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Statement of Changes in Equity

Second Fiscal Term (from April 1, 2018 to March 31, 2019)

(Unit: JPY)

	Shareholders' equity						Total net assets
	Capital stock	Capital surplus		Retained earnings		Total capital stock	
		Legal capital surplus	Total capital surplus	Other retained earnings	Total retained earnings		
				Retained earnings brought forward			
Opening balance	50,100,000	50,000,000	50,000,000	-5,602,241	-5,602,241	94,497,759	94,497,759
Changes of items during period							
Issuance of new shares	375,000,000	375,000,000	375,000,000	-	-	750,000,000	750,000,000
Profit	-	-	-	- 180,845,780	- 180,845,780	- 180,845,780	- 180,845,780
Total changes of items during period	375,000,000	375,000,000	375,000,000	- 180,845,780	- 180,845,780	569,154,220	569,154,220
Closing balance	425,100,000	425,000,000	425,000,000	- 186,448,021	- 186,448,021	663,651,979	663,651,979

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SYED NASIR HUSSAIN ADV.
NOTARY PUBLIC KARACHI, PAK.

TRUE COPY
S. NASIR HUSSAIN
Advocate & Notary Public
Karachi

S. NASIR HUSSAIN
NOTARY PUBLIC

決　算　報　告　書

（第 2 期）

自　　2018 年 4 月 1 日
至　　2019 年 3 月 31 日

ダイアモンド・ガス・インターナショナル・ジャパン株式会社

東京都千代田区丸の内二丁目3番1号

246

貸借対照表

第2期　(2019年3月31日現在)

(単位：円)

科　目	金額	科　目	金額
(資産の部)		(負債の部)	
流動資産	713,272,606	流動負債	106,644,817
現金及び預金	564,773,676	未払金	97,067,017
立替金	5,757,143	未払費用	5,271,100
前渡金	87,894,288	未払法人税等	4,306,700
未収入金	54,847,499	負債合計	106,644,817
固定資産	57,024,190	(純資産の部)	
投資その他の資産	57,024,190	株主資本	663,651,979
関係会社株式	57,024,190	資本金	425,100,000
		資本剰余金	425,000,000
		資本準備金	425,000,000
		利益剰余金	△186,448,021
		その他利益剰余金	△186,448,021
		繰越利益剰余金	△186,448,021
		純資産合計	663,651,979
資産合計	770,296,796	負債・純資産合計	770,296,796

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SYED NASIR HUSSAIN ZAIDI

NOTARY PUBLIC KARACHI PAK

損 益 計 算 書

第2期（自　2018年4月1日　至　2019年3月31日）

（単位：円）

科　目	金額	
営業費用		
システム運営維持費	47,000	
書信費	223	
業務委託費	213,356,619	
租税公課	21,753,849	
銀行手数料	182,900	235,340,591
営業利益		△235,340,591
営業外収益		
受取利息		787
営業外費用		
為替差損		63,356
経常利益		△235,403,160
税引前当期純利益		△235,403,160
法人税、住民税及び事業税		△54,557,380
当期純利益		△180,845,780

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株主資本等変動計算書

第2期（自　2018年4月1日　至　2019年3月31日）

（単位：円）

	株主資本						純資産合計
	資本金	資本剰余金		利益剰余金		株主資本合計	
		資本準備金	資本剰余金合計	その他利益剰余金	利益剰余金合計		
				繰越利益剰余金			
当期首残高	50,100,000	50,000,000	50,000,000	△5,602,241	△5,602,241	94,497,759	94,497,759
事業年度中の変動額							
新株の発行	375,000,000	375,000,000	375,000,000	-	-	750,000,000	750,000,000
当期純利益	-	-	-	△180,845,780	△180,845,780	△180,845,780	△180,845,780
事業年度中の変動額合計	375,000,000	375,000,000	375,000,000	△180,845,780	△180,845,780	569,154,220	569,154,220
当期末残高	425,100,000	425,000,000	425,000,000	△186,448,021	△186,448,021	663,651,979	663,651,979

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Advocate & Notary Public
KARACHI
S. NASIR HUSSAIN
NOTARY PUBLIC

TABEERENERGY

Rule 4(3)(w) 243

Dated: 11th November 2019

DECLARATION TO EMPLOY PROVEN TECHNOLOGY

Tabeer Energy (Private) Limited., a company incorporated under the laws of Pakistan, having incorporation number 0115629, with its registered office at Floor # 14-A, The Harbour Front, Dolmen City, HC-3, Block-4, Scheme-5, Clifton, Karachi 756000, Pakistan was incorporated on January 25th, 2018.

The company confirms that it employs proven technology and that the criteria set out in the LNG Policy for selecting the site has been met.

Yours faithfully,

Kosuke Makino
Chief Executive
Tabeer Energy (Private) Limited

TABEERENERGY

Rule 4(3)(x)

244

Dated: 11th November 2019

DECLARATION TO PROVIDE ADDITIONAL/OTHER INFORMATION

Tabeer Energy (Private) Limited., a company incorporated under the laws of Pakistan, having incorporation number 0115629, with its registered office at Floor # 14-A, The Harbour Front, Dolmen City, HC-3, Block-4, Scheme-5, Clifton, Karachi 756000, Pakistan was incorporated on January 25th, 2018.

The company confirms to be available to provide any information or documentation as the authority may, from time to time, require, including without limitation, supplementary information or documentation required by the Authority to clarify the information contained in the OGRA application.

Yours faithfully,

Kosuke Makino
Chief Executive
Tabeer Energy (Private) Limited

TABEER
ENERGY

Tabeer Energy (Private) Limited
Application for OGRA Construction License

Annexure C: Technical Brief

Sub-Annexures: C1 – C21

CONFIDENTIAL

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246

TABEER
ENERGY

Tabeer Energy (Private) Limited
Application for OGRA Construction License

Annexure C: Technical Brief

Sub-Annexures: C1 – C21

Confidentiality

Any and all information in our application package for the Construction License including this Technical Brief, which contains our technical and commercial aspects of Tabeer LNG Project including but not limited to cost, schedule, technical studies, basis of design et al., are strictly proprietary and confidential in nature. Disclosure to any third party of these information, tangible or intangible, without prior written consent of TEPL, is strictly prohibited. Kindly consult with, and seek permission from TEPL prior to the disclosure.

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1. Executive Summary

As a significant step towards the development of its integrated LNG Terminal Project **["Tabeer LNG Project"]**, Tabeer Energy (Private) Limited **["TEPL"]**, a wholly owned subsidiary of Mitsubishi Corporation, has compiled this Technical Brief for submission to Oil and Gas Regulatory Authority **["OGRA"]** as part of OGRA Construction License Application submission.

This Technical Brief, along with the accompanying technical and commercial studies (i.e QRA, HAZID, Navigation Simulation etc.), are prepared and submitted in accordance with the Government of Pakistan LNG Policy 2011, OGRA LNG Rules 2007, Port Qasim Authority **["PQA"]** Guidelines, and other relevant local and international rules and regulations.

Mitsubishi Corporation, being one of the world's most experienced and leading LNG players, and having a strong 60+ year history with Pakistan, is aiming to further strengthen its ties with Pakistan. The foundation of the Tabeer LNG Project, like all Mitsubishi Corporation project's globally, is based on the cornerstone of mutual beneficence that extends to the community and the environment at large.

The Project's LNG import terminal involves a Floating Storage and Regasification Unit (FSRU) moored at a Jetty, and delivering up to 1,000 MMCFD of Regasified LNG (RLNG) to an Onshore Receiving Facility (ORF) through a 20 km offshore to onshore pipeline.
TEPL has strategically chosen the Chann Wadoo Channel in Port Qasim, Karachi as the location for the FSRU and Jetty. We firmly believe that this location ensures maximum stability of operations and gas supplies for Pakistan, with the potential for future project capacity expansion.

In undertaking the technical studies that form the basis of this proposal, TEPL has engaged the services of one of the world's leading EPC contractors – JGC Corporation.

TEPL, with its Japanese pedigree, can strongly assure a world-class energy project.

2. Sponsors of the Project

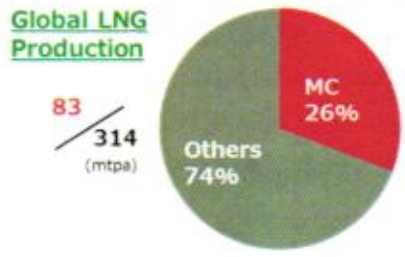
2.1. Mitsubishi Corporation (MC)

MC is a global integrated business enterprise that develops and operates businesses across various segments including energy business, environmental and infrastructure business, industrial finance, metals, machinery, chemicals and food. MC's current activities are expanding far beyond its traditional trading operations as its diverse business ranges from natural resource development to investment in retail business, infrastructure, financial products and manufacturing of industrial goods.

With more than 200 offices & subsidiaries in approximately 90 countries worldwide and a network of over 600 group companies, MC employs a multinational workforce of over 77,000 people.

MC has been active in the LNG industry since 1969 when the first ever liquefied natural gas was imported into Japan. Starting as a buyers agent, MC has continued to expand its LNG activities. MC's LNG portfolio now includes interests in natural gas liquefaction facitilies throughout the world including Brunei, Malaysia, Indonesia, Australia, Oman, Russia and most recently in the United States of America and Canada which are expected to commence operations in 2019 and 2024 respectively. 2015 earmarked the commencement of operations at the Donggi-Senoro project in Indonesia where MC acts as joint operator together with Indonesian state owned, Pertamina with the project enjoying a track record of reliable and safe operations. With its expanding LNG interests, MC has set up Diamond Gas International in Singapore who proactively engages in LNG marketing and trading, as well as downstream demand creation projects.

1. **Share of Global LNG Production from Mitsubishi Related Projects (2018)**



2. **Share of LNG Import into Japan from Mitsubishi Related Projects (2018)**

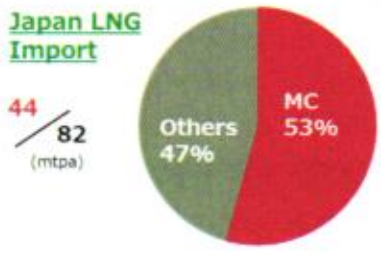


Chart 1 Mitsubishi LNG Share

Mitsubishi Corporation's Presence in Pakistan:

Established July 1, 1954, Mitsubishi Corporation - Pakistan enjoys a **65 year** active presence in a variety of business sectors in the country. Metals, Chemicals, Living Essentials, Energy,

Machinery & Infrastructure are some of the prominent active business groups at MC Pakistan. MC has been involved in the following notable joint ventures in Pakistan:

Table 1 MC Activities in Pakistan

Investment	Description
AISHA STEEL MILLS LIMITED SHAPING THE ECONOMY	Year JV established: 2007 MC/Metal One Share of Equity : 35% Nature of Business: Cold Rolled Coils – 220Kmt
SIDDIQSONS TINPLATE LTD.	Year JV established: 1998 MC Share of Equity: 10% (Divested) Nature of Business: Tin Plate 120 KMt
engro polymer & chemicals	Year JV established: 1997 MC Share of Equity: 10.24% Nature of Business: PVC:150Kmt, Caustic:106Kmt, EDC:127Kmt, VCM:200Kmt
Tri-pack	Year JV established: 1993 MC Share of Equity: 19% Nature of Business: BOPP: 70Kmt, CPP 16Kmt, Metalized: 7Kmt
DEWAN SALMAN FIBRE LIMITED	Year JV established: 1990 MC Share: 11% Nature of Business: PSF: 250K, A. Fibre: 25K

2.2. Diamond Gas International (DGI)

DIAMOND GAS INTERNATIONAL

Overview:

DGI, a corporation registered in Singapore, is the wholly owned affiliate of Mitsubishi Corporation. DGI's key focus is LNG trading including the marketing and sales of MC's equity LNG [such as MC's LNG entitlement from the Cameron Project in Louisiana, U.S.A]. In addition, DGI is actively involved in new LNG demand creation projects working closely with the global MC network to utilize and leverage the necessary resources and expertise available within the group. Despite its relatively young history, DGI enjoys a strong market reputation and presence in the LNG industry and continues to build strong regional and global networks.

DGI's key focus areas are:

- Short Term LNG Trading
- Marketing and sales of LNG (short-long term)
- Project development
- Fleet management
- Business development

2.3. Tabeer Energy Private Limited (TEPL)

Tabeer Energy (Private) Limited (TEPL), a company incorporated under the laws of Pakistan, is a wholly owned affiliate of Mitsubishi Corporation, engaged in the development of the country's first fully integrated LNG supply project in Pakistan.

In developing the Tabeer LNG Project in Pakistan, TEPL will have available to it MC's and DGI's network and experience across the whole gas value chain (e.g. Infrastructure Investment, Power Generations, Financing etc.).

Our research and analysis indicates that Pakistan will have an unconstrained natural gas demand deficit in excess of 4 BCFD from 2020 and should it make commercial sense, TEPL is ready, willing and able to expand its terminal capacity and subsequent gas supply to ensure that Pakistan receives an uninterrupted gas supply.

3. Project Overview: Tabeer LNG Project

3.1. Vision, Mission, and Value

Our Vision:

A Reliable and Safe Provider of Natural Gas by Regasification meeting the requirements of Customers.

Our Mission:

To market and deliver Re-Gas safely, reliably and environmental acceptable manner in accordance with prevailing laws, regulation and Company internal policies. To be a trusted partner in the sustainable development of Pakistan and its people.

Our Core Values:

To meet our values of Honesty, Respect, Responsibility and Commitment to conducting business in a manner that is compatible with the balanced environmental and economic needs of the communities in which we operate, we define the following:

- **Honesty:** Doing what is right even if no one is watching.
- **Respect:** Listening to concerns of stakeholders and considering their needs. Respecting diversity.
- **Responsibility:** Implementing and adhering to Company HSE Management System.
- **Commitment to Conducting Business:** Compliance with the law, internal policies and business principles in order to maintain credibility with stakeholders and the license to operate.

3.2. HSSE Commitment and Policy

We are committed to:

- Pursuing the goal of no harm to people;
- Protecting the environment;
- Using material and energy efficiently and minimizing waste;
- Developing our products and services consistent with these aims;
- Consulting with our stakeholders and publicly reporting on our HSE performance;
- Managing HEALTH, SAFETY, SECURITY and ENVIRONMENTAL matters as critical business activities;
- Promoting a culture in which all TEPL contractors and employees actively demonstrate personal commitment to our HSSE Policy; and
- Promoting practical means to support Sustainable Development in Pakistan.

In this way, we aim to have an HSSE performance we can be proud of, to earn the confidence of our customers, contractors, suppliers, shareholders and society at large and to contribute to sustainable development.

Our HSSE Policy:

- Manage Health, Safety, Security and its Environmental responsibilities systematically through a documented HSSE Management System which ensures continuous improvements in its HSSE performance;
- Comply with all relevant laws, legislation, regulations and agreements it has entered into;
- Set and measure targets for improvement, regularly review, appraise and report performance;
- Require contractors to manage HSSE in line with this policy;
- Include HSSE performance in staff and contractor appraisal;
- Report its HSSE Performance annually; and
- To promote this policy with those who have business with TEPL.

Please refer to [Sub-Annexure C1] for Draft HSSE Management System.

The policy put together and annexed herewith has been heavily scrutinized by in-house technical personnel as well as retained consultants and will form a basis of the final product, however, in order to adjust and adopt to potential modifications that arise on the ground and through ongoing review, the plan has been purposely left in draft form henceforth labeled "Draft".

3.3. Objectives & Definitions

The Tabeer LNG Project is an integrated LNG supply project that involves the construction of a terminal and related infrastructure at Port Qasim, Karachi for the import and regasification of LNG in Pakistan.

The project will be constructed in a staged manner. On completion of the first stage, the project will be able to process 750 MMCFD of natural gas as a base-load and 1,000 MMCFD or 1 BCFD as peak gas send out. The second stage will, subject to market growth, regulatory permissions and commercial alignment, envision scaling up capacity to 2 BCFD.

The import and regasification LNG terminal of the Tabeer LNG Project will be constructed off-shore. TEPL estimates to be able to unload approximately 100 cargoes per year from

LNG carriers onto an FSRU through a Ship-to-Ship transfer. The LNG will be vaporized aboard the FSRU and transported as RLNG to an Onshore Receiving Facility (ORF) through a 20 km offshore to onshore pipeline where it will be delivered into the national gas pipeline grid.

3.4. Project Components

The Tabeer LNG Project involves three main components*:

A. Jetty & Interface Hardware Construction/Operation:

A simplified description is:

- An offshore toon shore pipeline to connect the terminal to the existing national gas pipeline grid,
- Offshore service platforms and jetties allowing a safe berthing of the FSRU,
- Vessels and an LNG Carriers to discharge LNG,
- Auxiliary service units on top of service platforms and shore.

B. FSRU Operation:

The FSRU is a pre-built, ready to operate floating LNG terminal. Once it is moored to the offshore service platforms and jetties as stated in (A) above, it stores LNG transferred from incoming LNG carriers, re-gasifies stored LNG and compresses it into the pipeline. The FSRU shall be procured under a long term charter or lease arrangement from a renowned and reliable FSRU provider.

C. LNG Supply and RLNG Sales:

A local affiliate of TEPL will perform the specific functions of procuring LNG for import to the project, contracting pipeline capacity with the in-country pipeline operators and selling the RLNG to buyers in the downstream natural gas market of Pakistan.

**all of the above shall be built/operated in compliance with the OGRA rules and regulations and with the express permission of authorities that include and are not*

limited to Ministry of Energy (MoE), Port Qasim Authority(PQA), Ministry of Defense(MoD), Ministry of Ports & Shipping, etc.

The above system creates an interface that connects the mode of marine transportation (LNG carriers) with that of land transportation (gas pipelines).

The jetty allows for the mooring of the FSRU and LNG carriers like a regular port. The FSRU is equipped with LNG transfer arms which connect to the LNG transfer arms of the LNG carrier. Once connected, LNG is transferred from the storage tanks of the LNG carrier to the storage tanks on the FSRU.

Before it can be transported through pipelines, the LNG must be reconverted to its natural gas form. Vaporizing chambers built on FSRUs use heat from the atmosphere, the seawater or boilers to heat the super chilled LNG, thereby re-gasifying the LNG and restoring it to its natural form.

To transport the RLNG, national gas pipeline grid access must be secured that allows the gas to be delivered from the project to its end-consumer.

The RLNG will then ultimately, be sold to buyers in the downstream natural gas market which include and are not limited to power producers, manufacturing industries, urban residential and commercial projects and the transport sector.

3.5. Phases of Project Development

The Tabeer LNG Project will be constructed in multiple phases:

PHASE 1: BASIC HARDWARE

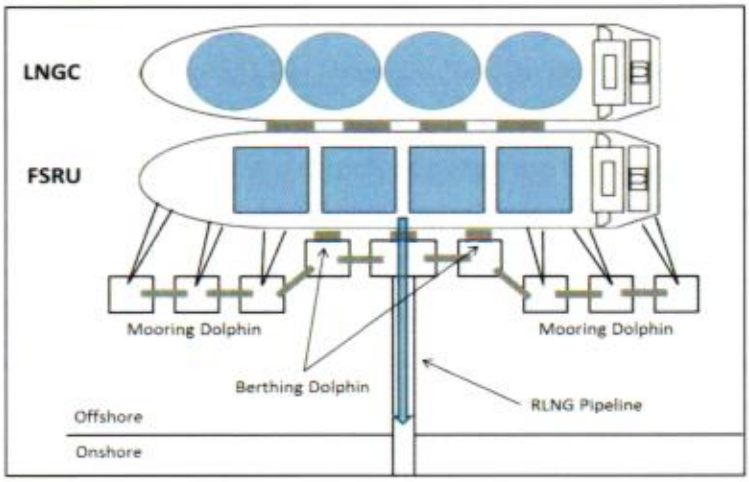


Figure 1 Ship to ship (STS) Docking Configuration

The hardware for Phase 1 will independently consist of a single FSRU berth, onshore and offshore pipelines to transport the RLNG discharged from the FSRU to the SSGC pipeline interconnection point (ORF), high voltage cables between the service platform and the grid interconnection point, ELV cables between the service platform and the SSGC interconnection Point.

Supporting equipment and systems will be comprised of a Pakistan telecom interconnection point, fire-fighting system, security and surveillance system, first aid center, control center, crew and maintenance reserves quarters.

This is not an exhaustive list of the topside units, but indicates necessary systems that have to be in place for the implementation of the Project. Meanwhile, other units may be added or removed based on recommendations from the gas operations team during construction and/or commissioning of the Project infrastructure.

PHASE 2: INTEGRATED HARDWARE

Phase 2 will include a fully integrated jetty structure, which will provide all the supporting functionality for receiving, re-gasifying and transporting the LNG.

The hardware would consist of: 1 FSRU berth, 1 LNG carrier berth capable of accepting Q-MAX sized LNG carriers, flexible hoses for LNG transfers between LNG carriers and the FSRU and loading arms for the transfer of RLNG from the FSRU to the transmission pipelines.

The basic hardware installation will allow LNG transfer on a ship-to-ship (STS) basis. The operation will use flexible hoses for LNG transfer. Quantity and quality of the gas will be verified onboard at the FSRU metering station. Pressure level of the LNG would remain constant at FSRU output only and methane content will be as per incoming cargo specs only.

- Vessels carrying LNG moor alongside the FSRU.
- Cryogenic hoses will be used to transfer the LNG from the LNG carrier to the FSRU.
- The LNG is stored in the FSRU before being re-gasified into RLNG.
- The RLNG is then exported to onshore facilities via high-pressure gas pipeline.

Supporting hardware that enables control over this integration will consist of an offshore metering station located on-board the FSRU to measure quantity and quality of LNG, odorizing unit, pressure reduction and adjustment facility and power generation capability using own gas supply.

PHASE 3: CAPACITY EXPANSION

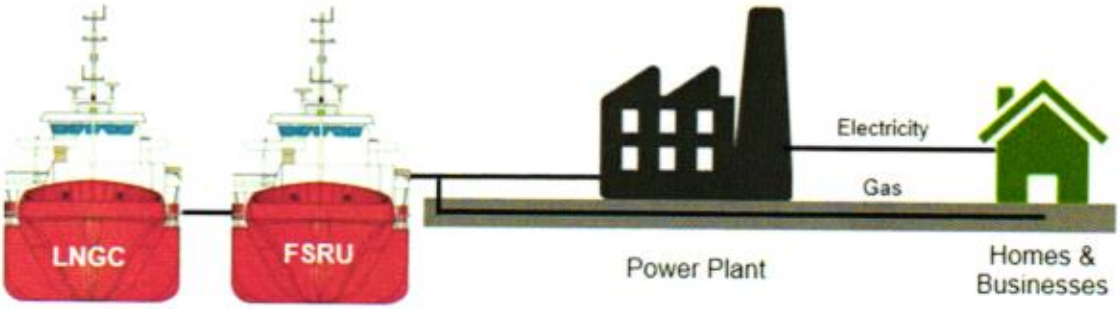


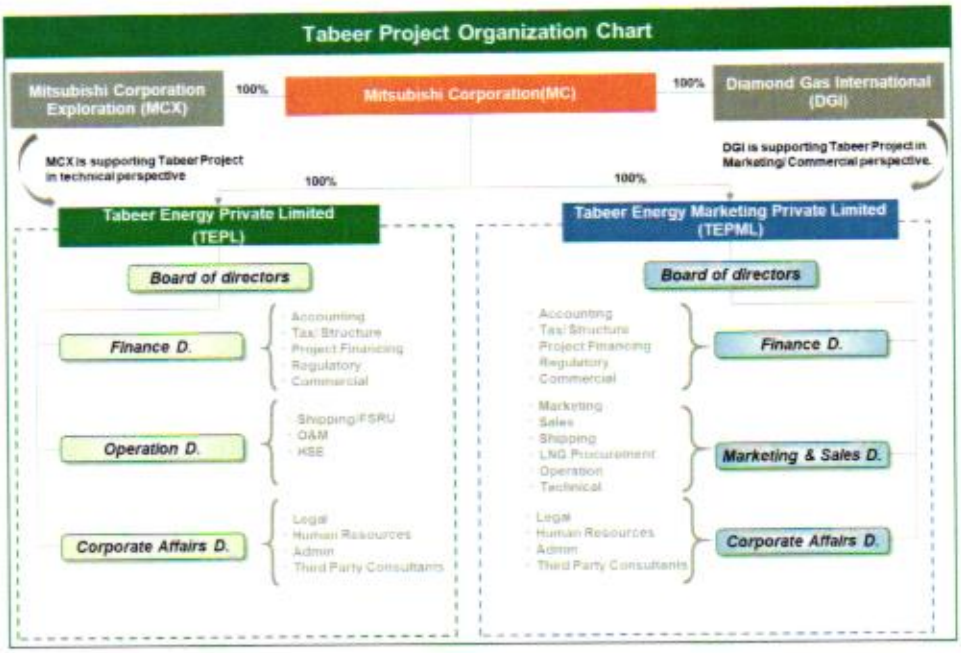
Figure 2 Terminal to market schematic

Subject to further market growth, achieving regulatory permissions and commercial alignment, TEPL will undertake an expansion of the Tabeer LNG Project. This will comprise of either, adding a new jetty, fully equipped service platforms and more FSRU(s), or other means of LNG storage and re-gasification to increase the gas send out capacity by up to 2 BCFD.

3.6. Management Capacity and Organization Chart

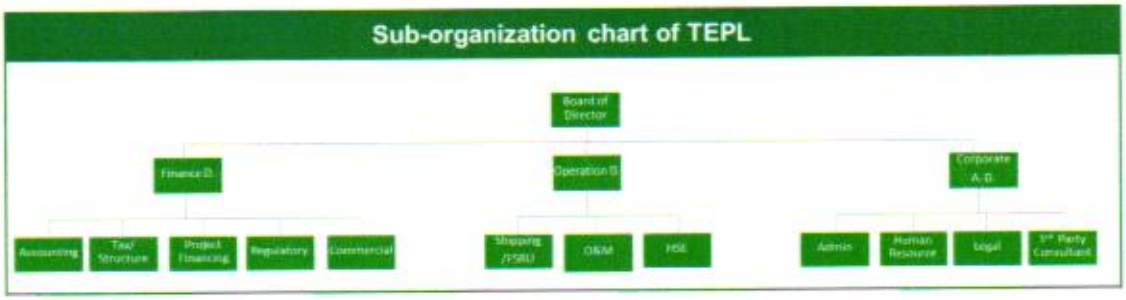
Tabeer LNG Project is supported by MC, its various subsidiaries/ affiliates, and by 3rd party consultants. As you can see from the following management capacity and Organization Chart.

Overview



MC owns 100% in share of Diamond Gas International Japan Co.,Ltd. **("DGIJ")**, which in turn owns 100% in share of sister subsidiaries TEPL and TEMPL incorporated in Pakistan. MC is the ultimate parent company and has direct, effective control of both entities.

- **TEPL Overview**



4. Overview of Our Technical Studies

Project Site Selection:

TEPL has determined the location of the project to be Port Qasim, Karachi.

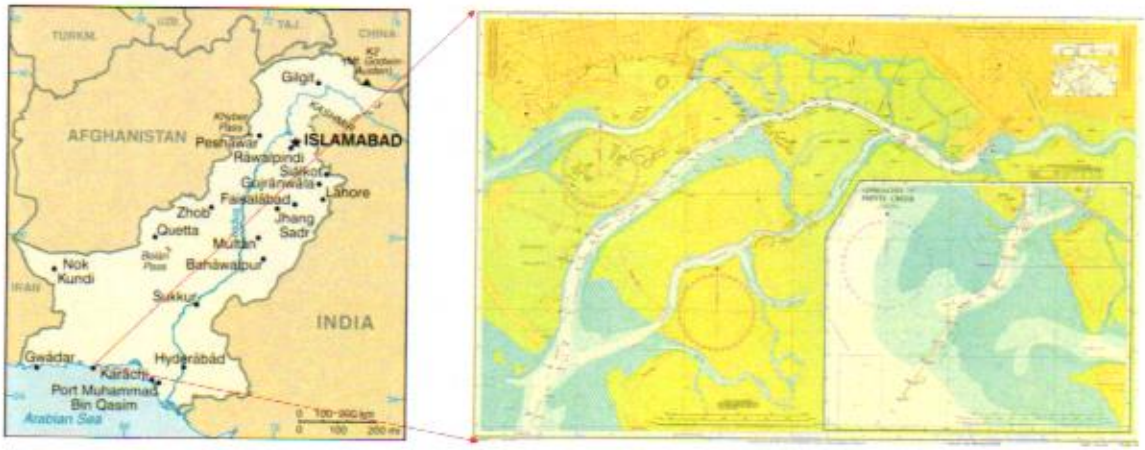


Figure 3 Location of Karachi, Pakistan

Port Qasim is a deep-water sea-port located at the coast line of the Arabian Sea and adjacent to the Bin Qasim Town, in the southern part of the Malir District, Karachi Division in the province of Sindh.

TEPL received the consent from the Port Qasim Authority (PQA) i.e. PQA Provisional NOC vide letter no. PQA/PSP/484/2017 dated 2nd March 2018, to carry out the detailed feasibility and technical studies required for establishing the LNG terminal. Further, TEPL was awarded Provisional Letter of Intent (LOI) vide letter no. No. PQA/PSP/484/2017 dated 5th September 2019.

TEPL's selected location, in Chann Wadoo channel, has been marked after undertaking detailed site selection studies, as explained in the following sections.

Figure 4 PQA – LNG Sites as per PQA NOC to TEPL

4.1. Congestion Study

In order to meet the shortfall in gas demand in Pakistan, LNG imports have proved to be a viable solution. Two LNG projects within Port Qasim are currently operational and are supplying RLNG to meet the energy requirements of the country while replacing expensive furnace oil imports.

For the selection of a suitable site for the Project in Port Qasim, TEPL carried out extensive studies, through highly reputed international Consultants – M/s JGC Corporation, Japan and also utilized significant internal technical resources of Mitsubishi Corporation.
Given the current and projected increase in vessel traffic in the main channel of Port Qasim due to operations at existing terminals, our studies raised material concerns about the future vessel traffic congestion in the main channel of the Port that may hinder smooth vessel operations for TEPL's proposed LNG terminal.

TEPL therefore, undertook a "Port Congestion Study", to analyze the current traffic congestion as well as the future traffic congestion at the port and in the main channel.

Following are the findings of the study:

- **Increase in Port Qasim Traffic**

  Serving the country's industrial activities, Port Qasim, together with Karachi Port has high levels of vessel traffic.

The number of vessels calling on Port Qasim surpassed 1,000 in 2012 and has since been on an upward trend. In 2018, the number of vessels calling on Port Qasim reached close to 1,500, indicating around 40% increase within a 5 year span. Considering further expected increases in vessel traffic in the main Port Qasim channel due to shifting handling of coal imports from the Karachi Port to Port Qasim and their projected increase in the coming years, the management of traffic in the main channel of Port Qasim will become a significant challenge for the PQA.

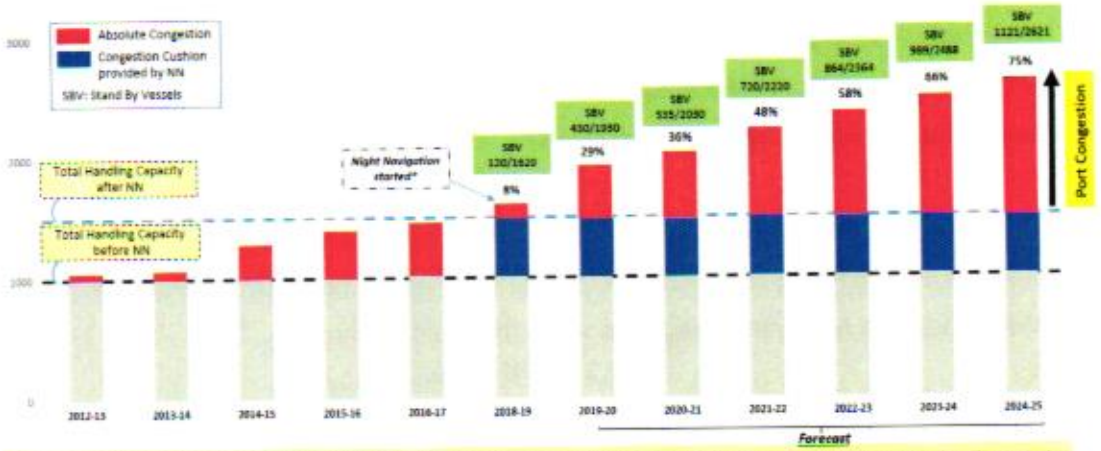
An additional LNG project in the main channel area, where the existing FSRU projects are located, will result in a further 50-100 vessels using the main channel, adding to the challenges and constraints experienced in the main channel.

In 2019, a further analysis of Congestion at Port Qasim was conducted and the introduction of Night Navigation at Port Qasim was also taken into account. Without Night Navigation, the typical operating hours are 6AM to 6PM, however, such operating hours do not allow smooth traffic management of the 1500+ vessels that arrive at PQA annually. The effect of increasing vessels in forth coming years and their subsequent impact to the Port Traffic can be seen below in red.

Night Navigation was started in 2018. At 100% efficiency, operation time is increased by 12 hours (6AM to 6AM), however, the handling capacity is increased by 50% only. Seemingly, Night Navigation has enabled to provide cushion of accommodating 500 vessels per year.

Chart 2 Current Traffic Profile at Port Qasim (with Night Navigation)

However, LNG vessels do not travel during night time, as only vessels bow thrusters are supported during Night Navigation. As seen below, Stand by Vessels (SBV) continue to follow an upward trend at Port Qasim

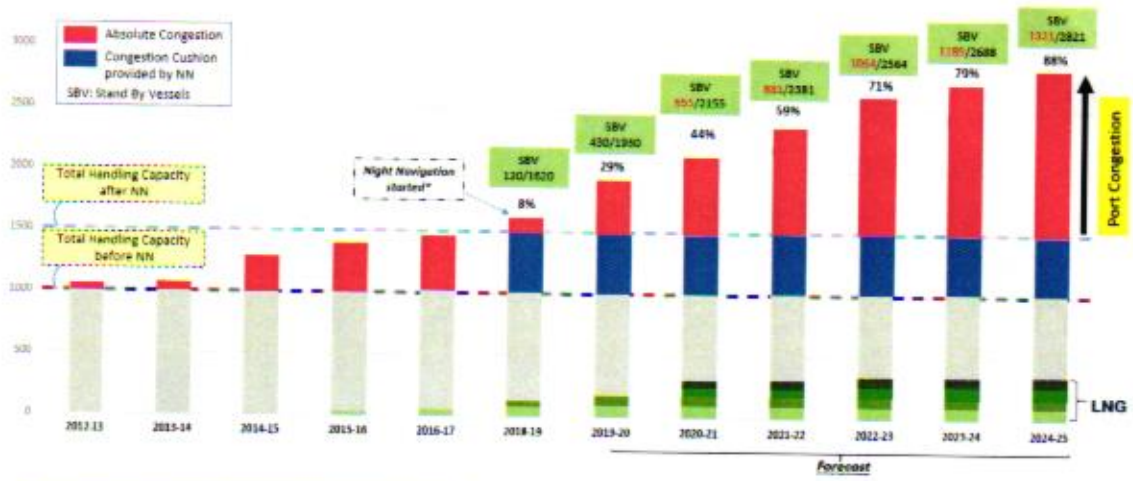


*Night Navigation (NN) was started in 2018. At 100% efficiency, operation time is increased by 12 hours (6AM to 6AM), however, the handling capacity is increased by 50% only.
Seemingly, NN has enabled to provide cushion of accommodating 500 vessels per year.
However, LNG vessels do not travel during night time, as only vessels bow thrusters are supported during NN. As seen above, Stand by Vessels (SBV) continue to follow an upward trend at Port Qasim.
Note: Above simulation does not account for 3rd LNG Terminal anywhere in Port Qasim.

Chart 3 Impact of Night Navigation on Port Congestion

Above simulation accounts for the addition of 3rd LNG Terminal in the Main Channel and the consequent increase in Port traffic and congestion.

Chart 4 Impact of 3rd LNG Terminal in the Main Channel on Port Congestion



Above simulation accounts for the addition of 3rd and 4th LNG Terminal in the Main Channel and the consequent increase in Port traffic and congestion.
Despite Night Navigation, accommodating any further LNG terminals in the Main Channel would compound the Port Congestion to alarming levels.

Chart 5 Impact of 3rd & 4th LNG Terminal in the Main Channel on Port Congestion

The above simulation, as seen in Chart 4 and 5, accounts for the addition of 3rd and 4th LNG Terminal in the Main Channel and the consequent increase in Port traffic and congestion. Despite Night Navigation, accommodating any further LNG terminals in the Main Channel would compound the Port Congestion to alarming levels.

- **Coat Import Increase**

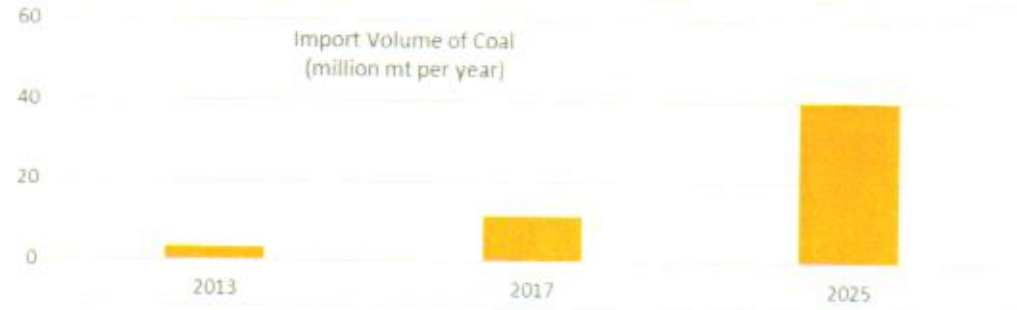


Chart 6 Import Volume of Coal, Records and Estimate

In 2018, the Government announced the suspension of coal imports at Karachi Port and designated Port Qasim to handle all coal imports due to environmental hazards. Industry estimates have put Pakistan's coal imports at 11.2 million mt (160 ships) in 2019, up sharply from 3.42 million mt (49 ships) in 2013. Given the significant investments in coal-fired power plants under the China-Pakistan Economic Corridor plan, imports are expected to rise to 40 million mt (571 ships) by 2025, according to industry experts . This increase in coal cargo vessels will inevitably impact the traffic within Port Qasim main channel.

- Waiting within Port Qasim

  The number of ships accumulating waiting time prior to entering the main channel has been analyzed.

  The below pie chart depicts the number of vessels delayed from entering the main channel and having to wait at anchor.

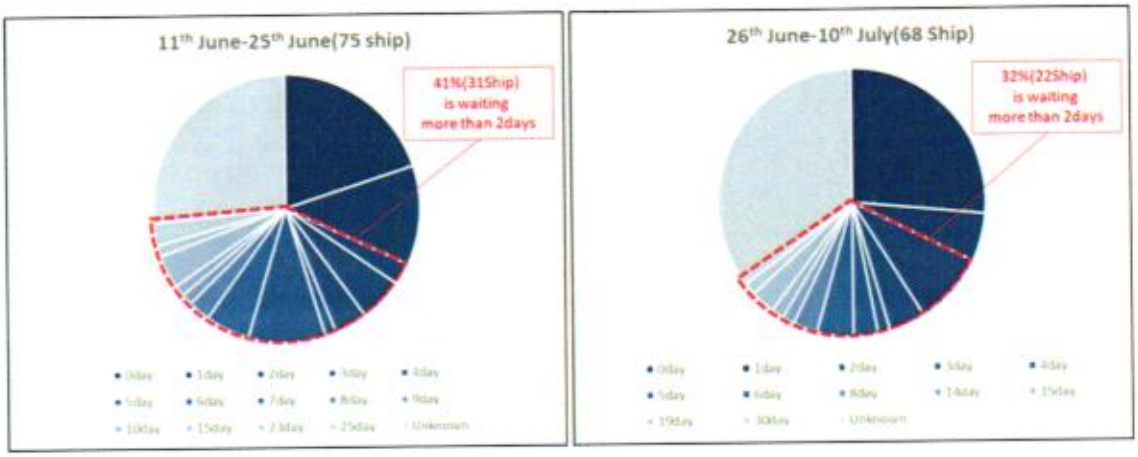


Chart 7 Number of Waiting Vessels

- **Main Channel Simulation**

The port congestion study included a desk-top simulation of the impact of additional LNG projects based on the case scenarios of a total of 2, 3, and 4 LNG projects in the main channel.

Assumptions are as below:

- Unloading Time: 18hrs (for both LNGC and Others)
- De-berth: 1.5hrs (for both LNGC and Others)
- Arm Cool Down: 2hrs
- Arm Connection: 2.5hrs
- Drain & Purge/Arm Disconnection: 2.5hrs
- 5 other vessels in/out per day (other than the LNG vessels)

Simulation results for each case are as below:

Case2: 2 FSRUs (2 LNG carriers /4days + 5 other carriers/1day)

From a practical standpoint, the port can handle the entire port traffic if LNG projects are limited to two. However, concern remains around schedule coordination particularly taking into account the lack of control over vessel arrival/departure that can arise due to weather limitation.

Case3: 3 FSRUs (3 LNG carriers /4days + 5 other carriers/1day)

Although theoretically possible, port regulations must be altered to prioritize right of way for LNG carriers. Regulation changes for LNG carriers such as allowing two-way crossing, night time

Case 1: 4 FSRUs (4 LNG carriers / 4 days and 5 other carriers/1day

Impractical. Port will be faced with a situation to give priority to 2-4 LNG carriers continuously occupying the main channel from sunrise for an extended period of time, thereby, interrupting/hindering passage for other vessels entering the port. This poses a significant challenge in schedule coordination and can be deemed impractical.

Conclusion of above studies is as follows:

- Traffic of Port Qasim via the main channel is nearing maximum capacity. Even under the current circumstances where only 2 FSRUs are operational in the existing two LNG Terminals in the main channel, careful planning and scheduling among all vessels using the main channel is crucial to maintaining day to day operations.
- Port Qasim traffic steadily increasing: During last 5 years, +6% traffic YoY (number of vessels)
- Increase of LNG carriers in the main channel likely to result in heavy traffic congestion and vessel delays. Channel congestion and vessel delays adversely impacts trade economics with demurrage costs will ultimately be borne by the end user.
- Safety may potentially be compromised if an environment where shippers are competing for a channel slot is created.

Based on the above findings, establishing an LNG import terminal away from the main channel yields strategic benefits including a stable and reliable supply of energy to Pakistan for the long duration of the project. Hence, due to the forecasted traffic congestion in the main channel, TEPL has selected the below highlighted radius, marked on the map produced from the PQA NOC, for undertaking a more detailed site selection study.

The establishment by TEPL of the LNG import terminal at the location marked below requires TEPL to construct a 20km pipeline for connecting the terminal to the ORF.

Figure 5 Radius of Selected Site on Map of LNG Sites as per PQA NOC to TEPL

4.2. Technical Site Selection Study

Within the radius specified in Table 2 Candidates' Data for Site Selection and Figure 6 Candidates' Area for Site Selection, three sites (six locations) have been compared as part of a detailed "Site Selection Study". This study comprised firstly of a desktop analysis which was conducted from 6th of November to 22nd of November 2017 by our Consultants JGC - Japan. After the desktop study, a site survey was performed for three days by a team of experts from JGC – Japan and a meeting with PQA officials was held. After diligent consideration of the results of the desktop study, site survey, and the PQA meeting, TEPL concluded the site marked "B1" as most preferable for TEPL's LNG import terminal.

Table 2 Candidates' Data for Site Selection

Items	Potential Sites					
	A1	A2	B1	B2	C1	C2
Dredging Volume (㎥)	4,550,000	4,550,000	2,250,000	3,750,000	2,150,000	2,100,000
Pipeline Length (km)	26	26	22	22	20	20
The Number of Creek Crossing (times)	3	2	2	2	1	1
Maneuvering (distance from turning cicle to bearth)	C	C	A	A	B	A
Trestle Length (m)	105	105	140	140	105	350
Influence on Future Dredging Plan	No	No	No	No	Yes	No
Result	BB	BB	AA	A	BBB	AAA

Figure 6 Candidates' Area for Site Selection

Hence, TEPL has selected the site location which is Site B1, bounded by the coordinates labelled and detailed below in Figure 7 TEPL Terminal Location (B1) bounding and Table 3 TEPL Terminal Location (B1) Points' Coordinates.

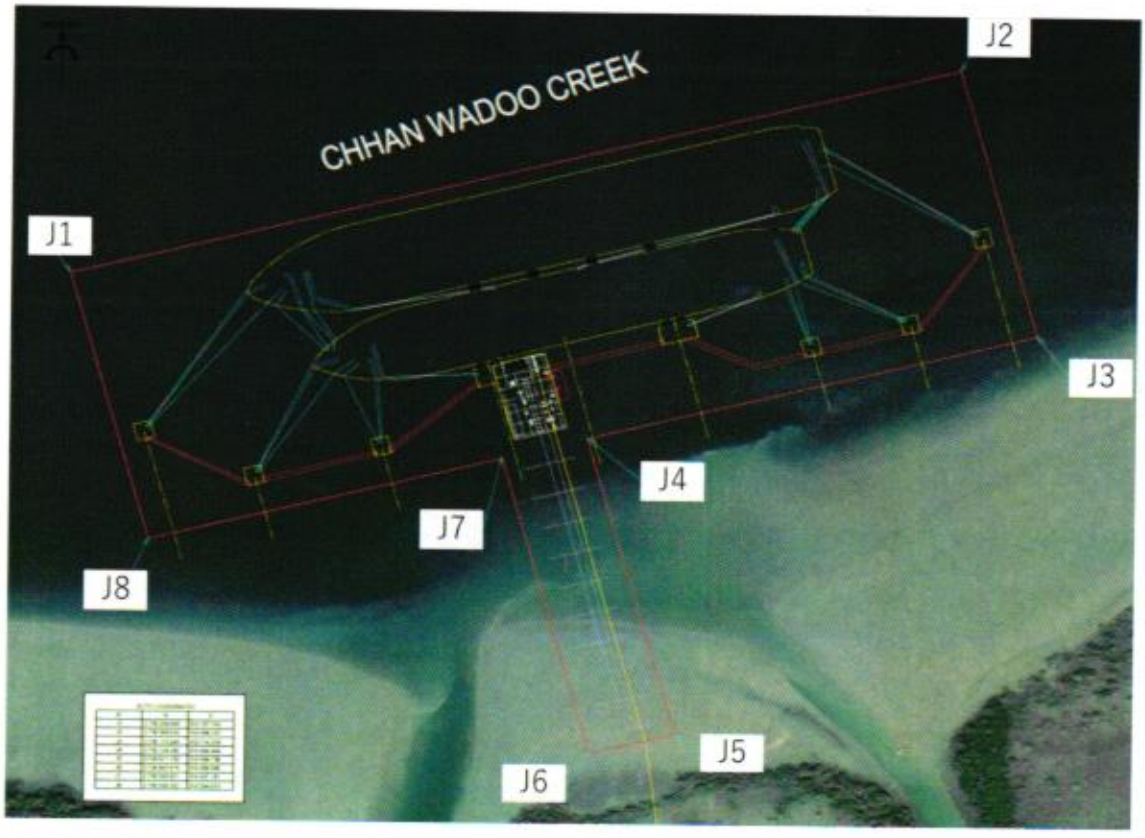


Figure 7 TEPL Terminal Location (B1) bounding

Table 3 TEPL Terminal Location (B1) Points' Coordinates

Point ID	Coordinates
J1	24°43'14.7"N 67°12'43.5"E
J2	24°43'19.4"N 67°13'01.6"E
J3	24°43'13.8"N 67°13'03.4"E
J4	24°43'11.5"N 67°12'54.2"E

Point ID	Coordinates
J5	24°43'05.2"N 67°12'56.2"E
J6	24°43'04.8"N 67°12'54.4"E
J7	24°43'11.0"N 67°12'52.5"E
J8	24°43'09.2"N 67°12'45.3"E

Site B1 is preferable due to:

- It being assumed that the upstream turning/swing basin as marked is feasible, otherwise the turning/swing basin will need to be located where marked on site A, which would offer no added advantage.
- Minimum additional dredging volume for the turning/swing basin compared with Site C.
- Site B possibly offers a more sheltered location from the effects of the intersecting waterways at Site C.
- Length of piping to the ORF will be about 2km longer than that required at site C.

4.3. Pipeline Route Selection

As the result of pipeline route selection study described in this section, TEPL decided it as drawn in Figure 8 Pipeline Route.

Figure 8 Pipeline Route

Objectives:

The main objective of the study is to select the most efficient pipeline route from Jetty to ORF considering CAPEX, constructability, construction duration, and environment.

Scope:

A total of 4 pipeline routes were evaluated during post routing study, and all routes have the following common attributes, crossing;

- Mangrove island
- Shallow water
- Shipping channel
- Onshore land

Length of each pipeline route and each section:

Pipeline length of each route are described in Table 4 Pipeline Length and they are drawn in Figure 9 Pipeline Route Candidates.

Table 4 Pipeline Length

	Route Length (km)					
	Mangrove Island	Bank	Creek/ Channel	Land	HDD	**Total**
Route - 1.2a	14.44	0	1.03	2.75	2.38	**20.60**
Route - 1.3	2.25	16.52	0.97	2.75	2.38	**24.86**
Route - 1.4	17.83	0	1.56	2.75	1.61	**23.75**
Route - 1.5	5.99	14.44	1.56	2.75	1.61	**26.35**
Note: The above length for each category are measured based on the satellite image.						

Figure 9 Pipeline Route Candidates

Evaluation Result of each pipeline route:

Based on the length of each pipeline route and each section, items were evaluated as shown in **Error! Reference source not found.**. Due to the evaluation of each pipeline routes, Route 1.4 (Figure 8 Pipeline Route) was defined as the most recommended options.

Table 5 Evaluation Results of Each Pipeline Candidates

Item	Route				
	1.2a	1.3	1.4	1.5	
Pipeline(Length)	1.0	1.2	1.1	1.3	※20.96km : [1.0]
HDD(Length)	1.9	1.9	1.3	1.3	※1.27km : [1.0]
Environment (Mangrove trim)	A	AAA	BBB	AA	
Environment (Dredging Vol.)	AAA	BBB	AA	BB	
Influence on Future Port Plan	Yes	Yes	No	No	
Creek Cross (No.)	1	1	2	2	
Constructability	AA	BB	A	BB	
Instl. Schedule	AAA	BB	AA	BB	
CAPEX	AA	BB	AA	BB	
Recommendation	•	△	○	▲	

Note: ○ > ● > △ > ▲

4.4. Pre-FEED Activities

Before beginning FEED study, Pre-FEED study based on Sight Selection Study and Pipeline Route Selection Study both explained in former sections was conducted. Main Purpose of this study is the conceptual study of our gas transporting system.

This study includes Field Survey in Karachi, 3D modeling of channels and dynamic simulation of vessels' safe navigation. Based on this study, we defined required components of our system and conducted their conceptual study. Furthermore, HAZID meeting was held with the participation of relevant PQA staff.

4.4.1. Site Survey

During the Pre-FEED stage, three import surveys were conducted to investigate the technical and commercial feasibility of the Terminal, along with safety and environmental aspect for construction and operation phase.

1. Metocean Data Investigation

Objective of Study:

The main objectives of the Metocean Survey are identification of surveying metocean data (wave, wind, tide current temperature and salinity) shall be collected and analyzed to obtain the technical parameters;

Scope:

- This study was conducted by JGC and Techno Consult International.
- Tidal Observations at one Locations T5
- Moored ADCP Current Measurements at 04 Locations MET-1, MET-2, MET-3 and MET-4
- Salinity, Temperature at 3 Locations MET-1, MET-2, and MET-3
- Sea Bed Sampling at 04 Locations from MET-1, MET-2, MET-3 and MET-4
- Sea Water Sampling 09 samples
- A UXO and Factual weather data study was also scheduled and report on which will be submitted separately.

Please refer to [Sub-Annexure C2] for Metocean Data Collection Report.

2. Bathymetric Survey

Objective of Study:

The main objectives of the Bathymetric Survey are identification of surveying the accurate

existing seabed level where encompass the area to be dredged, to calculate dredge volume.

Scope:

- The survey was carried out by narrow multi beam echo sounder;
- Single beam echo sounder allows to use the inshore sounder;

Manual survey (topographic / levelling) allows to apply where water depth is shallow and survey boat is not accessible;

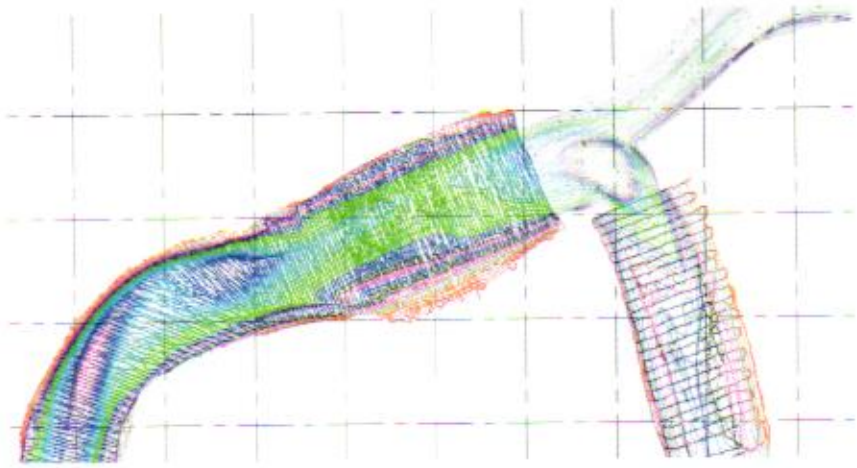


Figure 10 Bathymetry Survey Data

Please refer to [Sub-Annexure C3] for Bathymetry Survey Report.

3. Geotechnical Investigation

Objective of Study:

In order to determine the geotechnical parameters of the subsurface deposits, M/s. Soil Testing Services (STS) were entrusted by TEPL, to perform the geotechnical investigation at the project site.

Scope:

The scope of field work included the drilling of nine (09) boreholes: five (05) boreholes up to the depth of 50.0 meters to set up the jetty and four (04) boreholes up to the depth of 20.0 meters below sea bed. In each borehole, standard penetration tests were carried out along with the collection of soil samples via split spoon sampler. Boreholes in rock were advanced through continuous coring. Rock core samples were collected with the help of double tube core barrel. Sea water samples were also collected from the boreholes drilled at site. The samples retrieved from the field work were tested in the laboratory and this report is prepared from the information obtained from the field and laboratory tests.

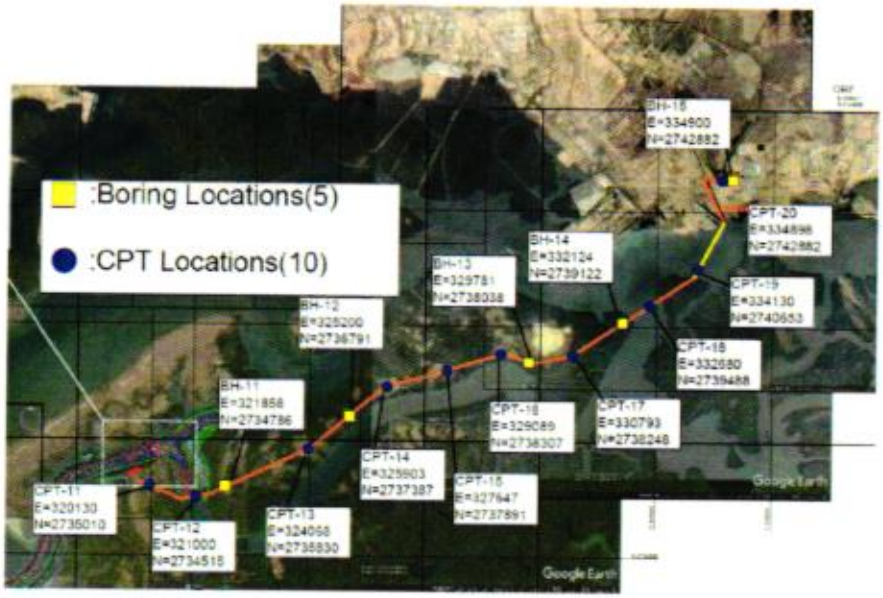


Figure 11 Geotechnical Survey Points for Pipeline

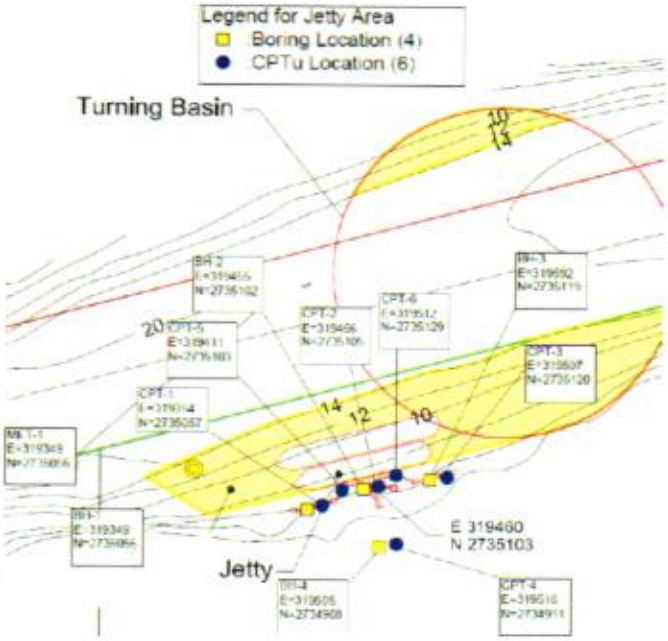


Figure 12 Geotechnical Survey Point for Jetty

Please refer to [Sub-Annexure C4] for Geophysical Survey Report.

4.4.2. Dredging Requirement

TEPL's proposed LNG import terminal site will require some amount of dredging for turning basin and berthing pocket to secure the project site and any passing vessel at Chann Wadoo channel.

Estimated total amount of dredging volume will be 2,700,000 m³ (turning basin:1,870,000 m³ and berth pocket:830,000 m³), and TEPL is considering to use cutter-suction dredging as a method identified at the Pre-FEED stage.

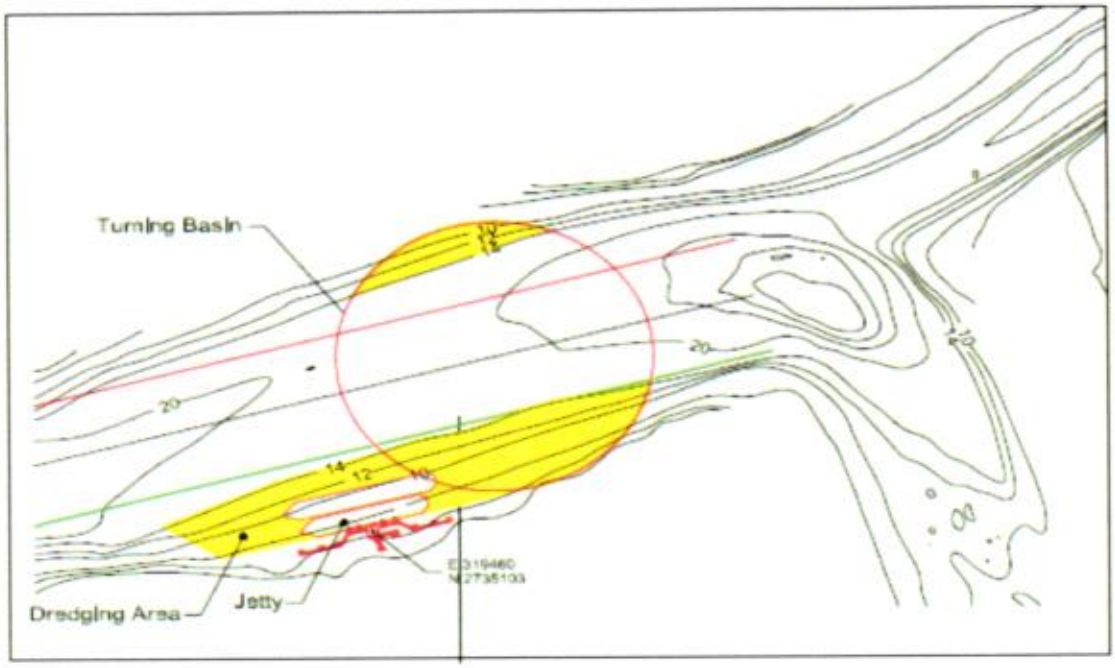


Figure 13: Dredging portions at TEPL terminal location

ATTN: The dredging area and volume have been optimizing since FEED began, and it might be less than 2,00,000 m³, depending of the size of Jetty Platform.

4.4.3. Quantitative Risk Assessment (QRA)

QRA report presented findings of the QRA carried out for the LNG Facility foreseen as a part of LNG Receiving Facilities feasibility study.

The LNG facilities foreseen for the Project consist of an FSRU, in which the LNG is pumped up to required pressure and vaporized by means of seawater. Then, vaporized gas is send to ORF through three HP Loading Arms and new pipeline. In addition, power generation,

service water, nitrogen and fire water system are installed on Offshore Platform.

The QRA study aimed to identify credible scenarios related to piping and equipment failure leading to possible fluid releases and to assess the effects of the resulting scenarios in terms of likelihood of occurrence and associated physical and chemical consequences with respect to people, health and safety.

The analysis has been focused for the risk to operators and public due to the hazards relevant to the new installations and the maritime traffic in the channel.

The following steps have been applied:

- Identification of risk;
- Calculation of frequencies and consequences;
- Risk assessment and evaluation.

Risk identification has been performed by means of existing HAZID study review and random rupture review for applicable isolatable sections in the project.

Frequency of Maritime hazards has been assessed as negligible; this result is mainly due to the foreseen navigation procedures which require the presence of a tug always connected to the LNG carries during channel navigation and the simultaneous presence of at least two working tugs during berthing and un-berthing maneuvers.

Frequencies of release due to random ruptures from loading arms, pipeline and equipment at ORF included in the SoW have been also calculated. Event Tree Analysis has been used to obtain associated frequencies for associated final outcomes (jet fire, flash fire, unignited dispersion).

Explosion scenarios have been neglected: no congested areas are to be observed in the jetty area or along pipeline routing (the assessment has been performed by reviewing aerial photography of the area of interest.

More detailed assessment should be performed during later project stages). In absence of congested areas, combustion of premixed flammable cloud would lead to negligible overpressure values. Moreover, the focus of the analysis is the assessment of risk for people (both personnel and public); as a consequence, attributing the whole delayed ignition to the flash fire scenario and extending the probability of fatality down to LFL/2 concentration value

will result in conservative assumption, since distances reached by LFL/2 concentration are generally greater than overpressure distances in presence of low confinement.

Consequences have been assessed by means of DNV Phast. Results have been expressed in terms of LSIR for public and IRPA for operators. Maximum LSIR along the pipeline has been assessed in the range of 1E-07 ev/y, thus falling in the continuous improvement area. No further barriers or mitigation measures are therefore envisaged to reduce the risk. Maximum LSIR in the Terminal and ORF area has been assessed in the range of 1E-05 ev/y, with 1E-06 ev/y extending for less of 500 m from the loading arms.

Risk in the Terminal and ORF is evaluated in the lower boundary of ALARP region; as additional mitigation measure, the installation of a Fire and Gas detection system is advised, in order to provide audible and visual warnings in case of loss of containment. Automatic actuations in case of fire of gas detection should be evaluated in future project phases. The set-up of an exclusion zone of approximatively 500 m from the jetty could be also taken in consideration, if technically and economically feasible.

Please refer to [Sub-Annexure C5] for QRA Report.

4.4.4. HAZID

Objective of the Study:

The HAZID workshop has objective to identify;

- Major accident events (MAE) that may cause serious or immediate risk to personal health and safety;
- Potential causes or threats that may lead to MAEs;
- Assignment of risk rating to MAEs to allow for prioritization of risk reduction measures;
- Safeguards, both engineering or operational control measures that have already been included in the design;
- Controls measures that are safety critical in managing and controlling potential escalation of MAE;
- Additional risk reduction measures to achieve ALARP;
- Provide inputs for subsequent HSE studies.

Scope:

The scope of work for HAZID study includes the following facilities;

- FSRU Vessel;
- Interaction with other Vessels/ Facilities in Vicinity;

- Jetty including Operation Concept and Vessel Navigation in Vicinity;
- Connecting Pipeline from Jetty to Onshore Facilities; and
- Onshore facilities.

HAZID Study Session:

The HAZID workshop was held over a period of 2 working days from 24th to 25th of April 2018 via teleconference between meeting venues in Karachi, Pakistan and JGC Corporation Head Office in Yokohama, Japan.

Overview

The HAZID Study identified all the hazards arising from the project and assessed the cause and consequence associated with the hazards, enabling recommendations to be made to eliminate the source if possible, control and/or mitigate otherwise.

A total of 37 recommendations were generated as presented in the below table and these recommendations will be addressed by MC and JGC during FEED.

Table 6 HAZID List of Recommendations

Sr. No.	Recommendations
1.	Evaluate the risk of fire escalation to FSRU from jetty area.
2.	Evaluate the potential anchor drop impact on pipeline based on the expected anchor size at main navigation channel - Gharo Creek.
3.	Marine chart to be updated to show pipeline routing during later phase of project.
4.	Consider implementing early leak detection system on jetty.
5.	Ensure Emergency Response Plan is developed and integrated with Port Emergency Response Plan during later phase of project.
6.	Evaluate the potential anchor drop impact on pipeline based on the expected anchor size along subsea pipeline route.
7.	Consider the risk of ship grounding in selecting pipeline route.
8.	Review the risk of land erosion during pipeline route selection and consider appropriate soil stabilization if required.
9.	Review appropriate means to control uplift of pipeline (e.g. concrete lining). Confirm suitable environmental friendly material for coating (e.g. concrete).
10.	Emergency Response Plan to consider third party assistance (e.g. from Port Authority).

11.	Consider permanent presence of firefighting capable tug boat (considering that terminal is far away from the port).
12.	Consider developing efficient MEDEVAC plan.
13.	Review lesson learnt on hydrocarbon release from pipeline (i.e. at insulation joint location) of one of the existing terminal on jetty.
14.	Review the orientation of pig receiver/ launcher to avoid potential damage by pig in case of door is blasted.
15.	Review appropriate escape routing and muster plan for incident at Jetty area.
16.	Review the requirement for metocean monitoring system.
17.	Consider provision of vessel traffic monitoring system.
18.	Review whether vessel traffic is monitored from cargo control room.
19.	Develop FSRU Standard Operating Procedure for monitoring passing vessels.
20.	Review the current PQA Standard Operating Procedure for consideration of bunkering of FSRU when LNGC is not alongside the FSRU.
21.	Review the risk of LNG vaporisation and dispersion in case of LNG release.
22.	Review the safety requirement associated with ship to ship transfer operation by cryogenic hose and in case of hose failure.
23.	Reconfirm the location of turning circle. The concerns is proximity of the turning circle to jetty.
24.	Review leak detection and containment for cryogenic release.
25.	Consider perform dropped object/ mechanical handling study during subsequence project stage.
26.	Review the requirements for safe handling of excess BOG in FSRU.
27.	Review the requirement for fire extinguishing system on vents.
28.	Consider performing dispersion and radiation study on vent release.
29.	Confirm the requirement for F&G detection and fire protection of ORF area.
30.	Confirm design condition of pipeline downstream of tie-in point.
31.	Develop security plan in conjunction with the local authority requirement (to cover terminal, jetty and ORF).
32.	Consider early approval of turning circle location with Port Authority.
33.	Dispersion study to determine the safety zone of the terminal.
34.	Review the effect of waves and body motion on unloading arm, hose and

	mooring lines.
35.	Consider develop SIMOPS plan in association with SSGC for ORF.
36.	In case there is requirement of transfer of data between terminal and onshore facility, cyber security should be in place.
37.	Consider developing spill response plan for ORF.

Please refer to [Sub-Annexure C6] for HAZID Report.

4.5. FEED Activities

FEED study is performed from November 2018 by JGC - Japan under supervision and review of MC's Technical Team. Based on conclusions of Pre-FEED, five key issues were further studied and defined. They are described in following sections of this document:

- Technical Basis of the Terminal Design
- Operation and Maintenance Philosophy
- Pre-Commissioning / Commissioning Philosophy
- EPC Execution Plan
- EPC Cost and Schedule

Discussions were held to analyze the above issues during a HAZOP Meeting with participation of the MC's Technical Team and JGC Engineering Design Team who are responsible for all the FEED activities. Full Mission Bridge Simulation (FMBS) was also carried out with the participation of the MC's and JGC Technical and Navigational Experts to determine the navigational safety and the viability of the selected site.

4.5.1. HAZOP

Objectives of Study:

The objective of the HAZOP Study is to identify hazards and operability issues that may be encountered during the operation of the Project facility such that suitable measures (i.e. mitigation measures) could be incorporated in the design and / or in the operating procedures.

Scope:

The HAZOP workshop study covered the following facilities;

- NG Unloading Arm & Jetty to Pipeline
- Pipeline to Onshore & Metering Station
- Gas Send-out Line
- Fire Water System

Please refer to [Sub-Annexure C7] for HAZOP Study Report.

4.5.2. QRA Update

Objectives of Study:

This report presented findings of the QRA carried out for the LNG Facility foreseen as a part of LNG Receiving Facilities feasibility study.

The LNG facilities foreseen for the Project consist of an FSRU, in which the LNG is pumped up to required pressure and vaporized by means of seawater. Then, vaporized gas is send to ORF through three HP Loading Arms and new pipeline. In addition, power generation, service water, nitrogen and fire water system are installed on Offshore Platform.

The QRA study aimed to identify credible scenarios related to piping and equipment failure leading to possible fluid releases and to assess the effects of the resulting scenarios in terms of likelihood of occurrence and associated physical and chemical consequences with respect to people, health and safety.

Scope:

- The scope of this document is to assess the risk to plant associated to dangerous liquid or gas releases and resulting hazardous scenarios.
- This study has been developed based on the most updated information available for the Project, and in compliance with international best practices for risk assessment.
- The Quantified Risk Assessment (QRA) study aims to identify credible scenarios related to piping and equipment failure leading to possible fluid releases and assesses the effects of the resulting scenarios in terms of likelihood of occurrence and associated physical and chemical consequences with respect to people health and safety.

Random rupture (loss of containment) and findings of Hazard Identification (HAZID) Study have been analysed in this QRA Study, considering the available control and safety devices used for the prevention and/or mitigation of hazardous scenarios.

Please refer to [Sub-Annexure C8] for QRA Report (Update).

4.5.3. Navigation Simulations

Objectives of Study:

The main objectives of the channel modeling and simulation report was;

- Assessment of the risk to plant associated to dangerous liquid or gas release and

resulting hazardous scenarios.

Scope:

The scope of work of the Navigation Simulation includes the following studies;

- The navigation study was to preliminary assess the technical and safety aspects of the proposed berth related to navigation though the Chann Wadoo Channel and the berthing and unberthing of different types and sizes of LNG carriers.

Main Outcomes:

The overall feasibility of navigation of Chann Waddo Creek is further confirmed for each of the vessels assessed within the existing environmental guidelines in force for navigation of the Main Navigation Channel and taking account of the new current flow data supplied.

The proposed configuration of Chann Waddo Channel is suitable for the navigation of 130k m3 Membrane type and 170k m3 Moss type LNG carriers under the existing wind limitations as per in force SOPs (not exceeding 20 knots) at all times of the tidal cycle. This is a fundamental result affecting the overall terminal availability as the majority of the LNGCs presently operating in the world fleet are within this size range and could therefore reach the berth during the operating daylight window with no additional limitations. Existing port SOP's require daylight transits of LNG vessels.

For Q-Max and Q Flex sized vessels, whilst the navigation of Chan Waddo Creek is feasible, it may be necessary, for the reasons detailed below, to impose limitations on the times within the tidal cycle at which the Creek transits should be undertaken.

The execution of the runs highlighted that for safe navigation throughout the channel for all the LNGCs types and sizes, a precise maneuvering strategy is required particularly in terms of the transit speed in the different sections of the channel.

The flood current regime has been identified as the most demanding scenario for arrival maneuvers whilst the ebb current is most demanding for vessel departures.

The maximum environmental conditions in which LNGCs may currently be moved are detailed in in the existing Port Qasim Standard Operating Procedures. Revised current flow data used in this study is derived from the hydraulic studies provided by Client (in particular current charts for the whole tidal range cycle). It has to be highlighted that the hydrodynamic database concerning current flow direction and magnitude within the area,

provided to RINA Consulting, may not take into account the possibility of enhanced flow magnitudes which can be experienced during occurrence of South West monsoon period, because it has been considered unsuitable the entrance and navigation of the channel by LNGCs.

Please refer to [Sub-Annexure C9] for Navigation Simulation Study.

4.5.4. Mooring Analysis Dynamic Simulation

Scope:

The scope of the dynamic mooring analysis is to confirm that the FSRU can be permanently moored at the Jetty and LNG carriers safely moored against the FSRU, discharging LNG into the FSRU by means of ship-to-ship cargo transfer. This report examines and confirms the Jetty/Dolphins layout by means of geometric study, dynamic mooring analysis and limitations in mooring safety.

Main Outcomes:

Results of the dynamic mooring analysis indicates that safe mooring can be achieved at the terminal under conservative combinations of forces resulting from environmental conditions, as well as forces generated by large passing ship (Q-max). Limitations in mooring safety are induced by the FSRU's mooring lines in all case scenarios evaluated in accordance with the Appendix and were defined using the worst-case combination of tidal current speed and direction, wind speed and direction, tidal elevation and vessel loading condition. Results of the dynamic mooring analysis indicates that the environmental load case is the governing case for fender design, as it yields 98% of rated fender reaction at 580mm deflection and an energy absorption of 2130kN.m; this is controlled by an environmental case, and not by a berthing or ship passing case.

Please refer to [Sub-Annexure C10] for Mooring Analysis & Dynamic Simulation Study.

4.5.5. Sedimentation Study

Scope:

The specification covers to determine sand/mud transport regime and accretion rates in the dredged approach channel to the project following development of the berth facilities.

Main Outcomes:

The aim of FEED was to quantify sedimentation in the approach and nearshore channels, berth and turning basin area. The offshore region and islands around the nearshore channel

are understood to be characterized by fine sand. In contrast, sediments in the approach channel comprise silt and clay. These different sediment types are thought to merge gradually in the area adjacent to Muchak Island. To correctly represent the different dynamical properties of these sediment types, two modelling approaches have been undertaken in this phase of the works:

- Sand Transport model (ST) - for the non-cohesive sandy sediment in the nearshore and approach channel; and
- Mud Transport model (MT) – for the muddy cohesive sediments in the approach channel, berthing and turning basin.

The results obtained from both models show that, in general, the approach channel is mainly dominated by sand processes, with some additional mud deposition during the monsoon season. Whereas, the area of the turning circle and the berths is dominated by deposition of cohesive sediments.

Please refer to [Sub-Annexure C11] for Sedimentation Study.

5. Terminal Components

5.1. FSRU

The FSRU facilitates the bulk storage of LNG and provides re-gasification of the LNG for export. The FSRU is classified by DNV-GL and designed and constructed in accordance with standards and norms issued by the following organizations: IMO, ISO, API, DNV-GL, SIGTTO, OCIMF enabling efficient and safe operations. General specification is shown in Table 7 General Specification for FSRU.

Table 7 General Specification for FSRU

Re-Gasification System	Vessel	FSRU (Upto 170,000m^3)
	Type	Heating with SW/Glycol/Propane as open loop
	Gas Send-out Capacity	Upto 1,000MMscf/d
Vessel Dimensions	Length	Upto 294m
	Breadth	Upto 46m
	Draft	Upto -11.6m CD
Hull Structure	Steel Material	Mild steel, higher-tensile steel for limited areas
	Fatigue Life	30 years
Tank Capacity	Cargo Tanks	Membrane Type (GTT reinforced Mark III)
Offloading	Type	STS
Power Generation	Type	Dual fueled
BOG	Type	Re-condenser embedded
Mooring	Type	Jetty

Boil off Gas Handling:

The guaranteed boil off rate is 0.15% per day of the net cargo tank volume of 166,600 m3 (Filling limit is 98% of at fully loaded condition based on pure methane).

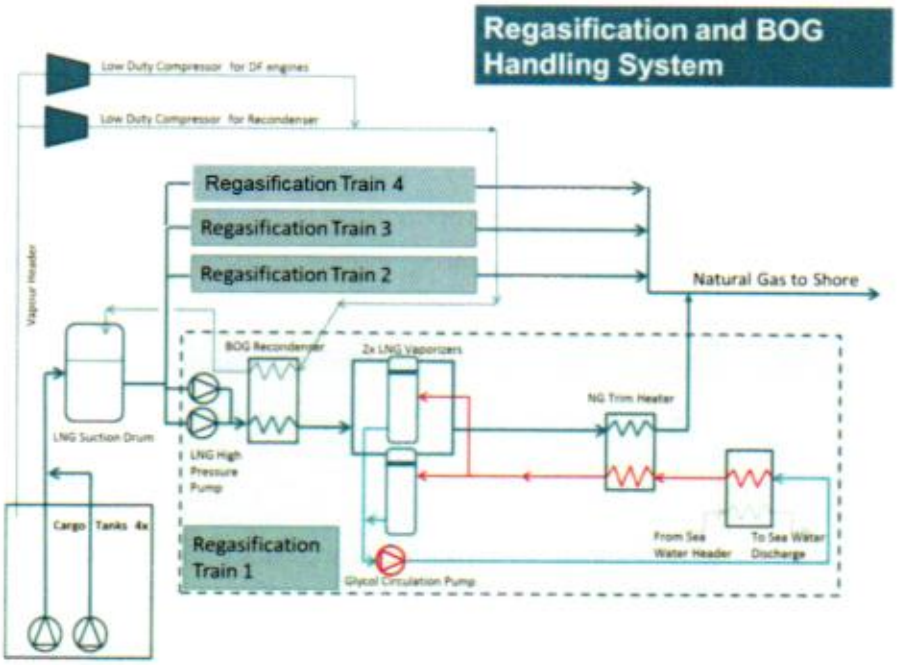


Figure 14 FSRU BOG Handling System

Reliability, Availability, and Maintainability (RAM):

- Operation Availability of Tabeer's planned FSRU
  - ✓ 97% availability. Total 11 days per year for planned and unplanned shutdown.
  - ✓ No dry-docking is required for 20 years.
  - ✓ After 20-year operation, dry-docking will be required, and it will take approximately 46 days (30 days in dock, 16 days for sea voyage).

- Historical availability figures for the Höegh LNG fleet

Historical availability figures for the Höegh LNG fleet are shown below. Please note that;

- ✓ Availability includes only unplanned failure of equipment and systems.
- ✓ Unavailability due to planned and preventive maintenance is not included in the numbers.

Table 8 Historical Availability of Hoegh LNG Fleet

Technical availability of fleet and safety performance	2014	2015	2016	2017	2018	2019 ytd
Technical availability	99.7%	100.0%	99.9%	99.8%	99.8%	100.0%

Höegh LNG plan to store critical spare parts in the PQA area, ensuring efficient repair and maximum uptime. This is to avoid critical components being delayed in customs and handling.

The onshore infrastructure of the terminal is expected to have better availability than the

FSRU. A full-scale RAM analysis will be performed after final design and selection of equipment/ makers for the entire terminal including FSRU, jetty, pipeline and other fixed infrastructure.

Based on the RAM analysis, proven uptime of the FSRUs and the fact that the FSRU is the most critical part of the project when it comes to availability, 97% availability is achievable. This implies 10.95 days totally for planned and unplanned maintenance. The unplanned part will be kept at a minimum, which is demonstrated by the historical availability figures of 99.7% to 100.0%.

5.2. Jetty

The jetty mooring and breasting dolphin layout would be based on receiving LNG Carriers ("LNGC") with a length overall of up to 345 m keeping in view potential project expansion. The jetty shall be equipped to initially allow the handling of large conventional size carriers.
The mooring and un-mooring operations will be governed by standard operating procedures, which will be created during EPC phase. The offloading rates shall be as per the standard procedures of the LNG Delivery Vessel and the FSRU to ensure safe transfer of LNG through cryogenic hoses. A safety exclusion zone around FSRU, Jetty and LNGC will be in place as per the safety standards. Vessel mooring will be supported by sufficient tugs and mooring boats in accordance with procedures set by PQA. Boat operations in the safety zone (crew boats, supply boats) will be monitored and controlled. A fully effective Operations Management System (OMS) and a Security Plan will be developed to include all required documentation, information and processes during EPC phase.

ATTN: Mooring capacity (up to Q-Max/Flex/170k) has been considered to re-design for the suitable size. The final decision of mooring capacity will be made before FID.

Please refer to [Sub-Annexure C12] for further detail of Jetty.

5.3. Pipeline

The pipeline may start on the Jetty and end at the ORF to Sui Southern Gas Company ("SSGC") interconnection point. It is likely to cross areas of mangrove area, shallow water, shipping channel, and onshore land.
The pipeline will be installed by traditional methods adapted to the marshy conditions in the mangroves. Due to the presence of shipping channels and corresponding depth requirements, tunneling (HDD) shall be selected for some parts of the route.

Spur Pipeline might be installed from TEPL Send-out Pipeline to some power plants preferred delivery points.

Please refer to [Sub-Annexure C13] for further details on Pipeline

5.4. Onshore Receiving Facility (ORF)

The natural gas flow will be metered and analyzed at the ORF prior to being sent to the consumers' distribution grid at the SSGC interconnection point. The ORF will be located in PQA controlled area so that the ORF has necessary safety functions installed to protect tie-in to the SSGC interconnection point. The ORF consists of but not limited to Electrical Room, Control Room, and Gas Metering Station (Ultra Sonic Meter).

Please refer to [Sub-Annexure C14] for further details on ORF.

6. EPC Execution Plan

EPC CONTRACTOR shall perform the WORK necessary for the realization of the PROJECT which include engineering, procurement, construction for READY FOR START-UP (RFSU), rendering assistance to OWNER during commissioning, start up, PERFORMANCE TESTING and project management.

Please refer to [Sub-Annexure C15] for EPC Execution Plan including Construction Execution Plan and Construction HSE Execution Plan.

6.1. Scope of Work

The Work includes but not limit to;

- Activities which include the followings;
  - Detail engineering work including project management
  - Procurement and logistics
  - Construction work which included installation and erection
  - Pre-Commissioning/Commissioning, start-up and Performance test
- The management of the realization of the Project which shall include the overall planning, supervision, scheduling and coordination of all Work as further specified in the Project Specification.
- Any other Work including services and facilities required to meet the requirements and intent of the Contract.

6.2. Owner's Organization

Tabeer Technical Team is consisted of as Chart 8 TEPL Organization Chart for EPC. PIC for classes will be defined later but CVs for candidates are attached as [Sub-Annexure C16].

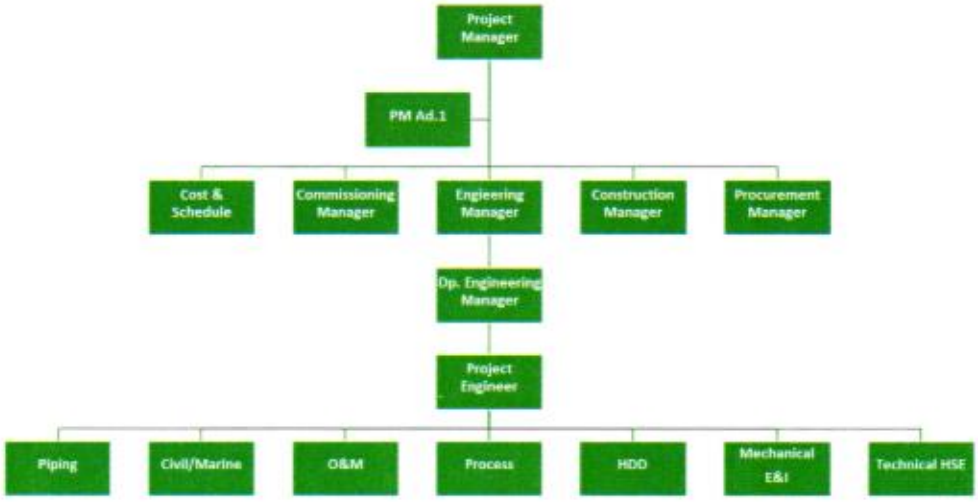


Chart 8 TEPL Organization Chart for EPC

6.3. Planned Contractor's Organization

EPC Contractor team will be constructed as Chart 9 Organization Chart for Planned EPC Contractor. Their structure is almost same as the one of FEED, however, structure for site workers shall be much different with this and be decided at EPC Phase.

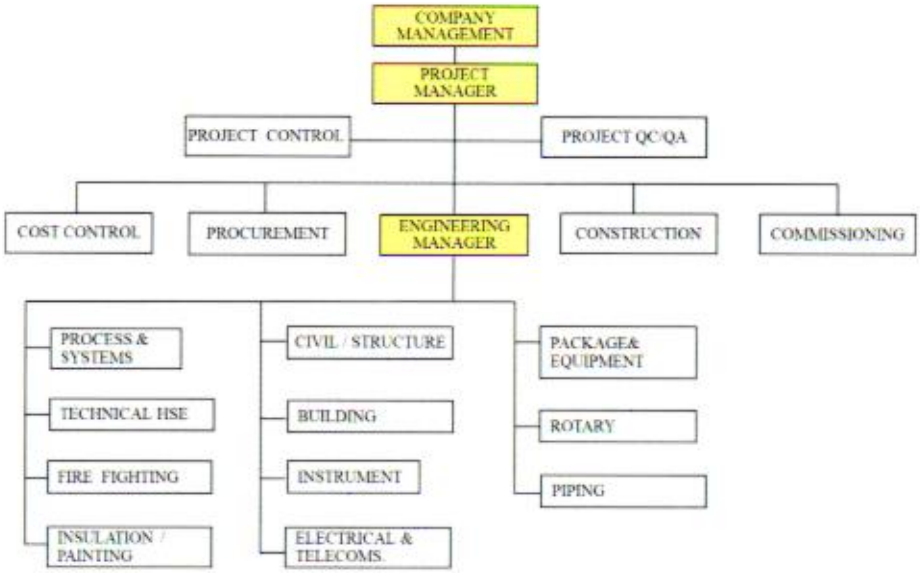


Chart 9 Organization Chart for Planned EPC Contractor

6.4. Engineering

EPC Contractor shall conduct following works for Engineering:

- Design calculation and detailed design in accordance with applicable codes and standards and internationally accepted good engineering practices.
- Update or modify FEED documents which has remaining issues based on the latest information.
- Check vendors' drawings and documents whether they satisfy the projects requirement.

6.5. Procurement and Logistics

EPC Contractor shall conduct following works for Procurement and Logistics:

- Evaluate and specify inspection, quality control and test requirements for all items ordered.
- Select Onshore and Offshore Forwarding company. Onshore shall be an accredited local forwarder in Pakistan and be registered with the concerned authorities, and Offshore shall be an accredited International vendor.
- Provide plan for packing and storage of all the equipment and materials considering tropical seacoast environment and bulk material management and control, interfaces with construction.

6.6. Construction

EPC Contractor shall conduct following works for construction:

- Submit the detail proposals and description on construction activities, organization, plan and schedule, work breakdown structure (WBS), suggestions and recommendations on the cost and schedule improving.
- Perform all survey (including topographic, geo-technical etc.) works as required for all the phases of the works.
- Provide advance detailed construction and subcontracting plans and philosophies prior to initiating execution of the construction works.
- Implement a constructability study to ensure that lessons learnt from previous projects are incorporated in the construction works.

6.7. Pre-Commissioning

Pre-commissioning means preparing a section of the work for safe commissioning leading to start-up by EPC Contractor. It comprises activities to prove that equipment and facilities have been constructed/installed, tested, inspected and finally prepared to the status required to allow the first run of the Plant.

Furthermore, it will also include confirming the service functionality of supporting services to ensure that the commissioning and functional testing of the process can proceed for the entire mechanically completed system.

6.8. Ready for Start-up

Ready for Start-up (RFSU) is reached when pre-commissioning activities are completed, and LNG Receiving Facilities are ready to receive the feed (re-gasified gas) provided from FSRU. EPC contractor shall be responsible for achieving RFSU of the facilities including all consumables, construction spares, lubricants and chemicals.

Prior to RFSU, Pre-Start-Up Safety Review (PSSR) shall be jointly conducted to ensure everyone involved in the RFSU will be trained to understand the entire facilities design, operational procedures, HSE requirements and compliance, emergency response procedures and team roles and responsibilities during the start-up and the plant operation.

6.9. Commissioning and Start-up

Commissioning means the carrying out initial operation with introduction of RLNG, to ensure that each section or component of the entire Plant can be operated in accordance with the contract between owner and EPC contractor.

Start-up is the phase that follows on directly from the end of commissioning of all systems. After this phase, the Plant moves into normal operation.

Successful Commissioning and Start-up of the Plant shall be the responsibility of the joint team of the Owner and EPC Contractor. Operating and Safety Manuals covering the entire Commissioning to Start-up stages including all vendor information shall be provided by EPC Contractor.

6.10. Performance Test

The facility shall be tested in accordance with the standards adopted and established in the approved specifications, quality plans and testing procedures. Prior to RFSU, EPC Contractor shall develop a testing protocol for the facility for review.

The aim of performance test is to check the operation at the design conditions or a part of these selected systems. The test will be carried out continuously and uninterrupted over a period of 72 hours as per the design unless otherwise specified.

6.11. Completion

All sections of the plant or unit which may comprise piping, equipment or instrument etc. will be tested, pre-commissioned and made ready for commissioning as individual sections. Once Facilities is reaching RFSU, utilities shall be commissioned as per design. Owner shall be responsible for supplying utilities.

- To prepare for Start-up of Process System, following 4 items shall be performed;
  - Pipeline pigging operation is planned for efficient pipe cleaning and drying. De-watering, cleaning, drying and internal inspection are expected to be completed.
    - Cleaning pig from ORF to Jetty is to be conducted during pre-commissioning phase, especially at the time when FSRU is not berthed to protect it from pigging accidental discharge.
    - Intelligent or smart pigging shall be arranged to obtain the initial data of pipeline condition for future maintenance.
  - The entire gas transmission facility shall be tested with either dry air or nitrogen at design pressure to ensure a tight built prior to introducing gas. Scope of high pressure leak test includes jetty gas line, pipeline, ORF gas line.
  - Before transmission of RLNG from FSRU, the gas line and associated equipment shall be air freed by nitrogen purging to specified O2 content.
  - Verification of ESD function is critical and shall be confirmed prior to commencing

the gas transmission. HIPPS is designed to protect existing gas pipeline tied in from over pressure, therefore integrated function of HIPPS shall be confirmed.

Please refer to [Sub-Annexure C17] for Pre-commissioning/Commissioning Execution Plan.

7. EPC and Commissioning (EPCC) Schedule and Cost

7.1. EPCC Schedule

Preliminary EPCC Schedule has been estimated to require approximately 24 to 25 months including pre-commissioning and commissioning as summarized. However, the project is currently in FEED stage and that is reflected in the provided Schedule.

Please refer to [Sub-Annexure C18] for EPCC Schedule.

7.2. EPCC Cost

Preliminary EPCC Cost at FEED Stage is estimated to be 304 million USD. Its break down items are summarized in Table 9 EPCC Cost Breakdown. TEPL has been working for Value Engineering Study to reduce the cost since FEED completion.

Table 9 EPCC Cost Breakdown

(AA) Preliminary EPC Cost Estimation (Unit : MM USD)

	ORF	Jetty	Pipeline (On/Off)	Dredging
	17.56	136.95	118.01	25.52
Total	298.04			

(BB) Excluded item from Cost Estimation during Pre-FEED

-Commissioning -Spare parts -Training Expense -Insurance (C/EAR, CGL, MCI) -Government authorizations for EPC	6.54

(AA + BB)

EPC Total (Net Receivable)	304.58

8. Operation and Maintenance Philosophy

8.1. General Philosophy

There are 3 operation stations from FSRU to ORF; One is at FSRU, another is at Jetty and the other is at ORF. The first is responsible for the operation of FSRU and safety function at Jetty, second is for the operation of Jetty and the last is for the operation of ORF where the control system is independent from FSRU and the Jetty. No electrical and communication cables will be planned to install between Jetty and ORF, instead the Communication in between will use Telecommunication means, such as Telephone, Radio, Wi-Fi etc.

Please refer to [Sub-Annexure C19] for detailed report on Operation and Maintenance Philosophy.

8.2. FSRU Operation Philosophy

The FSRU operation team will be responsible for the operation and maintenance of FSRU.

- The FSRU is designed to be as independent as possible, with its own safety systems and utilities
- Operation and Maintenance procedures, Safety procedures and checklists are made for all relevant operations and scenarios for the FSRU
- At FSRU arrival, the crew will, together with Jetty personnel, moor the FSRU to the Jetty, connect the High Pressure RLNG Un-Loading Arms to the FSRU, Connect Ship to Shore Communication Link and test Emergency Shutdown signals (ESD / PSD), and perform all necessary operational and safety tests prior to offloading any RLNG from the FSRU to the Offshore Pipeline.
- During re-gas operations, FSRU operators will monitor the process from the Cargo Control Room (CCR) located in Accommodation Block on FSRU, and regulate gas send-out rates in accordance with Nominations from the Client.
- All safety functions for the FSRU are controlled in the Cargo Control Room (CCR) of the FSRU.
- Before arrival of LNG Carrier (LNGC) for delivery of LNG to the FSRU, the FSRU Operator will verify LNGC compatibility and mooring layout and inform Ship to Ship (STS) transfer procedure and checklists to LNGC.
- The FSRU crew will receive mooring lines from incoming LNGC and moor the vessel to Quick Release Hooks onboard the FSRU and monitor the mooring line loads throughout the operation
- LNG transfer equipment will be connected to LNGC manifold and the LNG transfer will be controlled by FSRU Crew in cooperation with LNGC Crew
- Disconnection of LNG transfer system and mooring lines will be done in accordance

with the standard operating procedures and the LNGC will unberth and depart from the FSRU with assistance of the tugs.

- Emergency disconnection of the LNGC can be done from FSRU, both for LNG transfer equipment and LNGC mooring lines, if necessary in accordance with the Standard Emergency Procedures.

8.3. Jetty Operation Philosophy

- A fully-manned operation is planned at the Jetty Platform. Jetty Operators will conduct the routine operation and maintenance work required at Jetty, such as security patrolling, equipment monitoring and regular maintenance. In case of emergency at the Jetty, the Jetty operators will initiate safety actions (alarms and firefighting) and FSRU operators shall be notified immediately to take corresponding actions.

- Basic tools, equipment and consumable materials required for routine maintenance shall be available at Jetty.
- Main operation at Jetty Platform is the transmission of RLNG from FSRU to ORF via the pipeline. To introduce RLNG slowly at initial stage, a bypass with small size is provided at main block valves of each Unloading Arm and the gas line to facilitate the staged introduction of RLNG.
- Mooring system between FSRU and Jetty Platform is provided at Jetty. This includes Quick Release Hooks operable from the Jetty. 3 Nitrogen Gas (NG) Unloading Arms are provided; 2 arms are in use during normal operation and 1 arm is a reserve, so as not to interrupt the gas transmission during maintenance of any one of Unloading Arms.
- Relevant operational procedure including Procedure of Startup to receive RLNG from FSRU and shutdown of Gas Transmission will be prepared at EPC stage.
- An Inspection, maintenance and repair (IMR) plan will be established for the Jetty to minimize downtime and to coordinate maintenance campaigns with FSRU maintenance.
- Coordination of service personnel between Jetty and FSRU will ensure cost efficiency and quality, and minimize downtime

8.4. ORF Operation Philosophy

- Main operation at ORF is to receive the gas and send to downstream consumers. In addition to normal operation and maintenance of ORF facilities, operator shall also conduct on-line analysis of gas quality regularly by using metering system integrated

with gas chromatography / associated controller. Operation, maintenance and calibration of metering station and on-line analyzer shall follow vendor's manual.

- Operation and maintenance of Instrument Air Compressor, Pump and Generator shall be carried in accordance with the Manufacturer's manuals.

8.5. Operation Implementation Plan

We trust OGRA can appreciate that TEPL is in its infancy considering the nature of the company being purposely set up to undertake the terminal business in Pakistan. The plan put together and annexed herewith has been heavily scrutinized by in-house technical personnel as well as retained consultants and will form a basis of the final product, however, in order to adjust and adopt to potential modifications that arise on the ground and through ongoing review, the plan has been purposely left in draft form henceforth labeled "Draft".

Please refer to the [Sub-Annexure C20] for Draft Operation Implementation Plan.

9. LNG Supply

9.1. Source of LNG

Below is the list of equity volumes, which are under MC Group's commercial control. This is a confidential nature of the information.

Table 10 Mitsubishi LNG Sources

	Project Name	Country		Volume Available	GHV (Btu/scf)	Remarks
Confirmed Supply	North West Shelf	Australia		0.3-0.5 mtpa	1,133	Exclusive access to excess volumes as share holder
	Cameron LNG	USA		4 mtpa	1,035	Operations expected to start in 2019
	LNG Canada	Canada		2.1 mtpa	1,050	FID Taken in Oct 2018, all major permits has been obtained
	Qalhat LNG	Oman		0.3 mtpa	1,118	Volume under DGI's control
	Donggi Senoro	Indonesia		0.2-0.4 mtpa	1,103	Exclusive access as share holder
	Wheatstone	Australia		0.2 mtpa	1,070	Exclusive access as share holder
	Pluto, Ichtys, APLNG	Australia		0.7-1.0mtpa	Pluto 1,085 Ichtys 1,080 APLNG 1,011	Volumes from structured deal with DGI's key customers
	Confirmed Supply Total			7.8-8.5 mtpa		
Potential	LNG Canada Expansion	Canada		2.1 mtpa	1,050	Expansion now under discussion
	Cameron Expansion	USA		1.0 mtpa	1,030	Expansion now under FEED study
	Browse	Australia		0.7 mtpa	1,120	Now under FS with aim to start production by 2025
	Potential Total			3.8 mtpa		
	Grand Total			11.6 mtpa-12.3 mtpa		

9.2. Future Projections

The following projection has been prepared based on MC's portfolio/ LNG strategy going forward.

All Figures in MTPA

Table 11 Mitsubishi LNG Portfolio

Project	2025	2026	2027	2028	2029	2030 -
Brunei	1.8	1.8	1.8	1.8	1.8	1.8
Malaysia SATU	0.42	0.42	0.42	0.42	0.42	0.42
Malaysia DUA	0.96	0.96	0.96	0.96	0.96	0.96
Malaysia TIGA	0.31	0.31	0.31	0.31	0.31	0.31
NWS	0.92	0.79	0.67	0.58	0.5	0.42
Oman	0.2	0.2	0.2	0.2	0.2	0.2
Qalhat	0.13	0.13	0.13	0.13	0.13	0.13
Sakhalin Ⅱ	0.96	0.96	0.96	0.96	0.96	0.96
Tangguh	0.75	0.75	0.75	0.75	0.75	0.75

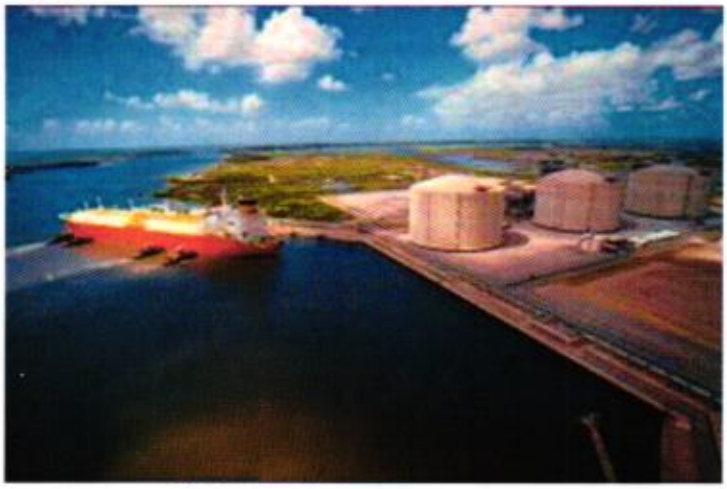
Project	2025	2026	2027	2028	2029	2030 -
Donggi Senoro	0.9	0.9	0.9	0.9	0.9	0.9
Wheatstone	0.28	0.28	0.28	0.28	0.28	0.28
Cameron	4	4.5	5	5	5	5
Tangguh T3	0.38	0.38	0.38	0.38	0.38	0.38
LNG Canada	2.1	3.2	4.2	4.2	4.2	4.2
Browse LNG	0.7	0.7	0.7	0.7	0.7	0.7
Sakhalin II T3	0.54	0.54	0.54	0.54	0.54	0.54
Total	**15.35**	**16.82**	**18.2**	**18.11**	**18.03**	**17.95**

9.3. Anticipated Sources

Just for illustration and explanation purposes, let us explain more about three of our equity projects: **1) Cameron LNG, 2) LNG Canada** and **3) Browse LNG**.

Cameron LNG

Cameron LNG is a 3 train (4mtpa each) 12mtpa natural gas liquefaction plant located in Hackberry, Louisiana. It is one of the first liquefaction-export projects in US and has commenced operations in 2019.



- **Key Benefits of Cameron LNG**
  - **Feed gas Availability:** Cameron LNG is connected to the existing US gas grid. US gas demand is strong but does not pose a risk to the project due to abundant domestic production.
  - **Experienced partners with strong balance sheets** developing and off taking from the project (Sempra LNG & Midstream, Mitsui & Co., Total, MC and NYK Line).

- **Full approvals received (DOE export authorization and FERC approval)** including required approvals for the potential expansion trains.
- **Competitive project economics** due to brownfield development, ensuring stable cash flows and operation of the Cameron LNG Plant.
- **Marine berths capable of accommodating Q-Flex sized LNG ships**, allowing a wide range of vessels to berth according to the buyer's needs.

- **Uncommitted volumes**
  - DGI is expected to lift 4mtpa of LNG from Cameron LNG.
  - 3.5mtpa has already been sold to LNG Buyers (while some being divertible).
  - Hence, we have 0.5mtpa of uncommitted volumes from Cameron LNG over the proposed Contract Term of 2024-2039. In addition, we expect to add additional trains to increase our producing capacities in the near future.

LNGCANADA

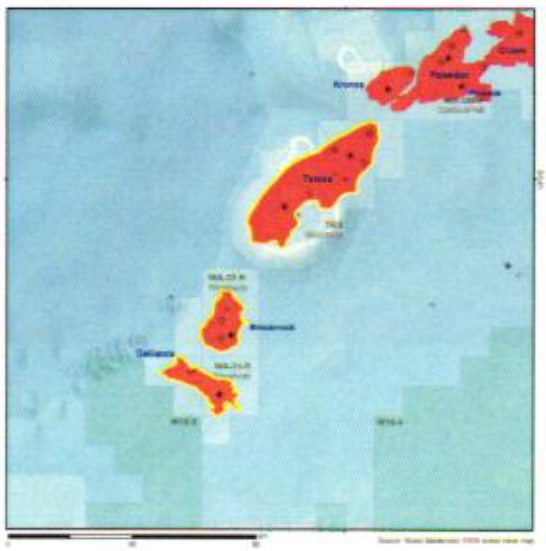
Opportunity for British Columbia. Energy for the world

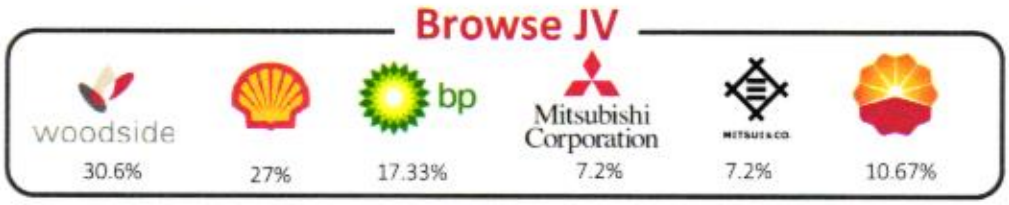
LNG Canada is a green-field, 2 train (7mtpa each), 14mtpa (Phase 1) joint venture export project located in Kitimat, British Columbia. The project has received most major approvals and permits, with a Final Investment Decision (FID) made on 1st Oct 2018 (Canada time) and operations slated to commence in the mid-2020s.

- **Key Benefits of LNG Canada**
  - **Best-in-class partners** (Shell, Petronas, CNPC, KOGAS), EPC contractor (Fluor-JGC) and operator (JV secondees led by Shell).
  - **Feed gas reliability** through equity in upstream gas reserves and access to the Alberta gas grid, which would provide supply security for many years to come.
  - **High governmental and communal support** from the Canadian Government, giving buyers access to LNG supply from an economically and politically stable source.
- **Uncommitted volumes**
  - DGI is expected to lift 2.1mtpa of LNG from LNG Canada, and we expect to expand our trains to double our producing capacity in the near future.

BROWSE LNG PROJECT

The Browse Project comprises from the Torosa, Brecknock and Calliance gas/ condensate fields. They lie in the Browse Basin, 425 kilometers north of Broome off the Kimberley coastline of Western Australia.





Browse JV has reached a preliminary agreement with North West Shelf (NWS) JV on Terms and Conditions for tie-in to NWS plant, which expects to have idle capacity from early 2020s onward. Browse JV is currently engaging with State (Western Australia) and Federal Governments respectively to obtain relevant government approvals (e.g. Environmental Approval, Development Agreement). Browse JV plans to achieve FID in 2020-2021, and RFSU (Ready For Start Up) in 2025-2026.

The project will start FEED in 2019, and is expected to produce 9mt of LNG annually, with MC/ DGI lifting 0.7mtpa.

- **Key Benefits of Browse LNG Project**

  - **Existing LNG Liquefaction Plant:** Browse project intends to utilize the existing NWS Facility to process the gas, leading to reduced start-up risk.
  - **Best-in-class partners** (Woodside, Shell, BP, Mitsui, PCI) and operator (Woodside who is the existing operator of the NWS project).
  - **Feed gas reliability** with an estimated natural gas reserve of 13.9 TCF.

9.4 Proven Reserves

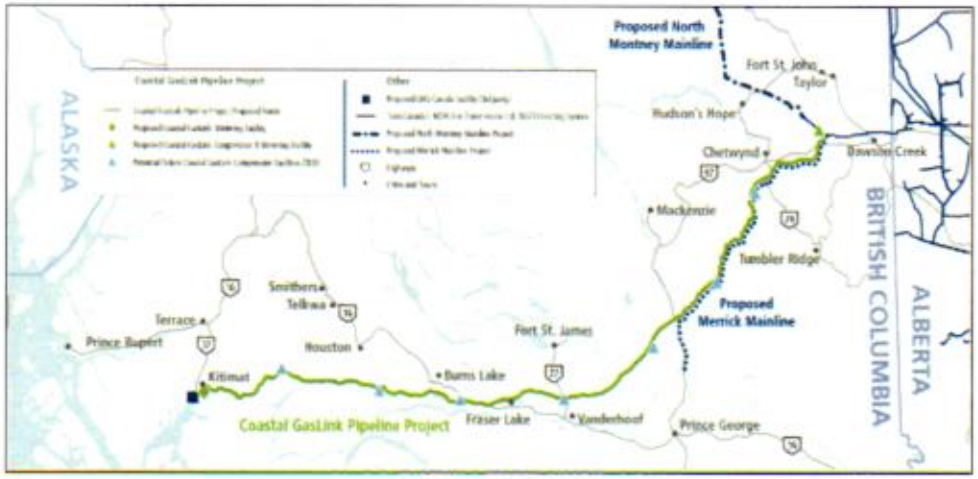
As our North American Sources (Cameron LNG and LNG Canada) are connected to the gas grid, the idea of proven gas reserves is not applicable. However, we have made a brief explanation on our feed gas procurement strategies in below.

- **Cameron LNG**
  - The Cameron LNG liquefaction plant is located 18 miles from the Gulf of Mexico, and connected to major interstate pipelines via the Cameron Interstate Pipeline.
  - Three major interstate pipelines provide gas to the Cameron LNG plant namely (1) Tennessee Gas Pipeline (TGP), (2) Texas Eastern Transmission (Tetco), and (3) Columbia Gas Transmission (CGT).

- These pipelines bring feed gas from four shale gas rich zones namely (1) Marcellus, (2) Haynesville, (3) Eagle Ford, and (4) Utica. The pipelines ensure that sufficient feed gas reaches Cameron LNG through the 2.35 Bcf/d Cameron Interstate in which MC has a firm transport capacity of (~740 MMcf/d).
- For the purposes of sourcing for competitively priced feed gas, MC also has a 100% stake in CIMA Energy Ltd., an oil and gas marketing firm, whose expertise we will utilize to source volumes from the US gas market.

- **LNG Canada**

  - The LNG Canada liquefaction plant located in Kitimat, British Columbia will be connected to the Montney gas-producing, shale rich region near Dawson Creek via the 415 mile, 2-3 Bcf/d Coastal GasLink pipeline.
  - Coastal GasLink Pipeline has received all major provincial regulatory approvals required from the BC Oil and Gas Commission for the construction and operation of the proposed pipeline and related facilities.
  - The LNG Canada partners will supply feedstock in proportion to their equity stakes and gas will be sourced mainly from the Montney and Horn River unconventional gas plays in northeast British Columbia and northwest Alberta and transported to the project through the Coastal GasLink pipeline.



- MC also has formed a partnership with Encana's Cutbank Ridge Project in the Montney, which has proven reserves of about 60 TCF in total while being expected to further develop its resource base by the time of LNG Canada project start-up (2024).
- This, in addition to the project partners being able to source for gas at AECO (Alberta benchmark gas prices, similar to Henry Hub in the US), ensures that the LNG Canada plant will have sufficient competitively priced feed gas throughout the life of the project.

- **Browse LNG**

- The Browse project comprises from the Torosa, Brecknock and Calliance gas/ condensate fields. They lie in the Browse Basin, 425 kilometers north of Broome off the Kimberley coastline of Western Australia.
- The current plan would utilize two gas FPSOs (one on Torosa and one on Calliance, with Brecknock tying back to the latter). The gas would be transported 900 km along a pipeline to the NWS infrastructure (North Rankin platform), from which it would be piped to the North West Shelf LNG plant.
- The Torosa and Brecknock field were discovered in the 1970s, while the Calliance field was discovered in the year 2000.
- Estimated commercial recoverable reserves of the three fields are as follows:

	Init Cond. (mmbbl)	Init Gas (bcf)
Torosa	177	7,168
Calliance	174	5,245
Brecknock	43	1,486
Total	**394**	**13,899**

(Source: Wood Mackenzie)

10. Project Schedule

- **Regulatory Progress**
  - Establishment of Tabeer Energy Pvt Ltd – LNG (FSRU) Terminal Company. **(25th January 2018)**
  - Received Provisional NOC from Port Qasim Authority to conduct project feasibility study in Port Qasim. **(2nd March 2018)**
  - Received Pipeline Capacity Allocation from Ministry of Energy on a provisional basis. **(16th April 2018)**
  - Establishment of Tabeer Energy Marketing Pvt Ltd – Marketing & Sales of RLNG. **(25th June 2018)**
  - Received Provisional License from OGRA for the construction and operation of a LNG terminal. **(17th Aug 2018)**
  - Submitted complete Technical & Financial Proposal (TFP) to Port Qasim Authority (PQA) for Issuance of Letter of Intent (LOI). Awaiting response against TFP for 9+ months. **(26th Nov 2018)**
  - Submitted application for OGRA Sales License submitted. **(3rd May 2019)**
  - Received Provisional Letter of Intent from Port Qasim Authority. **(5th Sept 2019)**
  - ESIA Completed. Awarded No Objection Certificate (NOC) from Sindh Environmental Protection Agency (SEPA). **(11th Sept 2019)**

- **Technical Process**
  - Qualitative and Quantitative Risk Assessment (QRA) and Full Mission Bridge Simulation (FMBS) complete.
  - Pre-FEED including Site and Pipeline Route Selection Studies completed.
  - FEED completed.
  - Undergoing engineering studies under supervision of Japanese renowned engineering company, JGC and JGC's qualified sub-contractors.

- **Commercial Progress**
  - Actively engaging with potential RLNG consumers with MoU executed to date.
  - Entered into agreement with world class FSRU Provider.

- **GTA Progress**
  - Signed a Memorandum of Understanding (MoU) with SNGPL.
  - Signed Non-Disclosure Agreement (NDA) with SSGC.

- **Project Schedule**

  Please refer to [Sub-Annexure C21] for Project schedule.

11. Environmental and Social Impact Assessment

The Environmental & Social Impact Assessment (ESIA) Study for the proposed Tabeer LNG Project in Port Qasim, Karachi identified potential environmental impacts that are likely to arise during the pre-Construction, Construction and Operational phases of the project. The ESIA study which was submitted to the Sindh Environment Protection Agency (SEPA) on 8th November 2018 found that the establishment of proposed Tabeer LNG import terminal at Port Qasim is compatible with the aims and objectives of sustainable development in making available a sustainable energy source and thus contributing to Pakistan's economic development.

Consequently, TEPL was awarded SEPA No Objection Certificate (NOC) on 11th September 2019. A copy of the awarded NOC is appended under Rule 4(3)h of OGRA LNG Rules 2007 in Annexure B/Sub-Annexure B7.

Main Points from TEPL's ESIA Study:
TEPL's Environment Consultant, EMC Pakistan Limited, based their impact predictions on previous experiences on similar projects; professional judgment; data collected in the field; and discussions with primary and secondary stakeholders including government officials and relevant technical specialists. Environmental aspects identified during the stakeholder consultation meetings and by the screening process were assessed for their severity and mitigation measures were proposed on the basis of assessment.

Potential environmental impacts identified were associated with site preparation which includes removal of mangroves, dredging and associated works, laying of pipeline in terrestrial and marine environment, LNG terminal installations which includes all activities associated with the installation of Jetty for the FSRU/LNGC, water withdrawals and waste discharges due to operation of the proposed Terminal, air emissions from construction activities and from the operation of FSRU, generation of noise from terminal operations, manmade hazards which include fuel spills-fire and explosion, marine hazard workplace hazard, natural disasters, protected ecosystem and the operational risks & hazards.

A series of mitigation and monitoring measures were included in the ESIA Report to address the risks involved in the handling of LNG/RLNG. Environmental Management and Monitoring Plan as well as safety and security measures would ensure that the Project will not create adverse environmental impacts that have not been mitigated or leave the safety and security concerns of the stakeholders unmitigated.

The Quantitative Risk Assessment (QRA) conducted for this project has taken into consideration all safety-hazard-risks categories. A cumulative impact of the proposed LNG Import Terminal was also assessed. The proposed site was found to be in the ALARP/Tolerable region from navigation and risk perspective and thus acceptable for setting up an FSRU based LNG Import Terminal.

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List of Sub-Annexure for TEPL Technical Brief	
Sub-Annexure	**Name of Document**
C1	HSSE Management System
C2	Metocean Data Collection Report
C3	Bathymetry Survey Report
C4	Geophysical Survey Report
C5	QRA & Fast Time Navigation Simulation
C6	HAZID
C7	HAZOP Study
C8	Preliminary QRA Report (UPDATE)
C9	Navigation Simulation Study
C10	Mooring Analysis Dynamic Simulation
C11	Sedimentation Study
C12	Jetty
C13	Pipeline
C14	ORF
C15	EPC Execution Plan
C16	Technical Members CVs
C17	Pre-Commissioning and Commissioning Execution Plan
C18	EPCC Schedule
C19	Operation & Maintenance Philosophy
C20	Draft Operation Implementation Plan
C21	Project Schedule