

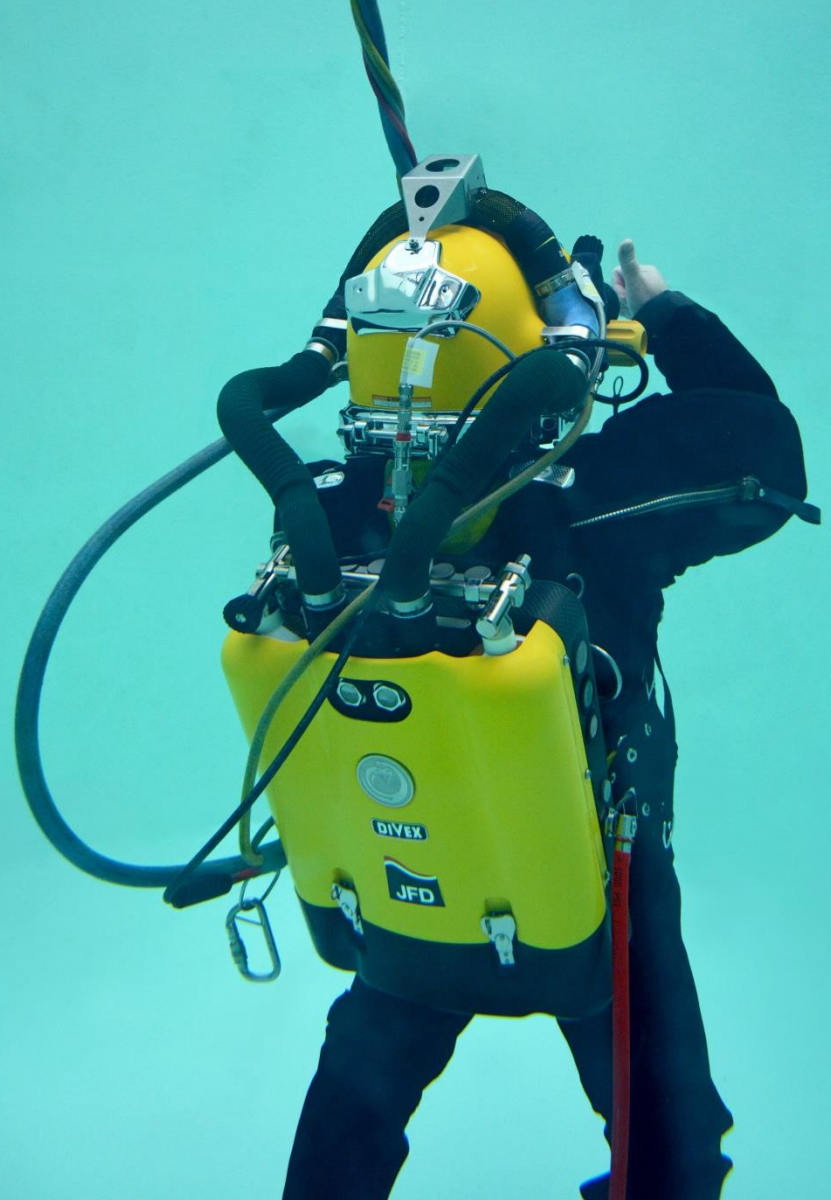


# COBRA

Bergen Diving Seminar – November 2019

# AGENDA

- Introduction and overview of the latest diver bailout system – COBRA
- Overview of operational deployments
- Share feedback & issues encountered



# 97

## SLS

Built and in operation  
over 22 year period  
(1995 - 2017)



# 57

## COBRA

Delivered and operational  
since CE mark awarded  
in May 2017



# 30

## COBRA

Currently in production  
and will be delivered by  
end of 2019



# 270<sub>m</sub>

## COBRA

Deepest working dive by  
DOF Subsea off Western  
Australia



# 186<sub>m</sub>

## COBRA

Deepest working dive in  
the North Sea carried out  
by Rever Offshore



# 1100<sub>+</sub>

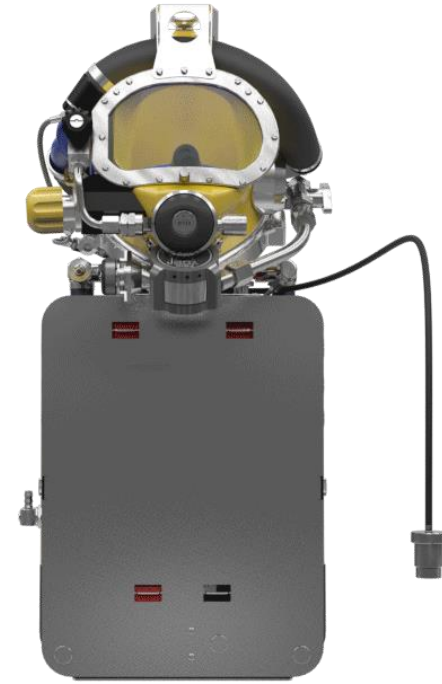
## COBRA

Number of dives carried  
out by Rever Offshore in  
the North Sea



# COBRA

- A fully self contained backpack integrated with a Kirby Morgan 17C Ultrajewel 601 helmet
- Mechanical semi-closed circuit system / Proven gas injection system
- CE certified bailout rebreather for saturation diving to a depth of 300 msw
- Integrity of breathing loop is maintained by overpressure from umbilical supply – rotowink gives visual indication of status
- Once activated the diver is supplied with warm breathing gas – helps maintain core temperature



Over 45 minutes  
endurance



1 turn to  
breathe



Low work of  
breathing



# ACTIVATING COBRA

- Single turn activation
- Set can be mechanically switched on & off by the diver
- Allows diver to test the bailout as part of their pre-dive checks
- Rotowink changes from green to red indicating set activation
- Requires no diver input once activated



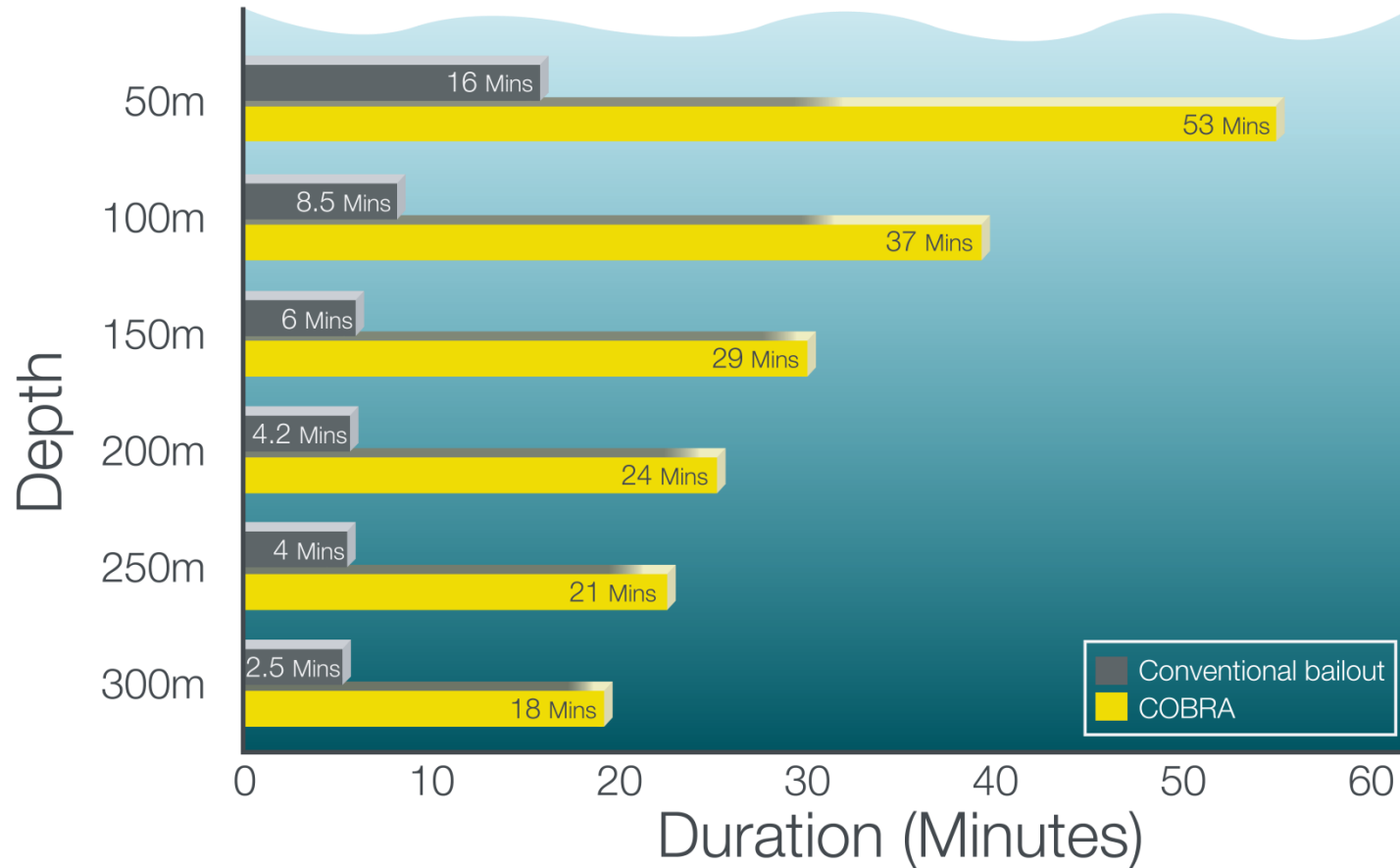
Low work of  
breathing



Single turn  
activation

# COBRA – BREATHING LOOP





\*Conventional bailout duration based on a consumption rate of 40lpm.



# COMPLIANCE

COBRA was designed & tested in accordance with:-

## BS EN14143:2013

COBRA meets the required safety, health and environmental standards to comply with EU standard EN14143 (Respiratory Equipment – Self Contained Rebreathing Diving Apparatus)

## NORSOK U-101

COBRA also meets the relevant requirements of NORSOK U-101 and is able to satisfy NORSOK emergency breathing gas duration guidelines to 300msw.

CE Mark awarded May 2017 – updated 2019

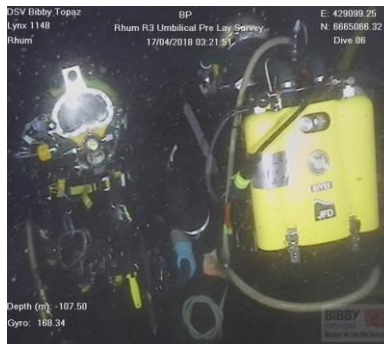
## NOTIFIED BODY



## TEST HOUSES



# COBRA IN SERVICE



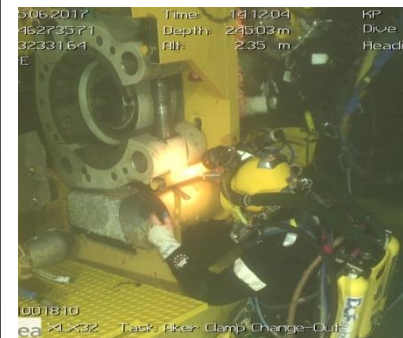
**Bibby Offshore: North Sea**  
DSV Topaz, Sapphire & Polaris  
depths: 70 to 180msw.



**Fugro – Far East**  
DSV Southern Star in 2018  
depths: 70-100msw



**Sistac – Brazil**  
Skandi Achiever 2018  
average depth: 170msw



**DOF: Western Australia**  
Skandi Singapore June 2017  
depths: 230 to 270msw.

# TRAINING & SUPPORT

A range of training courses to suit a variety of roles and requirements are provided:

- Diver familiarisation training
- Technician maintenance training
- Introductory courses for supervisors, LST's, OPM's & Client TA's

Training carried out at JFD facilities or on board vessel during mobilisation or transit

JFD instructor mobilised with vessel to provide additional support for duration of first project





# TRAINING & SUPPORT

- Significant volume of training carried out
- 482 - Divers, supervisors, LST's & OPM's trained
- 153 - Technicians trained
- Frequent urgent demands for training
- Too many attendees on a number of occasions
- Prospective users should kick off training as early as possible
- Videos & animations being produced



# OPERATIONAL FEEDBACK

JFD actively engage with clients to obtain diver feedback. 13 page questionnaire completed by each dive team covering:

- Dressing-in process
- Comfort out of water
- In water activities and movement
- In water comfort
- Buoyancy & Trim
- Displays & Indicators
- Controls
- Undressing
- General & any other comments



7.60

# OPERATIONAL FEEDBACK

Feedback received from divers, technicians & supervisors following completion of each project giving insight on equipment performance.

Overall feedback has been positive and included:

***“COBRA was great and very comfortable to wear”***

***“COBRA unit is easy to operate and breathes smoothly; the mouthpiece is in the perfect position”***





# FEEDBACK

- Contents Gauge & Rotowink Hose not long enough
- Stainless steel umbilical supply hose quick-connect (between backpack and helmet) should be lockable
- Main backpack cover & bumper cover not robust enough. Retaining clips have tendency to loosen over time. Easy to damage.
- Provide buoyancy compensator as an accessory – for midwater activities

These are currently in the process of being addressed (MKII variant)



# DRILLS & EXERCISES

- Not a “parachute” system like SLS
- Divers have the ability to switch set on & off – pre dive bell checks
- In water tests
- Activate set – breathing up to 5 times on COBRA – return to primary gas supply (umbilical mode)
- Greater reassurance compared with SLS

DSV Bibby Topaz  
Lynx 1148  
Rhum

BP  
Diver Obs  
21/04/2018 17:54:51

Depth (m): -110.20  
Gyro: 201.44

# DRILLS & EXERCISES

COBRA activation drills have been carried out across a number of DSV's

Deepest so far conducted at 254 metres in 2017

08:16am - Diver 1 on seabed  
- checked COBRA starting gas pressure  
- activated COBRA and began his return to the bell

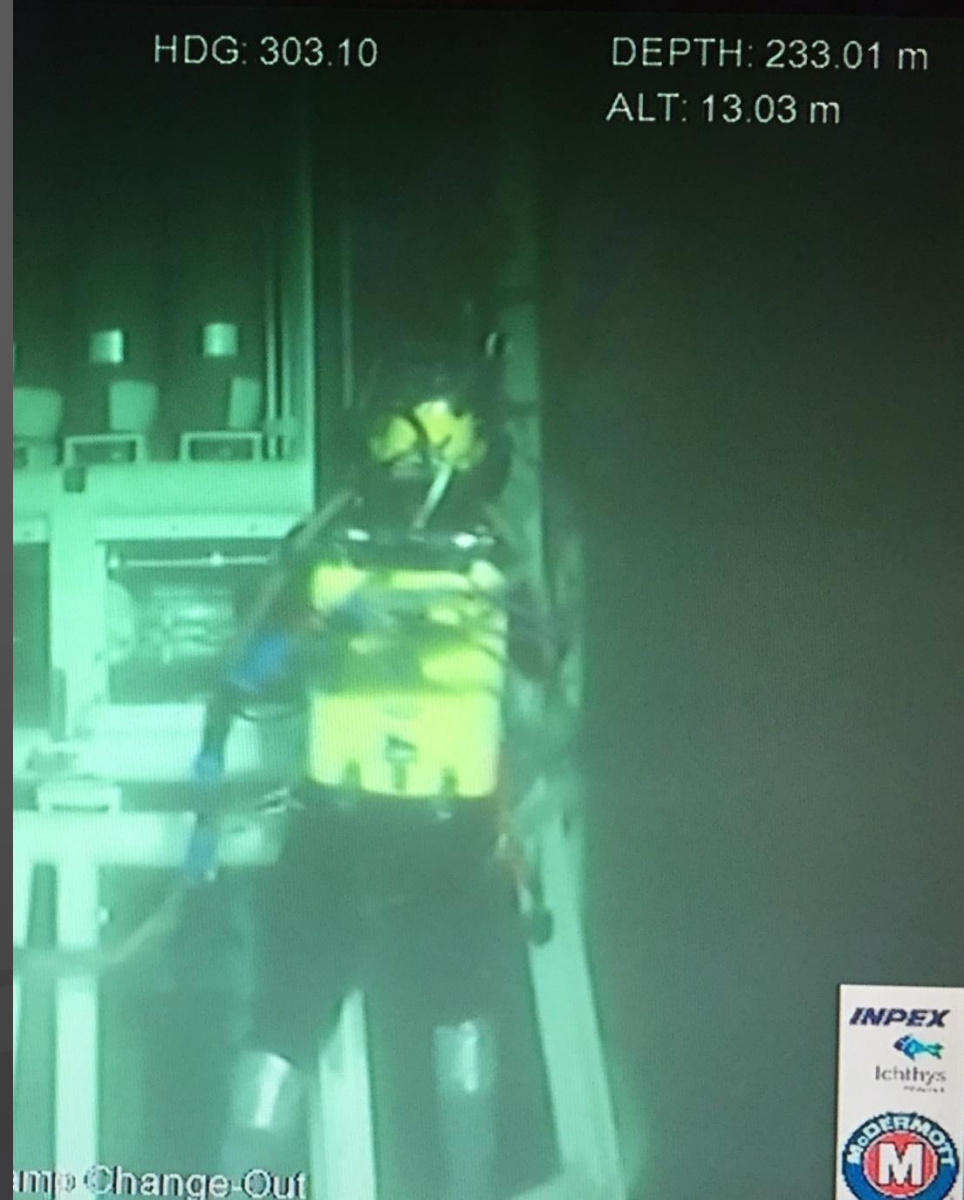
08:34am - Diver 1 in bell and helmet removed  
- COBRA end pressure checked & recorded  
- 15mins 55secs

Diver reported that COBRA breathed well during return to bell. Diver had to work hard to climb 17 metres from seabed to bell.

HDG: 303.10

DEPTH: 233.01 m

ALT: 13.03 m



# ISSUES ENCOUNTERED

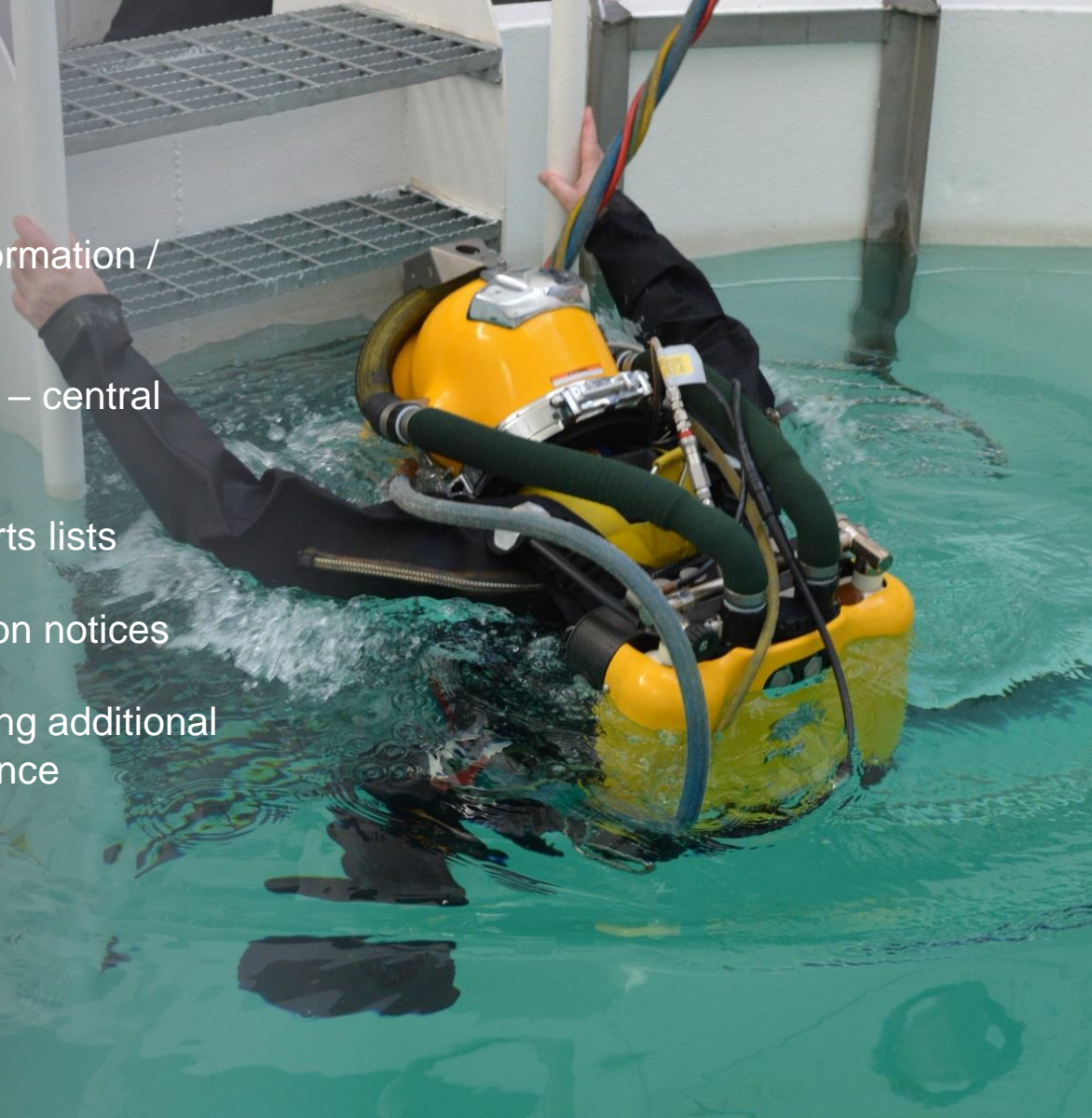
- Sensation of “Hamster Cheeks” on ascent to bell
- Seal between mouthpiece and divers mouth must be maintained at all times
- Any excess gas can be vented from side of mouth
- Advisory notice raised and circulated to all users
- Also now highlighted during diver familiarisation training course





# USER GROUP

- Forum to discuss and share information / Quarterly meetings
- Sharepoint site to be developed – central location for relevant information
- Central library of drawings & parts lists
- Product guidance and information notices
- Product manual updates including additional service instructions / user guidance
- F.M.E.A.
- Feedback log
- CE Certification



# OTHER CONSIDERATIONS

- Semi Closed Circuit Rebreathers - classed as Dual Use equipment
- Controlled item against the UK Strategic Control List
- Subject to export control upon exit from the UK / European Community
- Operators responsible for obtaining appropriate export approval
- Some users not aware until equipment and supporting documentation is delivered





# WHAT NEXT?

From feedback received the following changes are in the process of being finalised and rolled out :-

- New back cover design – more robust
- Longer Gauge / Rotowink Hoses
- Locking Quick-Connects
- Updated CE certification
- Mk2 variant available Q4 2019
- Buoyancy Control Device (also to be CE certified)



# SAT TRAINING AT FORT WILLIAM

An aerial photograph of Fort William, Scotland, showing the town built into a valley with steep hills in the background. The town features a mix of residential houses and commercial buildings. A large harbor area is visible in the foreground, with a long pier extending into the water. Several boats are docked at the pier, and a few more are in the water. The water is a deep blue, and the surrounding hills are covered in green vegetation.

- JFD Service+ team recommissioning system, vessel & pier
- Closed Bell course being refreshed and re-established
- Incorporating SPHL, Reclaim and COBRA
- Continue to develop other courses in line with market need such as Oxy Arc, Nitrox
- JFD aim to be where contractors come to solve diver training & competency problems
- Diving trials started this week
- Sat courses scheduled to begin early 2020



Questions?