

ISSN 1747-9754

MAGAZINE

H2Ops

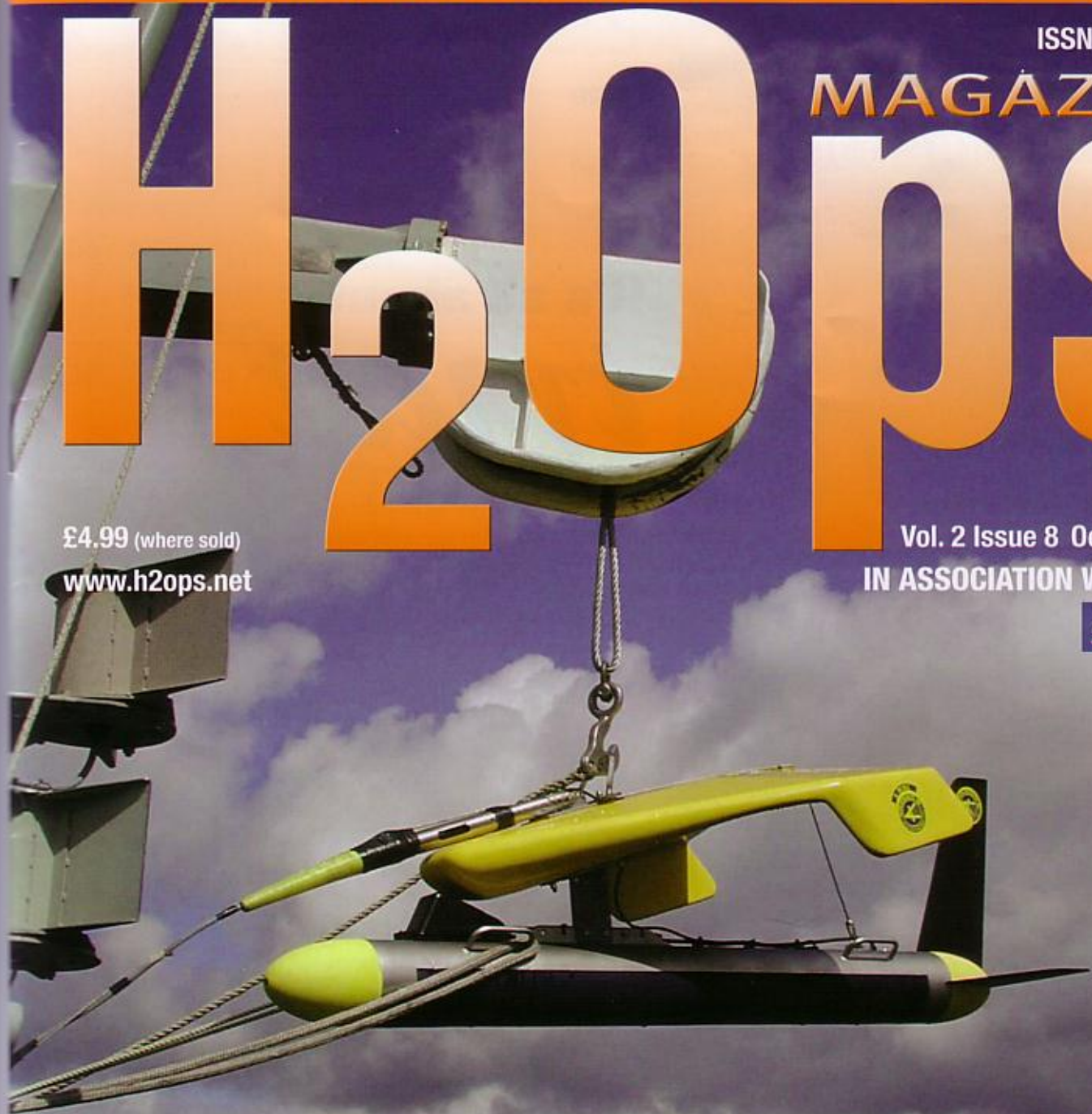
£4.99 (where sold)

www.h2ops.net

Vol. 2 Issue 8 October 2005

IN ASSOCIATION WITH ADAS

ADAS
Australian Diver Accreditation Scheme



SEARCH & SONAR

top products in the market explored

PLUS...

- MARITIME ARCHAEOLOGY
- SWORDFISH REVIEW
- PRODUCT NEWS
- INDUSTRY NEWS
- ADAS COMMENT
- SUT NEWS

incorporating
Commercial Diver International

commercial **c** DIVER **d i** international

- COMMERCIAL DIVING • ROVS • AUVS • SUBMERSIBLES • EDUCATION & TRAINING • TECHNOLOGY • EXPLORATION •
• CONSTRUCTION • MAINTENANCE • DECOMMISSIONING • OCEANOGRAPHY • GEOLOGY • ARCHAEOLOGY •

SPECIALITY WELDS - SWORDFISH WET WELDING SYSTEM - JC. ROAT/CAL DIVE

Short and sweet: Yes the Swordfish has a place in our tool box. I can think of many times it would have been my rod of choice. Will it replace exothermic and tubular steel rods? No I don't think so. With that said, here is what I think it will do.

It will handle about 80 % of the things I've burned underwater. Bolts out of flanges, pad eyes in the way of setting a clamp, the day to day small stuff that is most of the underwater burning we do. Like any rod it requires practice. For no visibility situations, a lot of practice.

There are two parts to this article: My report on the rod for Cal Dive Int, and what that testing brought up in my mind. The picture below is just to drive home why I believe the Swordfish is not a replacement but an added tool.



18" of 2 1/2" steel using 1 and 1/2 Tubular Steel Rods. No Hangers. 1 Minutes, 30 Seconds.

Cal Dive Int. Test - Swordfish Burning Rod

I have done the preliminary test on Specialty Welds, Swordfish Rod, high iron oxide MMA/SMAW electrode, which requires no oxygen whatsoever to be able to cut and found that in fact it does work.

They manufacture 2 Swordfish rods the 5.0mm / 3/16 and a 4.0mm rod. The 3/16 is the rod tested.

Myself and Lead Tender Justin Armstrong who has recently completed Burner 3 class, used the rod on 1/4" plate, 1/2" plate, schedule 80 6" pipe, and 1" and 1 1/4" plate.



1 1/4" plate 9" in length cut with 6 1/2 rods.



6" schedule 80 pipe, cut with 2 1/2 rods.

We were both able to cut all metals tested successfully. We also attempted to cut 2" plate and have had no success to date.

It would be my estimate that more than 80% of the burning we do can be done with this rod. Not to mention all the money and deck space that could be saved not dealing with Banks of O₂, shipping etc. On these pages you will see pictures of typical cuts.

Keep in mind this rod does create hydrogen and oxygen by splitting the water molecule. The bubbles from one rod displaced one gallon of water at -10 feet. These bubbles were captured did explode when hit with fire.

After having done some very diver-like

testing of the Swordfish, I read Shell's report (April 2004). Below is what was brought to my mind by reading the report.

To: ADC and IMCA
From: John Carl Roat
Subject: Scientific Testing Oxy-Arc Burning Process

Gentlemen,
After reading Andrew Pettitt's report on Swordfish O₂-less burning rod for Shell Oil UK, I was struck by the fact most of what we know about Oxy Arc Underwater Cutting is based on supposition, not scientific fact. I am proposing the ADC and IMCA jointly fund testing so that effective standards can be written.

Reasoning for test

- The basic technology was developed in the 1930s without the benefit of today's scientific testing capabilities. Although a vast amount of experience (trial and error) has been gained, much of it is based on theory & assumptions, some of which are wrong (see Mr. Andrew Pettitt's recent findings on the effects of underwater explosions). These findings have changed our understanding of explosive effects underwater.
- The offshore oil industry, worldwide, is placing more focus and dedicating more resources to the plugging/abandoning



1/2" plate. Each cut is one rod. All cuts are complete. Some are slag-filled.



1" plate 5" cut with 3½ rods.

of depleted wells, and the removal of associated production platforms. With the amount of injury and death over the last 30 years involving commercial divers and Oxy-Arc underwater cutting, many of the major oil companies are reluctant to allow the use of this still viable tool.

- c) It is my firm belief once appropriate/ rigorous scientific testing utilising modern technology is accomplished; we can write a standard allowing the safe and effective use of this valuable tool.

Suggested areas for testing

- a) Percent of oxygen required for Oxy-Arc Burning process at different depths.
 i) Pressure and volume of oxygen required at different depths.
- b) Optimum amperage settings for effective cutting.
 i) Amperage losses due to size

of cable, length of leads, and water temperature.

- ii) Amount of hydrogen created at different amperage settings.
- c) Thicknesses of steel able to be effectively cut with Tubular Steel (flux and non-flux coated) and Exothermic type rods.
- d) Amounts of explosive gases created by each type rod, per inch burned, in the Oxy-Arc burning process.
- e) Failure potential of burning torches: flash



¾" plate. The end cut was 1½ rods. The other two cuts are one rod each.

arrestors; flow valves; insulator hoses.

- f) Welding machines performance: comparison of DC Generators and AC/DC Converters.
 i) AC/DC converters tested for AC amperage leakage.
- g) Explosive potential of knife switches.

The testing team would be headed up by Andrew Pettitt. The proposed test would be run at the National Hyperbaric Centre in Aberdeen, Scotland. All burning would be done by a team of four experienced diver burners and four divers with limited to no burning experience.

I believe it would be in the best interest of the industry if these tests were funded by both the ADC and IMCA. The findings will be the basis for a joint committee to write definitive standards for Underwater Oxy Arc Cutting.

Reviewer John Carl Roat is Cal Dive International Supervisor/Diver; Training Facilitator.

PROFESSIONAL DIVING CENTRE SOUTH AFRICA

Professional Air And Mixed Gas Training for Comercial Divers

HSE (UK) approved qualifications

e-mail: pdcgrant@mweb.co.za

Tel: + 27 (0)31 205-8019 Fax: + 27 (0)31 205-7504

Mobile + 82 440 6016

Web Page: www.profdivingcentre.co.za



Rental of the AC-ROV Micro ROV System with or without an operator. System and operator ready to fly out anywhere.

A van-based system is also available with an operator and VCR/DVD recording and reporting facilities for the inspection of inland waterways, harbours, jetties and vessels etc. at short notice or planned maintenance at a very economical rate.

Tel: 01224 276924 Web: www.underwaterinspection.co.uk