

# MANUFACTURING AND SUPPLY OF ACCESSORIES FOR SUBMARINE CABLES



P.C.S. Italiana S.r.l. was established in January 1991 by a team of highly skilled maritime experts and cable manufacturing technicians

we are is based in Brandizzo  
(30 Km East of Torino)  
with offices and warehouses



Market grow for the O&G driven us also to establish a subsidiary in Doha Qatar that handles all operations for the ME we have also direct connections in:

- Egypt
- UAE
- USA

PCS Italiana S.r.l. since 1991 is operating in the O&G business with equipment and technicians for the laying and installation of power and optical fibres submarine cables.

From the early years of activity the Company started operation with international cabling makers and the experience list has extended to several of the major O&G Companies/Contractors and Utilities both in Italy and abroad.

Company activity is driven to provide services for submarine cables and umbilical laying and installation covering the service from engineering stages until final test and commissioning; within this range of application also the accessories supply is concerned and for this reason, thanks to the experience developed working on submarine cables Company started to design and propose a comprehensive range of accessories from topside platform junction boxes until repair joints, covering all the accessories and ancillaries within.

The track reference for supplied accessories shows a consistent experience, capability and reliability thanks to the fact that all PCS Italiana accessories are tailored designed and manufactured according to direct cable and site needs thus provide a specific solution for the purpose of installation.

All manufacturing and assembly activities are held in the headquarter in order to provide a safe and comprehensive location for all specific operations.

Company staff is composed of approx. 25 people that considers both employees and operational staff.

Thanks to the light structure capacity and relevant direct control on all activities, PCS Italiana can take direct and immediate actions in order to provide immediate and supportive responses to Customer needs.

Company location is in Brandizzo in North West Italy very close to Torino, with close access to Milano Malpensa Airport and closer seaport is Genoa situated approx. 200 Km South-West of Brandizzo.

Company has a complete owned headquarter and manufacturing-assembling unit of 2500 m<sup>2</sup> among which the covered surface is of 2000 m<sup>2</sup>. An additional area is available at 20 Km east with an open air surface of 9000 m<sup>2</sup> for storage of equipment and means.

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## PCS Cables L.L.C.

Mr. ALI MOHAMED JAIDAH

Office Bldg 4th Floor,

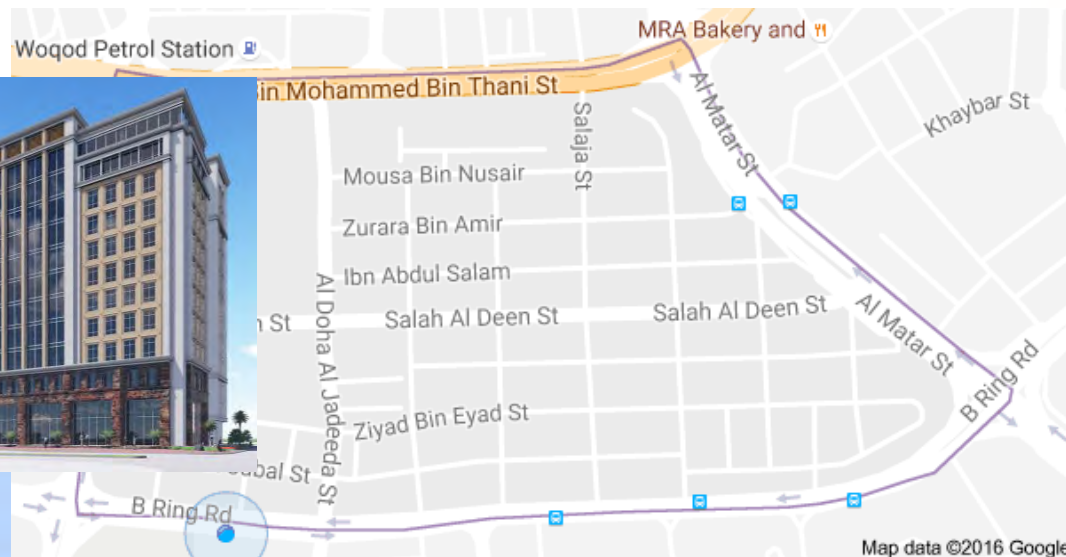
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## OUR ACTIVITIES

### MANUFACTURING OF SUBMARINE ACCESSORIES

Topside hang-off



Safety on seabed



Bull-noses and pulling head



PCS design and manufacture a complete range of accessories and ancillaries for submarine cables to deliver the relevant support to end users and contractors

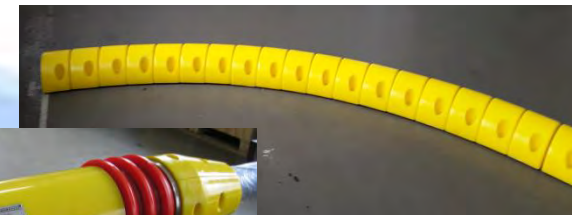
ATEX Certified Junction boxes for power and fibre optic



Submarine joints for power and OF cables



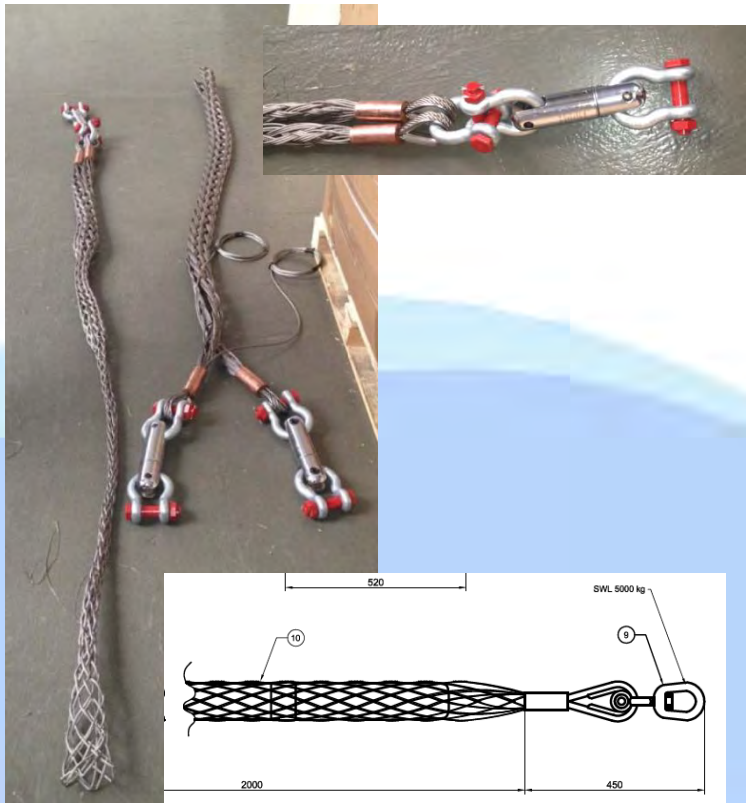
J-Tubes seals, centralizers and bend restrictors



# MANUFACTURING OF SUBMARINE ACCESSORIES

## CABLES BULL-NOSES AND PULLING HEADS

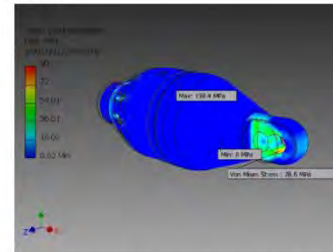
Cable bull-noses and pulling heads are designed and manufactured in reason of mechanical performances to be granted and cables dimensions.



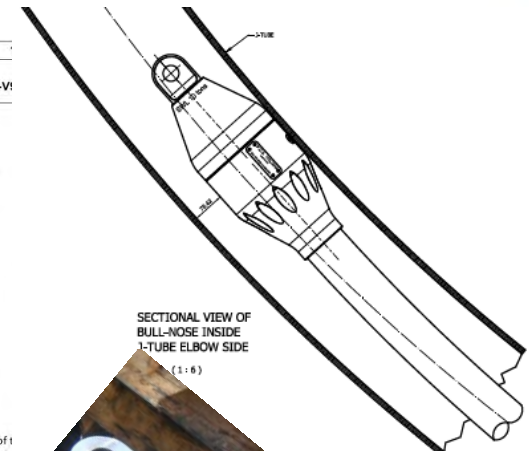
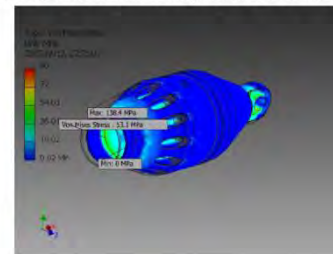
Supplier	ESNA-SOA CALCULATION REPORT	Rev. X4
PCS ITALIANA SRL	Subcontractor/Vendor Doc. No.: 1067 - BNPV	Contractor Doc. No.: 01-ZA-E-VI

Figures

Von Mises Stress - [MPa]



Von Mises stress results use color contours to show the stresses calculated during the solution of 1. The deformed model is displayed. The color contours correspond to the values defined by the color bar.

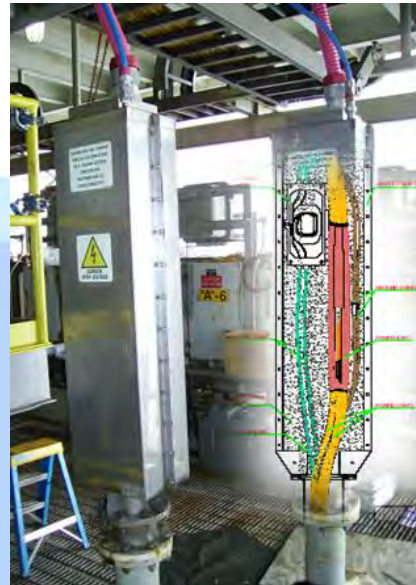
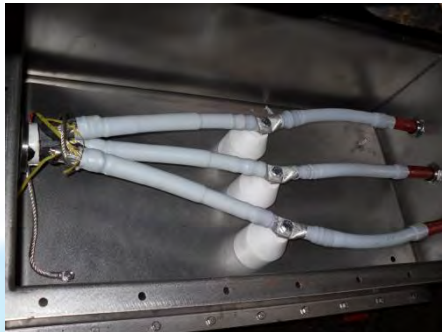


## MANUFACTURING OF SUBMARINE ACCESSORIES

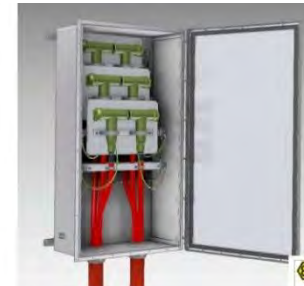
### JUNCTION BOXES FOR POWER AND OPTICAL CABLES

A wide range of junction boxes is available for power, control and optical cables with “Ex” Certification under IECEx or ATEX Standard with protection grade up to IP 68.

As alternative, also sealed JB without certification are available.



3D VIEW - Close  
**POWER JUNCTION BOX**  
up to 15 kV - 620 A  
ATEX CERTIFIED



3D VIEW - Open /Sectioned  
Available in different sizes to satisfy all necessities



Ex  
ATEX 2014/54/EU CT 17 CE  
ATEX 2014/54/EU CT 17 CE



3D VIEW - Close  
**FOC JUNCTION BOX**  
ATEX CERTIFIED



3D VIEW - Open /Sectioned  
Available in different sizes to satisfy all necessities



Ex  
ATEX 2014/54/EU CT 17 CE  
ATEX 2014/54/EU CT 17 CE

Sealed vertical and horizontal junction boxes

# MANUFACTURING OF SUBMARINE ACCESSORIES

## SUBMARINE JOINTS FOR MEDIUM VOLTAGE POWER CABLES

A universal range of power submarine joints allow PCS to provide a unique solution that covers different ranges of insulation, voltages and size. Joint is developed in cooperation with Nexans for the electrical part to provide to customers a reliable supplier for electrical joints. The joint have been tested to an independent laboratory to verify the compatibility for application at 150 m depth with satisfactory results.

**COMPLESSIVO GIUNTO  
JOINT ENSEMBLE**

**CAMPO DI UTILIZZAZIONE - APPLICATION RANGE**  
Per giunzione fra: a) cavi con conduttori rotondi  
b) cavi con conduttori ovali  
c) cavo con conduttore rotondo e cavo con conduttore ovale

For jointing between: a) cables with round conductors  
b) cables with oval conductors  
c) cable with round conductor and cable with oval conductor

**PARTE ELETTRICA - ELECTRICAL PART**  
A disegni GSC-01/EL1 (REV.1) e GSC-01/EL2  
According to drawings GSC-01/EL1 (REV.1) and GSC-01/EL2

**TEST REPORT**  
and issued on 17 April 2005  
issued by P.C.S. ITALIANA S.R.L. - Genova (Italy) on 18 February 2005

**TEST REPORT**  
and issued on 17 April 2005  
issued by P.C.S. ITALIANA S.R.L. - Genova (Italy) on 18 February 2005

**FOR OFFER PURPOSE**



# MANUFACTURING OF SUBMARINE ACCESSORIES

## SUBMARINE JOINTS FOR OPTICAL FIBRE CABLES

With the same universal philosophy also the fibre optic submarine joint has a universal design and allows with the same design, the connection up to 96 fibres thus including the largest industry solutions.

This joint has been designed by PCS and tested in cooperation with Tratos Cavi to an independent laboratory in order to confirm its design compatibility for application until 2000 m depth.

I.N.R.I.M.  
ISTITUTO NAZIONALE DI RICERCA METROLOGICA  
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E KUM@I.N.R.I.M. - KUM@I.N.R.I.M.  
PAG. 1/41

### TEST REPORT

N. 11-0420-01      Issued on      2011-06-13

Object      Fiber-optic submarine cable joint certification

Identification      Fiber-optic submarine cable manufactured by TRATOS mod. ST 963765  
Fiber joint realized by P.C.S. Italiana S.r.l.; type: SUFOJ

Test date      Dal 2011-02-11 al 2011-02-17

Customer      P.C.S. Italiana  
Posa Cavi Sottomarini e Lavori Marittimi S.r.l.

Address      Via Fratelli Roselli 24  
10032 Branzazzo (TO)

Responsable for the test      The head of the  
Optical Division

*Giorgio Baida*  
*Manuela Stell*  
(with Luca Bortolo)



## MANUFACTURING OF SUBMARINE ACCESSORIES

### TOPSIDE HANG-OFF

To provide a safe solution for cables hang-off on platform, PCS provide specific studies and design purposely the hang-off for topside application. These ancillaries provide the Customer required pulling strength by use of proven quality material and supported by specific fatigue stress calculation.



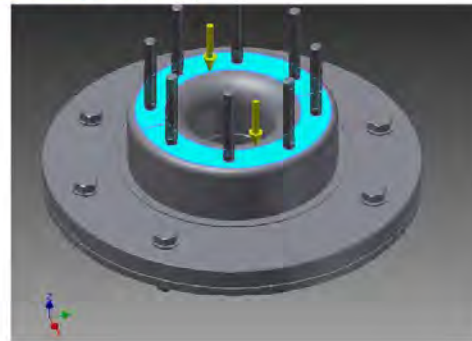
<b>PCS ITALIANA S.R.L.</b>	Subcontractor/Vendor Doc. No.: 1067 - HOPV	Contractor Doc. No.: 01-ZA-E-V91826
<b>01.10 - STRESS ANALYSIS REPORT</b>		

**Physical** (Note: Physical values could be different from Physical values used by FEA reported below)

Mass	127.657 kg
Area	2219560 mm <sup>2</sup>
Volume	16275300 mm <sup>3</sup>
Center of Gravity	x=-0.000302585 mm y=0.00077184 mm z=52.4764 mm

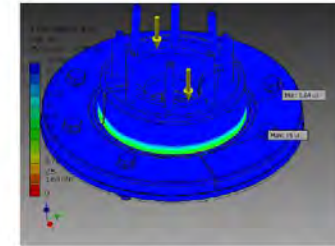
**Force:1**

Load Type	Force
Magnitude	182280.000 N
Vector X	0.000 N
Vector Y	0.000 N
Vector Z	-182280.000 N

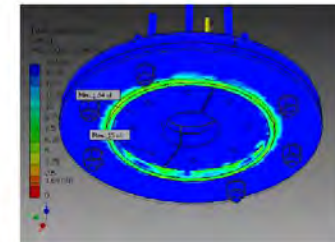


<b>Supplier</b>	Subcontractor/Vendor Doc. No.: 1067 - HOPV	Contractor Doc. No.: 01-ZA-E-V91826
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**Safety Factor**



Safety factor shows the areas of the model that are likely to fail under load. The color contours correspond to the values defined by the color bar.



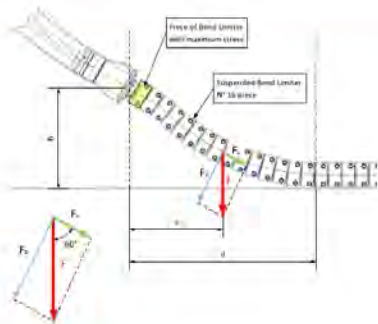
## MANUFACTURING OF SUBMARINE ACCESSORIES

### J-TUBE SEALS, CENTRALIZERS AND BEND RESTRICTORS

From topside to bell-mouth, PCS can provide all ancillaries. J-tube seals or centralizers that can be also completed by suitable bend restrictors elements for an increased safety for cables at j-tube exit.

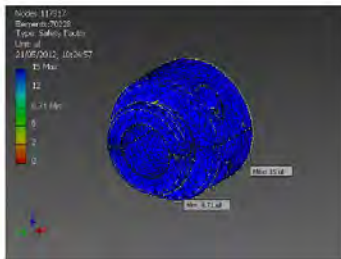
PCS ITALIANA SRL Subcontractor/Vendor Doc. No.: 1067 - CBRV Contractor Doc. No.: 01-ZA-E-V91830

#### 01.03 - CALCULATION OF PULLING FORCE ACTING ON CENTRALIZER



PCS ITALIANA SRL Subcontractor/Vendor Doc. No.: 1067 - CBRV Contractor Doc. No.: 01-ZA-E-V91830

#### Safety Factor



safety factor shows the areas of the model that are likely to fail under load. The color contours correspond to the values defined by the color bar.



# MANUFACTURING OF SUBMARINE ACCESSORIES

## SAFETY ON SEABED

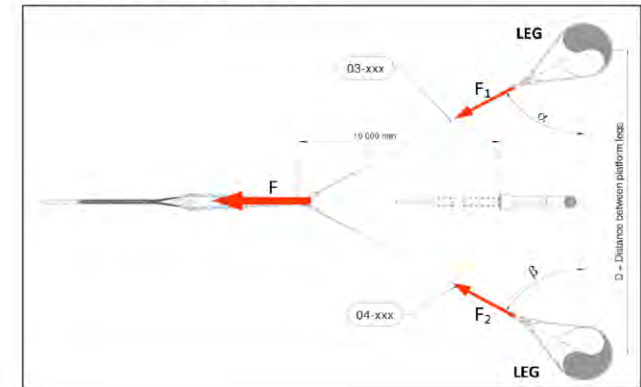
At j-tube exit, additional safety may be required and PCS can provide specific solution tailored for the need



Iron cast shell protection for preserved marine environment

<b>PCS ITALIANA SRL</b>	Subcontractor/Vendor Doc. No.: <b>1067 - CTBG</b>	Contractor Doc. No.: <b>01-ZA-E-V91832</b>
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### 02 - GS Wire Rope Verification



**Starting data:**

F =	8.00 [tons]	78 452.80 [N]	
α =	25.000 [deg]	0.43633231 [rad]	MINIMUM ANGLE
β =	40.000 [deg]	0.6981317 [rad]	MINIMUM ANGLE

**Results:**

$$F_1 = \frac{F \cdot \sin(\pi/2 - \beta)}{\sin(\alpha + \beta)} = 66\,311.17 \text{ [N]} \rightarrow 6.76 \text{ [tons]} \text{ VERIFIED}$$

$$F_2 = \frac{F \cdot \sin(\pi/2 - \alpha)}{\sin(\alpha + \beta)} = 78\,452.80 \text{ [N]} \rightarrow 8.00 \text{ [tons]} \text{ VERIFIED}$$

Tie-back grip calculation for supply and application at j-tube exit

## Document Deliverables

- **Accessories drawings**
- **Material Inspection Test Plan**
- **Assembly instructions**
- **Material certificates**
- **Type Tests on previous samples**
- **Shipment documents**
- **Certificate of Origin**

## LATEST ACCESSORIES SUPPLY REFERENCES

YEAR	CUSTOMER	SITE	ACCESSORIES TYPE
2010 -2012	ENEL Distribuzione	Italy	Supply of no. 14 MV power submarine joints developed with Nexans for the two years maintenance contract
2013	Fulgor Cables	Egypt	Supply of MV accessories for Suco for Ras Budran project: no. 2 hang-off, no. 1 centralizer, no. 2 universal submarine joints, no. 2 pulling heads
2013	ZTT Cables (China)	Aramco Mrjn-Safanya - Abu Safah	Supply of no. 30 cable pulling head and no. 40 chinese fingers for the MV cables supplied by ZTT to McDermott for the Aramco Offshore Long term Agreement
2013	Occidental petroleum of Qatar	Qatar	Supply of no. 2 universal submarine joints to repair PS-1K to R06 connection (JPS cable)
2013	ZTT Cables (China)	Aramco Wasit Project	Supply of: no. 6 Atex power JB, no. 6 Atex OF JB, no. 7 hang-off, no. 5 centralizer + 5 m bend restrictors, no. 6 bull-nose, no. 2 universal spare joints, no. 5 tie-back systems, no. 1 cable abandon head
2013-2014	NPCC - Abu Dhabi	ADMA OPCO - ZAKUM Oil Lines	Supply of no. 132 J-Tube seals C/W 5 mts. bend restrictor each (Prysmian Cable)
2015	STAPEM - Paris	SONANGOL - Palanca Field	Supply of no. 2 submarine MV composite joints for submarine cable (Prysmian cable)
2015	NPCC - Abu Dhabi	BUNDUQ OSII Ph. 2 Devel. Pjt	Supply of no. 2 J-Tube seals C/W 5 mts. bend restrictor each (JPS Cable)
2016	Orient Cables (China)	South Pars 19	Supply of : no. 4 15 kV Atex power JB, no. 4 Atex OF JB, no. 4 Atex Control JB, no. 4 J-Tube seal + 5 m bend restrictors, no. 4 hang-off, no. 4 universal MV composite spare joints
2017	J-Power System Saudi	NPCC for ADMA OPCO	Supply of 1 J-Tube seal + 5 m bend restrictors
2017	J-Power System Saudi	Mc Dermott for Saudi Aramco	Supply of no. 15 OF Splice Boxes NEMA 4x Splice Boxes for Safanya Header 9 and Berri
2017	J-Power System Saudi	Mc Dermott for Saudi Aramco	Supply of no. 13 OF IEC-Ex IP67 Splice Boxes for Safanya 5 Field
2017	J-Power System Saudi	EMAS	Supply of no. 8 OF NEMA 4x Splice Boxes and no. 8 diverless centralizers for Safanya 5 Field
2017	J-Power System Saudi	NPCC for Saudi Aramco	Supply of no. 6 OF NEMA 4x Splice Boxes for Safanya/ZULF/Berri Fields
2018	Sumitomo Electric Co.	COOEC for Qatar Petroleum	Supply of no. 2 IECEx IP66 Power JB, no. 2 IECEx FO JB, No. 2 hang-off, no. 2 centralizers with 5 m bend restrictors each, no. 1 composite submarine joint or QP NFA Project
2018	J-Power System Saudi	Dubai Petroleum Rashid A -D	Supply of no. 2 IECEx IP67 Power JB, no. 2 IECEx IP67 FO JB, no. 2 centralizers each with 5 m bend restrictors
2018	ENI Libia	Mellitah Field	Supply of no. 2 Submarine Joint Boxes for Power and Comms Tronic Flying Leads
2018	J-Power System Saudi	NPCC ONGC India	Supply of no. 10 IECEx IP66 Power JB, no. 10 IECEx FO JB, No. 10 diverless centralizers with 5 m bend restrictors each, no. 10 composite submarine joint
2018	J-Power System Saudi	NPCC Aramco 115 kV	Supply of no. 20 NEMA 4x FO JB, No. 4 diverless centralizers with 5 m bend restrictors, no. 4 tie-back systems
2018	PCS Cables LLC	QatarGas WH5 Replacement Qatar	Supply of no. 2 IECEx IP67 Assemblable JB for power and fibre optic cable
2018	J-Power System Saudi	L&T ONGC India	Supply of no. 2 IECEx IP66 FO JB, No. 4 diverless centralizers with 5 m bend restrictors, no. 2 composite submarine joints
2018	AVEON Offshore	Amni Tubu Nigeria	Supply of no. 2 Centralizers with 5 m Bend restrictors
2018	J-Power System Saudi	NPCC Saudi Aramco	Supply of no. 19 IECEx FO JB
under execution	J-Power System Saudi	NPCC Bu Haseer - UAE	Supply of no. 2 J-Tube seals with 5 m Bend restrictors
under execution	United Technical Services - UAE	ADMA-OPCO UAE	Supply of no. 2 J-Tube seals with 5 m Bend restrictors

## Contact in Iran

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