

# REPAIR SOLUTIONS FOR DAMAGED SUBSEA STRUCTURES



*Defects on subsea structures such as cracks, dents, ruptures etc. can be repaired using Underwater Dry Welding or Hyperbaric Welding at elevated pressures*

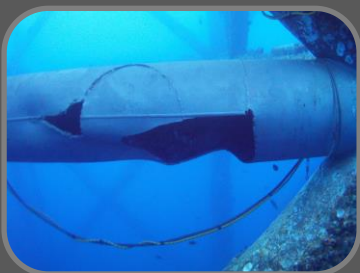


## THE UNDERWATER DRY WELDING PROCESS

Certified welder divers are employed to perform structural welds to Class inside dry habitats which are designed and built to fit around damaged areas. Welding quality is confirmed by NDT and certified by Third Parties. All welding works adhere to AWS D1.1:2006 Steel Structural Welding code.

Air is used to purge water from the habitat in welding applications to water depth of 20 metres. Beyond this depth, inert gases are used.

Besides crack repairs, Underwater Dry Welding can be used to weld sleeves, stiffeners and replacement members.



**DAMAGE ANALYSIS**  
Survey of the damage and proposal for repair solution



**CUSTOM-BUILT HABITAT**  
Custom fit habitat for underwater welding repairs

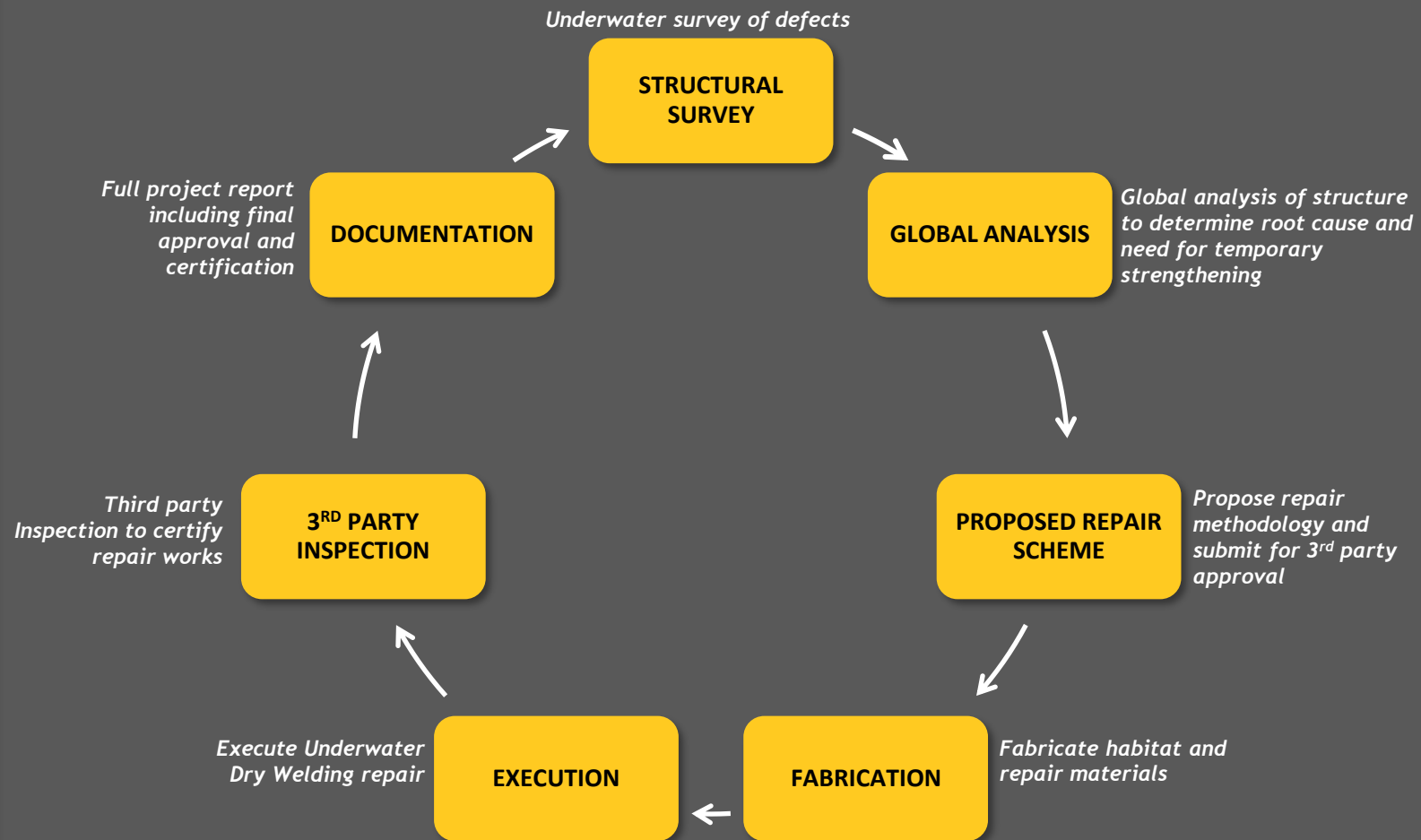


**REPAIR IN PROGRESS**  
Trained and certified welder diver performing Underwater Dry Welding

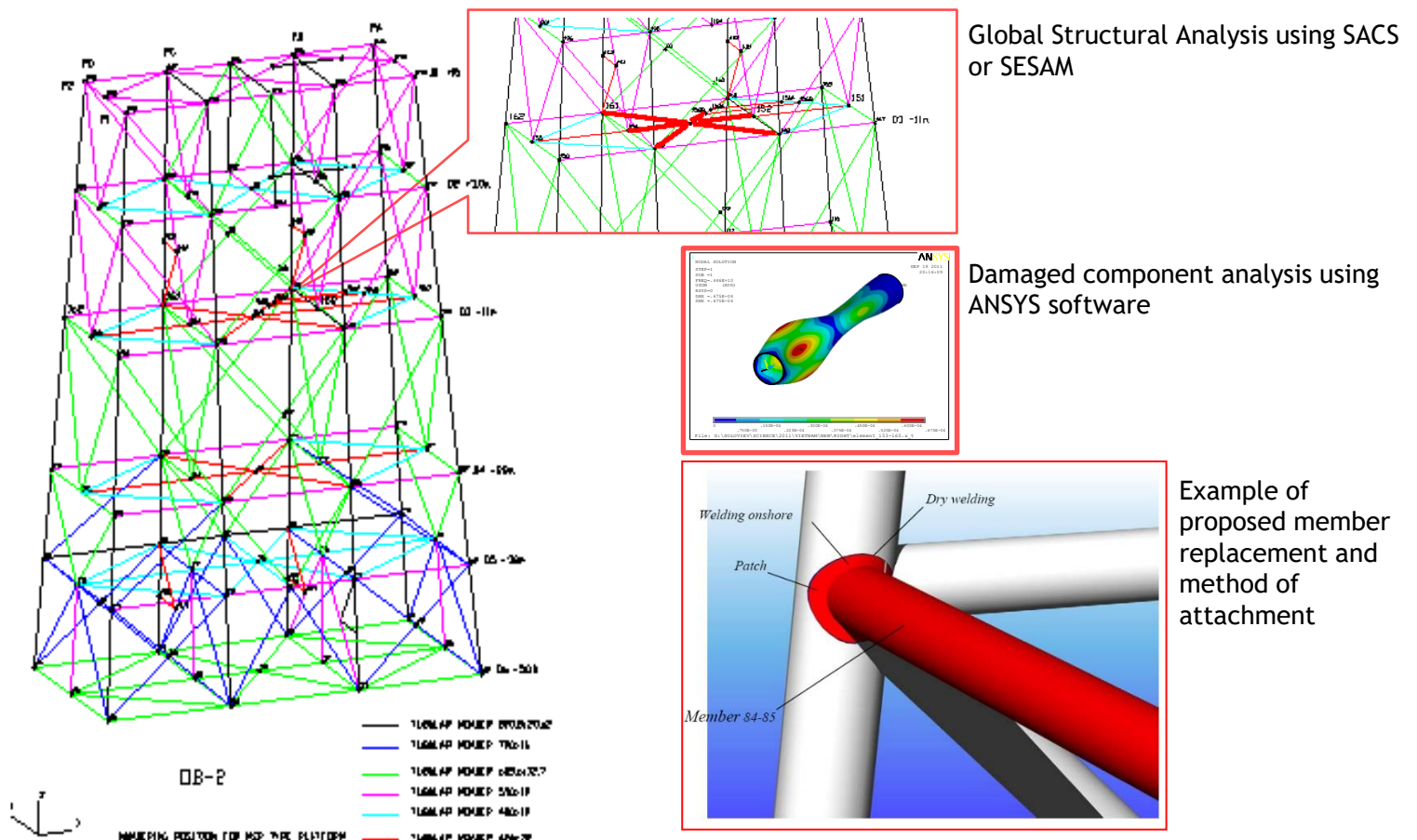


**REPAIRED AND REINFORCED**  
Underwater Dry Welding completed and coated

# OUR INTEGRATED APPROACH TO REPAIRS OF UNDERWATER DEFECTS



## DESIGN & ANALYSIS CAPABILITY





# UNDERWATER DRY WELDING SOLUTION

## CASE STUDIES

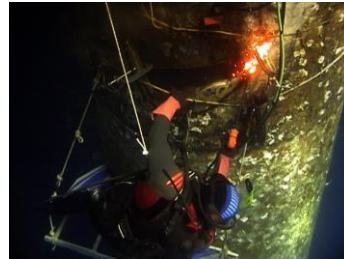
Year : 2010  
Structures : Jacket Leg  
Location : Offshore South East Asia  
Scope of Work : Repair of torn jacket legs



1. Damage at main leg



2. Preparation & Deployment of divers



3. Underwater cutting of damaged section



4. Position of plates



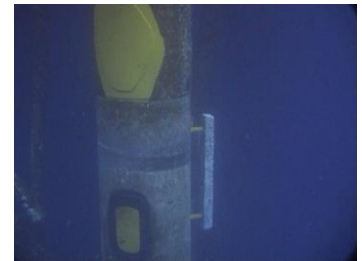
5. Habitat installed



6. Underwater dry welding inside habitat



7. Plates welded

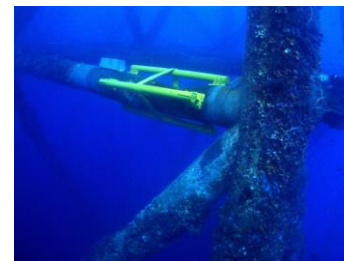


8. Jacket leg after repair

Year : 2011  
Structures : Offshore jackets  
Location : Offshore South East Asia  
Scope of Work : Repair of damaged members on jackets



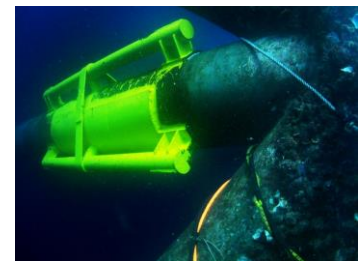
1. Defect on structural member



2. Repaired section



3. Defect on structural member



4. Repaired section



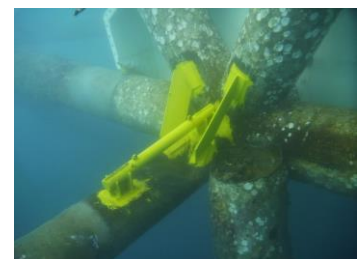
5. Defect on structural member



6. Sleeve repair



7. Habitat installed



8. Repaired joint

# UNDERWATER DRY WELDING SOLUTION

## NOTABLE PROJECTS

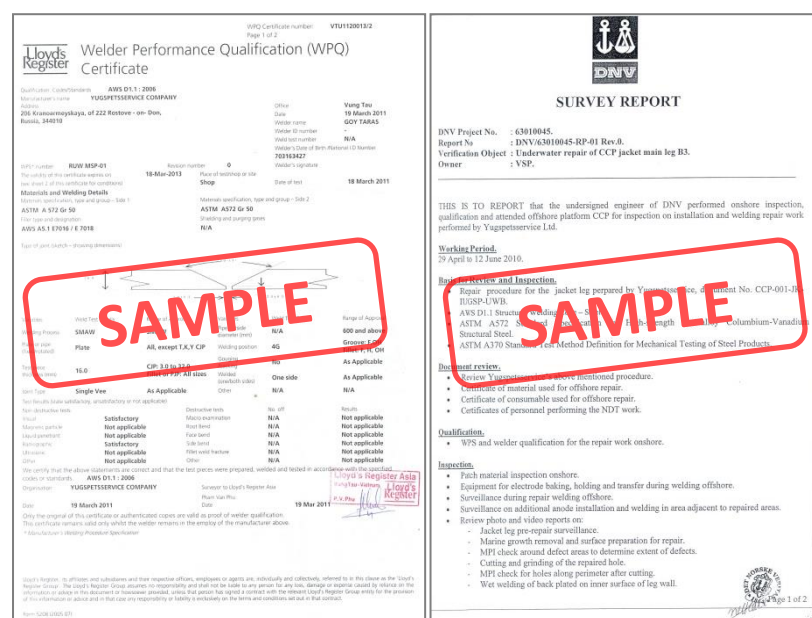
### OFFSHORE STRUCTURES - OIL & GAS PLATFORMS

YEAR	COUNTRY	CLIENT	SCOPE OF WORK	STRUCTURES
2010	Vietnam	JV Vietsovpetro	Underwater repair of damaged jacket main leg B3	Central Compressor Platform (CCP) in oilgas field "White Tiger"
2011	Vietnam	JV Vietsovpetro	Underwater repair of damaged jacket	MSP-1
2011	Vietnam	JV Vietsovpetro	Underwater repair of damaged jacket	MSP-4
2012	Vietnam	JV Vietsovpetro	Underwater repair of damaged jacket	MSP-6
2012-2013	Vietnam	JV Vietsovpetro	Underwater repair of damaged jacket	BK-2
2014	Vietnam	JV Vietsovpetro	Underwater repair of damaged jacket	MSP-5
2016	Vietnam	JV Vietsovpetro	Underwater repair of damaged jacket	MSP-4

### ONSHORE STRUCTURES - NONE OIL & GAS

Similar welding methods have been executed on onshore structures, particularly marine and river structures, in Russia since 1997.

## WORKMANSHIP & CERTIFICATION



### IEV - CUBIC CO-OPERATION

IEV and CUBIC entered into a co-operation agreement to bring cost effective, safe and proven underwater welding technology to operators of oil and gas platforms in the Asia Pacific region.

The Underwater Dry Welding service is an integral technology in IEV's Integrated Engineering Solutions which address the challenges of subsea repairs and strengthening needs for existing and ageing offshore structures.



For further information please contact:

**IEV GROUP OF COMPANIES**

**Headquarters address:** Menara PKNS, Block A, Level 5, No. 17 Jalan Yong Shook Lin, 46050 Petaling Jaya, Selangor

T : +6 (03) 7931 9921 F: +6 (03) 7931 9964 E: [info@iev-group.com](mailto:info@iev-group.com) W: [www.iev-group.com](http://www.iev-group.com)