EOI Meet
FOR HIRING OF FLOATING STORAGE AND OFFLOADING (FSO) VESSEL AT MUMBAI HIGH FIELD, WESTERN OFFSHORE

This template captures the key discussion points and provides general guidance to Bidders for making presentation at the EOI meet, so as to have a focused discussion. Template is not mandatory and Bidders may choose their own presentation format.

Mumbai
June, 2023

Introduction

- ONGC Mumbai High Asset intends to hire Floating Storage and Offloading (FSO) vessel on a long term lease for storage and offloading of processed crude oil through shuttle tankers at Mumbai offshore.

- FSO shall be placed at the SBM attached to NA wellhead platform located at Mumbai High North Field. Placing one additional or alternate FSO at SBM connected to SA wellhead platform (located at Mumbai High South Field) shall be explored.

- Currently approx. 61,500 barrels of crude oil per day is required to be handled at the FSO at NA SBM Terminal.

- FSO shall be suitable to moor Aframax tanker for offloading.

- FSO should have facility to remove water so that crude oil quality can be maintained below Basic Sediment & Water (BS&W) at 0.2 % with no free water.

Snapshot

Unit (one no.)	FSO
Offloading	FSO shall be suitable to moor Aframax tanker for offloading.
FSO Class	Aframax /Suezmax
Field	Mumbai High, Western Offshore
Country	India
New build /Conversion	Conversion
Location (either of)	1) SBM at NA wellhead platform of Mumbai High North Field 2) SBM at SA wellhead platform of Mumbai High South Field
Water Depth	80 meters at NA SBM 85 meters at SA SBM
Storage Capacity of FSO	Minimum 600,000 Barrels
Oil Handling	61,500 bopd Inlet at NA SBM 52,000 bopd inlet at SA SBM
Water handling	FSO should have facility to remove water so that crude oil quality can be maintained below Basic Sediment & Water (BS&W) at 0.2 % with no free water.
Contract	EPCI + Time Charter
Scope of Work	Engineering, Procurement, Construction, Installation, Operation &Maintenance
First Loading commencement date	To be discussed at EOI meet
Lease / Charter Period	10 years Firm plus 5 Years Optional. (Tentative. To be discussed at EOI meet)

SBM at NA & SA WHPs Mumbai Offshore

SBM Terminals installed at MH Field western offshore

NA SBM

61815 BOPD

- **MHN – 25956**
- **NQO – 35859**

SA SBM

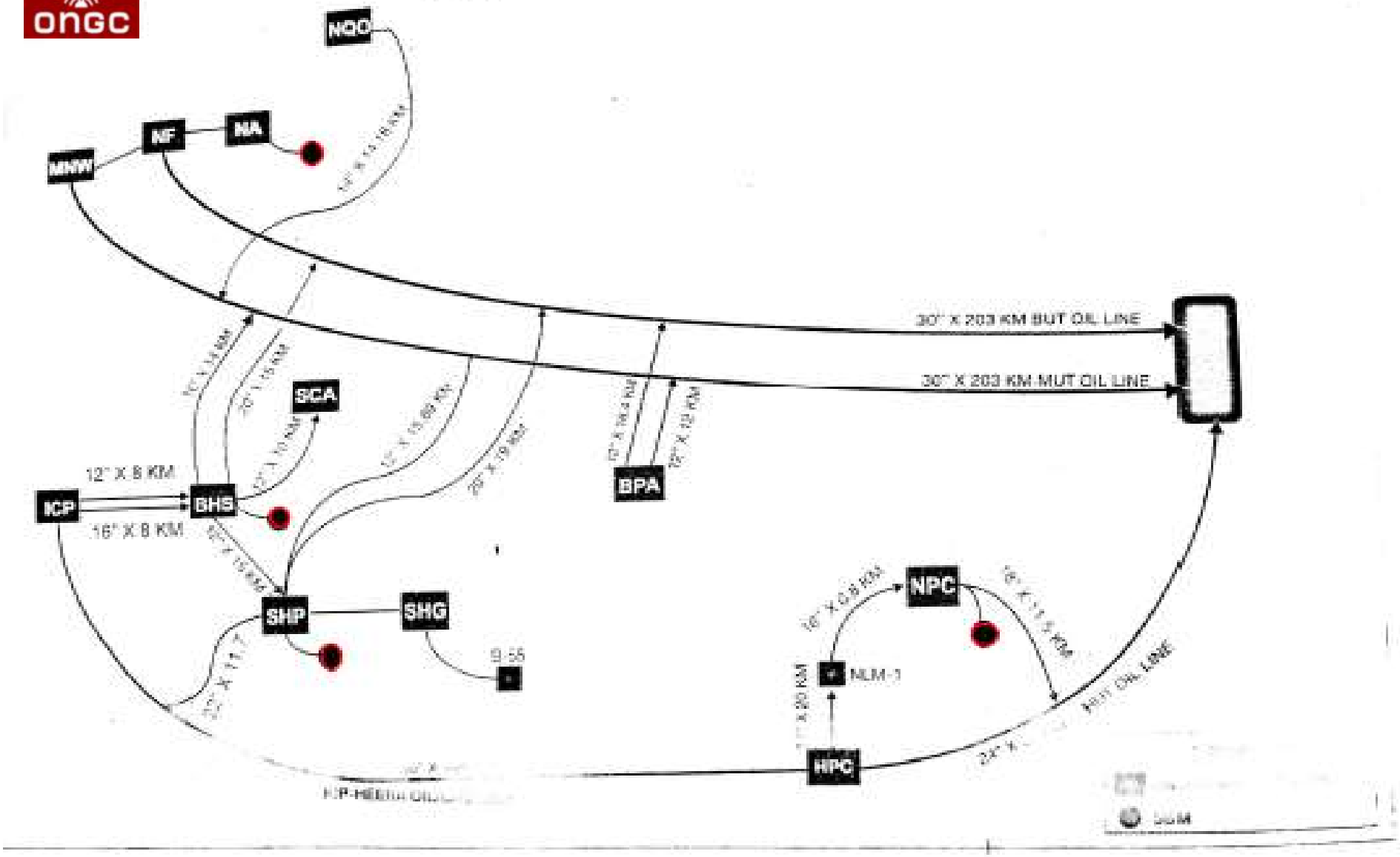
51337 BOPD

- **BHS - 20695**
- **SCA - 5418**
- **ICP – 25224**

- *Daily Production as on May 2023*

LAYOUT OF OIL PIPELINE NETWORK IN WESTERN OFFSHORE

Mumbai High Field



DESIGN AND OPERATING PARAMETERS OF SBM

Design and Operating Parameters of SBM at NA Terminal (SO17363)

- SBM commissioned in 2007.
- Design life of 25 years

CALM BUOY Design Parameters		
1	Product	Crude Oil
2	Maximum Flow Rate	3333 barrels per hour
3	Design Pressure	15.4 bar
4	System Test Pressure	23.6 bar
5	Design Temperature	60 Deg (Max)

Design and Operating Parameters of SBM at SA Terminal (SO17680)

- Commissioned in 2008
- Design life of 25 years

CALM BUOY Design Parameter		
1	Product: Crude Oil	Crude Oil
2	Maximum Flow Rate	3333 barrels per hour
3	Design Pressure	15.4 bar
4	System Test Pressure	
	• Buoy Piping	23.6 bar
	• PLEM	63 bar
	• Hoses	15.4 bar
5	Design Temperature	60 Deg (Max)

Class and Size selection of FSO

Class	Length	Beam	Draft	DWT	Crude Oil Storage Capacity
Aframax	245 m	34 m	20 m	• 80 -120,000 DWT [Afra scale] • 115-118,000 DWT [flexible market scale]	• 600000 Barrels • 735-750,000 Barrels (merchant tankers)
Long Range 2				• 80 - 125,000 DWT • 105-115,000 DWT [flexible market size]	• 750000 Barrels
Suezmax	285 m	45 m	23 m	• 120,000 - 200,000 DWT	• 800,000 - 1.0 Million Barrels
VLCC	330 m	55 m	28 m	• 160,000 - 319,999 DWT [AFRA scale] • 200,000 - 320,000 DWT [Flex market size]	• 1.9 - 2.2 Million Barrels

Coordinates of SBM and distance

Coordinates of SBM at NA wellhead platform:
LAT. 19°31.47 N
LONG. 071°19.44 E

Distance of nearby wellhead platforms from NA SBM given as below:

- SBM to NA: 076° / 1.5 NM (Nautical Miles)
- SBM to N9: 114° / 0.6 NM
- SBM to NV: 358° / 0.5 NM

Coordinate of SBM at SA wellhead platform:
LAT. 19°22.48 N
LONG. 071°22.46 E

Distance of nearby wellhead platforms from SBM given as below:

- SBM to SA wellhead platform: 270°/ 0.83 NM (Nautical Miles)
- SBM to SQ wellhead platform: 068°/ 1.47 NM
- SBM to RS16 wellhead platform: 116°/ 1.43 NM

Key Decision Points

1) Daughter vessel (offtake Tanker) to be from Aframax / LR-2 class subject to two conditions, (I) Minimum crude oil capacity 80 TMT (considering density 0.82) and (ii) DWT not exceeding 110 TMT. To maintain the desired class, Mother vessel (FSO) needs to be Aframax / LR-2 or higher class, i.e. Suezmax/ VLCC.
2) OEM M/s SBM Offshore has confirmed at technical calls that SBM at NA & SA are designed to handle FSO of 125,000 DWT and Tanker of 80,000 DWT.
3) It is technically possible to moor Suezmax vessel however, the disconnection limit is to be set after analysing Met ocean conditions. Further, conditions of SBM chains to be checked with class (ABS) for Suezmax mooring.
4) ABS stipulated maneuvering area for vessel in open sea is set at the minimum of 3 times the length of vessel.
5) M/s SBM Offshore has confirmed that both SBMs at NA and SA Terminals are designed for Tandem Mooring and Double Bunking (which permits STS). Keeping in view the monsoon period, Tandem Mooring may be designed for FSO. Designing tandem mooring for FSO will involve modification at the stern side of FSO. However, maneuvering area at each SBM to be assessed vs-a-vs mooring criteria.

Discussion Issues

Storage Capacity FSO shall have a minimum storage capacity of 600,000 barrels of crude oil. **Power Generation:** FSO should have a reliable and redundant power generation system to meet its operational and auxiliary power requirements.	
Mooring System FSO shall be capable of being moored at the NA SBM at Mumbai High offshore (or at SA SBM, if selected as alternate) and shall have a suitable mooring system to withstand the prevailing weather and sea conditions.	
Offloading System: FSO shall be equipped with a tandem mooring system to allow for offloading of crude oil to shuttle tankers. In case of restrictions of maneuvering area due to presence of wellhead platforms in the vicinity, STS offloading may be considered.	

Discussion Issues

Conversion of Aframax Class Oil Tanker (If required): Bidder shall have the capability and financial resources to convert an Aframax class oil tanker to FSO as per the technical specifications provided by ONGC.	
Modification/ Construction and Commissioning Bidder shall be responsible for the modification/ construction and commissioning of FSO vessel, including the installation of all necessary equipment and systems.	
Operation and Maintenance: Bidder shall operate and maintain FSO vessel for the entire Lease Period, including regular inspections, maintenance, and repairs.	

Discussion Issues

FSO Class Notation FSO shall be classed with a reputed classification Agency such as ABS/ DNV/ Lloyds/IRS. No dry dock during the firm contract and extension period (s) should fall due. Contractor shall be responsible for maintaining FSO in class during the firm contract and extension periods and complying with applicable regulatory framework.	
Crew Certification and Training: FSO crew should meet the required certifications and training standards as per the International Convention on Standards of Training, Certification, and Watch keeping for Seafarers (STCW) regulations.	
Effluent Treatment and Discharge Criteria: FSO should be equipped with an efficient effluent treatment system to treat various types of waste streams generated onboard. Discharge shall be as per OISD/ MARPOL guidelines.	

Discussion Issues

Maintaining BS&W below 0.2% FSO may be converted out of old, stripped-down oil tankers. To maintain BS&W at less than 0.2 % with NIL free water, customized water handling system may be required on board.	
Conversion Candidate and delivery on schedule (Timeframe) Bidder shall be responsible for procuring conversion candidate and undertaking conversion, class notation, and deliver the FSO on schedule at ONGC location. FSO conversion may typically include structural integrity, corrosion status and previous cumulated fatigue damage, with or without crack initiation. Treating structural defects can become time and cost intensive once a vessel is deployed offshore, and ONGC may entail production loss for such incidences, so Bidder is required to undertake thorough structural analysis of as many candidate units to determine the necessary conversion scope. Contractor shall carry out the Class notation plan approval activities, including fire safety, machinery, stability, mooring and 3D hull structure analysis at a yard of its choice at its own costs and risk.	

Thank You

Estimation of Lease charges
(Components to be discussed at EOI meet)

Sl. No	Category	Quantity	Unit	Day Rate INR / USD (Exclusive of GST)	GST Rate
1	Charges for charter hiring of FSO along with all its equipment, personnel, spares, lube oil, consumables, mobilisation/ de-mobilisation and O&M (10Y) Aframax Class / LR2	3650+ (5yrs optional extn)	Days		
2	Charges for charter hiring of FSO along with all its equipment, personnel, spares, lube oil, consumables, mobilisation, de-mobilisation and O&M (10Y) Suezmax Class	3650+ (5yrs optional extn)	Days		
1	STS operations*		Ton		
	Bunker Charges				
Sl. No	Category	Single Guaranteed Quantity for (10 years lease plus 5yr optional) / Other options	Unit	Rate(INR) /Unit inclusive of GST	
1	Diesel Oil**		Ton		
2	Furnace Oil**		Ton		

Representative Diagram