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SUBSEA DECOMMISSIONING CHALLENGES & LEARNINGS

Alan Edwards - Operations Director

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INDUSTRY INVOLVEMENT



Bibby Offshore an active member of Decom North Sea and were the first Subsea Contractor to join. We now have representation on the both the board and steering committees.

Bibby Offshore have been involved with remote decommissioning studies and a mattress removal study. Following our involvement in these we have provided support in further decommissioning initiatives.

Bibby Offshore presented earlier in 2016 at Decom North Sea's March Lunch and Learn and also presented at the Decom Offshore Conference in May.

AGENDA

- Introduction & Track Record
 - Projects Completed
 - Materials Recovered
- Challenges & Lessons Learned
 - Information Gathering
 - Onshore Planning
 - Offshore Execution
- Case Study
 - MacCulloch Decommissioning



BIBBY'S TRACK RECORD IN DECOMMISSIONING

- CNR Well Abandonment Project 2005
- ExxonMobil Beryl & Linnhe Decommissioning 2009
- ExxonMobil Linnhe Decommissioning 2010
- Granby Tristan Decommissioning 2010
- Perenco UK Welland Field Decommissioning 2010
- Hess FFFA 2012
- Hess IVRR 2013
- Maersk Leadon Decommissioning 2014
- Endeavour Renee / Rubie 2015
- ConocoPhillips MacCulloch Decommissioning 2015
- Tullow Thames Decommissioning 2015
- *ConocoPhillips Viking Decommissioning 2016
- *CNR Murchison 2016

*ongoing projects

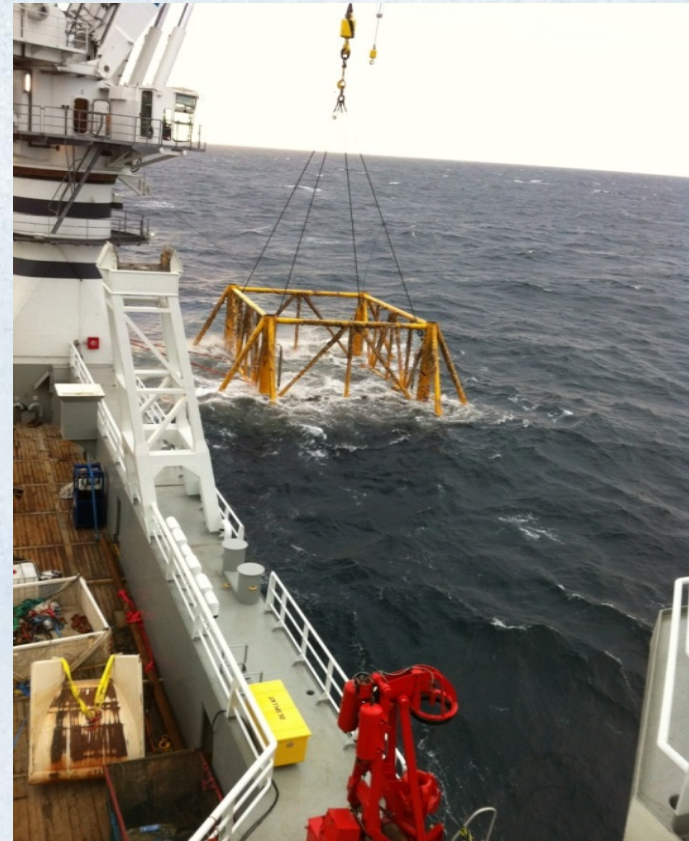


MATERIALS RECOVERED TO DATE

Items recovered	Totals
Concrete mats	1100+
Structures	40+
Flexibles	23000m+
Rigid pipe	1500m+
Flowlines	14000m+
Umbilical's	17000m+
Spools	20+
Piles cut	20+

Numerous:

- Isolations
- Flushing / degassing
- Disconnections
- Debris recovered





CHALLENGES & LESSONS LEARNED

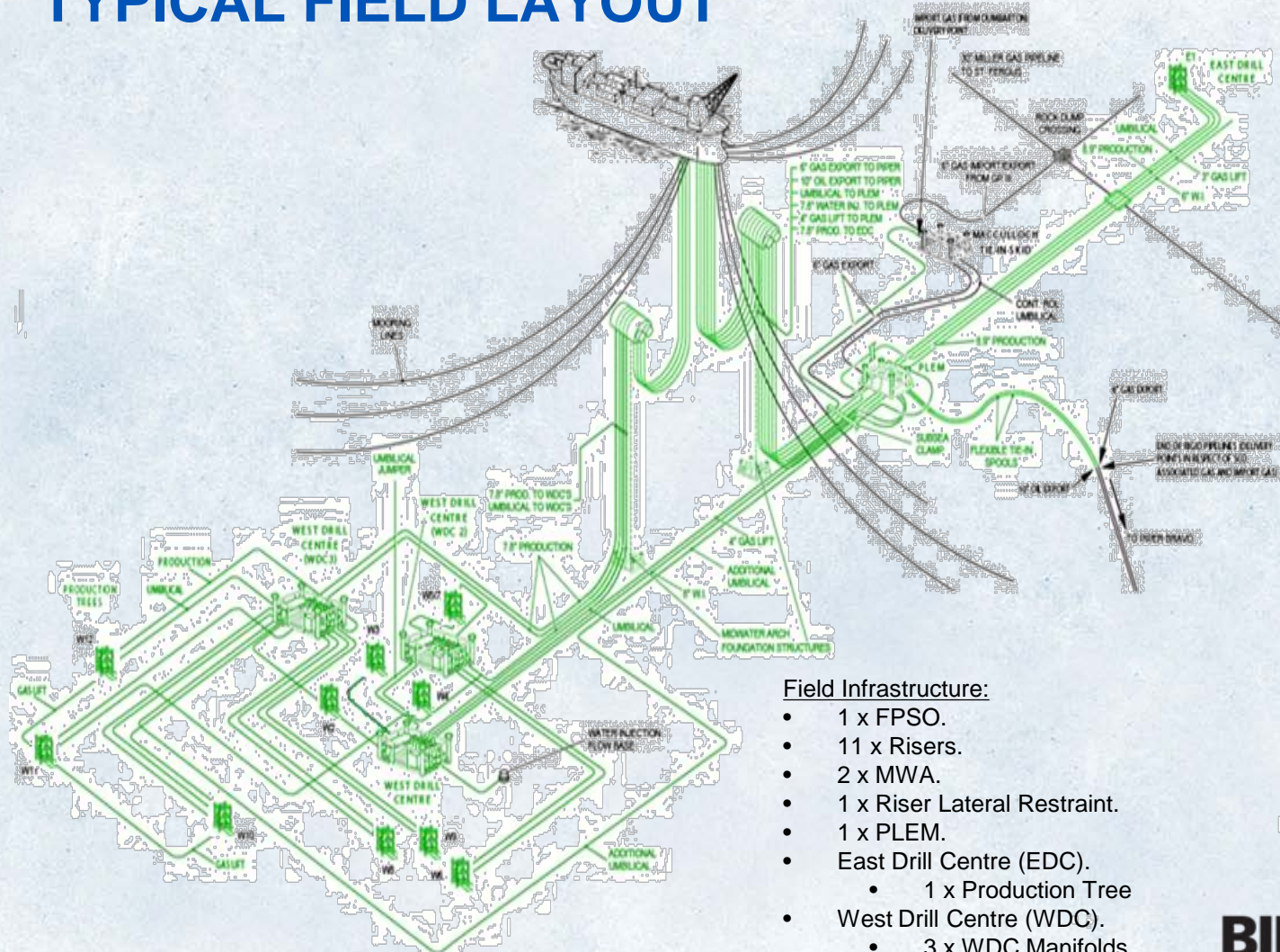
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CLIENT RECEIVED INFO TYPICAL FIELD LAYOUT



Field Infrastructure – 3rd Party Tie-in:

- MacCulloch Tie-in Skid – GP III.
- PLEM – Piper Bravo.

Field Infrastructure:

- 1 x FPSO.
- 11 x Risers.
- 2 x MWA.
- 1 x Riser Lateral Restraint.
- 1 x PLEM.
- East Drill Centre (EDC).
 - 1 x Production Tree
- West Drill Centre (WDC).
 - 3 x WDC Manifolds.
 - 10 x Production Trees
 - 1 x WI Flow-base

INFORMATION GATHERING

Key aspect of delivering a successful campaign

- Client received info at tender phase
- Additional survey carried out (if required) provides up to date data
 - You know what you have to contend with
 - No hidden surprises
 - No reliance on historic data to shape your recovery programme

Techniques Used/Required

- Sidescan sonar
- ROV pipeline survey with MBE & Pipetracker
- Wellhead inspection
- GVI of structures
- CP Surveys
- Environmental Assessment
- Cuttings Mound Surveys

SURVEY AND DATA MANAGEMENT

Existing data catalogued in GIS

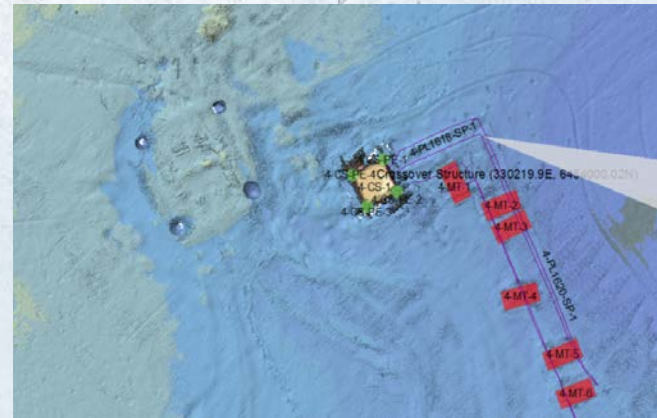
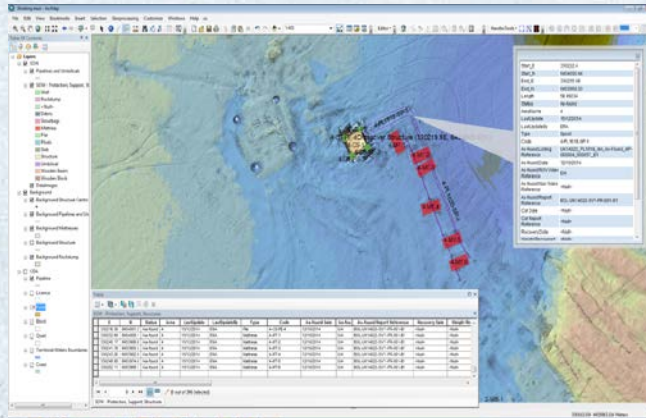
Pre-decomm survey

Complete Decomm scope defined & logged

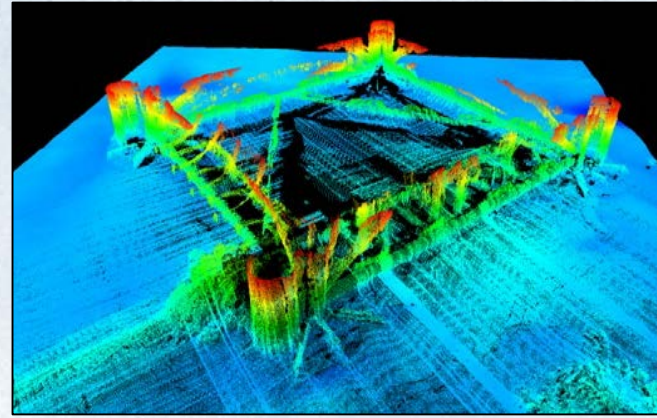
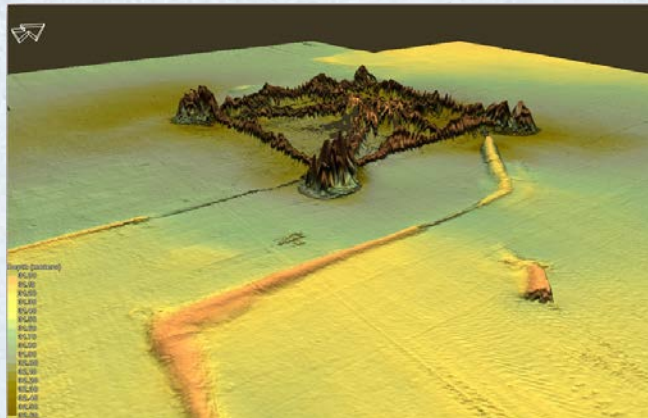
GIS used to aid planning

Efficient deliverable generation

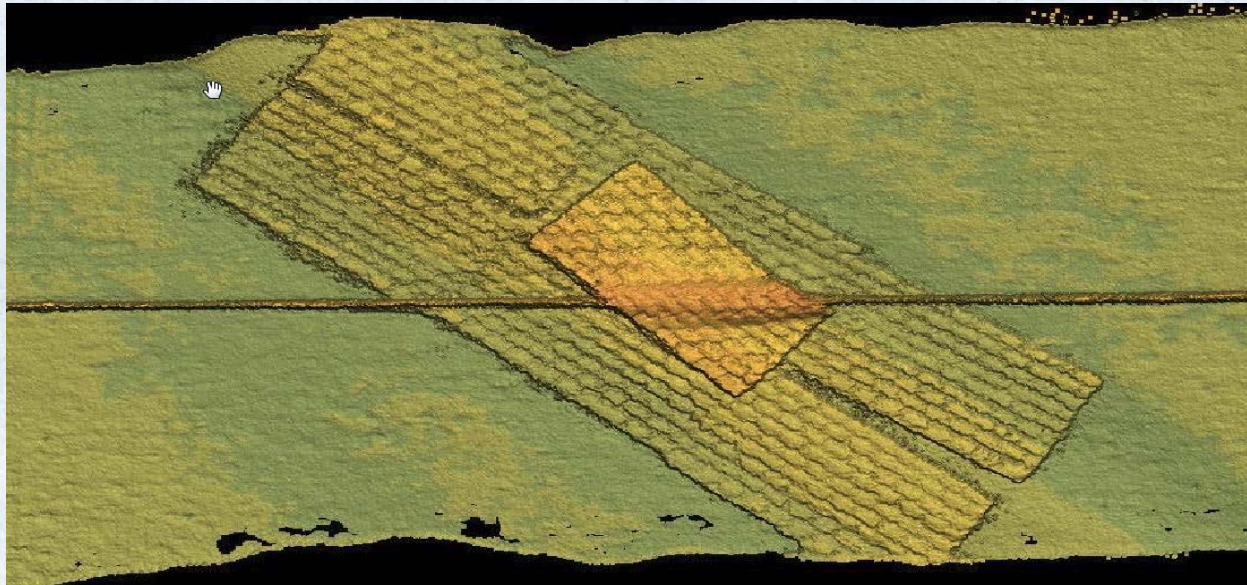
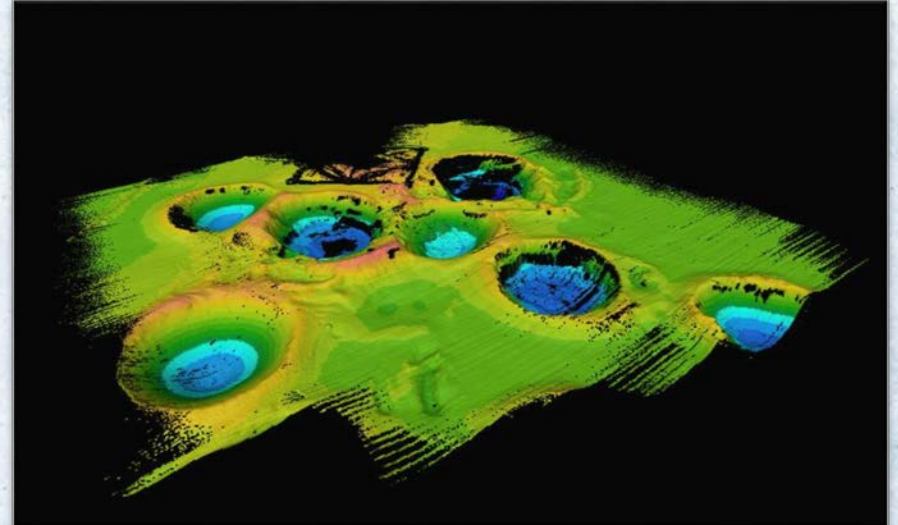
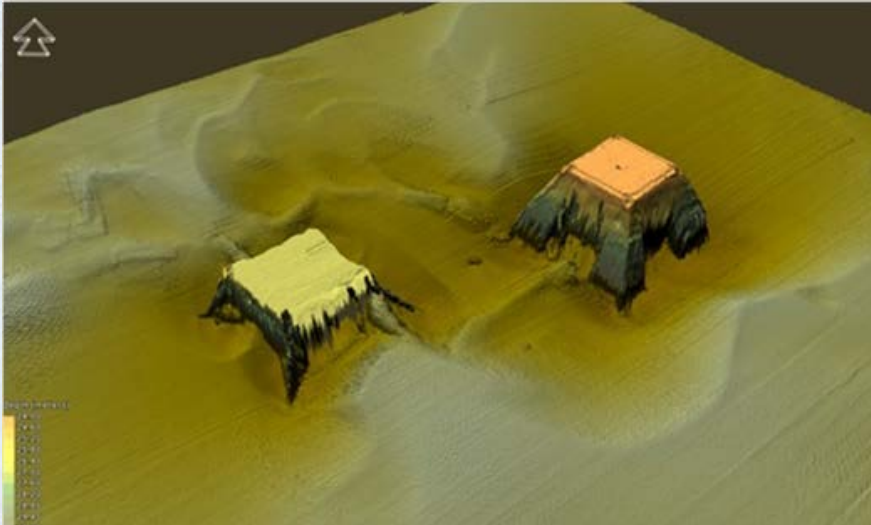
Structured approach to data management that allows for the model to be updated quickly and easily relative to the work scope



Data can be streamlined for reporting to DECC or other compliance queries

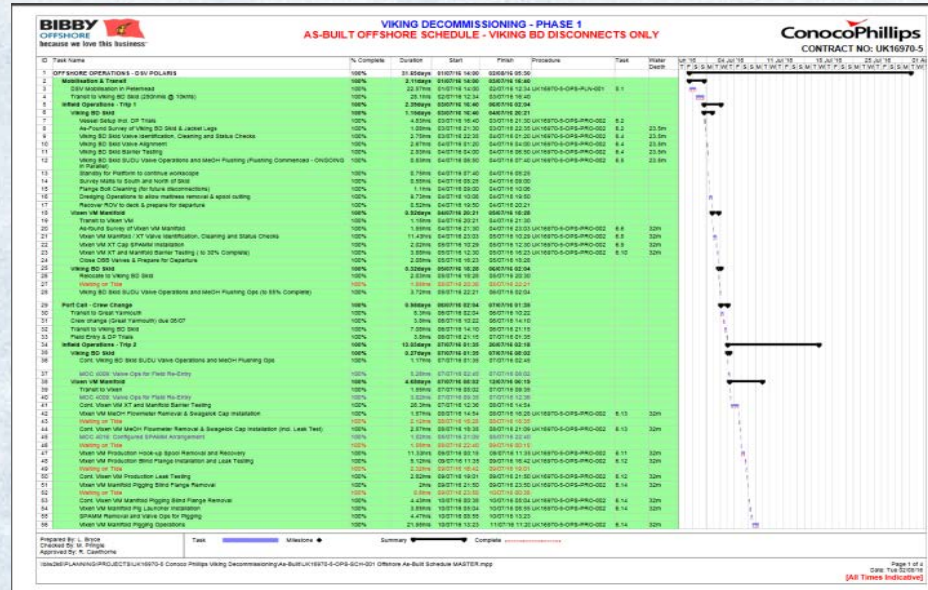


EXAMPLE SURVEY IMAGES

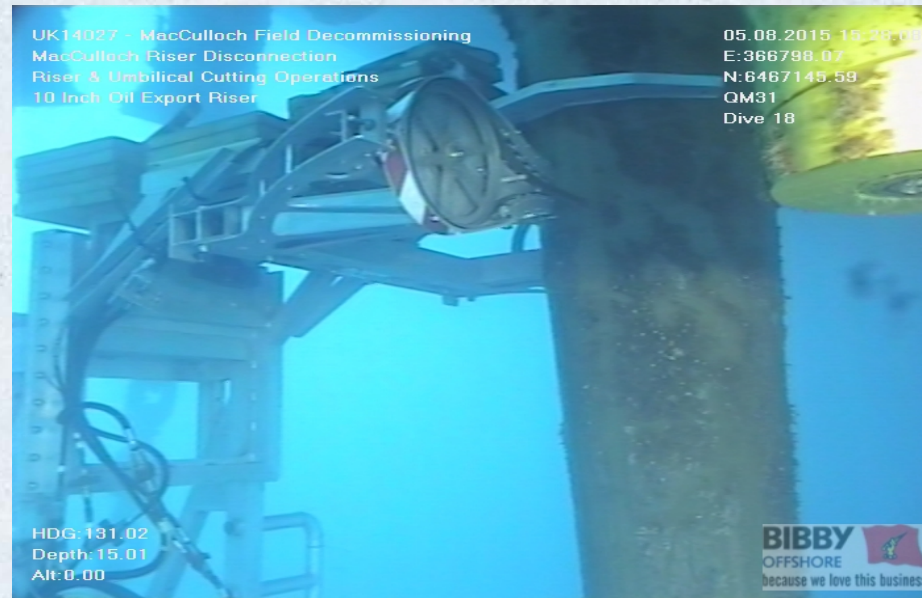


ONSHORE PLANNING

- Creating an efficient offshore schedule

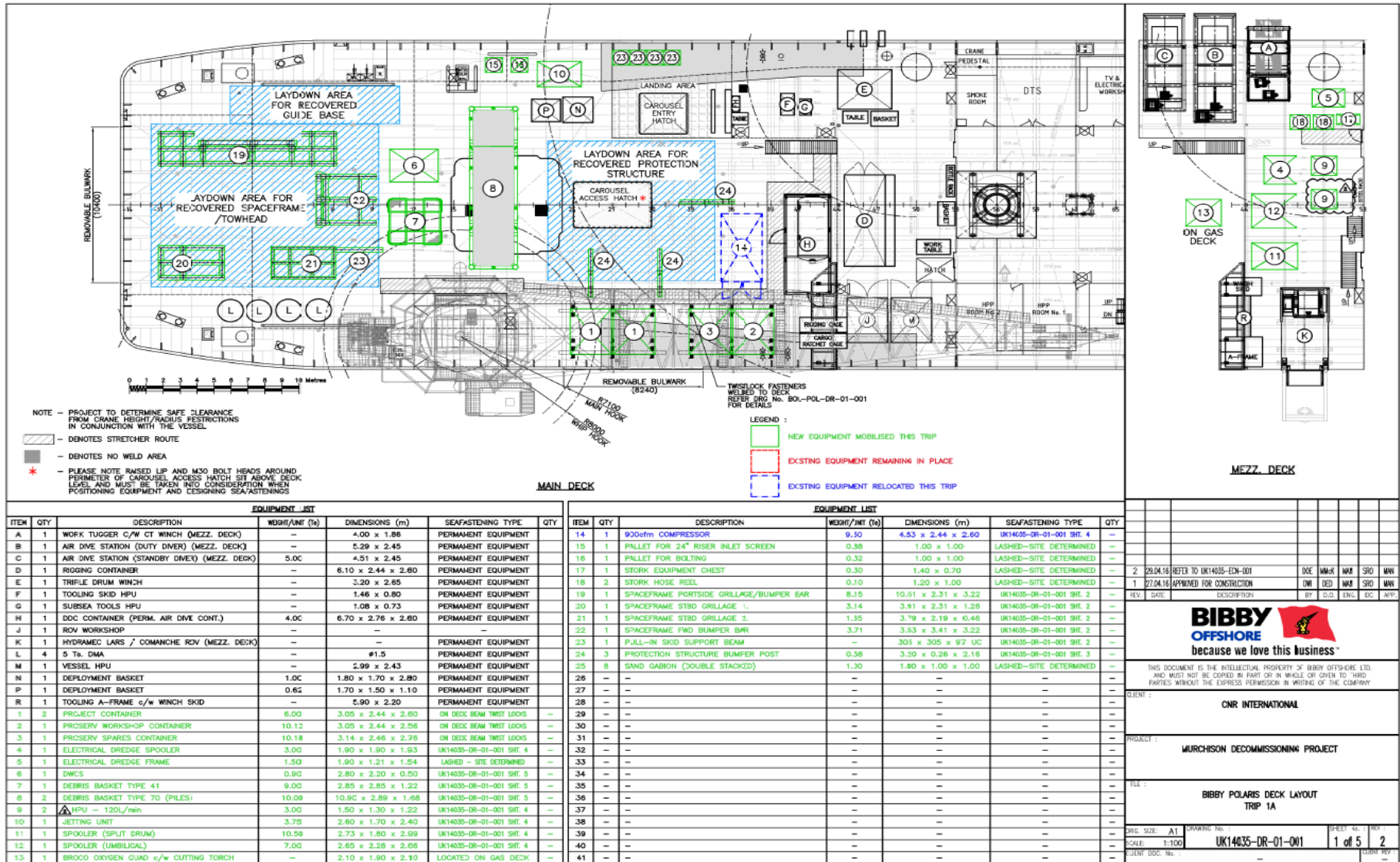


- Right tools for the job



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ONSHORE PLANNING - DECK LAYOUT



EQUIPMENT LIST						
ITEM	QTY	DESCRIPTION	WGHT/AMT (t)	DIMENSIONS (m)	SEAFASTENING TYPE	QTY
A	1	WORK TUGGER C/W CT WINCH (MEZZ. DECK)	--	4.00 x 1.86	PERMANENT EQUIPMENT	--
B	1	AIR DIVE STATION (DUTY DIVER) (MEZZ. DECK)	--	5.29 x 2.45	PERMANENT EQUIPMENT	--
C	1	AIR DIVE STATION (STANDBY DIVER) (MEZZ. DECK)	5.0C	4.51 x 2.45	PERMANENT EQUIPMENT	--
D	1	RIGGING CONTAINER	--	6.10 x 2.44 x 2.60	PERMANENT EQUIPMENT	--
E	1	TRIFLE DRUM WINCH	--	3.20 x 2.65	PERMANENT EQUIPMENT	--
F	1	TOOLING SKID HPU	--	1.46 x 0.80	PERMANENT EQUIPMENT	--
G	1	SUBSEA TOOLS HPU	--	1.08 x 0.73	PERMANENT EQUIPMENT	--
H	1	DDC CONTAINER (PERM. AIR DIVE CONT.)	4.0C	6.70 x 2.76 x 2.60	PERMANENT EQUIPMENT	--
J	1	ROV WORKSHOP	--	--	--	--
K	1	HYDRA-MEC LARS / COMANCHE ROV (MEZZ. DECK)	--	--	PERMANENT EQUIPMENT	--
L	4	5 Tn. DMA	--	Ø1.5	PERMANENT EQUIPMENT	--
M	1	VESSEL HPU	--	2.99 x 2.43	PERMANENT EQUIPMENT	--
N	1	DEPLOYMENT BASKET	1.0C	1.80 x 1.70 x 2.80	PERMANENT EQUIPMENT	--
P	1	DEPLOYMENT BASKET	0.6C	1.70 x 1.50 x 1.10	PERMANENT EQUIPMENT	--
R	1	TOOLING A-FRAME c/w WINCH SKID	--	5.90 x 2.20	PERMANENT EQUIPMENT	--
1	2	PROJECT CONTAINER	6.0C	3.05 x 2.44 x 2.60	ON DECK BEAM TWIST LOCKS	--
2	1	PROSERV WORKSHOP CONTAINER	10.12	3.05 x 2.44 x 2.56	ON DECK BEAM TWIST LOCKS	--
3	1	PROSERV SPARES CONTAINER	10.18	3.14 x 2.46 x 2.76	ON DECK BEAM TWIST LOCKS	--
4	1	ELECTRICAL DREDGE SPOOLER	3.0C	1.90 x 1.90 x 1.63	UK14035-DR-01-001 SHF. 4	--
5	1	ELECTRICAL DREDGE FRAME	1.5C	1.90 x 1.21 x 1.54	LASHED - SITE DETERMINED	--
6	1	DWCS	0.9C	2.80 x 2.20 x 0.50	UK14035-DR-01-001 SHF. 5	--
7	1	DEBRIS BASKET TYPE 41	9.0C	2.85 x 2.85 x 1.22	UK14035-DR-01-001 SHF. 5	--
8	2	DEBRIS BASKET TYPE 70 (PILES)	10.09	10.9C x 2.89 x 1.68	UK14035-DR-01-001 SHF. 5	--
9	2	HPU - 120L/min	3.0C	1.50 x 1.30 x 1.22	UK14035-DR-01-001 SHF. 4	--
10	1	WETTING UNIT	3.7C	2.60 x 1.70 x 2.40	UK14035-DR-01-001 SHF. 4	--
11	1	SPOOLER (SPLIT DRUM)	10.59	2.73 x 1.80 x 2.99	UK14035-DR-01-001 SHF. 4	--
12	1	SPOOLER (UMBILICAL)	7.0C	2.65 x 2.28 x 2.66	UK14035-DR-01-001 SHF. 4	--
13	1	BROCO OXYGEN QUAD c/w CUTTING TORCH	--	2.10 x 1.80 x 2.10	LOCATED ON GAS DECK	--

EQUIPMENT LIST						
ITEM	QTY	DESCRIPTION	WGHT/AMT (t)	DIMENSIONS (m)	SEAFASTENING TYPE	QTY
14	1	900cfm COMPRESSOR	9.30	4.53 x 2.44 x 2.60	UK14035-DR-01-001 SHF. 4	--
15	1	PALLET FOR 24" RISER INLET SCREEN	0.98	1.00 x 1.00	LASHED-SITE DETERMINED	--
16	1	PALLET FOR BOLTING	0.32	1.00 x 1.00	LASHED-SITE DETERMINED	--
17	1	STORK EQUIPMENT CHEST	0.30	1.40 x 0.70	LASHED-SITE DETERMINED	--
18	2	STORK HOSE REEL	0.10	1.20 x 1.00	LASHED-SITE DETERMINED	--
19	1	SPACEFRAME PORTSIDE GRILLAGE/BUMPER BAR	8.15	10.51 x 2.31 x 3.22	UK14035-DR-01-001 SHF. 2	--
20	1	SPACEFRAME STBD GRILLAGE 1.	3.14	3.91 x 2.31 x 1.26	UK14035-DR-01-001 SHF. 2	--
21	1	SPACEFRAME STBD GRILLAGE 2.	1.35	3.79 x 2.19 x 0.46	UK14035-DR-01-001 SHF. 2	--
22	1	SPACEFRAME FWD BUMPER BAR	3.71	3.83 x 3.41 x 3.22	UK14035-DR-01-001 SHF. 2	--
23	1	PULL-IN SKID SUPPORT BEAM	--	305 x 305 x 97 UC	UK14035-DR-01-001 SHF. 2	--
24	3	PROTECTION STRUCTURE BUMPER POST	0.58	3.20 x 0.26 x 2.16	UK14035-DR-01-001 SHF. 3	--
25	8	SAND GABION (DOUBLE STACKED)	1.00	1.80 x 1.00 x 1.00	LASHED-SITE DETERMINED	--
26	--	--	--	--	--	--
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2 28.04.16 REFER TO UK14035-EDN-001

1 27.04.16 APPROVED FOR CONSTRUCTION

REV. DATE DESCRIPTION BY D.S. ENC. DC APP.

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CLIENT: CNR INTERNATIONAL

PROJECT: MURCHISON DECOMMISSIONING PROJECT

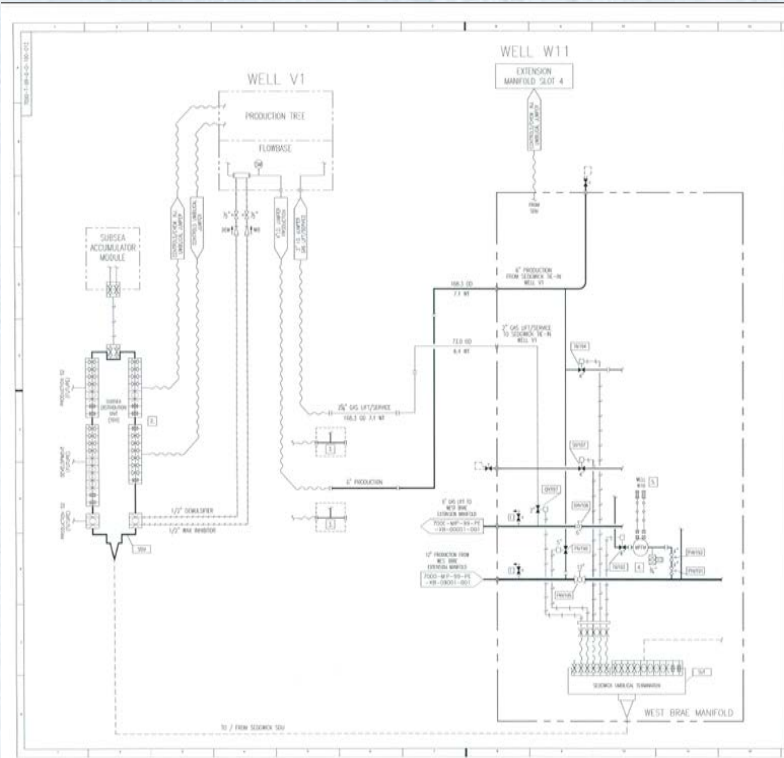
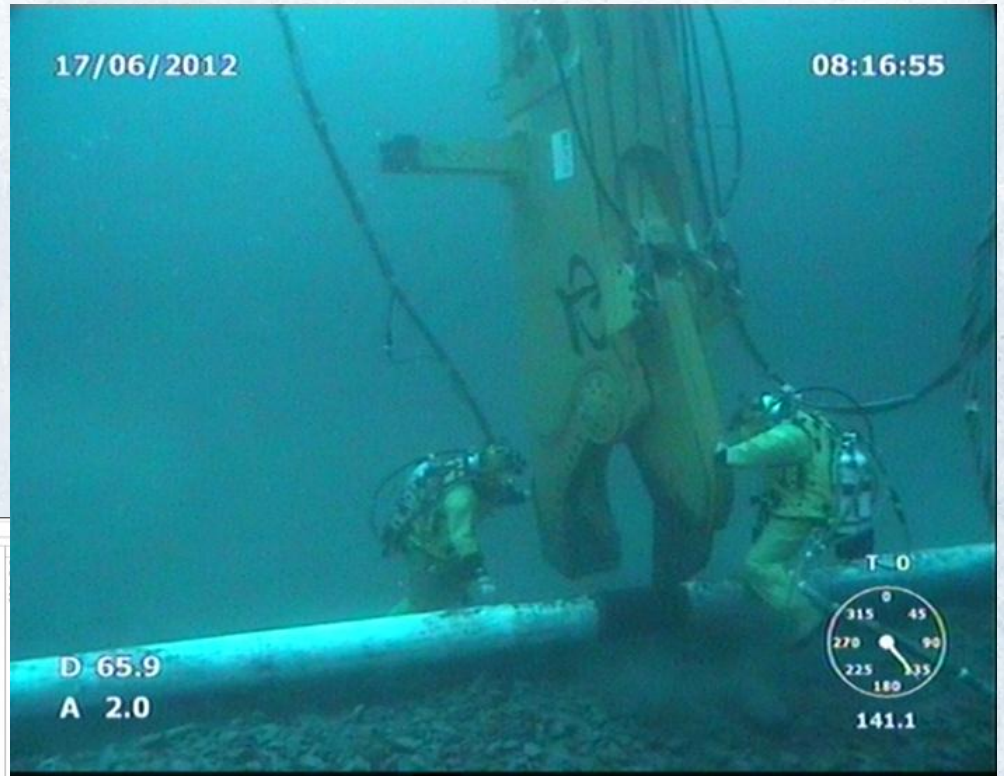
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DWG. SIZE: A1 DRAWING NO.: UK14035-DR-01-001 SHEET NO. OF: 2

SCALE: 1:100

CLIENT DDC No.:

ISOLATIONS AND DISCONNECTIONS



NO.	DESCRIPTION	DATE	BY	CHECKED
1	ISSUED FOR WORK	17/06/2012		
2	REVISION			
3	REVISION			
4	REVISION			
5	REVISION			
6	REVISION			
7	REVISION			
8	REVISION			
9	REVISION			
10	REVISION			

WELL V1 SCHEMATIC

DATE: 17/06/2012

BY: [Signature]

CHECKED: [Signature]

SCALE: 1:1

APP: [Signature]

REVISIONS:

NO. 1 2 3 4 5 6 7 8 9 10

DATE: 17/06/2012

OFFSHORE EXECUTION



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FLOWLINE RECOVERY

- Even flushed lines may contain residual hydrocarbons (trapped in high spots or coming out of walls when pressure reduced).
- Bunding must be sufficient to contain spillages and further responses (cleaning, processing) must be in place.



GAS RELEASES



Fully controlled (held in safe area whilst releasing), but major learning that even flushed lines can have pockets of gas within them.

NORM MONITORING

- Bibby Offshore vessel personnel trained as RPA – all considerations managed in-house



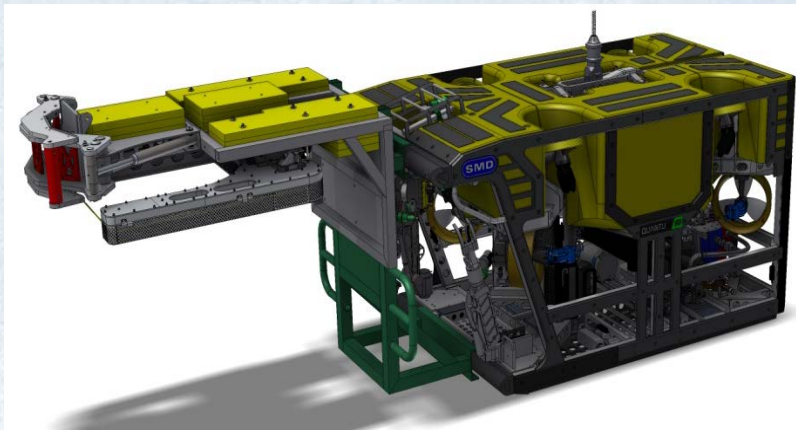
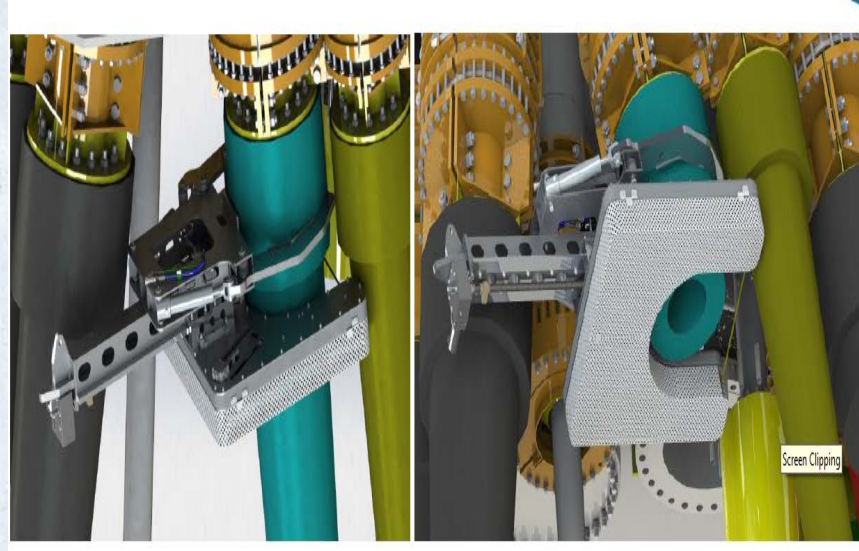
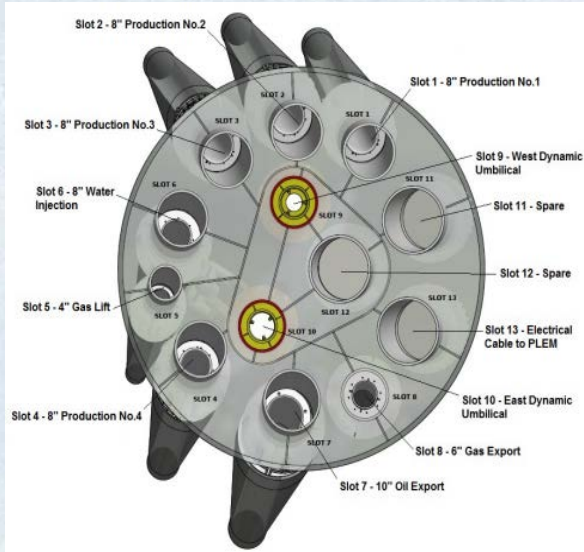
- Recording and reporting for disposal contractor and;
- DECC reporting / OSPAR compliance



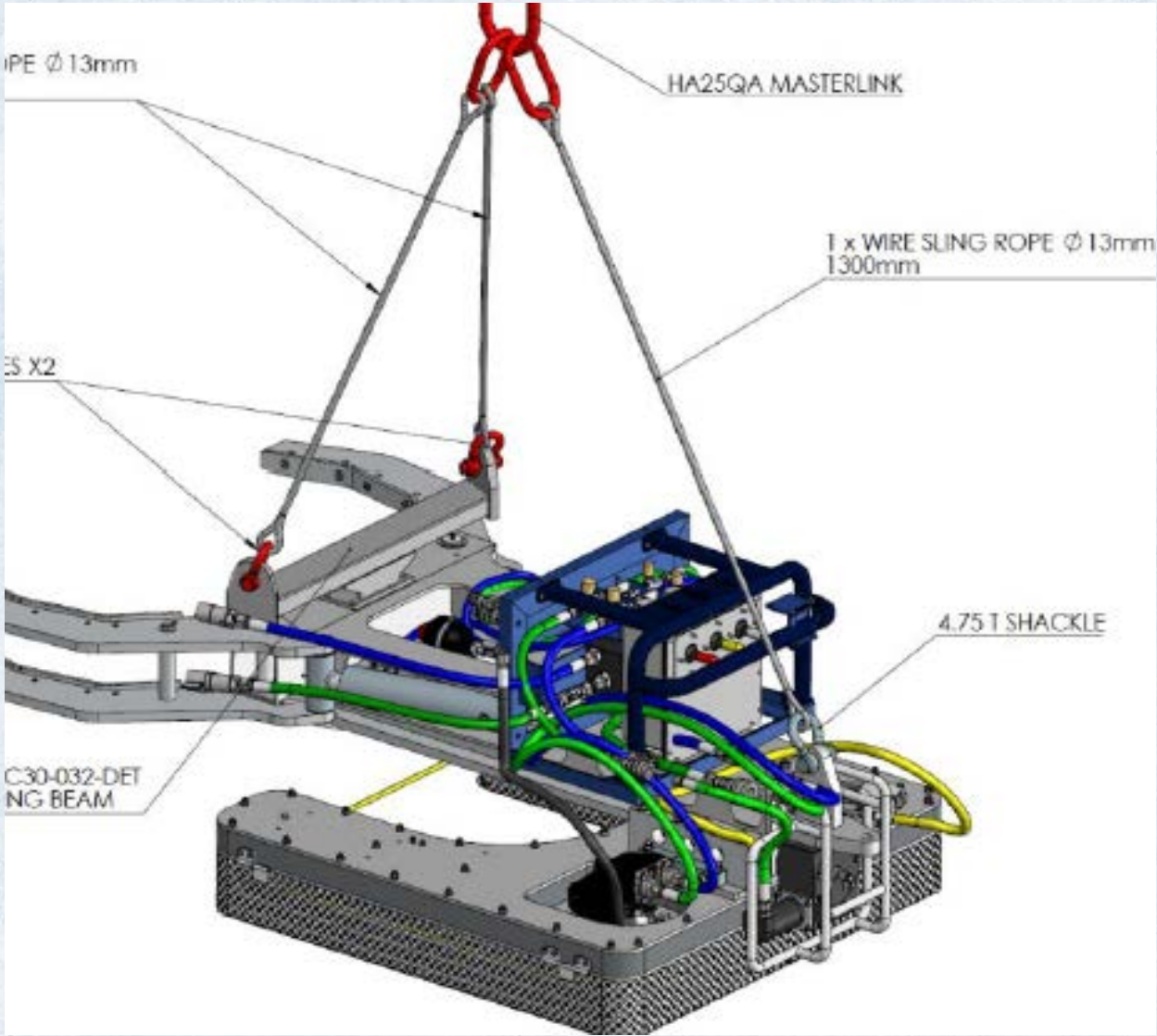
CASE STUDY -
MACCULLOCH DECOMMISSIONING

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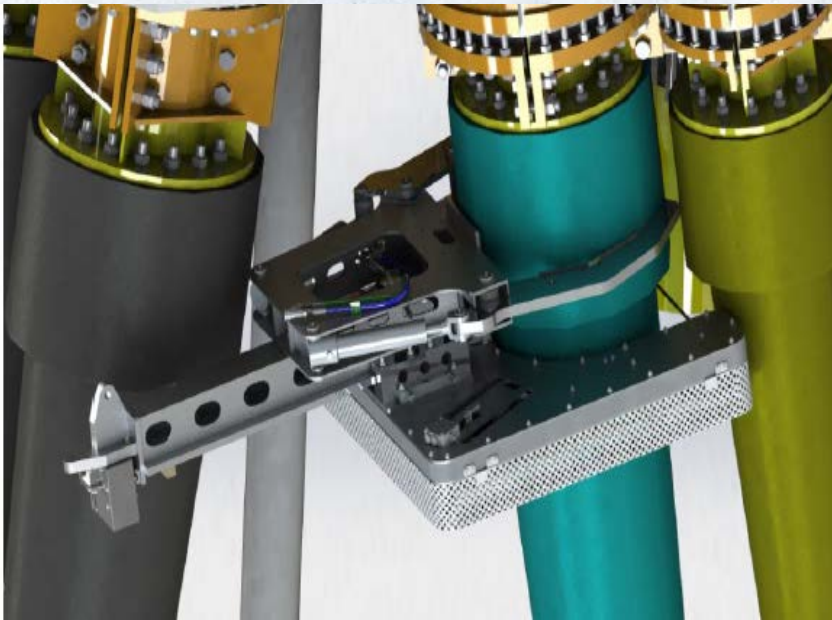
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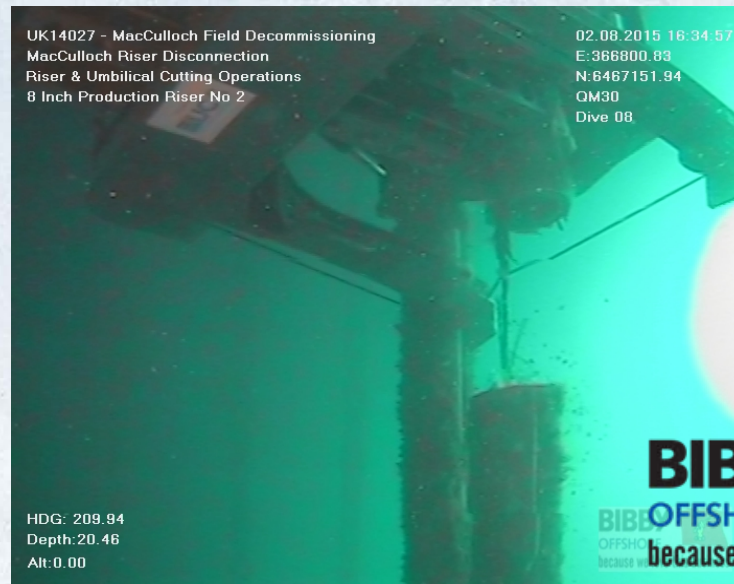
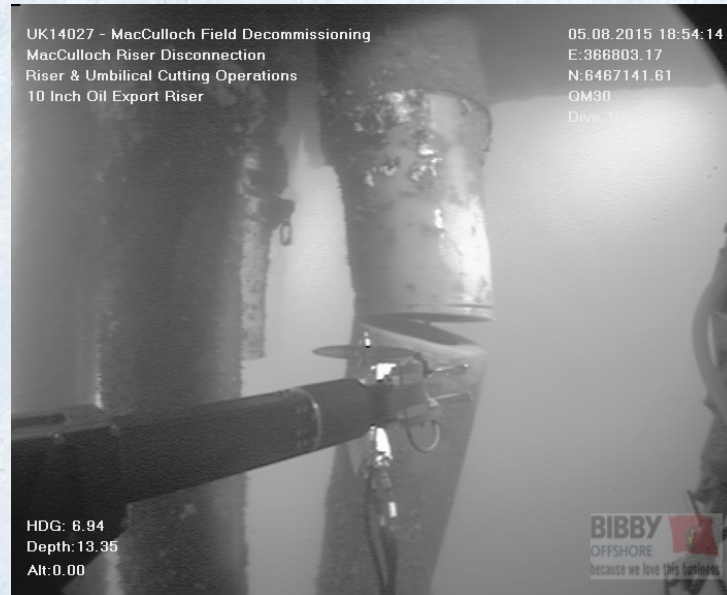
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MACCULLOCH DECOMMISSIONING



RISER AND CUTTING OPS



MACCULLOCH DECOMMISSIONING

OPTIMISATION OF SERVICE PARTNERS

- Making sure we are using the most effective and cost efficient methods the industry has to offer
- Our constant engagement with the supply chain has ensured we are aware of the most effective solutions available to us
- Managing our subcontractors constructively gives comfort to our clients and less interfaces for them to manage
- Relationships with key suppliers is an important factor in delivering a successful campaign

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**THANK
YOU**

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