

McLennans

Diving Service



- Marine Contractors

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To Martin Dawson
Department of Crown Lands

From Alan McLennan
Project Manager

LTMMMP Inspection of ex-HMAS Adelaide wreck

12/7/2018

Thank you for asking us to inspect the ex-HMAS Adelaide in order to carry out the requirements of the Long Term Monitoring and Management Plan (LTMMMP) for structural condition monitoring. Our last inspection was on 13th April 2017.

The Dive Team was supervised by myself and Jarod Eriksson with the two other divers being Louis Dupressoir and Daniel Fell. All the divers hold ADAS Part 2 or 3 qualifications and are experienced ship inspectors. The diving equipment used was SCUBA and the breathing gas was Nitrox 32%. We dived from our 2C surveyed boat "Sea Hunt" # 21081, in two separate buddy pair teams. We made two full sweeps of the vessel and observed the major monitoring points listed in LTMMMP Sec 2.1.2, We did not attempt to visit every space in the wreck. The depth of the diving was limited to 30 metres in order to maximize our dive time and comply with AS2299.1.2007 Section 6. This depth allows the divers to descend to just below the main deck line and observe the hull down to the seabed. The sea state was calm. There was no current and visibility was about 6 metres. In short it was ideal conditions for the inspection.

Structural Integrity (ref LTMMMP 2.2.2)

The wreck can be divided into two halves. The upper section above the main deck is the aluminum superstructure, which holds the mast and bridge area. The lower section from the main deck to the keel, is the steel hull, which contains the machinery and living spaces.

Steel Hull – Observations –

There has been no change in the steel hull since our last inspection. There was no sign of any cracking or deformations. The main deck is level with no signs of warping. The hull has a uniform coverage of marine life with very few signs of corrosion outbreaks.

The hull was fully supported by the sand. There was no scouring observed. The sonar dome was just visible at the bow and the duck tail was just covered on the stern. The sand level was very close to the ship's waterline. This is unchanged from last year

Aluminum Superstructure - Observations

The aluminum superstructure has suffered from major deterioration in the last twelve months and it appears that this will continue at an ever increasing rate in the future. During this inspection we observed wide spread cracking, corrosion breakouts, missing and swinging panels, collapsed structures and partially blocked passage ways.

The specific locations of the deterioration are:

1. The Port Side Helicopter Hangar Wall – The entire hangar wall has cracked on two sides and all of the aluminum sub frame members have sheared from their connections with the main deck. We observed that the wall was moving backwards and forwards over 150mm in the gentle swell. The failure of this wall is mirroring the failure of the starboard wall which broke away during a storm event in May 2015. I expect that this wall will also break away soon, probably during the next East Coast Low.

2. A three metre wide by two metre high section of the port side outer wall on 01 deck has broken out amidships and is laying on the main deck. This has allowed the swell surge to enter the compartment and this has dislodged numerous large sections of aluminum paneling which are laying loose in the compartment. It is possible these loose sections which are several metres long may impact recreational divers if they move about in larger swells. They were not moving during our inspection.
3. A three metre wide by a half metre high section of the starboard side outer wall on 01 deck just below the bridge has broken away. A larger section of wall above it is flexing in the swell, and will probably break off soon. Inside the compartment the water movement has caused internal walls to break and numerous aluminum panels are loose inside.
4. The horizontal roof panels on 02 deck have a large number of white corrosion deposits visible and some show signs that the panels have cracked. A number of panels were loose and flexed apart when pushed by hand.
5. Internally numerous aluminum panels were laying loose in the passageways. This has not been the case previously.

I conclude that the aluminum superstructure has reached a point, after seven years of relative stability, that that loose and swinging panels can be expected to appear in the passageways regularly.

LTMMMP Monitoring Locations

The Divers made note of the monitoring items listed in the LTMMMP Locations 1 to 6.

Location 1 – the hull plating on the forecandle just aft of where the GMLA launcher. There has been no deterioration in this area.

Location 2 – amidships at the base of the forward screen (where the superstructure and hull are bonded together) – There is no visible deterioration in this area. There is no sign of any separation between the forward screen and the hull.

Location 3 - at the vertical midpoint of the main masts –The entire main mast was examined. The mast is heavily encrusted with marine life restricting a detailed examination. However no sign of cracking or deformation was observed. All parts of the mast remains straight and true. The feet of the masts were also closely examined and no sign of cracking or deformation were observed.

Location 4 – the connections of the masts to the 02 deck. There is no sign of any deterioration ion the legs. No cracking or deformation was observed.

Location 5 – the hull plating on the transom – The transom area has changed very little since the sinking. It was noted that a number of the handrails have broken away in the last year

Location 6 – where the helicopter hangars are attached to the hull. In May 2015 the starboard hangar wall suddenly broke way and fell to the seabed. As noted previously the port side wall is about to fail also. However the main framework of the hanger is steel and this is still securely attached to the main deck. This frame shows no sign of failing.

Internal Debris

As noted previously there are numerous collapsed internal panels littering the passageways in 01 deck. These have presumably been dislodged by surge coming through the new openings in the port side walls.

2.1.3 Vessel Stability – The vessel's list was checked by measuring the water depth on opposite gunwales amidships. And by measuring with spirit level. We found that there is an 800mm difference between the two sides of the vessel which is equivalent to a 4 degree list to port. This is unchanged from previous years.

2.1.4 Vessel Position and Vessel Settlement –

There has been no change since last year. The vessel's position is unchanged since our last inspection. The trim is unchanged based on our check of the water depth at the bow and stern. The vessel has not moved its horizontal position which we confirmed by testing with a GPS.

Corrosion

There was no signs of corrosion observed in the steel hull. The aluminum superstructure has displayed numerous corrosion breakouts characterized by white deposits, especially on the external horizontal surfaces. This was not observed in this quantity in previous years.

Barred off and Restricted Areas

The wreck was originally fitted with eighty nine "barred off" areas that were designed to prevent divers entering spaces that were considered unsafe for SCUBA diving. The contributing factors that made barring off necessary were; extremely narrow passageways, no other exits and a danger of a zero visibility "silt outs" in the confined space.

The "barring off" was done in two ways. Method 1 was for smaller steel openings, a solid steel bar was welded across the opening. For more complex shapes Method 2 was used, a layer of "weld mesh" was cut to shape and welded into position. These methods are illustrated on pages 25 to 27 of the LTMMP.

The barred off areas are found in all parts of the ship but particularly in the lower deck spaces. It was not possible to inspect all of the barred off areas during the current inspection. This would take a number of additional days. However during this inspection and on previous inspections we observed that passageways barred off using Method 1 are still barred off. The areas barred off using Method 2 have mostly failed because the weld mesh was thin and the welds to the ship have broken away due to the force of the swell surge and corrosion.

In the upper decks (1, 01, 02,03) many of the aluminium partitions have been "blown out" and this has resulted in some "barred off" areas being washed away. There are no meshed areas left intact in these areas. In the lower decks (2, 3, 4, 5) the wall partitions are mostly still intact but the mesh is mostly dislodged.

The risk to divers of these meshes being dislodged would be low. This is because they are located in areas below 30 metres of water, and they do not look as they did when the vessel sank. All the paint work has now disappeared and marine growth covers every surface, which reduces access even further. So what might have been an enticing passageway for a shipwreck devotee at the time of the sinking, is now very uninviting. Only an advanced diver would make it to these areas now, and they could only enter them if they were determined. There is no possibility of entering these areas accidentally.

To replace these barred off areas would be impractical due to the very limited time available for diving at depths of more than 30 metres and the very high cost. A better alternative would be to alert those divers who are venturing below 30 metres that the barred off areas may no longer be protected.

Marine Life

The marine life has continued to increase in diversity and density every year since the sinking. All previously observed species were again seen. However this year we were entertained by a very inquisitive seal which appeared to have taken up residence and followed us through our dives. In addition this year we noted an increased quantity of snapper, blue morwong, silver trevally, groper and long fin pike.

The fixed life has continued to increase and the helicopter deck is no becoming a home to many mature sponges and anemones. The fixed life on the masts in particular has increased in diversity and is quite spectacular.

This year for the first time the divers noticed quite a few marine snails such as volutes and dicathais

Conclusion about Structural Integrity

- The position, trim and list of the vessel are unchanged since our last inspection in April 2017
- The steel hull is unchanged since our last visit

July 20, 2018

- The aluminum superstructure has deteriorated greatly since our last visit and numerous loose panels are laying in interior passageways. In addition several panels including the portside hangar wall are at the point of failing and breaking out. Numerous corrosion breakout are visible.
- The barred off areas have deteriorated and failed especially in the upper decks.
- The marine life has increased in diversity and density.

Attached: following are photographs which illustrate each part of this inspection.

Thank you for asking us to undertake this inspection, regards,



Alan McLennan
Project Manager



Missing panels on the port side. A similar panel is missing from the starboard side

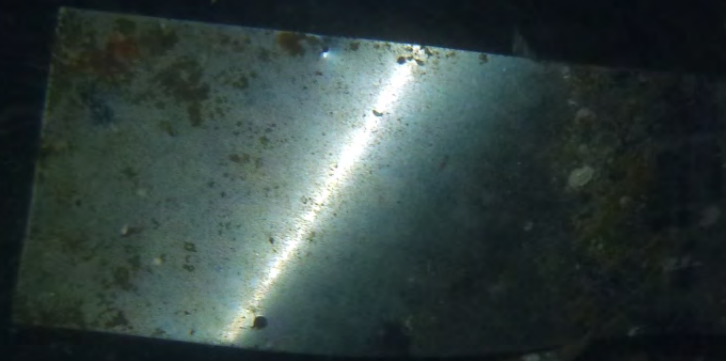
Area of broken frames and panels on the hangar wall

The missing exterior wall panel on 01 deck, port side. It is approximately 3m long and 2m wide. The opening has allowed swell surge to dislodge fitting inside,

The missing wall panel on the starboard side almost opposite the missing panel on the port side. The panel remaining above it is flexing heavily and will soon break off.

Some of the loose wall panels which are littering some of the compartments on 01 deck

Another view of loose wall panels inside the compartments on 01 deck



A smaller piece of stainless steel sheeting loose in the main deck compartments

This is the lower aft corner of the portside hangar wall, viewed from the inside. The panel was swaying backwards and forwards 150mm when we visited.

This is the portside hangar wall showing the break at the first frame member. Refer to next picture to see the degree of movement

Hangar Wall frame

Gap

Main Deck

12/7/2018

This is the same spot as the last photo, but a few moments later. The hangar entire wall is moving 150mm in the gentle swell

Main Deck

Hangar Wall Frame

This is the forward lower edge of the port hangar wall. The panel is broken right up to the bulkhead.

ex-HMAS Adelaide

This photo shows the missing starboard hangar wall. The port side wall will also soon break away

Hangar Steel Frame



This is one of the steel frames that hold up the hangar. It shows the connection to the main deck. The steel frame remains soundly attached to the steel hull.

Main deck





This photo shows one of the methods used for determining the list.

The list is unchanged since last year.

Approximately 4 degrees to port.

These are the handrails at the stern. The stern is mostly unchanged and has become richly colonised with sponges and anemones.



A view across the transom from starboard to port. There is little sign of deterioration in this area

ex-HMAS Adelaide

All mast components are intact and no sign of cracking or corrosion. The density and diversity of marine life on them has increased again from last year



One of the mast connections to 02 deck. All connections are sound and unchanged form last year

ex-HMAS Adelaide

Looking up the main
mast from 02 deck

A large number of white corrosion deposit breakouts were observed in the aluminum decks

The crack across 02 deck at the lift shaft which occurred shortly after sinking remains unchanged.



The main deck
around the GMLA
launcher. there is no
visible deterioration in
this area.

A second view of the GMLA launcher. Since last year the area has become colonised with sponges

ex-HMAS Adelaide

One of the many
sponges near the
GMLA launcher



The "Captains Chair" is still in place on the bridge but the coverings have gone leaving just the frame.

One of the species of sea snail observed on the main mast



a Volute shell grazing
on the sponges at the
transom



The vessel has attracted more fish life than observed during previous inspections.

ex-HMAS Adelaide

Silver Trevally were present in dense schools on 02 deck



ex-HMAS Adelaide

This large fur seal followed the divers throughout their inspection. It was observed eating several fish.



Sponges have
become well
established on the
stern

