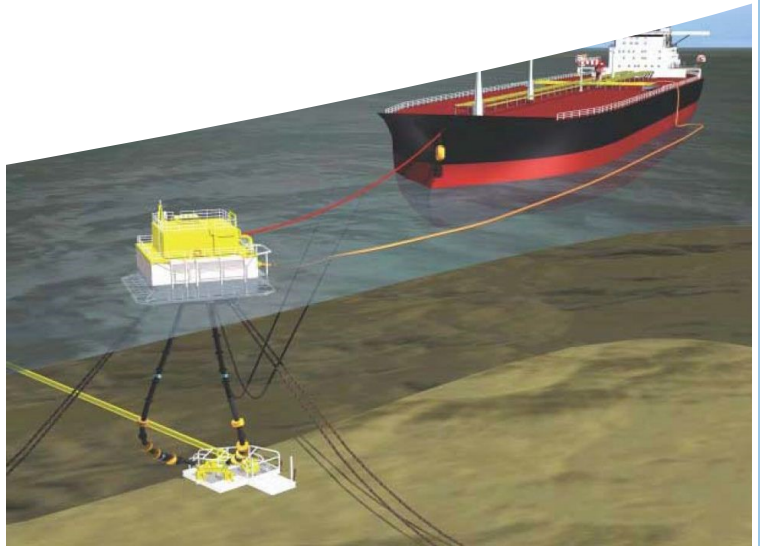


RHIZOMENERGY

DELIVERING SOLUTIONS



RHIZOME ENERGY LIMITED

WE AIM TO PROVIDE A RANGE OF MULTI-DISCIPLINARY SERVICES FROM
ENGINEERING CONSULTANCY TO CONSTRUCTION SUPPORT.

FLOATING PRODUCTION AND CALM BUOY SOLUTIONS

FLOATING PRODUCTIONS AND CALM BUOYS

RHIZOME ENERGY ENGINEERS HAVE EXTENSIVE EXPERIENCE IN FLOATING PRODUCTION SYSTEMS AND CALM BUOY MOORING SYSTEMS.

EXPERTISE RANGES FROM CONCEPT ENGINEERING TO FULLY DETAILED DESIGN ENGINEERING SOLUTIONS. IN ADDITION, OPERATIONAL, MAINTENANCE SUPPORT AND TROUBLESHOOTING SERVICES CAN BE PROVIDED.

THE PREDOMINATE FLOATING PRODUCTION SYSTEMS ARE CATEGORISED AS:

- **FLOATING PRODUCTION STORAGE & OFFLOADING (FPSO)**
- **FLOATING STORAGE & OFFLOADING / UNLOADING (FSO/ FSO)**
- **FLOATING STORAGE & REGASSIFICATION UNIT (FSRU)**
- **FLOATING LIQUIFIED NATURAL GAS TERMINAL (FLNG)**

CATENARY ANCHOR LEG MOORING (CALM) BUOY MOORING SYSTEMS ARE RECOGNISED AS TWO TYPES:

- **TURNTABLE TYPE—CALM BUOY SYSTEMS**
- **TURRET TYPE— CALM BUOY SYSTEMS**



SERVICES

- ⇒ **CONSULTANCY**
- ⇒ **CONCEPT & DETAIL DESIGN**
- ⇒ **THIRD-PARTY REVIEW**
- ⇒ **CONSTRUCTION SUPPORT**
- ⇒ **PROCUREMENT SUPPORT**
- ⇒ **EXPERT WITNESS**
- ⇒ **MAINTENANCE & OPERATIONS SUPPORT**

SERVICE DESCRIPTION

RHIZOME ENERGY LIMITED PROVIDES A COMPLETE RANGE OF SERVICES FOR FLOATING PRODUCTION AND CALM BUOY SOLUTIONS. WE CAN SUPPORT CLIENTS IN DEFINING THE BASIS OF DESIGN FOR THE PROJECT, CAN PERFORM A FEED CONCEPTUAL STUDY AND FOLLOW THIS BY A COMPLETE DETAILED DESIGN OF FLOATING PRODUCTION TURRETS AND SPM CALM BUOYS. ALL EQUIPMENT CAN BE SPECIFIED BY RHIZOME ENERGY INCLUDING COMPLETE SWIVEL STACK ASSEMBLY. WE CAN ALSO SUPPLY CALM BUOY SWIVELS FOR SPMs.

FULL TECHNICAL AND EXPEDITING SUPPORT CAN BE PROVIDED TO CLIENTS DURING THE PROCUREMENT AND CONSTRUCTION ACTIVITIES.

IN ADDITION, WE CAN ALSO REPRESENT THE CLIENT AND PERFORM INDEPENDENT THIRD-PARTY REVIEWS, TO ENSURE THE ENGINEERING AND FABRICATION CONTRACTORS MEET THE PROJECT REQUIREMENTS AND APPLICABLE LOCAL & INTERNATIONAL STANDARDS.

RHIZOME ENERGY CAN ALSO PROVIDE DETAILED PROCEDURES FOR OPERATIONS & MAINTENANCE OF THE CALM BUOY AND TURRET SYSTEMS.

REFERENCES

FLOATING PRODUCTIONS & CALM BUOYS

REFERENCES ARE PROVIDED AS PER THE EXPERIENCE OF THE COMPANY, IT'S STAFF MEMBERS AND ASSOCIATES OF THE COMPANY. REFERENCE FOR OTHER SECTORS & DISCIPLINES CAN BE PROVIDED ON REQUEST.

S.No	PROJECT	END CLIENT	SCOPE	YEAR
1	NAM DU U MINH FPSO PRE—ENGINEERING	HBA OFFSHORE	PRE-ENGINEERING DELIVERABLES FOR NAM DU U MINH FPSO	2020
2	FPSO LIFE EXTENSION STUDY	QUEST GLOBAL	LIFE EXTENSION STUDY—EXPERT CONSULTATION	2019
3	INDEPENDENT REVIEW—SWIVEL COMPATIBILITY	HBA OFFSHORE	REVIEW OF A STOCK SWIVEL, ENSURING COMPATIBILITY TO PROJECT	2019
4	FSO GOLDEN STAR	LMC/ IDEMITSU	THIRD PARTY REVIEW ASSISTANCE	2019
5	CALM BUOY AND PLEM	CONFIDENTIAL	BUOY & PLEM - PIPING DESIGN AND PLEM — STRUCTURAL	2019
6	OSX-1 FPSO	FPSO INVEST	SWIVEL & TURRET INSPECTION	2019
7	KARISH & TANIN FIELD DEVELOPMENT PROJECT	ENERGEAN OIL & GAS	PIPE STRESS ANALYSIS	2019
8	GREATER ENFIELD DEVELOPMENT - FPSO	WOODSIDE	FPSO - TURRET TECHNICAL AUTHORITY	2019
9	AL SHAHEEN	QATAR PETROLEUM	STRUCTURAL ANALYSIS	2019
10	ESCRAVOS EXPORT SYSTEM SPM	CHEVRON	PIPING & PROCESS DESIGN AND PACKAGE MANAGEMENT	2019
11	HELANG FPSO	YINSON	VARIOUS STRUCTURAL FE ANALYSIS	2018
12	RU VI BALONGAN SPM SYSTEM	PERTAMINA	PIPING & PROCESS DESIGN AND PACKAGE MANAGEMENT	2018
13	LAYANG FPSO	THHE - MALAYSIA	TURRET MOORING SYSTEM - TECHNICAL AUTHORITY	2016
14	COLD ENVIORNMENT CALM BUOY	STEP CHANGE ENGINEERING	NEW CALM BUOY SPECIFICATION	2016
15	KRAKEN FPSO	BUMI ARMADA - UK	TURRET MOORING SYSTEM - TECHNICAL AUTHORITY	2015
16	GENERIC	LMC - UK	TURRET STRUCTURAL ANALYSIS	2015
17	GENERIC	EMAS OFFSHORE	FE ANALYSIS OF VESSEL AND MOORING SYSTEM	2015
18	GENERIC	LMC - UK	TURRET SOLID MODELING AND MESHING	2015
19	CATCHER FPSO	PREMIER OIL - UK	TURRET MOORING SYSTEM - TECHNICAL AUTHORITY	2014
20	FSO SUSKAN	TEEKAY - THAILAND	TURRET PIPING DESIGN	2014
21	FSO BELIDA	CONOCOPHILLIPS - INDONESIA	TURRET PIPING DESIGN	2014
22	FSO GAZA	MOOG-LYBYA	TURRET PIPING DESIGN	2013

REFERENCES (CONTINUED.)

FLOATING PRODUCTIONS & CALM BUOYS

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S.No	PROJECT	END CLIENT	SCOPE	YEAR
23	PETRONAS FLNG 2 FEED STUDY	SAMSUNG HEAVY INDUSTRIES - KOREA	TURRET PIPING DESIGN	2013
24	SMART MOORING SYSTEM	SIGMA OFFSHORE - ABERDEEN	NEW MOORING SYSTEM CONCEPT DESIGN	2013
25	LEWEK EMAS FPSO - DUA FIELD ADDITION	EMAS - SINGAPORE	TURRET PIPING & MECHANICAL	2012
26	PERISAI KAMELIA	EMAS - SINGAPORE	TURRET PIPING, MECHANICAL & STRUCTURAL	2012
27	LEWEK EMAS FPSO	EMAS - SINGAPORE	TURRET PIPING & SWIVEL DESIGN	2011
28	CHEVRON CAPTAIN FPSO	CHEVRON	FAIRLEAD STRUCTURAL ANALYSIS	2010
29	FSO RATU SONGKHLA	M3NERGY - MALAYSIA	TURRET MOORING SYSTEM - PROJECT MANAGMENT	2008-2009
30	LIVORNO FSRU	SAIPEM - ITALY	TURRET MOORING SYSTEM - PROJECT MANAGMENT	2008
31	AQUILA FPSO	SAIPEM - ITALY	TURRET MOORING SYSTEM - PROJECT MANAGMENT	2008
32	FSO5	MONOBUOY - MONACO	TURRET MOORING SYSTEM - PROJECT MANAGMENT	2008
33	FSO CENDOR	MISC	PROJECT MANAGEMENT	2006
34	AOKA MIZU	BLUEWATER - NETHERLANDS	TURRET PIPING DESIGN	2005
35	SOOROSH FSU	NIOC - IRAN	TURRET PIPING & SWIVEL DESIGN	2000
36	CAKERAWALA FSO	SAIPEM - ITALY	TURRET PIPING & SWIVEL DESIGN	2000
37	GLAS DOWR FPSO	PETRO SA - SOUTH AFRICA	TURRET AND TOPSIDES UPGRADE	1999
38	JOTUN FPSO	EXXONMOBIL - NORWAY	TURRET PIPING DESIGN	1997
39	GLAS DOWR FPSO	BLUEWATER - NETHERLANDS	TURRET PIPING DESIGN	1996
40	CALM BUOYS	BLUEWATER - NETHERLANDS	PLEM & BUOY PIPING DESIGN	1997-2004



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