

# PROJECT SHEET

## RISER REPLACEMENT/REPAIR

INSPECTION, REPAIR, MAINTENANCE & LIGHT CONSTRUCTION  
DUBAI, UNITED ARAB EMIRATES

### BOSKALIS' ENERGY SOLUTIONS

Boskalis is a leading global dredging and marine expert. With safety as our core value we provide innovative, sustainable and all-round solutions for our clients in the energy market. Realizing projects in remote locations with a heightened environmental focus is one of our specialties. Under brands such as Boskalis, Dockwise, Fairmount, VBMS and SMIT. We offer more services than any other company in our industry, making us your next one-stop solution provider. We support the development, construction, maintenance and decommissioning of oil and gas import and export facilities, fixed and floating exploration and drilling facilities, pipelines and cables and offshore wind farms.

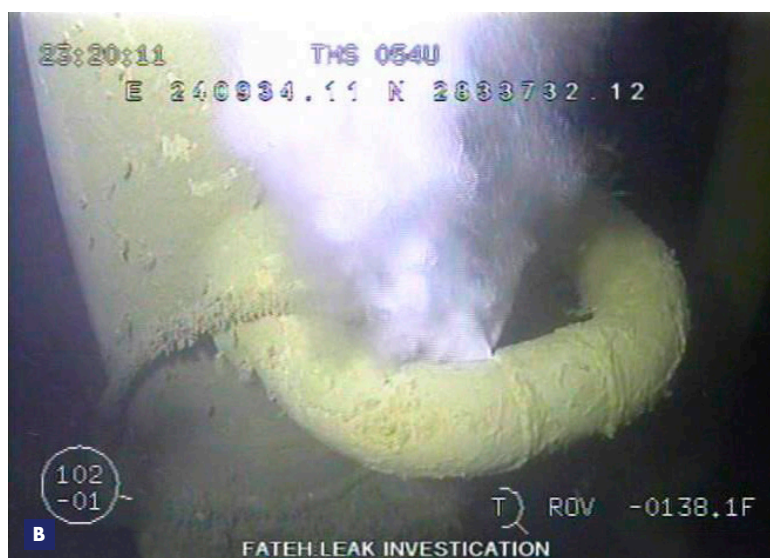
### INTRODUCTION

On the 5<sup>th</sup> May 2016 client identified a leak on a 20 inch transfer high pressure gas pipeline, upon confirmation Boskalis investigated the leak location. The results of the leak investigation confirmed a gas leak which was observed on the 4 inch piggy back riser coming of the main 20 inch gas transfer pipeline at EL(-)139 ft. Gas was seen escaping from the circumferential weld closest to the main weldlet connection.

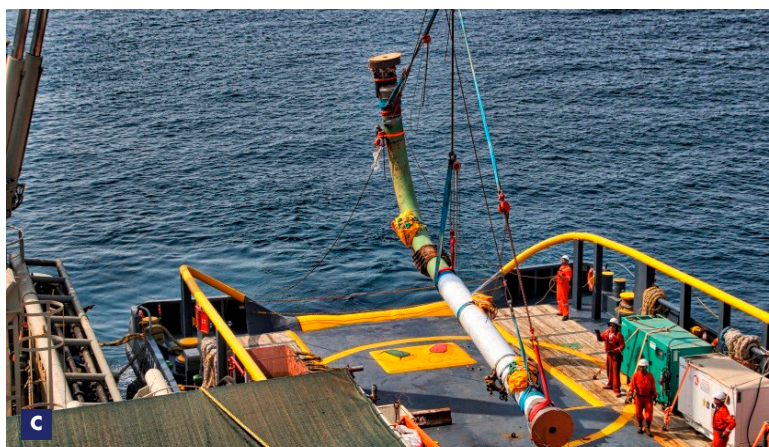
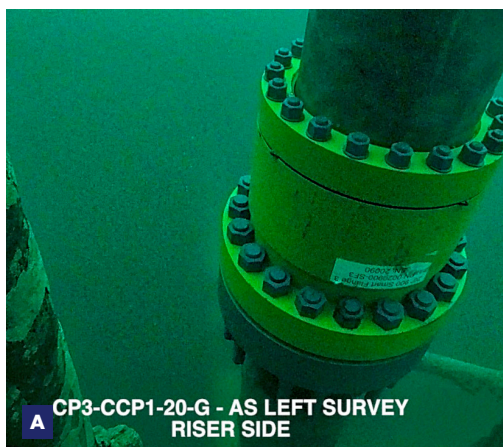
The main 20" gas transfer pipeline had two piggy back injection risers (2" & 4") connected either side of the riser bend. In close proximity of the 20" gas transfer pipeline were four independent risers, two on either side all with supporting knee braces. The average distance between all five risers was 700 mm, making access to carry out the repair difficult.

### FEATURES

Client	Dubai Petroleum Establishment (DPE)
Location	Offshore Dubai
Period	07-06-2016 - 06-07-2016
Contractor	Boskalis Offshore Subsea Services Middle East LLC



- A 4" piggy back injection line leak coming off main 20" gas transfer pipeline
- B CCP1
- C Deployment of the new 20" gas transfer riser bend section



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### METHOD

After reviewing several methods for repairing the leak, the direct riser bend section removal, repair and replacement was selected. This method of repair involved the cutting and removal of 10 m by 2" and 6 m by 4" injection riser sections to allow access to the main 20" gas transfer riser. Three DWCM cuts on the 20" gas transfer pipeline to allow removal of a 3 m section to allow access for the main gas transfer section for removal. Preparation for smart flange placement (Cleaning, weld grinding, UT, ovality check); Installation of two 20" smart flanges; installation of riser bend section & closing 3 m spool followed by bolt tensioning & testing.

The method of repair was split into 3 phases:

- **Phase 1:** removal of the riser bend section.
- **Phase 2:** onshore repair and hydro testing .
- **Phase 3:** Installation of the riser bend section & closing spool, bolt tensioning and testing.

### MATERIALS & EQUIPMENT

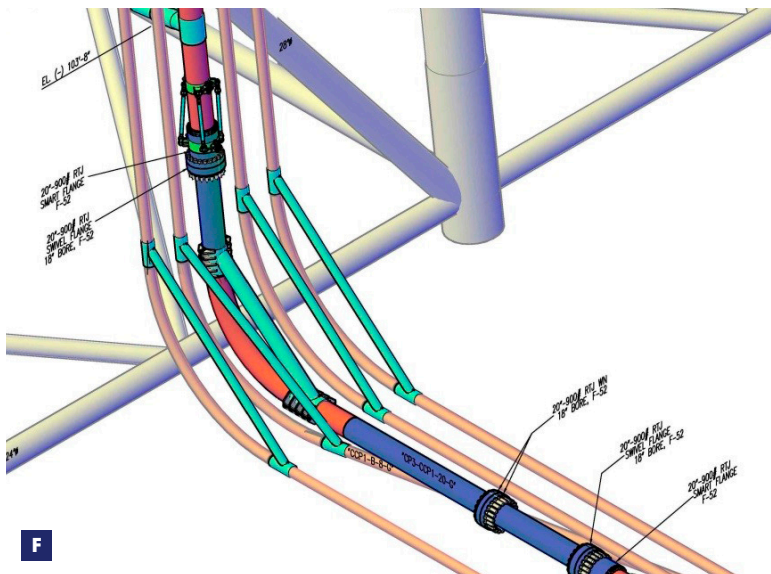
Main platform DP II DSV SMIT Komodo c/w 30 t AHC crane, HPWJ and cleaning equipment, hydraulic tools, hydrotight/tensioning equipment, diamond wire cutting units, 3 x sets of dedicated rigging and 3 x sets of adjustable rigging.

### DIVING TECHNIQUES

The pipeline repair tasks were carried out using saturation diving techniques (two man bell) 200 m rated system and a light work/inspection class ROV (Seaeeye Cougar XT) deployed from the DP II DSV SMIT Komodo.

### CONCLUSION

The project SOW was completed safely and in accordance with client and company prepared detailed work procedures and schedule. Final pressure test was successfully completed and pipeline handed back to client within the allotted timeframe.



- D** Installation, positioning and alignment of the new 20" gas transfer bend section into the 20" smart flange
- E** As built video survey during pressure test verifying the close proximity of the surrounding risers to the vertical smart flange connection
- F** As built 3D image of repaired 20" gas transfer bend section

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