

**9<sup>th</sup> CSPWG MEETING**  
**Seoul, Republic of Korea, 13-16 November, 2012**

**Paper for Consideration by CSPCWG**  
**Underwater moorings**

<b>Submitted by:</b>	UK
<b>Executive Summary:</b>	Two examples of 'underwater moorings' downloaded from the internet have been drawn to our attention. This paper shares the information.
<b>Related Documents:</b>	None
<b>Related Projects:</b>	None

### Introduction / Background.

Two examples of underwater moorings referenced from the internet have been drawn to UKHO's attention. Three relevant extracts from internet sites follow. Another example is from a UK produced chart, but derived from a Russian chart.

### Extracts from Hydro International

#### 1. Fiobuoy Underwater Mooring Security System 20/08/2008

**A novel underwater mooring security system with applications within the coastal monitoring, marine survey, ocean research, defence, aquaculture, water production, port & harbour and offshore energy markets is available. The Australian sourced Fiobuoy system is the world's first submersible marine marker buoy and retrieval system. The device has won technology awards on the way to becoming a firm favourite with several prestigious organisations including the US Navy.**



Although initially designed with the aquaculture market in mind, Fiobuoy first found favour within the defence market where it was quickly identified as having enormous potential in enabling sensitive equipment to be covertly secured underwater at deeper depths than previously possible. It allows valuable assets (scientific landers, mooring strings, monitoring packages, surveillance systems, etc) to be securely hidden underwater and retrieved safely at a later time.

After extensive evaluation trials, a major supply contract was secured with the US Navy and this proved to be a catalyst to similar sales to the Australian and Japanese navies. The US Navy evaluations demonstrated significant advantages of the system over other possible routes, including substantial "bottom line" savings.

The core product is available in both Time/Date and Acoustic "on demand" versions. Both versions currently have 100m and 200m depth models. In simple terms the

Fiobuoy remains tethered close to the secured underwater package until triggered by pre-set time/date or acoustic command. The Fiobuoy then release itself and unwinds to the surface where it sits as a surface marker until collected. Its trailing rope is then used to recover the seabed assets.  
www.rsaqua.co.uk  
Source: RS Aqua (UK)

## 2. Successful Acoustic Fiobuoy Trials for AHS 10/11/2009

**After using Time/Date Fiobuoys for almost ten years, the Royal Australian Navy's Australian Hydrographic Service has successfully trialled Fiomarine's Acoustic Command model Fiobuoys. After supplying them with six acoustic models, the Company now hopes the AHS will upgrade their entire Fiobuoy fleet.**



Fiomarine Industries Pty Ltd, manufacturer of the Fiobuoy submersible marine marker buoy and retrieval system, began supplying the Royal Australian Navy's AHS in 2000. The AHS has been using Fiomarine's original Fiobuoy TD100 models which are released at a pre-programmed time and date. Due to government protocol, the AHS is required to use at least two methods of recovery for their underwater monitoring instruments. The Fiobuoys have therefore typically been used in conjunction with another acoustic release system.

Recently the AHS expressed an interest in trialling the newer Fiobuoy AC100 acoustic command models. Two units were trialled this September 2009 in Jervis Bay, New South Wales, Australia. The Fiobuoys were tested on seven occasions and worked perfectly each time. Following these successful trials, the AHS ordered six new AC100 Fiobuoys for their operations based out of Cairns, Queensland, Australia. The Hydrographic Support Cell based in Cairns is currently in the process of testing the units.

This further legitimises Fiomarine technology and the Fiobuoy design, and gives the Company greater confidence as it tackles the international oil and gas and marine research markets. Fiomarine hopes the Acoustic Command Fiobuoys will soon become the primary means of recovery for underwater instruments by the AHS.

Fiobuoys are used by the AHS predominately for the recovery of bathymetric and oceanographic instruments such as tide gauges and current meters. They are used all around the Australian coastline, with the majority being utilised in Northern waters. **Deployments generally last about 30-40 days.**

The Fiobuoy is an all-in-one underwater recovery system that incorporates a release, marker, floatation, retrieval line and line storage. It was invented by John Fiotakis, Fiomarine CEO, and originally developed in collaboration with the Australian Defence Department. The original Fiobuoys are Time/Date models, where the release event is activated at a pre-programmed time and date. The second Fiobuoy model, the Acoustic Command, offers increased deployment flexibility.

The AHS is both a Commonwealth Government agency as well as an Australian Defence Force (ADF) agency. It is responsible for the publication and distribution of nautical charts and other information required for safe navigation of Australian waters. The AHS also provides operational [surveying](#) support and information for ADF operations and exercises. For further information visit [www.fiomarine.com](http://www.fiomarine.com).

### 3.

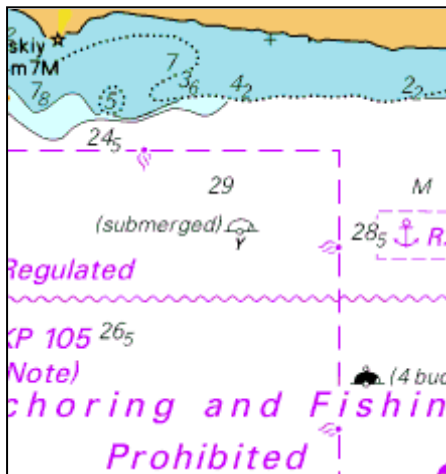
After a leisurely breakfast we powered to Molokini for a day of snorkeling and whale watching. Molokini is heavily used by commercial boats from Maui and has 20 or so buoys ranging from six to twenty feet underwater. Finding an empty mooring was not a problem and the charters came and went during the day, sometimes we shared the mooring field with 15 boats, sometimes none. The snorkeling was again spectacular.

Crossing back to the Makena area we chose to anchor on the South side of Pu'u Ola'i at Oneloa Beach Anchorage for protection from the Northeast wind and seas. We dropped our hook in 30' of water on a sand bottom off of the beautiful beach.



Underwater mooring

### 4. Extract from Admiralty chart 2264



This extract shows a yellow barrel buoy with the legend '(submerged)' adjacent to it. This example is derived from a Russian chart. There are other similar examples elsewhere in the world. UK would be interested to know what these are. Are they in fact submerged ODAS buoys, for which we have now provided specification B-448.4 and symbol L25? Or are they something different.

### Analysis / Discussion.

Given the highlight above [Deployments generally last about 30-40 days], the Fiobuoy item is not for the chart. It probably fits the definition of 'small data-recording stations' (B-448.4) discussed at WG8 (2011).

The third item, from a cruising society blog, appears to be a small craft mooring, visible close to the sea floor in very clear water, which the yachtsman probably picks up with a boat hook or perhaps a diver goes down to pick it up. These are adequately covered by the 'small craft moorings' legend (Q44).

We would welcome any advice on the fourth example.

### Conclusions and Recommendations.

None.

### Justification and Impacts.

Not applicable.

### Action required of CSPCWG.

The CSPCWG is invited to note this information and take no further action.