

# Divulged

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### JFD demonstrates why it is a global leader in Submarine Rescue

JFD has successfully delivered two recent submarine rescue exercises: Dynamic Monarch '17 (pg 2) and Black Carllion '17 (pg 11)

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### 24-man HRF upgrade completed at JFD's National Hyperbaric Centre

In response to larger diving support vessels coming into operation, JFD has completed an extension and upgrade taking their fixed HRF system from 18-man to 24-man.



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### JFD completes first two SPHLs

JFD is celebrating the delivery of the first two lifeboats which form part of their new safety-advanced range of self-propelled hyperbaric lifeboats (SPHLs).





# Dynamic Monarch '17

JFD demonstrates NATO Submarine Rescue System capabilities during major International exercise.

JFD recently took part in a major international submarine rescue exercise, Dynamic Monarch '17, which required it to demonstrate the NATO Submarine Rescue System (NSRS) capability, as well as provide training on various elements of the system.

JFD is responsible for maintaining NSRS in a permanent state of rescue readiness for the NATO partner nations of France, Norway and the UK, to go anywhere in the world at any time. JFD has been an integral part of the UK's submarine rescue provision since 1985, and has been at the heart of NSRS since it came into service in 2008.

The system is fully air transportable using a variety of suitable aircraft and is capable of launch and recovery in a significant wave height of up to 5m (sea state 6). NSRS is designed to reach a distressed submarine in 72 hours from the point of alert.

Dynamic Monarch is one of the largest submarine rescue exercises internationally, occurring every three years and is designed to test international forces' interoperability and ability to respond to submarines that have become disabled, anywhere in the world. The exercise offers the chance to demonstrate multi-national submarine rescue co-operation and provides a platform for sharing knowledge amongst participating nations.

The exercise required JFD to fully mobilise the rescue system to Turkey. The mother ship (MOSHIP) embarkation and mobilisation took place at King George V Dock in Glasgow, with the system sailing to the exercise point in Turkey. The main exercise phase commenced on 8 September and was executed over a two week period, in which various submarines took part in the simulated rescue operations.

The objectives of the exercise covered Transfer Under Pressure (TUP) operations and a series of demonstrations of submarine rescue vehicle (SRV) 'mating' with a variety of submarines. A total of nine mates took place during the exercise. There was also the provision of training opportunities to JFD operational personnel on each element of the system, as well as to NSRS Partner Nation personnel in areas such as rescue chamber operations and medical support functions, throughout the exercise process.

Upon completion of the exercise, the MOSHIP transited back to the disembarkation point at King George V Dock, where the equipment was removed from the vessel and returned to HMNB Clyde for restoration works to maintain 'Rescue Readiness' status.

Rob Pickering, JFD NSRS Project Manager said: "Dynamic Monarch '17 gives JFD the opportunity to demonstrate the world class capability that is provided by NSRS. The highly trained operational team delivered further confidence to the participant nations that in the event of a real emergency, the NSRS Rescue System can mobilise and participate in a successful rescue."

JFD has undertaken several successful NSRS rescue exercises over the previous two years of service, including Northern Sun '15, Golden Arrow '16 and Northern Sun '17, which shows the continued commitment to the NATO Submarine Rescue System as well as the recognition of responsibility to assuring the operations team is fully trained in all aspects of a safe rescue.





## 24-man HRF upgrade completed at JFD's National Hyperbaric Centre

JFD recently hosted an open day to celebrate the completion of an extension to their National Hyperbaric Centre in Aberdeen which enhances the Hyperbaric Reception Facility (HRF) capacity to 24-man.

Housing the only land-based saturation diving system in the UK, the National Hyperbaric Centre (NHC) has worked in collaboration with North Sea diving contractors over the last 28 years by successfully providing a comprehensive 18-man emergency Hyperbaric Reception Facility helping to ensure the safety of saturation divers in the event of an emergency.

In response to larger diving support vessels coming into operation, JFD announced in November 2016 an investment to extend and upgrade the facility which would take the system from 18-man to 24-man. This has ensured that JFD's National Hyperbaric Centre retains its position of centre of excellence for hyperbaric rescue by offering an incredibly comprehensive facility which is able to support diving operators across the whole of the North Sea.

Martin Robb, JFD Head of Delivery, Commercial Services said: "The NHC is now one of only a few facilities in the UK that is able to support the reception of new-generation 24-man SPHLs. Our facility benefits from being connected to a dedicated DMAC 028 (Diving Medical Advisory Committee) compliant medical chamber, supported by leading hyperbaric specialists, allowing JFD to offer the most comprehensive HRF and support package in the world."

Giovanni Corbetta, JFD Managing Director said: "We are committed to enhancing the standard of subsea safety and believe a similar level of hyperbaric rescue capability to what we provide in the UK should be available for divers globally. We have recently added a portable 18-man HRF to our asset pool to help support remote diving operations and plan to further strengthen our presence and capability in key locations across the world over the next couple of years."

## Divex watch found at bottom of Indian Ocean!

One of our Divex branded watches was recently found 175ft (53m) underwater on HMS Hermes, a sunken British warship off the East Coast of Sri Lanka! It was determined that the watch was likely to have been there for around a month, and although not in ideal condition, with a broken strap and crusted in salt, it was still working!

The watch has now been reunited with its owner, a diver from the Sri Lankan Navy who lost it during a commemorative dive on the Shipwreck.

This is testament to the quality of these watches, and why they are still so popular.

Please get in touch if you would like to enquire about purchasing one of our watches.



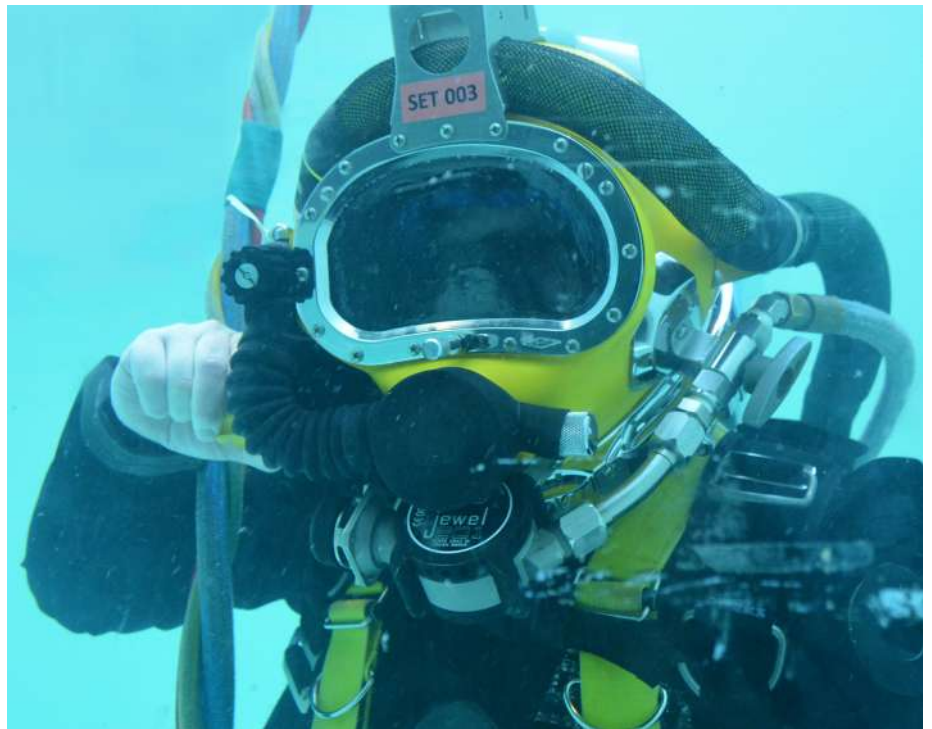
# Chris Blake joins JFD

As part of a recent organisational change JFD is pleased to welcome Chris Blake as Business Execution Director.

Chris has over 30 years' experience in oil & gas, nuclear and civil engineering industries with a proven track record of running teams involved in multi project and programme management activities, organisational design and business process development.

Chris was, until recently, Project Operations Manager for both the Harkand Group and Neptune, where he was responsible for running all projects and offshore operational campaigns, prior to this he was Asset Development Manager for Subsea 7.

JFD looks forward to having Chris on board, calling on his wealth of knowledge and experience to deliver on current and future projects for the business.



## COBRA passes trials to 450msw enhancing diver safety at extreme depths

JFD is delighted to confirm that its new COBRA (Compact Bailout Rebreathing Apparatus) system has passed further trials rating it safe for use at depths up to 450msw.

Released earlier this year, COBRA is a new bailout solution designed to replace conventional SCUBA bailout methods, providing divers with a greatly extended supply of breathing gas in the event of a primary supply failure. In July 2017, COBRA was granted CE marking status for use at depths up to 300msw making it the only approved system of its kind to fully comply with NORSOK U101 (Diving Respiratory Equipment) and EN14143 (Self Contained Rebreathing Apparatus) standards at this depth.

The system has recently been subject to further pressure testing and has undergone rigorous assessments which have ensured it is safe for use at depths up to 450msw. This is a huge safety advancement for divers working within the extreme conditions experienced during the world's deepest diving operations. As the only system on the market which provides this level of safety, JFD hopes COBRA will be adopted by diving contractors improving the safety of their divers by increasing the chance of survival in the event of a catastrophic failure of the primary breathing system.

Giovanni Corbetta, JFD Managing Director said: "The intention for COBRA was always to design a system which would not only greatly extend bailout duration for commercial divers working at more common depths of around 200msw, but also for use at extreme depths which haven't previously been tackled. We are delighted that the equipment passed these final assessments without any issues.

The announcement of the 450msw rating is expected to satisfy a number of our clients currently operating at depths over 300msw within the Asia Pacific region who have been closely following COBRA's release."





# JFD completes first two SPHLs

JFD is celebrating the delivery of the first two lifeboats which form part of JFD's new safety-advanced range of self-propelled hyperbaric lifeboats (SPHLs).

In February 2016, JFD won a multi-million pound contract to design and manufacture six SPHLs; four 18-man and two 24-man, as part of the saturation diving systems on board a new fleet of diving support vessels (DSVs). Final testing on the first two 18-man SPHLs has now been completed and they are ready for installation and commissioning following the launching ceremony held on 12 September 2017.

These lifeboats mark the first to be completed as part of a new partnership between JFD and Vanguard to develop a range of next generation SPHLs

and integrated davit systems which lead the way in terms of operational safety standards for saturation divers. The partnership combines JFD's globally trusted chamber manufacture and design expertise with highly respected Singapore based lifeboat manufacturer, Vanguard.

JFD is now able to offer saturation system customers around the world a full range of SPHLs designed and manufactured entirely in-house, reducing associated integration risks and cost implications.

Standard vessels are engineered to 12, 18 and 24-man configurations with built-in self-righting capability and can be rated down to 600msw based on customer specification however bespoke designs are also available. JFD's SPHLs can be

supplied compliant with NORSOK, ABS, DNV, IMCA and Lloyd's register depending on requirement.

Giovanni Corbetta, JFD Managing Director said: "The delivery of these first two SPHLs is a huge milestone for JFD. Our highly experienced engineering and manufacturing teams have put in an incredible amount of hard work and dedication which has resulted in the production and delivery of two of the most safety-advanced SPHLs on the market.

JFD is now in a very strong position, able to offer a range of lifeboats to suit a variety of specifications. We are looking forward to being able to offer our clients an even more encompassing solution for their saturation system requirements."





# On time. On location. Nothing else matters.

In light of the recent missing Argentinian submarine, the San Juan, the importance of submarine rescue and ensuring an adequate solution is available has never been more paramount.

Over the past 30 years JFD has solidified its position as a world leader in the design, manufacture, support and operation of submarine rescue systems, and is at the forefront of developing innovative equipment and services that drive the highest standards in safety and quality in protecting life at sea.

While providing fast, safe and reliable submarine rescue services to the Royal Australian Navy (RAN), NATO and Singapore, JFD has also been developing its new state-of-the-art system; the 3rd generation flyaway submarine rescue system.

To ensure the safety of submariners across the world, submarine rescue services and system capabilities needs to be world class. Crucially, they need to be on location in time to affect a rescue anywhere in the world, and it is this element that has been the key driver in the development of the 3rd generation system.

## What is the 3rd generation submarine rescue system?

JFD's 3rd generation flyaway submarine rescue system (SRS) represents a real step change in capability. It was conceived by drawing together the extensive experience gleaned through the operation of the three in-service flyaway SRS systems, and in that respect owes its genesis

to the thousands of operational hours dedicated to driving innovation in improving submarine rescue operations around the world.

The 3rd generation submarine rescue system concept is fully adaptable and customisable to customer requirements. The system is small, light, and can be quickly transported and mobilised onto a wide variety of ships, whilst providing a highly effective capability.

## On time

In order to maximum chances of a successful rescue, it is critical that the SRS is able to get to the location of the incident as quickly as possible. Regardless of the capabilities of a rescue system, if it cannot reach the distressed submarine (DISSUB) in time, it is of no use.

With the previous generations of submarine rescue systems, performance has been measured in terms of Time to First Rescue (TTFR). This represents the time from initial notification of an incident to the entry of the first submariner from a DISSUB into a submarine rescue vehicle.

The key to getting the 3rd generation system to location on time is its transportability. As a flyaway submarine rescue system, it can be maintained on shore and deployed via road and/or air, before being mobilised to a suitable Vessel of Opportunity (VOO) close to the DISSUB site. The 3rd generation system is contained within ISO standard containers and ready to move within 12 hours, with a mobilisation time of less than 24 hours to an



unprepared VOO. Currently there are three such flyaway systems in service, two of which are operated by JFD. These are the Australian JFSRS and the NATO submarine rescue system.

Due to the configuration of the system, the decompression chambers are integrated into the Launch and Recovery System (LARS)'s strongbacks. The 3rd generation system has a reduced number of assets to be deployed, enabling more types of aircraft to transport and therefore a greater number of available aircraft at any given time, and this allows for the shortest possible delivery process.

### On location

One of the key elements of submarine rescue is in recognising that for any equipment to be useful, it must be able to get to the site of the DISSUB. As such, the speed and reliability with which any flyaway system can be deployed must be carefully balanced against its effectiveness and capacity once onsite. Whilst the level of available emergency life support varies by submarine, and the nature of the accident to which it has befallen, the other key differentiator relates to a Navy's geographic operating area.

Some nations operate submarines regionally. In these cases, in the event of an incident it is generally possible to quickly reach most operating areas with a surface rescue vessel. Such an approach is robust and there is little risk involved in deployment. These navies will operate a rescue vessel with the SRS equipment permanently installed. Other navies operate on a global basis; in order to reach a DISSUB within an acceptable timeframe a flyaway SRS such as the 3rd generation system is used.

Older generations of submarine rescue systems are larger and heavier, meaning they occupy a greater footprint on a ship's deck. This therefore reduces the number of suitable VOOs which the system can be deployed on, and those vessels may be several days' sailing away from location.





The 3rd generation system has a compact architecture and design. The system can be deployed in multiple layouts; meaning it can also be installed on vessels with unusual deck arrangements. The system is modular and various aspects can be deployed independently – for example individual Deck Decompression Chambers (DDCs) can be deployed independent of the rest of the system for escape support or secondary roles.

#### **Driving innovation with the 3rd generation system**

The 3rd generation system incorporates a number of features that, in conjunction with the holistic, integrated approach to its design, provide a genuine step change in submarine rescue capability. The solution is low risk and evolutionary in that it draws heavily on proven, in-service equipment, as well as feedback from operators. Whilst innovative in arrangement, the methodology is built on tried and tested approaches and so it requires little change

to operating doctrines, existing procedures and crewing, and there is no need for extensive training.

There are a number of key enhancements which greatly reduce the deck footprint and weight of the system, ensuring quicker mobilisation. The DSAR class Submarine Rescue Vehicle (SRV) is capable of diving to deeper depths with a crew of 3 and up to 17 rescuees, while the medical hyperbaric complex can treat and decompress up to 90 personnel at any one time. The launch and recovery system has been designed to handle the SRV in conditions up to and including sea state 6, while two self-contained generators are capable of providing a fully redundant electrical supply to the entire system.

JFD is currently advancing with the build of two 3rd generation flyaway submarine rescue systems for the Indian Navy, the first of these is to be shipped in March 2018 for final commissioning and trials, with full system due to complete in June 2018.

#### **JFD's heritage**

As the world's leading company in submarine rescue, JFD provides fast, safe and reliable submarine rescue services to navies around the world. With over 30 years' experience operating submarine rescue, JFD has a strong, ongoing commitment to safety to ensure the ongoing protection of the people whose lives depend on our experience and expertise.

#### **Nothing else matters**

The very real and tragic events of the Kursk incident in 2000 serve as a constant reminder of what is at stake. Though a happier outcome, the events of the Priz rescue in 2005 are similarly sobering. The crew were safely rescued; however the realities of mobilising "for real" to a foreign military port by air and onto an unknown and highly unsuitable VOO overnight demonstrate that events rarely go to plan.

Submarine rescue exists for one purpose only; to save life following a submarine accident.



JFD 3rd Generation Submarine Rescue System





## 2017 International Underwater Operations & Offshore Industry Expo, Xiamen China

The 2017 International Underwater Operations & Offshore Industry Expo - organised by the China Diving & Salvage Contractors Association - took place in Xiamen, Fujian Province, China from 3<sup>rd</sup> to 5<sup>th</sup> November, 2017.

This was JFD's first chance to showcase their new Chinese joint venture partnership alongside the manufacturing arm of the Shanghai Salvage Company - Wuhu Diving Equipment Plant. The long term joint venture agreement brings the two companies together as Wuhu Divex Diving Systems Limited, dedicated to the manufacture of advanced diving systems for the China market.

Wuhu Divex Diving System Ltd shared a double stand with JFD's China agent, United Sterling. Staff of JFD (Marieke Barker, Doug Austin and Derrick Chow), staff of Wuhu Divex joint venture company (Helen Chen, Jerry Zeng and K K Ong) and staff of United Sterling's Hong Kong and Beijing offices (Colin Bosher, Hou Yue, Chan Koon-for, Liu Xiaomeng and Tony Zhou) all attended the show.

JFD's newly released COBRA bailout rebreather system attracted a lot of attention following the announcement of its safe use at 450msw which is hoped to satisfy a number of clients in the region who are currently operating at depths over 300msw.

United Sterling received an "Outstanding Exhibitor" award - recognition for taking part in all of the China Diving & Salvage Contractors Association annual meetings and exhibitions since its establishment in 2008.

JFD is looking forward to promoting the increased resources and capabilities the new joint venture offers to the Chinese market and is excited to exhibit next year at other events in the region.

## JFD employee graduates while inspiring future generation of engineers

Jill Hughes, Pipefitter at JFD in Glasgow has recently graduated from Glasgow University with a diploma, recognising her achievement of attaining an 'A pass' through her higher education.

Jill joined JFD in August 2014 and has been encouraged to develop herself through her role. She has so far gained a National Certificate in Fabrication and Welding Engineering, as well as an SVQ in Manufacturing Engineering while completing her modern apprenticeship in Science, Engineering and Manufacturing Technology.



Jill is so dedicated to developing her engineering skills and knowledge she then went on to complete an HNC in Fabrication, Welding and Inspection Systems, which consisted of two years of evening classes and a series of report writing and exams.

For the past three years Jill has been actively encouraging young people through Inverclyde Enterprise Plus, to consider taking up engineering apprenticeships and roles. Jill enjoys sharing her experience within JFD and engineering to inspire the next generation considering their future opportunities.

Jill said: "I feel I have come a long way since I first entered into the world of JFD and can honestly say that every step of the way I have been mentored, encouraged and given the confidence to take charge of my career, which I hope will benefit me and the company for the foreseeable future."

JFD is proud to be able to support employees through their chosen education paths while still being able to be part of the team supporting ongoing projects.



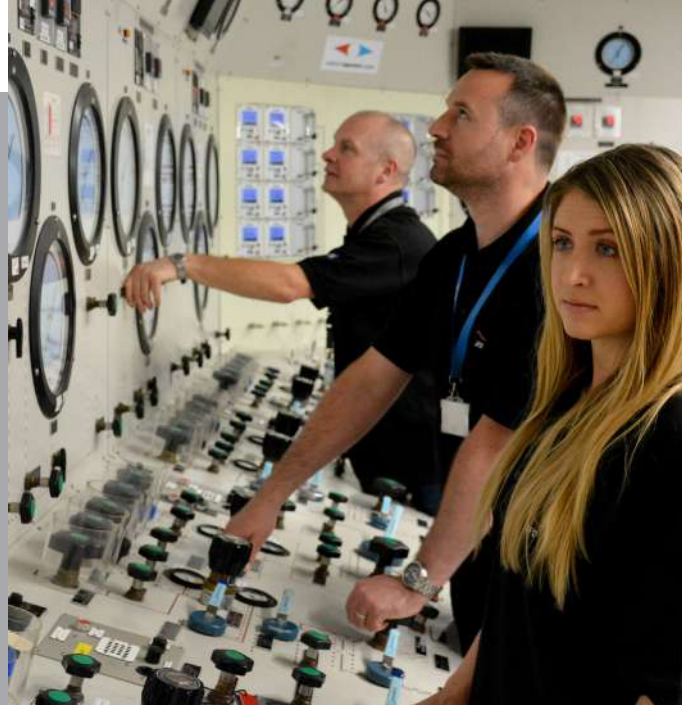
# JFD successfully implements simultaneous operation [SIMOPS]

JFD successfully managed an on-call emergency which occurred at the same time as an ongoing hyperbaric welding trial at their National Hyperbaric Centre in Aberdeen, necessitating the deployment of all aspects of its saturation system.

The facility also plays an important role as an emergency medical centre and is on call 24/7 to provide emergency medical and hyperbaric treatments to patients. On-call emergencies are rare occurrences, however JFD must be prepared at all times to accept an emergency as a priority even if a saturation diving trial is in progress.

In May 2017, during the hyperbaric welding trial, JFD received an emergency call to provide medical treatment to a recreational diver for decompression illness during the early hours of the morning.

As decompression of the diver welders from 43m would take 2 days, JFD implemented its robust emergency response plan in order to simultaneously manage both operations.



Expertly trained JFD staff were well placed to quickly prepare the adjoining medical chamber and accept the diving emergency. As the medical chamber can be independently controlled, the welding trial had no operational impact and was completely unaffected.

Martin Robb, head of delivery for commercial services, said: "At NHC, we continually review our emergency response plans and take part in various training exercises to ensure our team is well prepared. This event was one which we plan for but hope will never happen. I am delighted with how the team seamlessly implemented the SIMOPS procedure, this is testament to the expertise and dedication of our team and the capability of the assets we have here at the centre."

## JFD Lexmar official name change to JFD Singapore

1st August 2016, LEXMAR became part of JFD, improving the company's capability and offering of specialist diving equipment services to the Asia Pacific market, as well as strengthening the support to the Singapore Navy, especially related to submarine rescue.

Dedicated to becoming the unrivalled global partner in the commercial diving and defence industry, we believe it's important to go forward as ONE JFD. We are happy to announce that effective 2 November 2017, we officially changed the company name and legal entity from LEXMAR Engineering Pte Ltd to JFD Singapore Pte Ltd.





# Success for JFD at Black Carillon submarine rescue exercise

Every year JFD participates in a Submarine Escape and Rescue Exercise off the West Coast of Australia. Exercise Black Carillon 2017 (BC17) took place in the challenging waters of the Western Australia Exercise Areas (WAXA) and tested all involved. JFD showcased its ability to save lives in the event of a real time disabled submarine (DISSUB) incident whilst exercising with HMAS Waller.

The attitude of “train as you fight” was paramount to a successful exercise and allowed all parties to conduct vital training, keeping the competency of JFD’s Global Operations Team at an extremely high standard.

Launching from the deck of the rescue gear ship MV STOKER, JFD’s LR5 rescue vehicle achieved depths of 400 metres to locate the submerged training target plates and simulate the safe mating to a submarine rescue seat. The dive to this depth was witnessed by Lloyds Register, resulting in LR5 and the full JFSRS rescue suite being class certified for another 12 months.

This further amplifies JFD’s excellence as the world leader in submarine rescue systems, people and capabilities.

Numerous live mates also took place with RAN submarine, HMAS Waller, with the crew of LR5 repeatedly demonstrating their skills in achieving mates with the submarines rescue seat and successfully transferring passengers between the rescue submersible and the submarine.

Toff Idrus, JFD Australia General Manager commented: “This year threw up some very tough conditions, the weather was closing in and our operations team, engineers and technicians really needed to put their knowledge and experience to the test. That makes the success of this operation even more pleasing and shows that the fast, safe and proven submarine rescue service we have been providing to the navy for the past decade is still unrivalled.”

JFD Australia has a solid track record in offering a full submarine rescue system from our advanced maintenance and service centre at Bibra Lake, south of Perth which is on standby at all times to respond to a submarine emergency within 12 hours.

JFD Australia is soon to deliver a world-class hyperbaric equipment suite to the Australian Government which will offer lifesaving medical and decompression treatment for up to 65 rescuees with room for a further 14 chamber operators and medical staff in what is further evidence of JFD’s capability and commitment to local jobs and continued growth of its local workforce.

BC17 once again showcased that while a submarine rescue capability is hoped never to be needed, that through the joint training and exercising of a combined navy, JFD, SERCO and industry partner teams, it is a capability that can be relied upon.







# Specialist hyperbaric welding trials completed at JFD's National Hyperbaric Centre

JFD facilitated a dry hyperbaric welding trial for Subsea 7 within its saturation diving complex in Aberdeen.

Ten diver welders were welcomed to JFD's National Hyperbaric Centre in May and were accommodated for 13 days at a depth of 43msw within the saturation diving system in order to prove their welding techniques prior to fulfilling an offshore contract.

The 16-man land based saturation dive complex within JFD's National Hyperbaric Centre is the ideal choice for clients looking to simulate a realistic, controlled hyperbaric environment in order to pre-qualify their diver welders prior to an offshore project ensuring welding procedures are safe, compliant and efficient. The saturation system is capable of

facilitating manned trials to 300msw in a wet or dry habitat environment. The centre has enabled a number of welding trials over the years and its unique facilities and specialist technicians have attracted customers from around the world - even as far as Australia!

Performing hyperbaric welding trials within a controlled environment is essential to ensure safety and efficiency during mobilisation, and to reduce downtime offshore which could be time consuming and costly for the client.

Martin Robb, head of delivery for Commercial services, said: "This is the first hyperbaric weld we have performed in the last couple of years following the industry

downturn and I am delighted with JFD's performance. The dive system is continually maintained and audited and as such can be fully operational on short notice. JFD staff worked closely alongside the client to mobilise and fit out the work chamber for the weld trials and the project ran to schedule.

The chamber complex ran 24 hour operations efficiently and smoothly which is testament to our highly skilled and experienced staff and technicians who managed the project exceptionally well from start to finish, quickly and expertly responding to any requests that arose from either the divers or the client."

## Christening of DSV Everest

JFD Singapore was invited to attend the official christening of DSV "EVEREST" on Tuesday 31st October 2017 at Keppel Singmarine's yard in Singapore. The 18-man twin Bell twin SPHL Saturation Diving System for this vessel was proudly designed, manufactured and commissioned by JFD Singapore. This Bureau Veritas Class Approved system is similar to the previous LEXMAR DNV approved systems installed on the UDS Lichtenstein and the UDS Picasso.

Our thanks to Owner MCS and to Keppel Singmarine for their great support on this project and we wish them every success in the future.

