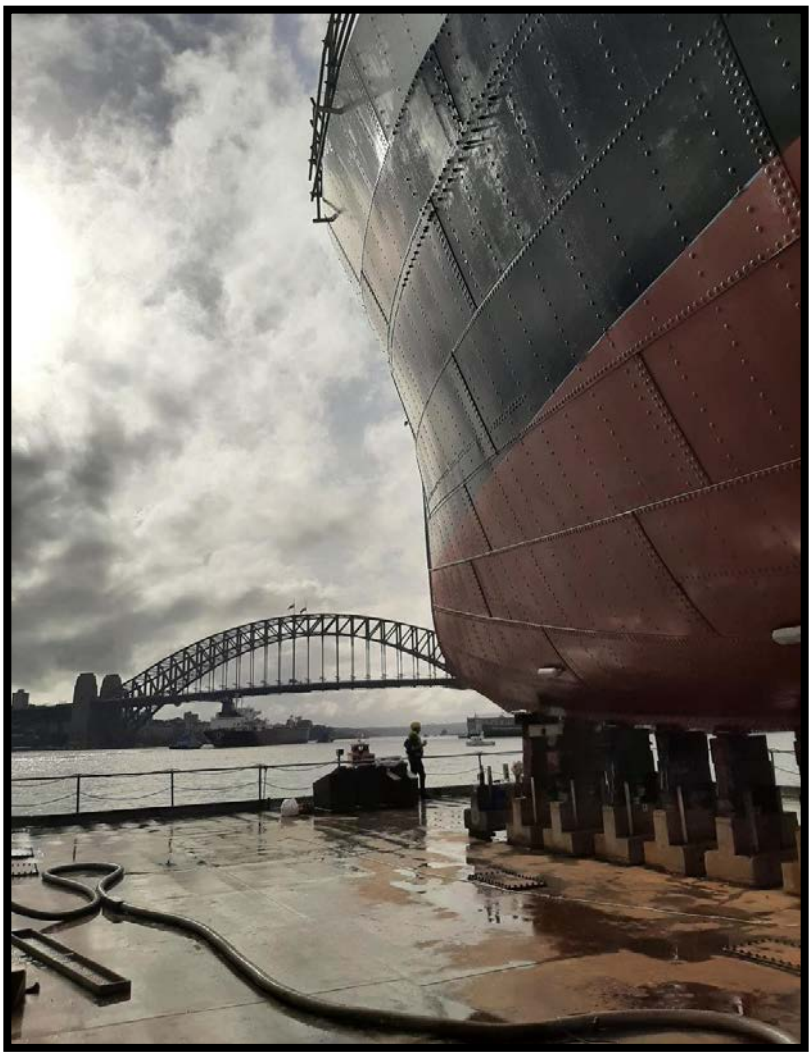
Sydney Heritage Fleet

JOHN OXLEY REPORT - END 2022



The John Oxley on the Sea Heritage Dock being towed over to Captain Cooks Dock to be relaunched. A milestone for the SHF Team and all the sponsor that have supported this incredible project. Thank you All.

2022 has been a huge year for the *John Oxley* restoration and for the Fleet with very significant milestones achieved. For this report, the most important was clearly the refloat of *John Oxley* at Garden Island Dockyard.

SWAP

This complex operation saw *John Oxley* refloated from its long-term home atop our work barge, and then replaced by Sydney ferry *Kanangra*.

A significant major donation plus existing sponsorship enabled work on *John Oxley's* hull, engineering, and electrical to progress to refloat. A smaller grant from another trust provided coatings with the application of these by our volunteers.

Total expenses for the entire SWAP operation exceeded sponsorships and shortfalls were handled by the SMM main account – 2023 will be a far more austere year.

Outline of SWAP Operation – March/April 2022

- *John Oxley* hull plating was completed, and all hull seams caulked and made float worthy
- Anodes were installed, and all underwater and topside coatings applied
- Electricals included donation of 1 diesel genset plus supply and install of Main Switchboard and Non-Essential Switchboard plus supply, install and connections of wiring trays and cables to bilge and fire pump circuits
- Naval architect calculations for refloat stability were completed
- Negotiations for Garden Island Dockyard (Thales) were in place
- Permissions for safe transit movements on Sydney Harbour obtained
- Insurances negotiated and in place
- Commercial tugs donated by Ausbarge plus SHF tugs assisted
- SHF crews were in place for SWAP event

Movements

- Wednesday March 31 - SHF work barge (*Sea Heritage Dock*) with *John Oxley* towed to Garden Island Dockyard and docked in Captain Cook Dock
- SHD hatch openings removed so that it will stay submerged
- Saturday April 2nd - Captain Cook Dock filled and *John Oxley* refloated off and away from SHD barge
- Sunday April 3rd – John Oxley towed from GID to White Bat temporary mooring
- Captain Cook Dock emptied and *SHD* work barge maintained. Bilge and keel supports prepared to accept *Kanangra*
- Tuesday April 12th – *Kanangra* towed to GID and docked the next day onto *SHD* barge

On Thursday April 14th, the *SHD* work barge with *Kanangra* now safely atop was then towed to our worksite at Rozelle Bay, and lastly, *John Oxley* was towed back around and moored alongside our work barge.

A highlight was to see our veteran steamship successfully refloated and then towed from Garden Island across Sydney Harbour. This was a tremendous boost for our people after many years of hard work. We thank our sponsors for their magnificent support over the years.

Then a bonus! Hull checks on a just refloated *John Oxley* saw our engineers emerge from each compartment with a resounding “Thumbs up” - No leaks, dribbles or mists throughout the entire hull!

Congratulations and thanks here to our platers, riveters, welders, caulkers, and sponsors.

MEDIA COVERAGE OF SWAP

We had some excellent help here and our SWAP operation gained a lot of quality news coverage.

[Coastal steamer John Oxley moved on a pontoon to Garden Island Naval Base | 7NEWS]

[Sydney steamship John Oxley recommissioned in 2022 | 7NEWS]

Other videos can be seen SHF YouTube channel - [(2) Sydney Heritage Fleet - YouTube]

SWING OPERATION

Next task was to rebuild our site - This was termed SWING...

The first requirement was to swing the SHD barge 90 degrees to the wharf. The outboard end of the SHD barge is now secured by two spud piles, which fix the moored position of the barge against any expected weather conditions. Spud piles were driven by neighbours Clements as a donation.

Current arrangements for smaller SHF vessels are still being finalised and some donated wharf pontoons will assist here. This work will continue in 2023.

COVID ARRANGEMENTS

This pandemic restricted progress on the *John Oxley* project and SWAP at various times. Initially there were lockouts. When teams returned, they had to show regular PCR testing and only core team members came back to work. Physical separation and masks were required. Staying home if unwell was always necessary. We separated morning tea and lunch breaks so that people were not messing together (this remains today). We moved some teams to different days to reduce the numbers of people on site each day. We have had members come down with COVID during this time - We are fortunate not to have anyone hospitalised. A small number of people chose not to return after lockdowns, but most in this group were older and would have retired from active volunteering around this time.

With our COVID lockdowns eased, we have recommenced volunteer recruiting and have recently added new faces to our teams.

PRE-SWAP WORK ON JOHN OXLEY

Hull – Extensive amounts of work on the hull to ready the hull underwater and topsides plating was undertaken as set out below:

Final hull plates were riveted and then made ready for final sealing by caulking. Our caulking team were volunteers and new to this work. After training, they took on the arduous task of pneumatic chiseling the faying edges of every plate join up against its partner. Caulking would take many months and there would be numerous COVID interruptions as well.

The ship required a depth sounder and a Furuno 50B transponder was recommended. This would be installed in an accessible location in the main hold. The team designed a new housing and steel mountings were machined in house. Final welding into the hull was completed before primers and antifouling were applied. The new transponder can be removed and replaced with the ship afloat.

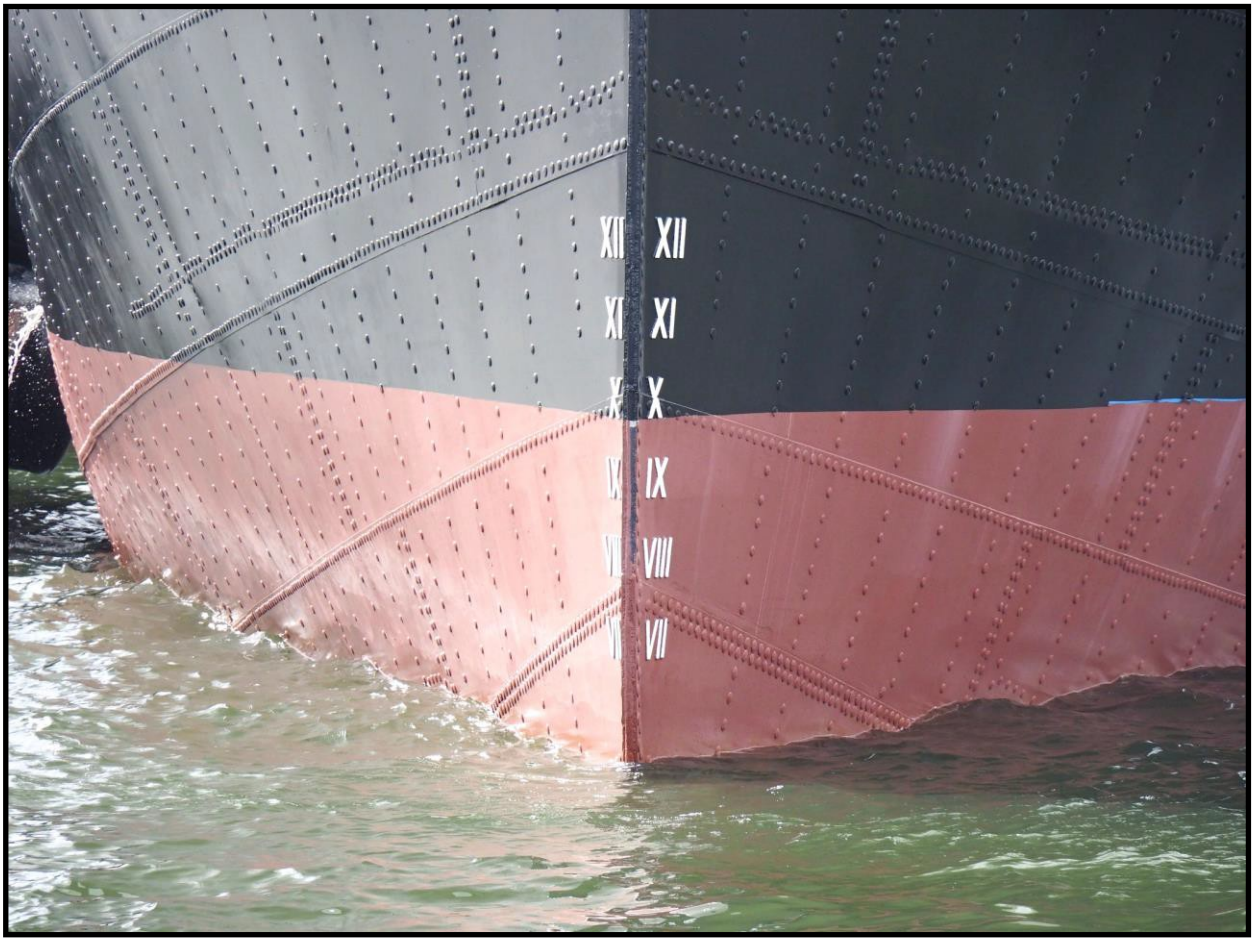
With the hull caulked, advice from International Paints gave us a working paint scheme for our steel hull. Coatings were mostly provided by a grant. The topsides were painted black

with the highest above deck strakes in white. Underwater plates received regular antifouling.

The waterline level was set by our naval architects and checked from the photographic record. To mark the waterline, the team simply drove the scissorlift around the ship with a marker pen gauge at waterline height, and then applied masking tape at this line.

A problem here became Sydney's extreme rain events of late 2021 through to early 2022, which the painting team battled on to "paint while the sun shone". Many volunteers from other SHF vessels came across during this time to help with the painting of J*ohn Oxley's* hull.

One feature that sets *John Oxley's* hull apart are Roman Numeral draft marks at stem and stern. Today, these marks must be metric, however, special permission was given for these to be traditional Roman Numerals. These were water jet cut in steel plate and their exact positions were determined by one of our volunteers (retired marine surveyor) whose work our surveyors would accept – Last task was to weld these to the hull and then pick them out in white enamel.



One of the last tasks was the selection and installation of anodes – SHF practice is to weld angle brackets to our hulls at a standard distance apart as set by a template. The template is

kept and is brought out of stores to drill new anodes. These are bolted to their brackets as the last antifouling coatings were applied. The advantage here is that future replacements can be carried out by divers and expensive dockings are avoided.

Hull anode installed

Rudder anodes installed

Some portside bow riveting that was not completed before refloating due to supply chain issues with repairs to our site air compressor. Our fabricators are poised to complete this work early in 2023 – This commences in early 2023 and will be accompanied by a riveting team recruiting program. Many SHF skill sets are no longer found in the metal and engineering community, and the Fleet must preserve these skill sets through training new people.

Anchor deck plate work is poised to continue in early 2023, but the current priority is the welding of steam pipes for the engine room (See Engineering below). This welding must be completed within a 6 month pressure welder certification time limit.

The fabricators have also been working on SWING requirements – They have constructed and welded support tubes into the SHD barge for the new mooring spud piles and then installed all bracketing for these. This was not part of the John Oxley account subdissection work.

Engineering – A continuing task focused on the replacement of bilge and fire systems and installation of new electric pumps.

As a restoration, *John Oxley* retains her original steam fire and bilge pump system, but for Survey, an additional full electric pumping system is also required. 415 volt pumps for fire fighting and bilge services are required and under modern codes, these must be separate

installs to prevent accidental discharge of oily bilge water into the environment or onto a fire. New pumps have been supplied and installed for these services.

The original bilge and fire piping was corroded, and an entirely new system in steel pipe was needed before refloat. New steel pipe lengths were cut and tack welded to bends and flanges in location. Pipes were then carried out on deck and full welded. When a trailer load of pipes was collected, they were sent out to be hot dip galvanised. We are grateful for the support of Nepean Galvanising for their sponsorship here.

Bilge pipes just back from galvanising New pipessystems installed and painted

Final task then is to install these new pipes and commission the system. One of our lady volunteers has taken on the task of painting inside *John Oxley* and all pipes are now correctly colour coded to match their intended contents.

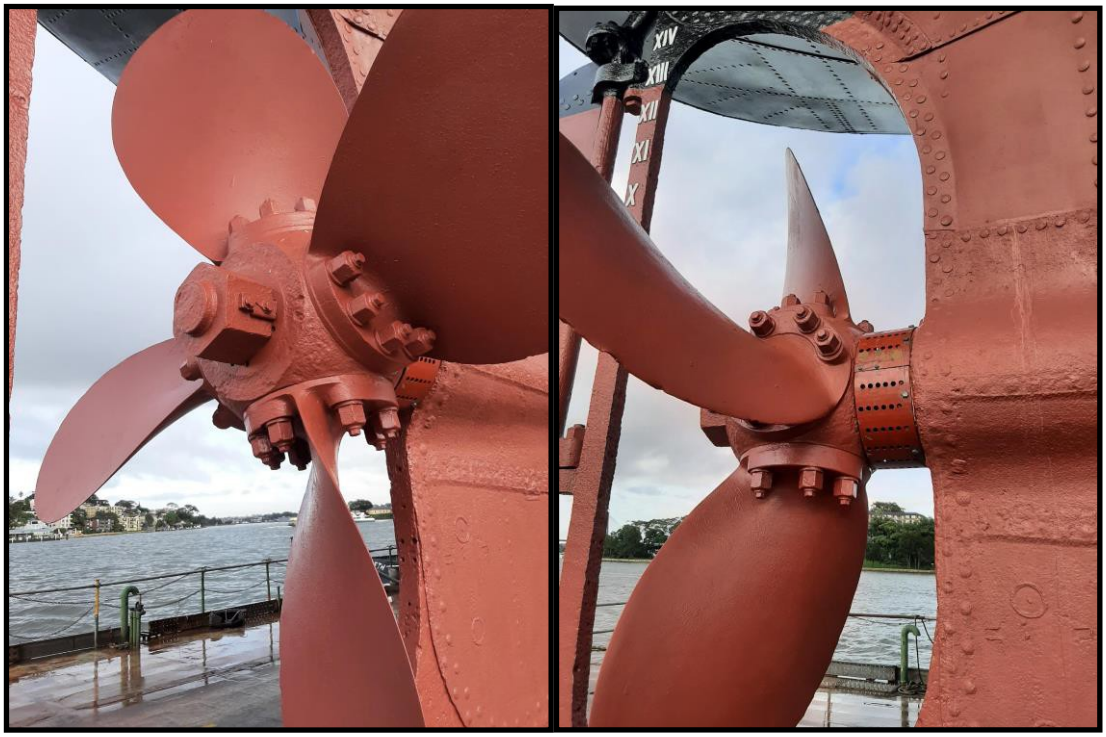
A new system of submersible pumps in each compartment was also installed to direct any bilge water to the main hold oily water tank. Each compartment has one of these pumps, which will remove almost all water in these spaces.

Other steel piping systems completed for refloat included fresh water mains that run the length of the ship to provide connections to the forward and aft peak water tanks. These include fresh water connections for flushing out pipes and pumps that have been used for salt water and dirty water. Connections have also been made for town water supply along with the correct anti-backflushing non-return valves required by Sydney Water.

A Wartsilla propeller shaft seal was installed to the aft end of the propeller shaft and bears up against a machined cast iron pad on the propeller post forging. A sponsor generously provided this seal and it was installed by our team. This type of seal is preloaded to a specified number of millimetres and our engineers set this amount on propeller hub installation.

John Oxley's propeller was supplied by the Stone company, which still operate from the UK - This propeller is unusual and consists of a cast iron hub with Manganese Bronze blades bolted in place. The hub had already been sent out for proof machining and was installed

after the seal. The team installed the blades and then adjusted the pitch of each blade to the original setting.



Stones propeller showing hub and blades Propeller showing rope guard around seal

The rudder had been installed earlier and would need to be locked off at least for towing of a refloated hull. *John Oxley's* Master did ask for the rudder to have wheel control so the emergency steering was completed and rudder quadrant locking pins were installed. Anodes were also fitted to the rudder after antifouling.

There was also a lot of work for our engineers in checking and double checking all underwater fittings, sea valves, gratings, and bilge drain plugs. All sea valves were inspected and checked for integrity and water tightness. Gratings were installed and some water boxes had internal anodes. Locking wires had to be installed. Rudder pintle nuts were checked and lock wired. Peak tank plugs were also installed and locked in.

Some carried over work has included the steam pipes. The 1927 copper steam pipes no longer comply with current codes and steel pipes are required. We are fortunate to have the services of NSW Pressure Vessel Inspections, who handle all pressure vessel inspections for SHF. We have been careful to continue this relationship as their inspector has a high level of experience with riveted boilers – We clearly cannot postpone this work. There are also time restrictions on pressure welding qualifications and our engineers are pushing to get all new steam pipes welded by our fabricators in this time frame allowed. This does take our welders off *John Oxley's* Anchor Deck plating, but we expect most steam pipes will be welded, pressure tested and inspected early in 2023.

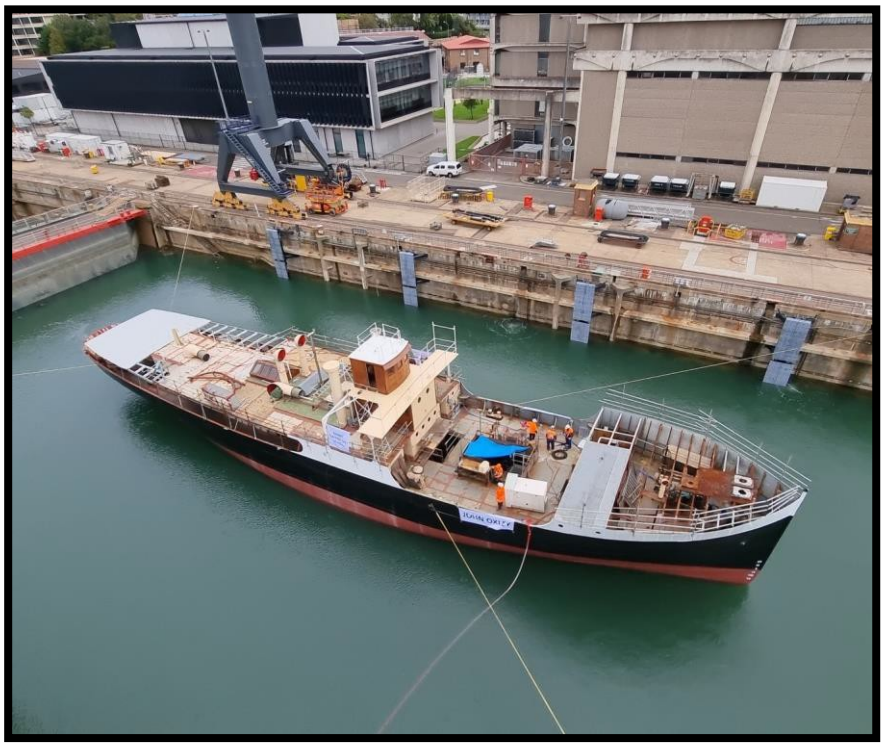
Welder Raj on steam pipe work

Engineer Malcolm pressure testing steam pipe

Naval Architect and Survey – Again we are very fortunate to have the services of a number of naval architects who work for the John Oxley project. All supply work as a donation or at a discount. It is imperative that the project's naval architects have professional indemnity insurance as commercial operators.

MSA provides inspections of ongoing work and supervises hull, engineering and electrical work.

Graeme Mugavin provides advice and approvals on stability, weights, and future planning.



John Oxley just after afloat

(SHD barge remains submerged beneath on the dock floor)

John Butler Designs provides computer modeling on future weights and stability. JBD worked with Thales naval architects in the dockyard to determine ballasting distribution so that the lightship condition of *John Oxley* would be stable when it refloated from the keel blocks. We had to know when *John Oxley* would float, the loadings on stern keel blocks just before refloat, plus would be any instability issues that could tip the vessel over before the keel aft had left the keel blocks.

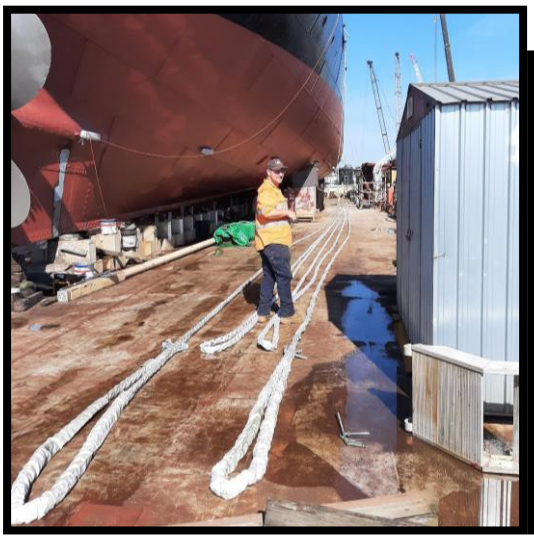
All naval architects provided immeasurable support and assistance throughout SWAP and *John Oxley's* undocking.

Upperworks - This part of the vessel saw work on bulwarks, access scaffolds, bulwarks and railings, towing points and moorings.

Some work on bulwarks was left as access onto the ship was needed. It was resolved to keep a sally port on the port side open as this was needed before docking, at Garden Island, and then later when afloat back at our Rozelle Bay base.

Meetings were held with Ausbarge tugmasters to determine where their tugs could tie on to firstly the SHD barge, and then a refloated *John Oxley.* Some additional brackets were welded as needed.

John Oxley afloat would need moorings, and also mooring lines (We had not needed these for 25 years). Ausbarge again helped out and donated ample amounts of 65mm. synthetic line - These were laid out and eyes spliced in by our volunteers.



Rigger Tom laying out new mooring lines

Well deck bollards set installed

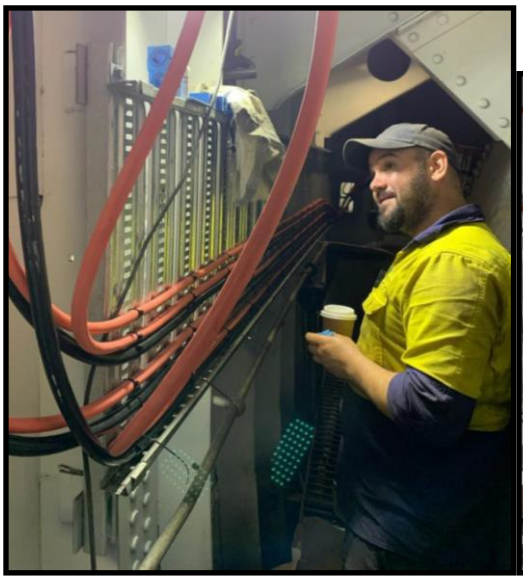
John Oxley's original mooring bollards were passed fit for service and were descaled and painted. New hardwood mounting pads were sourced from Griffith from an old hardwood bridge that had been scrapped. These 50 year old Ironbark timbers were seasoned and very hard. The team matched each pad and bollard set with its original location, then drilled the

steel deck beneath, and bolted down each bollard on copious amounts of sticky black sealant.

Electrical – We had volunteer electricians on our team, however, the final electrical system on *John Oxley* required design, installation, and commissioning by an electrical contractor whose work would be signed off by our electrical surveyor (MSA under AMSA).

We noted that Ken Toumazis, Mazis Electrical Contractor Group had originally provided this work for *James Craig*. Ken had retired, but his business had been handed over to son George. Both came on board the project for SWAP and worked incredibly hard to get *John Oxley's* electrical system ready for refloat.

For refloat, the electric bilge pumps (and fire pumps) would need power. A completed *John Oxley* will have 2 matched diesel gen sets, however, funds were very tight. A generous sponsor supplied one of the 2 gen sets needed and this was purchased and installed by our engineers on the Main Hold Tween Deck.



Lead electrician George Toumazis

Gen set switchboard and wiring runs

Mazis built 4 main switchboards (at home workshop during COVID lockdowns).

- Essential Services Switchboard (ESS) was installed in the old Cool Room and handles emergency lighting and pumps for flooding or fire
- Non-Essential Service Switchboard (NESS) is installed in the old Lamp Room (must not be installed near ESS)
- Shorepower Switchboard was also installed in the Lamp Room
- Generator switchboard with Woodward controllers installed in Main Hold

A requirement for shore power would be an isolation transformer, which is an expensive requirement fortunately obtained through a grant. This transformer isolates the ship's metal from nearby earths and stray current problems.

Cable tray locations were determined and installed by our engineers and welders. The choice of wire for a ship in Survey is important – Cables must be sized to carry the current, and must not give off toxic smoke if there is a fire. Obtaining the cable is another matter but eventually, George found a supplier for marine rated cable and was then able to wire in all essential equipment. A commissioning test was run, and all arrangements have been inspected by our marine Surveyors (under AMSA).

All electrical works have been inspected and passed by surveyors. When future funds allow, Mazis will continue installation of power and lighting circuits for the rest of the vessel.

Cabin teams – It was resolved to focus as many teams on SWAP work over 2021 and 2022, however, our two cabin woodworkers were retained on finishing off the area around the wheelhouse, chartroom, and master's cabin. It was important to get this highly visual part of *John Oxley* ready for refloat and media.

Cabin team applying coatings under Bridge Deck

SHD barge – Railings had to be added to meet Thales WHS to protect workers below in dry dock. We used 50 mm. scaffolding tube with clamps to achieve this

Our team also overhauled all SHD barge openings, and this involved undoing many hundreds of hatch bolts, replacing rubber gaskets, and then reassembly with copious amounts of grease.

The deck of the SHD barge also had to be cleared. An earlier stair tower was craned off by neighbour Clements Marine and our people cut this up for scrapping. There was a lot of gear being stored on the SHD deck and everything had to be removed. This again was a big job that fell to a few people, and we thank them.

Existing electrical services had to be removed from the SHD barge as it would become fully submerged during SWAP – These were replaced with temporary "service leads" that could

be removed at the last minute. Site electricians also have designed and are currently building new electrical layouts post SWING for final implementation in 2023.

We are pleased that our SHD barge was surveyed and found to be in excellent condition. This is attributed to the zinc anodes slung over the side of our SHD barge and we thank some special volunteers who faithfully monitored our anode voltages over many years.

A refloated *John Oxley* berthing ahead of *James Craig*

2023 AND 2024

2022 saw large expenditures on *John Oxley* and on the SWAP operation, and expenses also drew on the main account. Correspondingly, expenditures in 2023 will be much reduced.

For *John Oxley*, the following is programed through 2023:

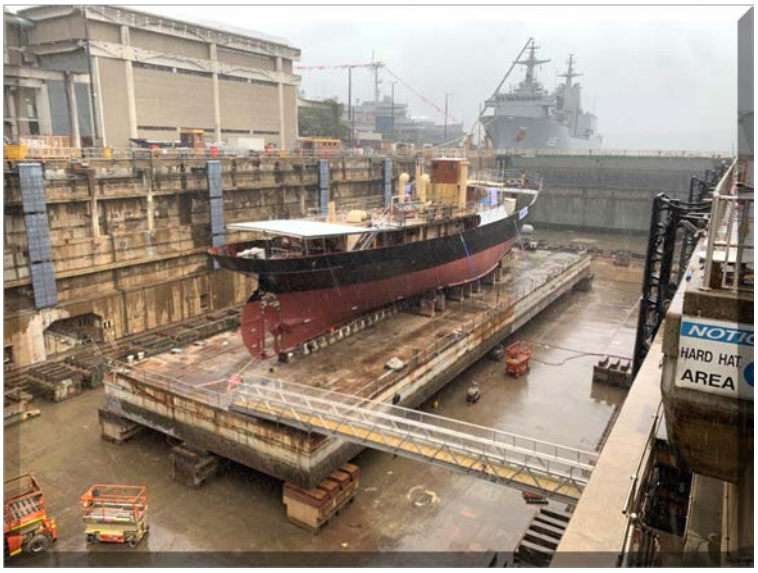
- Grants and fundraising – A continuing active program to identify and apply
- Pilots Mess – Part CF grant – Finalise furniture and lighting – 80% complete
- Officers Mess – Part CF grant - Complete fitout - Commenced 2022, but team leaders retired due to age and health – New team being recruited
- Anchor Deck - Community Grant - Commence Jan 2023 – Install new steel deck plates , margin angles, and railings
- Bridge Deck – Install original teak rails and varnish
- Wheelhouse - Complete deck, install ER telegraph and fitout
- Boat deck – Stanchions (in stock) and rails – Erect aft stanchions and rails, then fwd stanchions and rails, then midships stanchions and rails
- Officers wash and head – Commenced - Refurbish, install WCs, sinks and shower
- Galley – Display – Remaining fitout including steam urn, power and light – 50% complete
- Foremast rigging bands and brackets - overhaul – galvanise
- Foremast – Descale + coatings – Provide new foot and deck sleeve, clear threads, make screw rivets - Assemble (Install early 2024)
- Main steam pipes – Certify and reinstall original - Almost complete
- Auxiliaries steam pipes – steel replacements and certification program – 75% complete
- Main feed pipes – steel replacements and certification program – 75% complete
- Exhaust steam pipes – Overhaul and reinstall – 75% complete
- Steering system – Install sheaves and rods (7/8” chain later) - 50% complete
- Windlass – Completed - Install on anchor deck
- Clarke Chapman deck winch – Complete and install on well deck

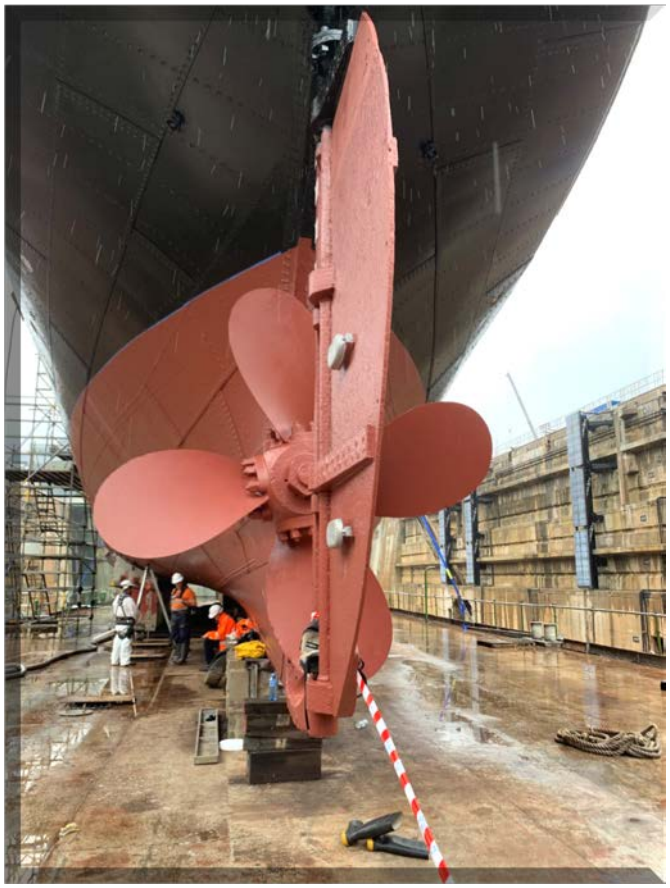
The above list defines current work that matches available funds, materials and workforce. This draws from the detailed MS Project plan, which is used to plan the entire project.

There are grant applications in train for work on boilers, uptakes and funnels that may shape the above list.

Sydney Heritage Fleet and the John Oxley team thank PB Trust for their massive support for our project over the years and look forward to continuing our shared work to completion.

Images above: The Sea Heritage Dock has landed on the bilge blocks in the Captain Cook Graving Dock, Garden Island and the John Oxley is ready to be relaunched once the Graving Dock is flooded.





Images above: The Thales Team are removing the Sea Heritage Dock Flooding Ports to allow the John Oxley to lift off (Relaunch) when the Dock is Flooded.

Images above: John Oxley passing under the Sydney Harbour Bridge after the vessel was relaunched at Garden Island. Should note the John Oxley is being pushed by Ausbarge tugs who donated their tugs and crew.