DRYING / INERTING GMS AT ORF		
9		DETAILED PROCEDURE FOR WATER FLUSHING FIRE WATER HEADER AT THE JETTY		
10		DETAILED PROCEDURE FOR MECHANICAL RUN-IN OF FIRE WATER PUMPS		
11		RED SPADE PROCEDURE		
12		GAS-IN PLAN		
13		LIQUID NITROGEN IMPORT PLAN		
14		COMMISSIONING HSE PLAN		
15		GENERAL PROCEDURE FOR PIPE/EQUIPMENT CLEANING		
16		GENERAL PROCEDURE FOR INERTING		
17		GENERAL PROCEDURE FOR SYSTEM TIGHTNESS TEST		
18		GENERAL PROCEDURE FOR SYSTEM DRYING		
19		INITIAL START-UP PLAN		
20		COMMISSIONING EXECUTION PLAN		
21		MARKED-UP P&IDS FOR SYSTEM DEFINITION		

2. Appendix 2 Maintenance Procedure List

No	Document No.	DOCUMENT TITLE	Status

			Complete	Target date for completion
INFOR EAM PROCEDURES				
3		Procedure for Resetting of INFOR EAM USER password		
4		Procedure for Creating a new user in INFOR EAM		
5		Procedure for Change in INFOR EAM A Model		
6		Procedure for Generating and Solving INFOR EAM Customer Service Request		
7		Procedure for Delegation of Authority with INFOR EAM		
8		Procedure for Maintenance Work Order		
9		Procedure for Equipment Register on Infor EAM		
10		Procedure for Work Order Estimating		
11		Procedure for Material Requisition for Work Order		
12		Procedure for Outside Repair of Equipment		
13		Procedure for On-Call Duty for Technician & Supervisor		
14		Procedure for Preparation of Maintenance Budgeting		
MECHANICAL PROCEDURES				
1		Procedure for Shutdown Management		
2		Procedure for Maintenance Section Budget Management		
4		Procedure for Vehicles Entry to Facility		
5		Procedure for Overhaul of Instrument Valves		
6		Procedure for Relief Valves test and Overhaul at vendor equipment		
7		Procedure for Mechanical Workshop Equipment Overhaul		
8		Procedure for Calibration of Workshop Tools and Equipment		
9		Procedure for Storage of Special Tools		
10		Procedure for Control and Issue of Mobile Equipment		
11		Procedure for Equipment Transport label		
12		Procedure for Flange Tightening		
13		Procedure for Piping System Inspection		
14		Procedure for Job Hazard Analysis		
15		Procedure for Heat-Treatment		
16		Procedure for Heavy Lifting		
17		Procedure for Hot-Tap		

18		Procedure for Maintenance Plan		
19		Procedure for Tools		
20		Procedure for Waste Cleaning Yard		
21		Procedure for Equipment Preservation		
22		Procedure for Cleaning internal Vessels		
23		Procedure for Mole Sieve Replacement of IA Dryer		
24		Procedure for Calibration of Workshop Machine Tools		
CIVIL MAINTENANCE PROCEDURES				
1		Procedure for Insulation Works		
2		Procedure for Scaffolding Erection/Removal		
ELECTRICAL PROCEDURES				
1	MNT-80-PRC-XXXX	Procedure for Appointment of Authorized Persons		
2		Procedure for Working on High and Low Voltage Equipment		
3		Procedure for Locking and Issue of Keys		
4		Procedure for Safety Rule Audit		
5		Procedure for Identification of UG Cables		
6		Procedure for Installation of Temporary Accommodation		
7		Procedure for Temporary Electrical Equipment Installation		
8		Procedure for Inspection of Portable Electrical Equipment		
9		Procedure for Insulation Resistance check on Unloading Arm		
10		Procedure for Earthing of Low Voltage Switchgear		
11		Procedure for Electrical Safety Rules		
12		Procedure for High Voltage Isolation & De-Isolation		
13		Procedure for Low Voltage Isolation & De-Isolation		
14		Procedure for Earthing of High Voltage Switchgear		
15				
INSTRUMENTATION / QMI PROCEDURES				
1	MNT-70-PRC-xxxx	Procedure for Reference and Test Equipment		
2		Procedure for the Health Check of E and I Workshop		
3		Procedure for Inline Modifications and Forcing of IPS		
4		Procedure for Gas Metering Station USM validation		

5		Procedure for Calibration of Instruments Critical to Plant Performance		
6		Procedure for Condensate Custody Transfer Measurement		
7		Procedure for IPF Activities		
8		Procedure for Alarm Management		
9		Procedure for Software Change		
10		Procedure for AMADAS		
11		Procedure for TSO Test		
12				
INTEGRITY & RELIABILITY PROCEDURES				
1	MNT-60-PRC-xxxx	Procedure for Goods Inward Inspection		
2		Procedure for Procedure for Inspection and Testing of Lifting Equipment		
3		Procedure for Site Radiography		
4		Procedure for Qualification of Welders		
5		Procedure for Reliability and Integrity Management		
6		Procedure for Implementation of OBI - Opportunity Based Inspection		
7		Procedure for INFOR EAM for Inspection		
8		Procedure for Reporting and Investigating Reliability & Integrity Incidents		
9		Procedure for Painting and Insulation Integrity Management		
10		Procedure for Material Traceability		
11		Procedure for the Control of Welding and Fabrication		
12		Procedure for Pressure Testing of Equipment and Pipe Work		
13		Procedure for Hose Testing		
14		Procedure for Preventative Maintenance Scheduling		
15		Procedure for RBI Updating and Review Procedure		
16		Procedure for Develop Civil Inspection Maintenance Plan		
17		Procedure for Control and Calibration of Inspection Owned Inspection Section Measuring and Test Equipment		
18		Procedure for Extension Process for Inspection and Test Due Dates		
ROTATING EQUIPMENT PROCEDURES				
1	MNT-52-PRC-xxxx	Procedure for Condition and Performance Monitoring		

		of Rotating Equipment		
2		Procedure for Operating and Maintenance strategy for Rotating Equipment		
WAREHOUSE PROCEDURES				
1	MNT-20-PRC-xxxx	Procedure for Requisitioning		
2		Procedure for Tender		
3		Procedure for Purchase Order & Variation		
4		Procedure for MESC		
5		Procedure for Color Coding		
6		Procedure for Shutdown Resource Logistics and Monitoring		
7		Procedure for Invoice		
8		Procedure for Inventory & Repairable Items		
9		Procedure for Supply Agreement		
PROJECT PROCEDURES				
1	MNT-40-PRC-xxx	Procedure for Project Procedure		
2		Procedure for Preparation of a Basis of Design		
3		Procedure for Preparation of a Basic Design and Engineering Package		
4		Procedure for Preparation of a Project Implementation Plan		
5		Procedure for Managing Project Changes		

3. Appendix 2 Training List

NO	Document No.	Title	Status

			Complete	Target date for completion
Training				
1		Vendor Training Plan for Operation & Maintenance during CSU		
2		Competence Mapping for Operation & Maintenance		
3		Competence Assurance for Operator & Maintenance Technician Procedure		
4		Competence Training Plan for Operation & Maintenance		

. Appendix 3 QHSE List

Item No.	Document No.	Tittle	Type	Primary QHSE MS	Responsibility	Status	
						Complete	Target date for completion
1		Environmental Policy	Practice	6	ENVIRONMENT		
2		EMS Management Plan	Plan	5	ENVIRONMENT		
3		Environment Aspect & Impact Register	Procedure	6	ENVIRONMENT		
4		Regulation, other requirement & evaluation of compliance	Procedure	6	ENVIRONMENT		
5		Environment Objectives, Target and Program	Practice	6	ENVIRONMENT		
6		Competence, Training, & Awareness	Procedure	6	ENVIRONMENT		
7		EMS Communication	Procedure	6	ENVIRONMENT		
8		Environmental Monitoring	Procedure	6	ENVIRONMENT		
9		Waste Management	Procedure	6	ENVIRONMENT		
10		Hazardous Material Management	Procedure	6	ENVIRONMENT		
11		Recycling Product, waste & material based on hydrocarbons	Procedure	6	ENVIRONMENT		

12		Natural Resource & Energy Conservation	Procedure	6	ENVIRON MENT		
13		Green House Gas management	Procedure	6	ENVIRON MENT		
14		Water Management	Plan	6	ENVIRON MENT		
15		Energy Efficiency	Procedure	6	ENVIRON MENT		
16		Removed					
17		Non-Hazardous Solid Waste	Procedure	6	ENVIRON MENT		
18		Inert landfill handling	Procedure	6	ENVIRON MENT		
19		Emission management	Plan	6	ENVIRON MENT		
20		Hydro test water Management	Plan	6	ENVIRON MENT		
21		Marine Management	plan	6	ENVIRON MENT		
22		QHSE Compliance Assurance	Procedure	6	ENVIRON MENT		
23		Hazardous waste	Procedure	6	ENVIRON MENT		
24		Oil Spill Contingency	Plan	9	ENVIRON MENT		
25		Spill prevention and control	Procedure	6	ENVIRON MENT		
26		Protection of endogenous species	Procedure	6	ENVIRON MENT		
27		EMS Monitoring and measurement	Procedure	6	ENVIRON MENT		
28		Calibration and maintaining monitoring equipment	Procedure	6	ENVIRON MENT		
29		EMS Nonconformance, corrective & Preventive action	Procedure	6	ENVIRON MENT		
30		EMS Internal Audit	Procedure	6	ENVIRON MENT		
31		EMS Management Review	Procedure	6	ENVIRON MENT		

32		CSR Environmental	Plan	6	ENVIRON MENT		
33		Alcohol & Drugs Policy	Policy	2	HEALTH		
34		Health Surveillance Program	Procedure	2	HEALTH		
35		Fitness for Work Procedure	Procedure	2	HEALTH		
36		Health Risk Assessments	Procedure	4	HEALTH		
37		Health Management System	System	6	HEALTH		
38		Industrial Hygiene Procedures	Procedure	6	HEALTH		
39		Occupational Health Procedures	Procedure	6	HEALTH		
40		Malaria Control	Procedure	6	HEALTH		
41		Heat Stress Management	Procedure	6	HEALTH		
42		Removed					
43		Pandemic Response	Plan	6	HEALTH		
44		Medical Benefit Program	Procedure	6	HEALTH		
45		Health Impact Assessment	Procedure	6	HEALTH		
46		Fatigue and Stress Management	Procedure	6	HEALTH		
47		Respiratory Protection Program	Procedure	6	HEALTH		
48		Skin Protection Program	Procedure	6	HEALTH		
49		Pest Control Procedure	Procedure	6	HEALTH		
50		Hearing Protection and Conservation	Procedure	6	HEALTH		
51		Medical Emergency Response Plan	Procedure	6	HEALTH		
52		Communicable Disease Control	Procedure	6	HEALTH		
53		Health Map Workbook	Practice	6	HEALTH		
5		HazComm (Chemical Risk Assessment)	Procedure	6	HEALTH		
55		Food hygiene Procedure	Procedure	6	HEALTH		
56		Ergonomics Program	Procedure	6	HEALTH		
57		Mass Casualty Procedure	Procedure	6	HEALTH		
58		Medical Evacuation Procedure	Procedure	6	HEALTH		
59		Disability and return to work procedure	Procedure	6	HEALTH		
60		Medical Assistance Program	Procedure	6	HEALTH		
61		Indoor Air Quality	Procedure	6	HEALTH		
62		Community Health	Plan	6	HEALTH		
63		Quality Policy	Policy	6	QUALITY		
64		Quality Manual	Manual	6	QUALITY		
65		Quality Plan	Plan	6	QUALITY		

66		Document Control	Procedure	6	QUALITY		
67		QMS Internal Audit	Procedure	6	QUALITY		
68		QMS Non-Conformance	Procedure	6	QUALITY		
69		QMS Corrective Action	Procedure	6	QUALITY		
70		QMS Preventive Action	Procedure	6	QUALITY		
71		QMS Management Review	Procedure	6	QUALITY		
72		QHSE Management System	Program	1	SAFETY		
73		QHSE Committee Charter	Practice	1	SAFETY		
74		Safety Leadership Conversation "SLC"	Procedure	1	SAFETY		
75		QHSE Promotional Campaigns	Practice	1	SAFETY		
76		QHSE Training Programs/Matrix	Practice	2	SAFETY		
77		Induction Training	Practice	2	SAFETY		
78		QHSE Passport	Procedure	2	SAFETY		
79		Contractor Safety Management System	System	3	SAFETY		
80		QHSSE Risk Assessment Procedure	Procedure	4	SAFETY		
81		Construction EHS Management	Plan	5	SAFETY		
82		Hazard Warning Signage	Procedure	6	SAFETY		
83		Road & Sea Travel SAFETY MANAGEMENT JOURNEY	Procedure	6	SAFETY		
84		Personal Protective Equipment	Procedure	6	SAFETY		
85		Smoking Policy	Policy	6	SAFETY		
86		MSDS (HazCom) Procedure	Procedure	6	SAFETY		
87		Jewelry Policy	Policy	6	SAFETY		
88		Office Safety	Procedure	6	SAFETY		
89		Action Tracking System	Procedure	10	SAFETY		
90		Incident Reporting and Investigation Procedure	Procedure	8	SAFETY		
91		TEPL KPI Review	Practice	1	SAFETY		
92		Incident Analysis and Trending	Practice	8	SAFETY		
93		On-Scene Commander Assessment	Practice	9	SAFETY		
94		TEPL Emergency Duty Roster	Practice	9	SAFETY		
95		Crisis Management Plan	Plan	9	SAFETY		
96		TEPL Emergency Response Plan	Plan	9	SAFETY		

97		QHSE Audit Program	Procedure	10	SAFETY		

ENVIRONMENT	
HEALTH	
QUALITY	
SAFETY	
TOTAL	**95**

Project Schedule	Status	2019 Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
FID target										FID Target							
Regulatory																	
ESIA	8 Nov 2018																
QRA	2018 Q3																
SEPA NOC	11 Sep 2019																
PQA Provisional NOC	2018 Q1																
PQA Provisional LOI	5 Sep 2019																
PQA Final LOI	on going																
PQA IA	on going																
OGRA Provisional Licence	17 Aug 2018																
OGRA Provisional Licence Extention	5 Nov 2019																
OGRA Marketing Licence	on going																
OGRA Construction Licence	on going																
OGRA Transmission Licence	on going																
Technical																	
Site Selection	25 Jan 2018																
Pipeline Route Selection	2018 Q1																
FSRU TCP	2019 Q1																
Pre-FEED	2018 Q3																
FEED	2019 Q1																
Value Engineering Study	on going																
EPC	to be started																
Marketing/Commercial																	
MOU with Gas Buyers(Tier 1 Customers)	on going																
HOA with Gas Buyers(Tier 1 Customers)	on going																
GSA with Gas Buyers(Tier 1 Customers)	to be started																
HOA/GSA with Gas Buyers(Tier 2 Customers)	to be started																
Pipeline GTA	to be started																
...eering	on going																