



Ministry  
of Defence



# Recycling of **Type 22 Frigate**

HMS Cornwall

Disposal Services Authority



Defence Equipment & Support

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Type 22 Frigate Cornwall departing from HMNB Portsmouth  
on the 24 October 2013





# Executive Summary

In 2013 an open competition for the disposal of Type 22 Frigate HMS Cornwall was undertaken, and in July 2013 the Disposal Services awarded preferred bidder status to the UK company Swansea Drydocks Ltd who had tendered in competition with other UK based Ship Recyclers. Their formal proposal was to conduct the recycling of this Type 22 Frigate at their dedicated ship recycling facility at the Prince of Wales Dry Docks in Swansea.

To win the contract, Swansea Drydocks were required to demonstrate their capabilities and resources; relevant experience and technical expertise; the mandatory permits, approvals and licences and those of its subcontractors; the competence to deliver a safe and environmentally sound ship recycling service and the ability to maximise the financial return from the ship's metals, materials and equipment whilst minimising waste to landfill.

The former HMS Cornwall was towed independently and departed from HMNB Portsmouth under commercial tow on the 24 October 2013. After a somewhat eventful journey through a large storm front, during which the Captain and crew were forced to take shelter off the coast of Waterford in the Republic of Ireland, she arrived safely on the afternoon tide at 3.30 on 30 October 2013 and was finally secured on the wet berth in the Queens Basin.





Wet Berth Mooring at Swansea Drydocks.



31 May 2014 - Cornwall leaving Wet Berth 1 to go to the Dry Dock.



# Background

## General Particulars

Date and Place of Build	The vessel was built in 1985 by Yarrow Shipbuilders in Glasgow, commissioned at Falmouth in 1988 and decommissioned in 2011 following a six-month deployment conducting counter-piracy operations east of Suez.
Date ceased service	20 October 2011
Type of Vessel: Official No. Ex Pennant No.	Formerly a Warship - Frigate: F99
Summary of condition	Sound for Towing, not in running condition.
Displacements and tonnage in Tonnes	Current: 4753 Normal: 5077 te
Draughts	Current: Fwd 3.8. Mid 4.2 Aft 4.6
Length OA and Waterline	Extreme: 148.1m WL: 136.32m
Breadth	Extreme: 14.75m
OA height Mast-head to keel	30.2m
Last Docking	2008 Plymouth
Last Refit	2004 Plymouth

## Background on the Disposal Services Authority (DSA)

- The DSA has delegated authority to dispose of all UK MOD surplus equipment in the UK and overseas.
- The DSA's role is to dispose of surplus assets identified by the owner for release into the commercial market.
- The DSA is the only Government Organisation offering a completely managed service for the Re-use, Recycling and ultimately disposal of surplus government assets.

The DSA's primary aim is to sell surplus ships for further use but where this is not possible (for instance, when ships are no longer seaworthy and only suitable for recycling) its objectives are to ensure that the vessel is recycled in a safe and environmentally sound manner, and in compliance with its legal responsibilities as a producer of waste.

# Introduction

In February 2013 the DSA conducted a tender exercise for the recycling of HMS Cornwall, the vessel was sold on an 'as seen as lying' basis for the recycling within the Organisation for Economic Co-Operation (OECD) and in full compliance with the principles of the Basel Convention and all other associated EU & UK legislation including Regulation (EC) No 1013/2006 of the European Parliament and the Council of 14th June 2006 on Shipments of Waste.

## Competition

### Information and Requirements

The preparation for HM Vessels for disposal is carried out by the MOD's Disposal Reserve Ship Organisation (DRSO) in Portsmouth who play a vital part in the process producing an Inventory of Hazardous Materials (IHM) highlighting the hazardous material on board along with an independent Asbestos Management Survey provided by Lucion Environmental Ltd, both of which were included as part of the tender documents. The activity conducted by DRSO demonstrated to ship owners the value in investing in the preparation of vessels for disposal which is of enormous benefit to the UK MOD as it continues to set standards for the dismantling of Government owned vessels.

Tenders were limited to bidders from within the EU and the OECD – as recommended by the UK Ship Recycling Strategy (SRS).

The recycling of ships is covered by a range of UK and EU legislation for which Department for Environment, Food and Rural Affairs (DEFRA) is the lead department in the UK. This Legislation includes, but is not limited to:

- The Waste Shipments Regulation (EC)
- No 1013/2006 of the European Parliament and of the Council of 14 June 2006
- Parts of the Radioactive Substances Act 1993
- Environmental Protection (Duty of Care)
- Regulations 1991 SI 2839
- Hazardous Waste (England and Wales)
- Regulations 2005 SI 894
- Health & Safety at Work etc 1974
- Control of Asbestos at Work Regulations 2006



# Ship Recycling Evaluation

Following the recommendations of the SRS, the DSA once more convened a Ship Recycling Evaluation Committee, involving representatives from the Maritime Coastal Agency (MCA), DRSO and the DSA who assessed the tender responses against set criteria called for in the Strategy. Prospective purchasers were required to produce a detailed Ship Recycling Plan, demonstrating their understanding of all the requirements involved in Ship Dismantling against each of the following:

- Facilities & dismantling methodology
- Health & Safety
- Environmental plans
- Operations, sub-contractors
- Licences & permits
- Media and Trans-Frontier Shipment of Waste (TFS)

The Ship Recycling Plan is paramount to the consideration of offers to purchase and provides evidence to enable the Evaluation Committee to score against.

## Award of Preferred Bidder Status

The DSA awarded preferred bidder status to Swansea Drydocks Ltd and a formal contract was awarded in July 2013. Swansea Drydocks Ltd is a family run business formed in 2009 by the Dunn family. The Chairman is Mr Alan Dunn and the business is run by his sons Karl, the Managing Director and David the Operations Director. It was formed to return the Dry Docks in Swansea to service and undertake both the Recycling and Repair/overhaul of all types of Marine units.

# Recycling of Ex-HMS Cornwall

Upon arrival the vessel was secured on the wet berth and the process of ensuring security as well as environmental and health and safety controls were in place and commenced in accordance with the Swansea Drydocks Ship Recycling Plan. This was the working document that detailed the precise order of events that would ensure the safe and environmentally sound disposal of the vessel. It was an integral part of the Swansea Drydocks Ship Recycling Facility Plan (SRFP) and prepared in accordance with the requirements of the Hong Kong International Convention 2009. Ex HMS Cornwall was the proving project for what eventually evolved into the Swansea Drydocks Ship Recycling Facility Plan that was approved by the UK Competent Authorities in June 2015 and now forms part of the facility Environmental Permit. Swansea Drydocks became the first company in the UK to be approved in accordance with The Ship Recycling Facilities Regulations 2015. They are also the first company in Europe to be advised to the European Commission (by DEFRA) for inclusion on their list of approved ship recycling facilities under the EU Ship Recycling Regulation that entered into force on the 30 December 2013.

Whilst Ex HMS Cornwall was exempt from these regulations, Swansea Drydocks was able to use the recycling of her to prove their processes and procedures to achieve their registration. The surveys, assessments, controls, record keeping and reporting on all aspects of her recycling enabled the SRFP to be formally adopted as part of the Environmental Permit.

Swansea Drydocks Ltd were required to provide a monthly breakdown of the outturn of metals and waste during the recycling programme. Audits were conducted by DSA staff during the life of the project which involved a physical inspection of the yard in Swansea, together with an audit of weighbridge tickets, licences and consignment notes which were checked against the reported outturn.

Photographic evidence was provided at key stages of the dismantling process, which ensured that the DSA could be confident on the method and manner in which the Vessel was dismantled and recycled in accordance with the aims of the Ship Recycling Plan. In all over five thousand photographs were taken by Swansea Drydocks during the recycling of Cornwall, a few of which can be seen in this report.

In addition to the audits by DSA Swansea Drydocks Ltd were also subjected to periodic checks and inspections from Natural Resources Wales. These checks were to ensure that the company were adhering to all current H&S and Environmental Legislation, the terms of their environmental permit and also to confirm and verify the content of the material and documentation provided by the Company as part of the notification process required to receive and recycle the vessel.





# Photographic Evidence

The photographic evidence shows the dismantling progress and this coincides with the monthly reports, Demo Schedule and the sales progress.



Holes were cut in side of the vessel to allow access for the removal of some non ferrous & soft strip materials, authorised and permitted by the Ballast Water and Stability management plans within the Ship Recycling Facility Plan (SRFP). The vessel remained in the wet berth repair area until 20 May 2014.

Photographs of items, salvage and electronics were taken to create a website link for potential buyers. Website link - <http://www.swanseadrydocks.com/category.asp>



Electronics and items of interest to other Navies were catalogued, documented by NSN reference and stored.





Non Ferrous Removal



28 May 2014. The hard strip and recycling commences in the Dry Dock and the first piece removed is the main Foremast.



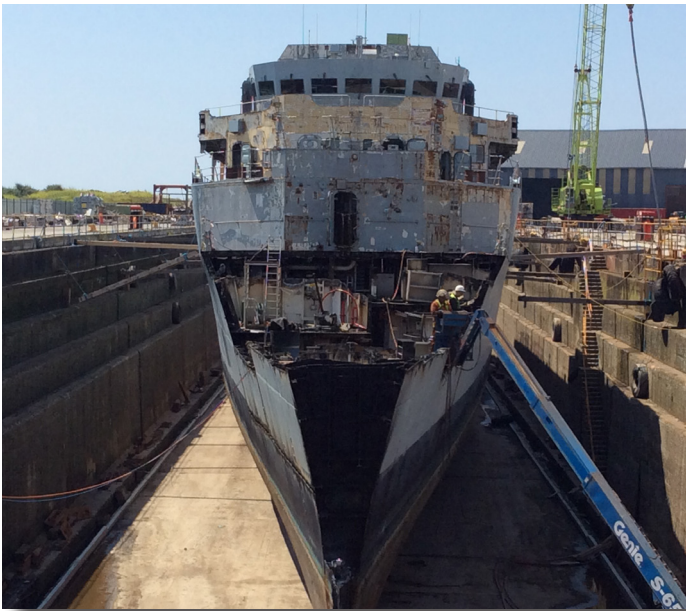


23 June 2014. The propeller once removed was completely stripped down to reveal all of the component parts. Each petal weighed approximately 800kg

23 June 2014 Dismantling of the forward structure.







June 2014 Photograph showing the vessel in the dry dock. The vessel is set on blocks with stability bracing and shoring. This bracing and shoring was planned and controlled by the Ballast Water and Stability Management Plans as part of the SRFP. In the foreground is the Sonar Array Dome that required a special plate to split it apart and allow the vessel to be placed on the blocks safely and securely.





Various stages of dismantling July 2014.







Recycling of the Sonar Dome July 2014. The Sonar Array was removed from inside the dome in one piece. It weighed 15 tonnes and consisted of 64 transducers that yielded over 7.8 tonnes of non-ferrous metal.



Lead Ballast Aug 2014 182 tonnes removed in total.



Various stages of dismantling in the dry dock of the superstructure Sept 2014.







The picture above shows ballast water being collected by the retaining concrete bund within the dry dock. The collected discharge was pumped into the specially designed single site drainage system and then filtered through the interceptors and stored in holding tanks where samples were taken and sent to laboratory for analysis. All ballast water and discharge readings for HMS Cornwall, over 1000 tonnes in all, were well within the specified parameters of the discharge consent in the environmental permit. This meant that the ballast water and discharges were not deemed to be waste and were able to be released from the tanks on the outgoing tide. This procedure is controlled by the Ballast Water management plan that forms part of the SRFP.



Final stages of dismantling in the dry dock.







The final Pictures of the dry dock where the Former HMS Cornwall was dismantled. The final pieces were removed from dry dock no.2 on the 30th October 2014 twelve months to the day of her arrival. Thorough cleaning of the dock is undertaken prior to re-flooding in preparation for the next ship arrival.



# Final Outturn

At the start of the project DRSO produce an Inventory of Hazardous Materials (IHM), the purpose of this was to identify what hazards were contained in the vessel which is then compared with the final outturn figures reported to the DSA by Swansea Drydocks Ltd.

A detailed outturn of materials (ferrous, non-ferrous, plastics, asbestos, oils etc) is recorded by the company and this information is communicated to the DSA on a monthly basis, with hard copies available for inspection during the regular visits by DSA personnel.

DSA personnel also took the opportunity to visit Sub Contractor sites to check corresponding Weighbridge tickets & Consignment notes against Swansea Drydocks Waste Tracker Yield Reports and Quantity Lists in order to verify the accuracy of the records and reports.

Materials Recovered (All figures in Tonnes)	Expected	Actual	Destination
Ferrous Metals	2,591	2,270.705	Recycled
Non-Ferrous Metals	1,229.70	761.404	Recycled
Other Products		356.342	Sale/Recycled
Waste		234.718	Disposed
Total	3,820.700	3,851.32	

Final Destination	Tonnes	Percentage of Total
Sold or Recycled	3,616.60	94%
Disposed	243.718	6%
Totals	3,851.32	100%



# Conclusion

There was relatively low asbestos content for the size of the vessel found in the gaskets of the pipe systems, this matched the findings of the Management Survey and Inventory of Hazardous Material.

Items such as Davit Cranes, Anchor & Chain, Lights & Doors were sold for further use. Over 200 tonnes was removed for reuse as part of the recycling plan, a process that led to it taking a full year to fully recycle the vessel. Equipment such as the one remaining Tyne gas turbine engine, the four Paxman 12RPA200Z generators, auxiliaries & pumps were removed to maximise sales potential.

Ex-HMS Cornwall was completely recycled on the 30 October 2014.

The recovery of nearly 20% non-ferrous materials from the vessel was in line with Company expectation from the results of the initial surveys of all of the vessels undertaken during the tender process. This level of recovery does not include materials in items removed for reuse. The 6% disposal yield was about 2% higher than Company estimates primarily because of the layer of concrete screed covering the decks.

The total variance between material content recovered against that estimated in the official DSA/DRSO sales documents was 0.800%.

The report has been sent out to senior internal stakeholders and a growing number of other foreign Governments as they view the UK MOD as the lead when it comes to recycling warships.

**The report can be found on the DSA website**

<https://www.gov.uk/government/collections/dsa-ship-recycling>



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