

## SAPURA ENERGY SHARE INSIGHT INTO A RISERLESS LIGHT WELL INTERVENTION CAMPAIGN IN AUSTRALIA

Offshore Network have put together an original report which looks at case study on a riserless light well intervention (RLWI) campaign carried out by well services company Sapura Energy Australia. The report looks more depth into the necessity of using local resources, and new and advanced technologies to ensure the success of future RLWI campaigns.

### WELL RIGLESS, RISERLESS LWI CASE STUDY

In this article, we look at a case study on a 14-well rigless, riserless light well intervention (LWI) campaign carried out by well services company Sapura Energy, as outlined in a presentation by Mark De Castro, Sapura Energy Australia business development manager

The Browse Basin case study looked at two offshore projects deploying cutting-edge rigless, riserless technology, aimed at respectively supporting the coming online of seven new upstream wells and the decommissioning of seven old ones.

The first campaign involved using the Subsea Intervention Device (SID) to recover suspension plugs on wireline prior to the start-up of a new live field, while the second used the AXE Severance tool to sever seven wellheads below the mudline. All equipment was locally developed and is stored and maintained in the region.

The campaign highlighted how local capability enabled rapid response and flexible operations amid evolving project conditions. Extensive planning, ownership of all assets as well as reliance on local engineering and manufacturing facilities were key to the successful outcomes.

With first discussion around the decommissioning part of the project dating back to 2009, the campaign’s timeline highlighted how the right window of opportunity is needed for decommissioning plans to progress, given there is often a lack of incentive for companies to invest money in this type of end-of-life well operations.

Sapura Energy’s example suggested stringing together multiple campaigns, as in this case, can offer a solution to the issue, by significantly reducing asset mobilization and demobilization costs.

The Browse Basin campaign also achieved “goal zero” in terms of incidents recorded, the first project worldwide for the operator in two years to achieve this status.



## SUSPENSION PLUG REMOVAL

The first part of the campaign in the Browse Basin, offshore Western Australia was carried out between May and June 2017. Seven shallow and one deep set suspension plugs were removed from seven subsea wells, so that the wells could be brought online once the field was ready to flow the wells. This enabled flexibility and cost saving in the field installation, by using lower cost assets to deploy trees, and recover suspension plugs.

The project relied exclusively on regionally based assets and in-house personnel which offers the advantage of more experience, lower cost, and greater flexibility to adapt to changing conditions in field, as new information came to light.

Preparation to the campaign included performing significant upgrades to the SID. These included

1. Increasing the full through bore to 7 " diameter, with the addition of a new upper SID.
2. Increasing the Product service level from PSL3 to PSL3G (Gas Tested)
3. Increasing the working pressure from 5,000 to 10,000 psi
4. Increasing maximum tool string length from 15m to 21m

Sapura collaborated locally with BHGE for the design, manufacture of the new Upper SID, and Gas testing of the stack components in Perth.

Previous	upgraded Configuration
Lower SID 7-3/8", Upper SID 5.31"	Clear bore 7-3/8"
BOP3 – Uni-directional Shear Seal	BOP3 – Uni-directional Shear Seal
BOP2 – Bi-directional Shear Seal	Gate Valve – Bi-directional Shear Seal
BOP1 – Unidirectional Blind	BOP2 – Bi-directional Shear Seal
	BOP1 – Unidirectional Blind
Rated Working Pressure 5,000psi	Rated Working Pressure 10,000psi
Tool string length 40' / 15m	Tool string length 70' / 21m
25 tonnes without tree connector	32 tonnes without tree connector
API 6A PSL 3 with Temp Class U, Sour Service to ISO 15156.	API 6A PSL 3G with Temp Class U, Sour Service to ISO 15156.
Electrohydraulic Control, with fully customisable ESD	Electrohydraulic Control, with fully customisable ESD

The SID electro-hydraulic control system gave flexibility in meeting the client's specific XT control requirements, as well as the ability to tailor emergency shut down systems to project specific needs

When not mobilized on board a vessel, the SID spread is stored regionally by Sapura Energy in either Perth, Malaysia or Singapore, allowing a quick response to project's needs. The equipment has been flown to remote locations for emergency interventions in the past.

For this project, the SID spread was transported by trucks from Perth to Broome, and then mobilized onto the Sapura Constructor vessel. The 118-meter-long intervention services vessel, which was utilised to perform the project's operations, is equipped with a 7.2 x 7.2 meters moon pool, has 1,000 square meters of deck space, and can accommodate up to 120 people.



The project also used the Sapura Intervention Compensation System (ICS) which provides compensated guidewires/pod-lines and compensated sheaves over the moonpool to allow safe deployment of umbilical's and wireline tools during vessel heave. The ICS has two independent H-frames, each with two in-line compensation systems providing up to 6 tonnes of guide wire compensation and is mobilized onto the vessel in just two lifts.

The ICS delivered a reliable solution to manage wireline and umbilical's despite the region's high currents, preventing interference between wire line and umbilical's, and a providing a stable reference to seabed for the wire line sheave.

## WELLHEAD RECOVERY

The second part of the campaign, also based in Australia's Browse Basin, was related to the well head severance and recovery of 7 exploration wellheads in various configurations.

Operations were carried out in June 2017, at a water depth of 125 to 266 meters.

The AXE wellhead severance system utilised in the project is a locally developed tool owned and operated by Sapura Energy. It uses proprietary high-pressure grit entrained water jetting technology to cut multi strings in a single pass.

The field-proven system can sever 7 to 36 inches casings and wellhead in a single pass and has up to 100-inch diameter cutting capabilities. It's a quick, efficient and cost-effective system, which has been successfully utilised in over 70 subsea cuts to date.

Cuts are typically performed between 1 to 6 meters below seabed.

The AXE has been upgraded to include a bulk grit handling system, which eliminates manual handling, and doses the correct amount of grit and additives.

As the campaign was running onto multiple wellhead types, Sapura Energy designed and built a customised connector, which could be configured to latch externally onto the profile of a H4 connector or Cameron hub, or internally in a 30-inch conductor. All wellheads were successfully cut and recovered to deck.



## NEXT PROJECTS

Moving forward, despite the oil and gas well services market remaining sporadic, Sapura Energy was awarded a number of new contracts including an order for the suspension of 6 wells as part of rig-based plug and abandonment (P&A) operation, an India-based project for the severance of 31 subsea casings as part of an oil terminal jetty project and a light well intervention campaign on three wells in the Timor Sea.

Further campaigns for the second part of 2019 in the Northwest Shelf include the installation of a new subsea tree, flowline jumper installation, and removal of suspension plugs in 800m water depth. Following on from this, SID will be used to carry out interventions on another two wells to carry out tests and install plugs.

The latter will require a new bore selector; a tool developed by Sapura Energy which allows the selection of either production or annulus bores, without recovering subsea lubricator, leading to significant time and cost savings.

## BROWSE BASIN CAMPAIGN TAKEAWAYS

The Browse Basin campaign highlighted the efficiency gains of stringing together multiple work-scopes into a single campaign. This is particularly important to justify decommissioning projects from a financial perspective, by substantially reducing mob-demob costs. Further benefits are gained by combining multiple clients' projects into longer campaigns, with minor interim demob/remob.

The use of a cost-effective multi-role vessel, and availability and use of in-house local resources and personnel were key elements for the successful outcome of the project.

In future, the regional introduction of a standardized Light Well-Intervention contract template/format, and multi-user technical specification, as is generally accepted in the North Sea, would greatly improve the ability to string campaigns together, and share cost benefits among operators.

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