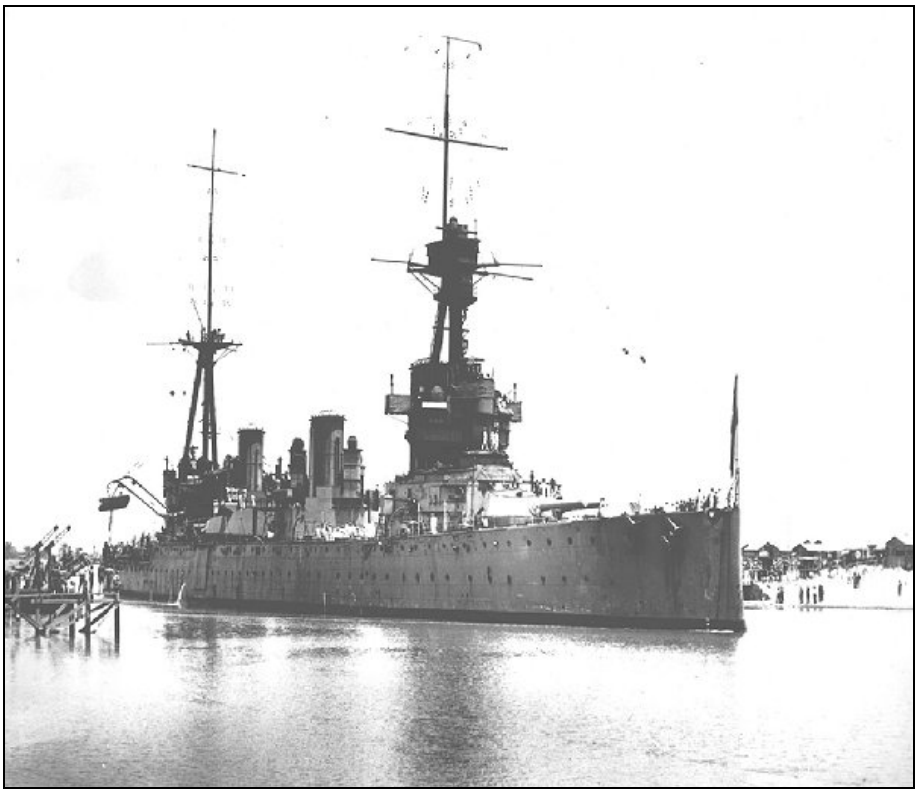
Battlecruiser
HMAS Australia (1)
(1910 - 1924)

WRECK INSPECTION REPORT



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NSW Department of Premier and Cabinet
Maritime Heritage Unit
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Figure 1 (Cover): *HMAS Australia* heading home through the Suez Canal after serving in WWI (Photo: RAN Webpage http://www.navy.gov.au/File:Australia1.jpg)

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Abbreviations

ANMEF	Australian Naval and Military Expeditionary Force
AO	Order of Australia
BL	Breech Loading
CGG	Commonwealth Government Gazette
CNF	Commonwealth Naval Forces
CSC	Conspicuous Service Cross
DMS	Defence Maritime Services
EAC	East Australian Current
HMAS	His Majesty's Australian Ship
HMS	His Majesty's Ship
HMVS	His Majesty's Victorian Ship
IJN	Imperial Japanese Navy
MV	Motor Vessel
Pdr	Pounder
QF	Quick Fire
RAAF	Royal Australian Air Force
RAN	Royal Australian Navy
RANAS	Royal Australian Naval Air Service
RMS	Royal Mail Ship
RN	Royal Navy
ROV	Remotely Operated Vehicle
RSL	Returned Services League
SMS	Seine Majestäts Schiff (German: His Majesty's Ship)
USN	United States Navy

INTRODUCTION

In 2002, the (then) NSW Heritage Office became aware that Fugro Australia had accidentally discovered a very large shipwreck off Sydney in 400m during a remote sensing pipeline survey for a telecommunication route in 1990. The site was suspected to be that of the former Australian warship, the battlecruiser *HMAS Australia,* which was deliberately scuttled 50 km east of Sydney Heads in 1924.

This report details an initial inspection of the shipwreck site undertaken on 18 March 2007 at the request of the Heritage Office (now Heritage Branch, Office of Environment and Heritage). The preliminary photographic inspection was undertaken by a remote operated vehicle (ROV) by Defence Maritime Services (DMS) under the direction of the Royal Australian Navy (RAN). The survey was coordinated by Tim Smith, Maritime Archaeologist (now Deputy Director, Heritage Branch), and is a part of the agency's role in administering the State's component of the National Historic Shipwreck Program (NHSP).

Interpretation of the results of the photographic inspection definitively proved that the wreck is that of the former *HMAS Australia*. A back ground history of *HMAS Australia* and other World War One battlecruiser sites is included to assess the significance and make management recommendations for the site.

The work at this wreck is ongoing in nature, in line with continued historic research and archaeological inspections of related sites internationally. As such, the findings presented here are preliminary in nature. Future work might revise details contained herein.

This report was written and compiled by Dr Brad Duncan, with contributions by Tim Smith and Stirling Smith.

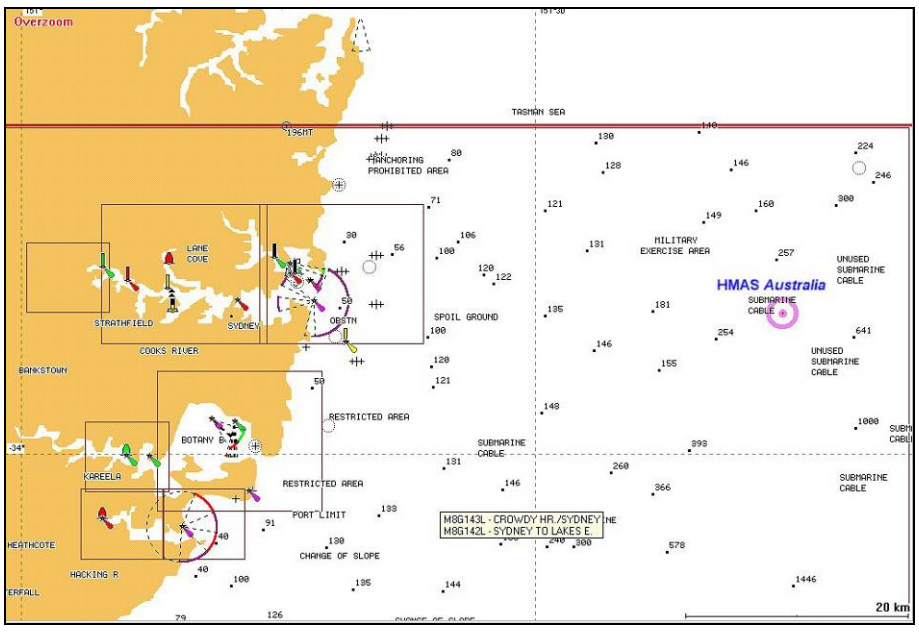

Figure 2: Location map of *HMAS Australia* scuttling site (Image: Manly Hydraulics Laboratory).

AIMS

In 1990, a very large steel ship was accidentally discovered during a remote sensing survey of the seabed undertaken for a submarine telecommunications cable route. The shipwreck was later reported to the Heritage Branch (formerly the NSW Heritage Office) on 7 June 2002. The survey had located an unidentified shipwreck on the seabed in 400m of water some fifty kilometres east of the entrance to Sydney Harbour, Australia. At the request of the Heritage Office, an inspection of the site was undertaken on 18 March 2007 using a remotely operated vehicle (ROV) from Defence Maritime Services (DMS) under the direction of the Royal Australian Navy.

The photographic investigation's key aims were to inspect the site with a view to providing positive identification of the wreck, which was suspected to be that of the former Australian battlecruiser *HMAS Australia*, and to assess its condition and preservation.

This report will provide an overview of the findings of the inspection. The aims of this report are:

- provide background historical research of *HMAS Australia*;
- provide a summary of the results of the initial photographic survey;
- record an accurate position for the wreck;
- provide positive identification of the wreck;
- provide a baseline preliminary inspection to enable later assessment of the site formation processes and guide any later surveys;
- assess the physical condition and possible risks to the wreck site;
- to assess the site's heritage significance;
- to consider the implementation of site protection measures under the *Historic Shipwrecks Act*, 1976;
- provide management recommendations

HISTORICAL BACKGROUND

Formation of the Australian Fleet

Australia's navy was built upon the backbone of vessels already acquired by the individual colonies under the provisions of the *Colonial Naval Defence Act 1865*. This enabled the individual states to acquire, maintain and use their own naval vessels, which consisted mainly of gun and torpedo boats used for port and coastal defence. These vessels were supplemented with mainly redundant British naval vessels from the Australia Station, which formed part of either the Australia Auxiliary Squadron or Imperial Squadron. Under the *Australian Naval Defence Act 1887*, the British gave an undertaking to supply a fleet of five cruisers and two torpedo gunboats for the protection of Australian Maritime trade, and defence of selective ports and coaling stations. From this time until the first half of the first decade of 1900, Australia's navy was focussed on the concept of using localised naval forces based around torpedo boats to defend against localised attacks on coastal towns, as opposed to full scale invasions (Mortimer 1986:21, 22).

The Australian State Governments transferred control of their individual colonial navies to the Commonwealth government on 1 March 1901, but were administered by each state's legislation until the *Commonwealth Defence Act 1903-1904* was proclaimed. In 1901, the Naval Commandant of Queensland (William Creswell), advocated that Australia was only safe from attack as long as the British maintained its naval supremacy in the East. When Edward Barton sought naval advice from the Rear Admiral Beaumont (Admiral in charge of the Australian Station), he received a response that Australia should continue to rely on the Royal Navy (RN), and that Australia should increase its financial contribution to maintaining its presence in the region. Although Creswell reiterated to the Defence Minister that Australia should follow-up on the 1887 Naval Agreement, specifically to focus on acquiring the promised four cruisers designed for Australian conditions, as opposed to increasing contributions to Britain's fleet which did nothing to strengthen Australia's control of its own defence. Creswell argued that whereas RN vessels which were designed to sail long distances for lengthy periods, and were subsequently lightly armed, a ship specifically built for Australia's regional conditions could dispense with large fuel and store areas to include greater arms and armament (Mortimer 1986:23).

In March 1902, Australia's first Defence Minister, Sir John Forrest warned Prime Minister Edmond Barton that Australia's Auxiliary Squadron Fleet was inadequate which left Australia exposed to attack by powerful long range cruisers being constructed by France and Russia. Forrest warned that the Australian ports faced the prospect of being held to ransom by these vessels, and that the current fleet would be forced to flee into the harbours or be sunk. However, Forrest did not recommend the creation of an independent Australian Navy, as he felt that a small independent force would be inefficient and expensive. He suggested an extension to the existing agreement with the British and that the current vessels should be upgraded (Stevens 2001:13).

Under the terms of the *Naval Agreements Act (1902-03)*, Australia and New Zealand agreed to act as part of a Royal Naval presence in the region for the next ten years. Although Australia's Auxiliary Squadron was abolished as a separate entity, the Admiralty agreed to maintain a squadron strength presence in the Western Pacific which was based around Australian ports, but which was still controlled by the British Commander-in-Chief of the China Station. Although the agreement also included

eight annual naval cadetships whereby Australians and New Zealanders would be trained as officers, it was not well received by Australians who felt a loss of ownership of the Australian Squadron which might be located overseas in times of need. Although objections were raised by both sides of Parliament and many believed that Britain's contribution to the Squadron only totalled half of the annual expenditure required, the agreement was eventually ratified (Stevens 2001:13).

During the following decade, international developments reiterated Australia's exposure to attack from small groups of armed cruisers (Mortimer 1986:21). The increased might of the Imperial German Navy posed the greatest risk to the British Empire, leading Britain to concentrate her resources in Europe and leaving commerce in the seas around Australia unprotected. The flagship of the German East Asiatic Cruiser Squadron based in China, the modern armoured cruiser *Fűrst Bismarck* was far superior to any British warship on the Australia station. This fact was emphasised in the German Squadron's war orders, which highlighted the presence of the vessel on retarding shipping movement and its subsequent effects on trade and the local economy (Stevens 2001:14).

Despite the 1902 Anglo-Japanese Alliance, the growing Japanese Imperial Navy presence in the region raised further concerns for Australian security. After the Japanese victory over the Russian fleet at the Battle of Tsushima, the British withdrew their five pre-dreadnought type battleships to Europe and replaced several of the Australian Station warships with inferior cruisers. These actions led to a perception within the community that it was being abandoned to the Japanese, resulting in calls for better protection of Australia (Stevens 2001:14).

At the Imperial Conference in 1902, delegates agreed to the new *Naval Agreement Act 1903*, and consequently it was agreed that the Australian Station would be increased to one first class armoured cruiser, two light cruisers, four third class cruisers and four sloops. These vessels could be deployed anywhere in the East Indies region where the Admiralty thought risks to Australia and New Zealand may exist, and Australia was to provide assistance totalling £20 000 (Mortimer 1986:23).

Over time, the notion of an Australian Navy, manned with local recruits for coastal defence under the Executive direction of the Commonwealth began to attract increased support. The proclamation of the *Commonwealth Defence Act in 1904*, led to the creation of the new position of Director of Naval Forces (with Captain Creswell being appointed) in December the same year. A Board of Naval Administration was also established in 1905, which consisted of Creswell, the Minister for Defence (J. McCay – President) and Financial Member (J. Thompson). Creswell and McKay (a former citizen soldier) disagreed on several issues, including the need to establish land forces prior to creation of a navy, and the comparatively higher rate of expenditure allocated to army as opposed to the navy. Creswell reiterated that the most efficient deterrent for an enemy cruiser attack was an adequate navy, and that that as the nation had virtually no internal communications between the States aside from shipping, any attack would cripple industry and lead to economic ruin (Mortimer 1986:21-23; Stevens 2001:15).

In 1905, the British government withdrew their battleships from the China Station to Europe, and henceforth maintained no permanent battleship presence in the Far East (Mortimer 1986:23). In 1905, Creswell recommended that three all weather cruiser-destroyers, 16 torpedo boat destroyers and 13 torpedo boats be purchased over a five year period at a cost of approximately £1.8 Million. He advocated that it was imperative that these vessels be able to operate in all weather conditions and to the limit of their range, as any defence centred on major coastal ports left large

sections of the country open to attack. With a change of government later that year, he submitted a revised version of this plan to the new incoming Defence Minister (Playford), who sent Creswell to Britain in 1906 to examine current naval developments and doctrine. Creswell's ideas were met with scepticism by the Committee of Imperial Defence, who advocated that an expanded Australian Navy would have no strategic justification as Great Britain would send an attack force in response to any raider attack on Australia. They indicated that Australia should continue to operate under the auspices of the 1903 Naval Agreement (Mortimer 1986:24, 26; Stevens 2001:15:16).

Despite his proposal's dismissal in the UK, Creswell refined his plans. In September 1906, he advocated a force of four ocean going destroyers, which would police the sea trade routes between Fremantle east to Thursday Island, and a fleet of 16 smaller coastal destroyers and four torpedo boats which would protect the major ports. In the event of a raider attack, all vessels could be summoned via wireless radio communications to respond as a cohesive unit. The proposal was supported by Prime Minister Deakin, who was already concerned that the local defence of Australia had become a secondary interest to the British. In September 1906, he announced an initial three year program to build eight coastal destroyers and four torpedo boats, but deferred funding until after the forthcoming election due the next year, when the plan's components would be reviewed in light of current naval technology and doctrine. He further pointed out that the threat to Australia had increased due to the growing German naval presence in the Pacific, and that the country would be exposed to attack if Britain were to lose control of the seas (Mortimer 1986:26, 27; Stevens 2001:16).

Although the British Admiralty changed their position in 1905 to support the concept of an Australian Navy, predominantly due to growing financial pressure burden on the British to provide colonial defence, they were overruled by the Colonial and Foreign Offices. Furthermore, with the appointment of Admiral Sir John Fisher as First Sea Lord in 1904, the Admiralty began to review naval strategy. Following hard on the heels of the revolutionary battleship *Dreadnought,* Admiral Fisher proposed new approaches to naval engagement which included the use of flotilla defence networks and a new concept of battlecruisers. Fisher proposed the concept that small tactical units consisting of new battlecruisers armed with multiple battleship calibre guns, which sacrificed armour protection for long range and speed (a fatal flaw which was revealed most notably at the Battle of Jutland in 1916). He advocated that these vessels could be used in conjunction with several high speed light cruisers as a semi-independent force to protect colonial interests in areas where more heavily armoured battleships were not present. Despite initial limited acceptance of his ideas, Fisher finally convinced the Admiralty in 1907 to encourage Australia to undertake construction of smaller warships which could not be provided by Britain (Stevens 2001:16, 17).

Inconsistencies in advice from the Admiralty regarding the best forms of local defence for the Commonwealth colonies did not help the situation. In May 1906, the Admiralty determined that naval forces comprising predominantly of destroyers were ineffective for coastal defence or trade protection, but this advice changed again in 1907, when it was suggested that a small fleet of submarines would offer the best defence (Mortimer 1986:21).

In late 1907, Prime Minister Alfred Deakin upset the British when he independently invited the American Great White Fleet to visit Australia in 1908, a move which may have been an attempt to force the issue of Australia's naval defence, as well as to garner advice from the Americans. The fleet visited Sydney, Melbourne and Albany,

drawing larger crowds than those previously seen at Federation celebrations (Stevens 2001:14). An officer from the visiting fleet commented on the Australian Squadron fleet that: "*These vessels were, with the exception of the Powerful* (British Flagship), *small and unimportant*" (Reckner 2001:191).

Following discussions at the 1907 Imperial Conference, and with the Admiralty, Deakin modified the structure of the planned naval force to include nine small submarines and six coastal destroyers. Senior officers were sent to Britain, Japan and the United States to obtain plans and estimates for building the planned warships. Plans for building a fast 700 ton destroyer designed for Australian oceanic conditions were drawn up by naval architect Professor John Biles, which became know as the River Class Destroyers. Although Deakin lost office in 1908, his successor Andrew Fisher continued the venture when he announced a three year scheme to produce 23 destroyers for coastal and harbour defence, as the Australian government became increasingly aware that Britain could not be relied upon in times of war to defend Australia in times of need (Mortimer 1986:21, 27; Stevens 2001:17,18).

Captain R. Collins (Australia's naval representative in London) called for tenders for the first three destroyers, *Parramatta*, *Warrego* and *Yarra*, with the successful tender awarded to two Scottish shipyards at a cost of £81 500 per ship. The first vessel launched on 9 February 1910, *Parramatta*, was described as "the First Born of the Commonwealth Navy", but had been built under the provisions of the *Colonial Defence Act 1865*. Crews from the first Australian contingent for the new vessels were sent for training with the Royal Navy's specialist schools in communications, gunnery, engineering and torpedoes. The *Parramatta* and *Yarra* were commissioned on 10 September 1910 at Greenock, and sailed from Portsmouth a week later under the command of Captain Ticknell (former Naval Commandant of Victoria). The vessels temporarily remained under the control of the Royal Navy until they arrived at Broome on 15 November, where they were transferred to the Australian Commonwealth Naval Force (CNF). *HMAS Warrego* was commissioned in 1912 under Commander F. Hyde (a former Royal Naval Reserve commander in the Merchant Navy), who also took command of the flotilla (Mortimer 1986:21, 30; Stevens 2001:17-19).

In March 1909, the news of an increase in the German battleship construction program led to alarm within the British Empire, as it was revealed that unless Britain increased production of her own battleships, the Germans could have numerical superiority over the seas by 1912. This led to the 1909 Imperial Conference, which discussed this issue and rising suspicion of Japanese intentions associated with the impending expiration of the Anglo-Japanese Alliance in 1915. When Deakin returned to power in June 1909, he sent Colonel Foxton (Minister without portfolio) and Creswell as his naval advisers, along with an offer to pay for battleship or any other such help that the conference recommended. Admiral Fisher advised the conference that there was a real danger that Britain could no longer guarantee sea supremacy, and that Australia may be in danger as a result of increased German and Japanese Fleets strengths (Mortimer 1986:21, 30, 31; Stevens 2001:19-20).

The conference delegates agreed that armoured vessels must return to the Pacific and Admiral Fisher took up Australia and New Zealand's offers to contribute to the cost of new vessels, stipulating that they should be battle cruisers. Admiral Fisher further suggested that the battle cruiser should form the nucleus of the new Australian Navy (consisting of three second class [light] cruisers, six destroyers, and three submarines) and that Canada, India and South Africa might also be encouraged to undertake a similar action. He again suggested his previous model of

using these fleets of tactical units based around mobile battle-cruisers and light cruisers, with localised defence flotillas of smaller destroyers, submarines and support vessels. He proposed that this combination was "small enough to be manageable in times of peace, but, in war, capable of effective action in conjunction with the Royal Navy, and that this idea would allow the British to leave defence of the Pacific Colonies to the dominions. The formation of an Australian Fleet Unit could then be used in conjunction with the East Indies and China Station Units, to form an Imperial Pacific Fleet (Mortimer 1986:21, 30, 31; Stevens 2001:19-20).

Foxton and Creswell were unprepared for this suggestion, and argued that Australia was unable to afford a battlecruiser, as there were other priorities at home for establishing local naval harbour defences and infrastructure ashore. After further discussions with Deakin, Federal Cabinet endorsed the proposal on 27 September 1909 as it not only transferred control of the Australia Station to the Commonwealth, but it also gave came with the ownership of all imperial shore and dockyard facilities. The *Naval Loan Act 1909* provided the funds required for the purchase, and the tender to build *HMAS Australia* was awarded to John Brown, Clydebank shipbuilder in December that year. Tenders were subsequently approved for the building of the light cruisers *Melbourne* and *Sydney* in October 1910, submarines *AE1* and *AE2* in December 1910 and later for an oiler (*Kurumba*) and depot ships (*Platypus*) (Mortimer 1986:31; Stevens 2001:20-21).

When the Fisher government returned to power in April 1910, the Prime Minister instigated steps to refuse British financial assistance to build the vessels and to fund their construction from the Commonwealth budget. This led to the proclamation of the *Australian Defence Act 1910* in November, which provided the legislative mechanism for establishing a navy. The Act outlined the provisions for creating a new Board of Administration, colleges and educational institutions, division of Permanent and Citizen Naval forces and other provisions of service. The Naval Board was replaced with the Australian Commonwealth Naval Board in March 1911. At the 1911 Imperial Conference, the Australian Commonwealth Government gained the right to decide whether its naval vessels would be placed under Admiralty control during times of war, but that if this were granted, then the ships could be sent wherever Britain dictated. The Permanent CNF was granted the title Royal Australian Navy (RAN) by King George V on 10 July 1911. On 5 October, the Naval Board announced that all naval vessels would be given the prefix His Majesty's Australian Ship (HMAS) and that the Australian blue ensign should be replaced at the stern with the Royal Navy's White ensign, and that the Australian Flag should be flown at the jackstaff (Stevens 2001: 21, 22).

In May 1910, the recently retired Royal Navy Admiral Sir Reginald Henderson was invited by the Australian government to provide advice on naval infrastructure. Henderson, a former dockyard administrator, advocated the gradual expansion of the Australian Naval force over the next generation, and that it should comprise of 8 battlecruisers, 10 light cruisers, 18 destroyers, 12 submarines and 15000 personnel by 1933, with at least two bases and submarine bases in each state to be built in the interim period. The Prime Minister instigated steps in March 1911 for NSW to construct the light cruiser *Brisbane*, and three torpedo boat destroyers *Derwent* (later renamed *Huon*), *Swan* and *Torrens*, although the first vessel was not completed until 1916 (Huon). The light cruiser *HMS Encounter* was loaned to Australia until *Brisbane* was completed, and the former was used for training local crews for the Australian fleet (Mortimer 1986:31, 32; Stevens 2001:22, 23).

Difficulty also arose in increasing the 400 men of the RAN to the proposed 3400, and the Naval Depot at Williamstown was designated as an interim training depot for

general entry recruits who initially signed up for 5 – 7 years of service. Admission to the seamen's entry program was restricted to those who had completed the Boy Seamen entry Scheme, whereby the old sailing hulk *Sobraon* was converted to a boys training ship and renamed *HMAS Tingira* in 1912. By June 1913, there were 2500 personnel in the RAN, with 900 additional seamen from the Royal Navy. All personnel in the RAN were eligible for duty in the RN, which offered scope to further develop their careers. In order to maintain and encourage Australian naval traditions and culture, the Royal Australian Naval College was temporarily established at Osborne House in Geelong in 1913, but was later moved to Jervis Bay in 1915 (Mortimer 1986:31, 32; Stevens 2001:22, 23).

Launch of *HMAS Australia*

By the time the order was placed with John Brown & Co. of Clydebank for the new battlecruiser, the 'armoured cruiser' envisaged by Admiral Fisher had been replaced by an improved version, one of the three-strong *Indefatigable* class. The keel of *HMAS Australia* was laid down 23 June 1910, and the finished vessel was commissioned just less than two years later on 21 June 1913. She was commanded by Rear- Admiral George Patey, who was to later become the first Flag Officer of the Australian Fleet. When King George V inspected the vessel prior to its departure, he performed the first knighting ceremony since the time of Sir Francis Drake, when he knighted Patey on Australia's quarterdeck deck. Despite over half the crew being British, the ceremony had a distinctive Australian culture, and after the official ceremony, a rating shouted "three cheers for Wallaby Land" (Steven 2001:26).

In July 1913, *HMAS Australia* sailed in company with the new light cruiser *HMAS Sydney*, and proceeded via Cape Town and Simon Town to Jervis Bay, NSW. They were joined there by the cruisers *HMAS Melbourne* and *HMS Encounter* (on loan from the Royal Navy), destroyers *HMAS Parramatta*, *Warrego* and *Yarra* for the official entry into Sydney Harbour. Hundreds of spectator craft joined the flotilla and hundreds of thousands of people lined the shore. As the flotilla entered the Harbour, Admiral Sir George Kinghall RN lowered his flag on *HMS Cambrian*, thus signifying the end of British control of the Australia Station and the coming of age of Australia as a nation. The ship was one of the largest vessels ever to visit Port Jackson and stirred up great nationalistic fervour as the nation could now defend itself:

> *The sight of her revealed the nation's dreadnought in all her beauty and majesty, no longer a thing to be looked at on a printed page, but a living sentient thing whose mission is to guard our shores and protect our commerce and trade routes. We do not look upon her as standing for war, but for peace which comes by being prepared for war* (cited from The Navy, April 1984:9 in Steven 2001:26).

Defence Minister Sir Edward Millen summed up the public elation:

> *Since Captain Cook's arrival, no more memorable event has happened than the advent of the Australian Fleet. As the former marked the birth of a nation, so the latter announces it's coming of age* (RAN 2011).

HMAS Australia was fitted with four 12 inch gun turrets, with two fore and aft on the centreline at the bow and stern, with a second pair "en echelon" amidships. The design of the superstructure of the vessel was altered to allow these latter turrets to have a ten degrees arc of fire over the opposite beam, which effectively meant that all four turrets could be brought to train on an enemy target at any one time (Gillett 1983:26).

The securing of an Australian fleet had been undertaken in just four years with the assistance of the Royal Navy. The RAN had inherited the great strategic naval traditions of the RN, but concerns were also raised that the Royal Navy discipline and the inherent English stratified social class system would not be well received by Australian citizens and potential recruits. This issue was to have consequences for the Australian crew later in her career. Furthermore, the RAN needed to develop more experience in how to run an effective navy in their own region, which was not always compatible with RN naval traditions and priorities. Australia's commitment to a new navy at the Imperial conferences in 1909 and 1911 was based on the expectation that the flotilla would be able to keep an enemy at bay until assistance arrived for the Imperial Pacific Fleet. However, after the retirement of Sir John Fisher, the British government failed to deliver on promises that other fleet units would be built, and the role of the RAN within the Imperial Navy was not finalised. Although the Naval Board began developing its own operational concept plans, the build-up to World War I (WWI) curtailed the development of any significant independent strategic planning (Stevens 2001:26, 27).

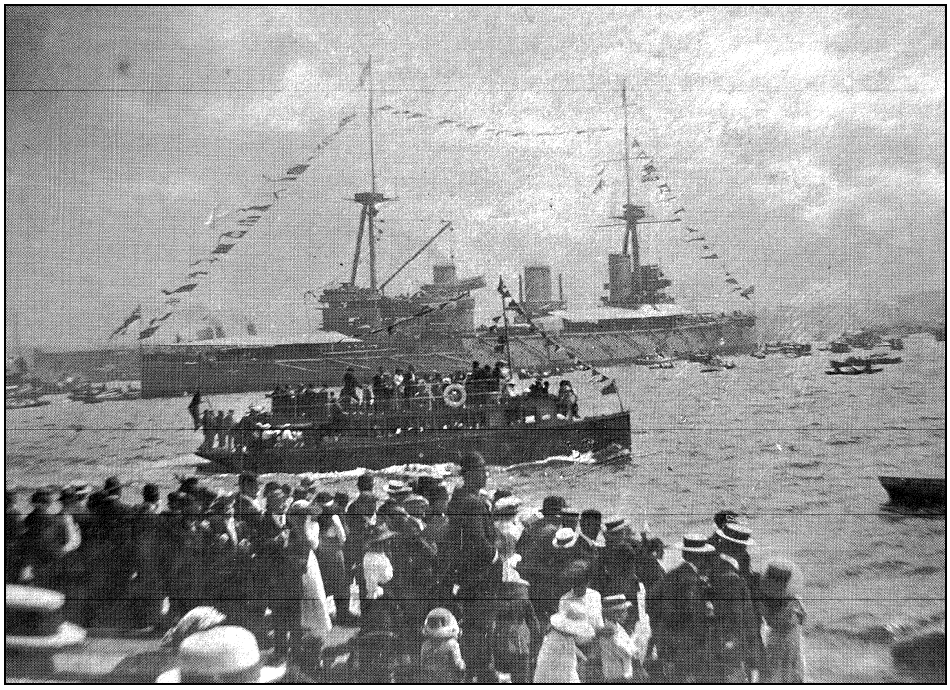

Figure 3: *HMAS Australia* arrives in Sydney Harbour on 4 October 1913 (Photo: from Stevens 2001:25)

War Service (WWI)

By 1914, the RAN had recruited 3800 men and had commissioned 16 ships. By the end of the War, this number had increased to 5000 personnel and 37 vessels.
Despite a large mortality/ injury rate in the Australian Infantry Forces (AIF) (65%) compared to 3 dozen in the navy, many Australians chose to enlist in the army (Stevens 2001:29).

After the assassination of Archduke Ferdinand in June 1914, Australia received its first warning of imminent war on 27 July 1914, when the Austro–Hungarian ultimatum threatened Serbian sovereignty. The Australian fleet received official orders by the end of the month to return to Sydney to replenish stores and prepare for possible war footing. By August 3, the Australian Government had committed a large contingent of soldiers to Britain and for the RAN to be placed under Admiralty control, which

meant they could be sent anywhere in the world where they were needed. This caused concern for the Naval Board, and Creswell sought council with the Defence Minister (Senator Millen) specifically to discuss the intended use of *HMAS Australia*. Although war orders called for her to be assigned to the China Station where other British warships were concentrating, she was also authorised to seek out enemy shipping in local waters prior to departure. The Australian Navy focused on intercepting the threat posed by the German East Asiatic Cruiser Squadron commanded by Vice Admiral von Spee. The fleet was headed by the armoured cruisers *Scharnhorst* and *Gneisenau* which had left Tsingtao as the European crisis worsened, and which remained un-located at sea (Stevens 2001:32).

When the British declared war on Germany on 4 August 1914, the RAN was primarily engaged in hunting for von Spee's fleet with the assistance of the Australian wireless telegraphy network that monitored radio signals to try to locate the fleet. Despite early signals, the lack of radio direction detection devices only allowed the approximate location of the flotilla to be plotted to within 300 miles north east of Papua. Patey gained permission to search the area around Rabaul, the Germans Colonial Capital where von Spee was most likely to shelter on his way south), and the Australian fleet moved northwards to intercept it. Patey's operational plan outlined a night torpedo attack on the harbour by destroyers, with *HMAS Sydney* blocking the entrance and *HMAS Australia* providing backup support against possible engagement with any heavy cruisers. Despite finding the harbour empty, the RAN had proved its efficiency by mounting a night raid within a few days of the outbreak of war (Stevens 2001:32, 34)

Hamilton, a doctor aboard *HMAS Upolu* described the presence of the Australian fleet: *We look very imposing and are of course a very formidable crowd… The* (*HMAS*) *Australia dominates everything and everybody, and is a splendid looking ship* (Hamilton 1914:24).

Von Spee had been pre-warned about the immanency of war, and, after deeming *HMAS Australia* to be of too great a risk to his squadron to approach the Australian coast, and being unable to wage cruiser warfare in East Asia due to the Japanese Fleet (which was an ally with Britain), had fled to east into the Pacific. He left the light cruiser *Emden* to harass commercial shipping in the trade routes of the Indian Ocean (Stevens 2001:32, 34).

With the outbreak of war, a coastal examination service was set up at major Australian ports. After a code book was captured on a German merchant vessel in August 1914, the Naval Board were able to decipher encrypted radio messages which pinpointed the whereabouts of von Spee's fleet, but the Admiralty's determination to centralise command led to lost opportunities to engage them. The Admiralty insisted that the Australian fleet escort various sorties to seize German wireless telegraphy stations in Samoa, Marshall Islands, Nauru and New Guinea, much to the consternation of the Australian forces who viewed these escort duties as detracting from doing the real work of hunting the German fleet. These frustrations brought home the fact that the decision making process was now firmly in the hands of the British Admiralty (Stevens 2001:34, 35).

In August 1914, the Australian Naval and Military Expeditionary Force (ANMEF) consisting predominantly of 500 naval reservists and 1000 volunteer infantry sailed on the P&O liner *Berrima* for Australia's first land engagement in New Britain. They were joined at Port Moresby by the Australian fleet, consisting of *HMAS Australia, Sydney*, *Encounter*, *Parramatta*, *Warrego*, submarines *AE1* and *AE2*, and five auxiliaries. They arrived at Rabaul on 7 September, where they quickly

overwhelmed the small German force that was based there. It was during this time that Australia suffered the first casualties of WWI: an Able Seaman of the Royal Australian Naval Brigade – Bill Williams (Cassells 2000: 20; Stevens 2001:35, 36).

Due to the presence of *HMAS Australia*, the German Governor soon surrendered the colony to the allied forces, and similarly a number of other German territories in the region (including Bougainville and mainland New Guinea) were quickly taken without resistance. Although these successes demonstrated the efficiency of Australia's naval warfare, it was considered an inefficient use for a battlecruiser. The RAN did not come out of the action unscathed, as the submarine *AE1* disappeared after failing to return from a patrol outside Rabaul, probably after hitting an uncharted submerged obstacle, experiencing a mechanical failure or being sunk by gunfire (Hamilton 1914; Stevens 2001:35, 36).

Following early defeats in Belgium, Britain called for reinforcements in Europe. The Australian cruisers *HMAS Melbourne* and *Sydney* were detailed to escort a contingent of the Australian Infantry Force (AIF) to Europe, leaving *HMAS Australia* to guard the Pacific against von Spee, whose position had been revealed at Samoa on 14 September. A week later the German fleet shelled Tahiti, but despite the Naval Board's recommendation that *HMAS Australia* give chase, the Admiralty ordered the vessel to patrol the waters off Fiji in case they returned.

In the meantime, von Spee joined two other light cruisers *Leizig* and *Desden*, and soon afterwards sank two British armoured cruisers in the Battle of Coronel off the coast of Chile, which was the first British loss of a sea battle in 100 years. Many in the Australian Navy believed that if *HMAS Australia* had been allowed to pursue von Spee, then the disaster could have been averted. The Admiralty immediately instructed Patey to assemble a force off Mexico to block any move northwards by the German fleet, and *HMAS Australia* were dispatched from Suva on November 8. However, von Spee made the mistake of sailing into the Atlantic and when he attacked Port Stanley on December 8, where four of his fleet were sunk by the British battlecruisers which had been dispatched to protect the Falkland Islands after the Coronel incident. Although the *Dresden* escaped the encounter, she was eventually sunk off Chile in March 1915 (Stevens 2001:36, 37).

The sinking of von Spee's squadron removed the German threat in the Pacific region, which allowed *HMAS Australia* to be reassigned to the European war theatre. In January 1915 the Australian warship intercepted and captured the German liner *Eleonora Woermann* which had been sent as a resupply ship for von Spee's squadron, but as Patey could not spare the crew or time to bring it to port, the vessel was sunk, much to the disgust of the Australian crew who resented the loss of a war prize (Stevens 2001:36-38; RAN 2011:6).

HMAS Australia arrived in Rosyth, Scotland on 17 February 1915, where she became the flagship of the new 2nd Battlecruiser Squadron, which formed part of Vice Admiral Beatty's self contained battle cruiser fleet consisting of *HMS New Zealand* and *HMS Indefatigable*. As Patey was senior to Beatty, he was transferred to the North America and West Indies (where he took control of *HMAS Sydney*) and was replaced with Rear Admiral William Pakenham. *HMAS Australia* was then assigned to a series of patrols and escorts throughout the North Sea, where she fired her only shot in anger at a suspected submarine in December 1917.

In April 1916 during a patrol to counter an attempted German raid on the coast, *HMAS Australia* twice collided with *HMS New Zealand* in heavy fog whilst engaged in evasive zigzag manoeuvring to avoid submarine attack. *HMAS Australia* remained

in dry-dock for several weeks as a result of the accident, and consequently was out of action when the 2nd Battlecruiser Squadron left for the Battle of Jutland on 31 May 1916. She was again involved in a collision with *HMS Repulse* on 12 December 1916, and as a result was in dock for 3 weeks (Stevens 2001:36-38; RAN 2011:6).

Aircraft Trials

Captain Dumaresq RN (later Rear-Admiral), who was later to take command of the Australian Fleet, took command of the cruiser *HMAS Sydney* in April 1917. During an investigative patrol a month later in the North Sea, *HMAS Sydney*, *HMS Dublin* and four destroyers were engaged by a zeppelin (*L43*). Despite a duel in which the ships fired their cannons and the zeppelin dropped bombs, neither side was harmed. However the incident drew attention for the need for the cruisers to be able to defend against aerial attack. In August 1917, *HMAS Sydney* was fitted with a rotating aircraft launching platform, which was successfully tested in December with a Sopwith Pup aircraft, and another was later also added to *HMAS Melbourne,* which were successfully tested in battle the following year (Stevens 2001:47-49).

HMAS Australia was used for further experimental testing of launching a non-seaplane aircraft onboard, when a Sopwith Pup biplane was flown from a platform built atop one of the 12 inch turrets in December 1917 (Gillett 1983:26; Australian Flying Corps 2003;). These experiments continued in March and May 1918, when a Sopwith Strutter 1 ½ was flown from a rotating platform into the wind, the first flights of a two seater aircraft from a battlecruiser. Following these tests, *HMAS Australia* henceforth carried a Strutter on the port P turret, and a Sopwith Camel on the starboard "Q" turret, but would occasionally travel with two Camel aircraft. Each platform had a canvas cover to protect the plane in inclement weather.

The operational use of these aircraft were instrumental in ensuring that nearly every British Capital ship was fitted with a Strutter for reconnaissance or a Sopwith Pup or Sopwith Camel as a fighter by the end of the war. The aircraft were continually used by the Second Battle Fleet for operational sorties until the end of the war. Although the Australian government attempted to purchase the aircraft used on her three cruisers at the end of the war to form a Royal Australian Naval Air Service (RANAS), this action was not approved, as it was assumed that the cruisers would be outfitted with aircraft as part of the RANAS formation. As a result of these actions, aircraft were never fitted to the Australian cruisers (Gillett 1983:26; Australian Flying Corps 2003; RAN 2011; Wikipedia 2011g).

The armament of *HMAS Australia* was also redesigned to reflect the threat of aerial attack. The number of four inch guns was also reduced during the course of the war, with a four inch anti-aircraft gun mounted atop the rear superstructure, with another four inch gun later added to the stern. The submarine anti-torpedo netting was also removed due to the problems it caused in action (Gillett 1983:26). With the growing threat of German raiders and submarines to Australian mercantile trade, Japanese cruisers supplemented allied patrols along the Australian coastline, much to the consternation of the public. (Stevens 2001:49).

Figure 4: View along the fore deck of *HMAS Australia*, showing 'A' turret with 12 inch guns, 4 inch guns behind, and a two seater Sopwith 1 1/2 Strutter biplane on a platform above the port turret. (Photo: Australian War Memorial Image # EN0010)

Figure 5: Crew on board HMAS Australia watch a Sopwith 1 1/2 strutter biplane aircraft taking off from the platform over the starboard gun turret. (Photo: Australian War Memorial image # EN0544)

In February 1918, 1 officer and 10 crew members from *HMAS Australia* volunteered for a commando raid against the Belgian ports at Ostend and Zeebrugge. Although the raids did not produce definitive results, they were great sources of propaganda, and several Australian were awarded medals for their distinguished service in the action.

War ends with the signing of the Armistice on 11 November 1918 after the German surrender. In an attempt to further humiliate their defeated enemy and demonstrate their might as victors, the British designed a final parade of the interned German Fleet across the North Sea to Scapa Flow. *HMAS Australia* was given the honour of leading the port line at the Head of the Squadron entering the Scapa Flow. These honours were bestowed by the British Admiralty as a mark of recognition of the Australia's naval contribution in the First World War. After the vessels were anchored, *HMAS Australia* was assigned specific guard duty of the battlecruiser *Hindenburg* (Stevens 2001:49-53).

Figure 6: Image by Arthur Burgess 1920 entitled "*HMAS Australia* at the surrender of the German fleet in the Firth of Forth" - Australian War Memorial Image ART00192)

Return to Australia

In January 1919, *HMAS Australia* was refitted at Portsmouth for the return journey to Australia (Sydney Morning Herald 30/1/1919:7). The Prince of Wales visited the vessel to wish the officers and crew goodbye on behalf of the King. Admiral Dumaresq had been recently appointed commander of the Australian Fleet (Barrier Miner 5/7/1919: 12). At the final departure ceremony for *HMAS Australia* on 15 April 1919, King George V thanked the Australian navy for their role in supporting the Empires naval victories, and that the RAN had demonstrated their mettle as a functional navy (Stevens 2001:53).

The vessel left Portsmouth accompanied by the cruiser *HMAS Brisbane* on 17 April, 1919, where they were farewelled by large crowds onshore and the crews of British warships in the harbour (Argus 23/4/1919:9). The vessels parted company in Aden, where the *Brisbane* was scheduled to tow one of the six J Class submarines which were being presented to Australia by Britain as surplus war stock. *HMAS Australia* was delayed for two days in case her assistance was required with this task (Western Argus 17/6/1919:12).

On her return home, *HMAS Australia* began a tour of Australian ports, starting with Fremantle on 25 May 1919, where they were welcomed by the acting Minister of the Navy, Mr Peyton. He expressed the thanks of the Australian people for the role the vessel's played in defending the nation:

> *The Royal Australian Navy has received its baptism of fire and officers and men have upheld the great traditions of our forefathers, and have proved that our race has in no wax deteriorated. The world owes its liberty today to the allied navies' decisive actions at sea, making it possible for the land forces to be reinforced with troops and all requisites for their operations*, Sydney Morning Herald 31/5/1919:18).

The Fremantle visit was the first time the vessel had been in Australia in over four and a half years, and hence the first time many of the crew had seen family and friends in a long time. As *HMAS Australia* prepared to leave the dock, stokers in the boiler room left their posts in protest of the short visit to Fremantle, and the vessel's departure was delayed. The vessel then made its way to Adelaide and Melbourne (Sydney Morning Herald 14/5/1919:10).

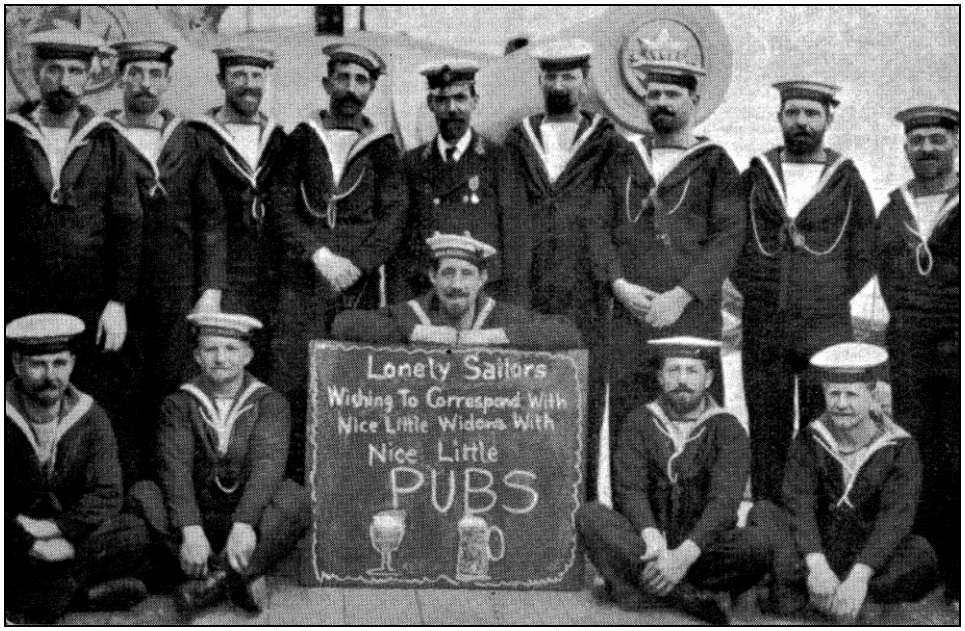

Figure 7: Ratings from *HMAS Australia* preparing to return home (Photo: Cerberus Museum)

In Adelaide, the local population was surprised when the vessel anchored off Glenelg instead of in the outer harbour, and their concern was further increased when it was announced that due to the account of the influenza epidemic, the local public would not be allowed on board. The real reason behind these actions was in response to the alleged mutinous behaviour in Fremantle which had delayed the vessel's departure (Western Argus 17/6/1919:27), which is examined in further detail below.

The vessel and her crew received warm welcomes wherever she docked. In Melbourne, the vessel gave a 19 gun salute for the Admiral on the *New Zealand*, and the latter replied with 11 guns (as accorded to a Commodore) (Western Argus 17/6/1919:12). 30 Officers and 450 petty officers and men marched through the streets to the cheers of the local residents, and the Commonwealth Government later hosted an official luncheon for the ship's officers and crew (Sydney Morning Herald, 12/6/1919:7). Similar scenes were experienced in Sydney. With the arrival of Admiral's vessel *HMS New Zealand* in Sydney Harbour on 21 June 1919, *HMAS Australia* was removed from the Flagship's mooring at Farm Cove to Burt's Buoy mooring in Neutral Bay (Sydney Morning Herald 21/6/1919:13).

The *HMAS Australia* Mutiny and Naval Reform

The refusal to follow orders by some of *HMAS Australia*'s crew in Fremantle was viewed as a serious breach of discipline by senior officers in the RAN. Local newspapers offered an explanation of the cause of the "mutiny". As the local people had so generously entertained the crew during their stay, the crew wanted to return the hospitality, and invited their local patrons onboard. However, when hoards of people arrived, the decks of the vessel were too inundated for the entertainment to be effective. The next day some of the crew asked Captain Cumberledge to delay departure until the next day so that they could adequately entertain their friends, but when he stipulated that the voyage schedules were already fixed, some men refused to obey an order to get steam up, and petty officers were forced to do the work.

HMAS Australia proceeded to sea, but the engines were stopped some distance out, and all hands were called on deck where they were read the riot act ("Kings Regulations") and ordered to return to work. As a result of these actions, Commodore Dumaresq decided to moor the vessel offshore in Adelaide. Prior to reaching Glenelg, an inquiry was undertaken and seven men were sentenced to 90 days imprisonment, and others were scheduled to be charged with mutiny (Western Argus 17/6/1919:27). The Acting Minister for the Navy stipulated that he was waiting upon a report on the Fremantle incident, and that he would make a decision on what further action should be taken after he had studied its contents (Western Argus 17/6/1919:12).

The incident was an embarrassment to the Navy, whose commanders insisted that maintenance of discipline was paramount for the efficient running of any naval force. Later, after an official investigation, 12 men were charged with mutiny, and five were subsequently court martialled for the incident and received 1- 2 years imprisonment at trial, including one Australian who had been recognised for valour at the battle of Zeebrugge. However, the circumstances surrounding the insubordination aroused much public sympathy, and calls were made for leniency from members of both the government and opposition (Stevens 2001: 56).

By July 1919, the sentences imposed for the breaches of discipline were being debated in State Parliament (House of Assembly), where MP's called for the Cabinet to request the Commonwealth government for remission or reconsideration of the strict sentences imposed upon the mutineers (Advertiser 17/7/1919:7). The matter was again raised in the House of Representatives in September, where the Minister for the Navy stated that discipline in the Navy must not be interfered with, and the matter should be allowed to rest, which drew much dissention from the opposition. Although an Admiralty review found that the sentences were not excessive, the sentences were halved on account of the offenders' youth. Calls for clemency by the Commonwealth Government to the Admiralty led to a full remission of the sentences by the end of the year, but as members of the Australian Naval Board had not been consulted, Fleet Commander Commodore Dumaresq and Rear-Admiral Percy Grant resigned in protest, both of whom argued that these actions would have serious consequences for naval discipline. They later withdrew their resignations only after agreement was reached to post an order throughout all the RAN that although the sentences had been repealed due to special circumstances, the original judgements had been justified and necessary (Steven 2000:57).

Although most of the court martial panel members were RAN officers, the "mutiny" incident had occurred before *HMAS Australia* was placed under Commonwealth control on 1 August 1919. Public concern centred around the issue that Australian

crews were being controlled by British officers, who were using the harsh and excessive standards of Royal Naval discipline. Arguments were raised that this was not appropriate in an Australian context, where the culture was less driven by social status and favoured egalitarian ideals. However, the RAN reiterated the importance of the highly sophisticated British disciplinary code, especially as it protected against any instances of arbitrary authority, which had led to the collapse of the German fleet (Steven 2000: 57).

This stance was reiterated when Admiral of the Fleet, Lord Jellicoe, was requested to report on the state of the Australian naval defence in 1919. He reiterated that Australian naval discipline was lax in contrast to the Royal Navy, as RAN officers first had to earn the respect of their crews before orders would be followed. The situation was further exacerbated by the poor standard of RN officers transferring to the RAN. He considered that the situation was being further inflamed by the local politician's inferences that Australians will not submit to authority, which could lead to the failure of the RAN due to ill discipline encouraged by political interference. The political inference with discipline issues and naval appointments from the RN to the RAN soured relations between the RAN and the government during the inter-war years, as it seemed the government did not comprehend that to build an effective naval force, officers needed to be coached and groomed to gain practical expertise (Steven 2000: 57).

The incident did, however, lead to improvements in the working conditions of naval ratings across the board. The RN introduced a system where ratings could elect an Advisory Committee representative, who then represented any concerns about their conditions to the Welfare Committee of Officers. These concerns were then passed to the Board of Admiralty for consideration. In 1920, after pressure from the Admiralty to adopt this model, the RAN Advisory Committee was formed and forwarded its initial requests from the ratings. However, due to refusal of many of the requests for various reasons, the system was viewed with suspicion by the ratings and officers, and although the committees met sporadically under different guises until 1935, they never received widespread support (Stevens 2001:58).

Naval Administration Post WW1

Despite the creation of the Naval Board in 1915, the Minister of Navy retained an active role in Defence issues in subsequent years, and often the Naval Board was not consulted or their professional advice was ignored. The situation became so bad that a Royal Commission was established to investigate the best way to run the Navy. The commission found that the Naval Board had been over worked and weakened by Ministerial interference, but the findings were disputed by the Cabinet subcommittee, who ruled that Ministerial responsibility would be undermined unless Ministers could intervene whenever they thought it necessary. The Naval Board were eventually given executive command of the fleet, and in 1920 it drew up its own rules of operation. Although the Navy Minister still retained executive override of all decisions, the Board members could express disagreement in writing. Despite some debate over responsibility, most Ministers did not actively engage in naval administration from that point onwards (Stevens 2001:58).

The Department of Navy was abolished on 21 December 1921 as the defence force was downgraded post WW1, when the RAN was placed under the Minister for Defence, which effectively removed its capacity to be heard in the political realm. This action had twofold consequences. As Ministers effectively no longer attended Naval Board meetings, the Board enjoyed a free reign in management of the RAN,

and they subsequently devised a board of administration to manage finance, infrastructure and personnel issues. As the Board limited exposure of their policies to other sectors of government to restrict ministerial interference, they inevitably further isolated themselves from prevailing public opinion, leading to heated disagreements with politicians from both sides. The Board's direct ties with the Board of Admiralty drove further wedges between the Navy and Army. By proxy, the Naval Board tended to act a pseudo representative of the Admiralty in Australia (Stevens 2001:59).

Prelude to Abandonment of *HMAS Australia*

In 1919, the Australian Government commissioned Lord Jellicoe to visit to undertake a report on the strategic defence of Australia. Specific consideration was given to the future requirements of the fleet and associated naval bases in the Pacific and East Indies, along with the structure and administration of the RAN. The removal of German Pacific territories exposed Australia to the danger of Japanese Imperial expansion, particularly in the Far East. He recommended that the best defence against the anticipated Japanese threat would be to establish a large base for an Eastern fleet comprising eight battleships and eight battlecruisers from Britain, Australia and New Zealand at Singapore. The proposed Australian commitment of an aircraft carrier and two battlecruisers was far too expensive given the economic restraint of the period, and demonstrated the Naval Board's lack of understanding of the political environment of the time, and the governments hope that the Jellicoe plan would replace the previous Henderson Plan to help reduce defence expenditure (Stevens 2001: 61).

In the meantime, Britain developed a post-war policy which was determined to down size defences to aid in economic recovery. On 15 August 1919, Britain approved the "Ten-Year Rule" policy, which directed the defence forces to base their future expenditure on the assumption that there would be no major conflict for the next ten years. This policy effectively let Treasury considerations dictate defence expenditure and hence defence policy. Although not adopted by the Australian Government, Australia was also invariably trying to reduce defence expenditure to cover its war debts, and hence actively avoided the implementation of any new defence policy. Although Jellicoe reiterated the need to defend Imperial trade as opposed to previous schemes to fortify coastal townships against bombardments, the lack of political direction inhibited the RAN's planning capacity for the post war era.

The economic cutbacks to the RAN budget led many officers to comment that Australia was now at risk and could again only be defended with British assistance. The financial situation further curtailed the Navy's plans to establish a naval air service, and a reduction of the fleet to one light cruiser, six destroyers and six submarines. By July 1920, Admiral Dumaresq labelled the RAN as "strategically impotent and tactically inefficient", and as his appointment ended with the RAN, he openly criticised the government and public for the reduction in the navy, a move which brought the ire of the Australian politicians (Stevens 2001: 61- 62).

Although Jellicoe's plan was not adopted both the British and Australian governments recognised the potential threat posed by Japan. A meeting with the British China and East India Stations led to the recognition that given there were no plans for a new Imperial Fleet, that the Main Fleet would be dispatched from Europe to protect British assets and Imperial trade. Furthermore, it was recommended that a defensive base should be established at Singapore supported by the RAN which would provide a diversionary force to stem any Japanese expansion in the interim

period until reinforcement arrived. At the Imperial Conference in 1921, the British conceded that the Australia's model of an independent but compatible dominion navy was the best policy for defence of the East Indies, as long as it remained under the central Imperial authority in times of war. The conference approved the construction of a naval base at Singapore and also recognised the importance of maintaining a presence in the Asia-Pacific region. However, the inclusion of the Pacific region in the Empire's vital sea protection area also recognised that American participation was required to guarantee security of the region, as the cost to the British Empire of patrolling the area alone was inhibitive. Hopes were raised that results of the impending Washington Conference might address international arms limitation, which might alleviate the costs of any such undertaking, and the government delayed any decisions on the navy until after this meeting (Stevens 2001: 63).

Although the RAN had gained approval to purchase six Fairey IIID seaplanes in 1920, the establishment of the Royal Australian Air Force (RAAF) in March 1921 further threatened the ability of the RAN to establish a maritime aircraft force. The proposed RAN expenditure estimates saw further reductions in naval capacity to just 14 vessels, with seaplanes under RAAF control (Stevens 2001: 63).

The Washington Conference was convened between November 1921 and February 1922 and produced several major outcomes for Pacific defence. The first, the *Four Power Treaty*, was a pact which committed Britain, USA, Japan and France to promoting peace in the Pacific through respecting each others territorial rights, a freeze on constructing any new fortifications, which stymied Japan's ability to build a new base that might threaten Australia (Stevens 2001:63, 64). Although Australia was happy with the agreement, it's exclusion from it demonstrated the British lack of respect for the Australian Navy as an independent fighting force.

The subsequent *Five Power Treaty on Limitation of Naval Armament* (signed in February) concentrated on reducing the naval arms race in the Pacific. At America's request, it outlined the fixed ratio of tonnage of warships which could be held by each nation, (Britain, United States, Japan, France and Italy – 5:5:3:1.67:1.67) and gave equality between the dominant naval forces of Britain and America. The treaty was a substantial step forward in stabilisation of the Asia Pacific region, but was to have profound implications for the fate of *HMAS Australia*, which was scheduled for scrapping as part of the British share of naval reductions, much to the consternation of naval officers. The 12 inch guns used on *HMAS Australia* further added to her being targeted for redundancy, as the Royal Navy had cancelled the production of 12 inch ammunition, as did the excessive cost of maintaining the vessel which consumed much of the RAN budget (Stevens 2001:64, 65).

Now protected by the British Fleet, the Washington Treaty and the League of Nations, Australia now began to further reduce the naval budget from 1923-1925, where expenditure was cut by 31 percent overall (Stevens 2001: 65). Despite the signing of the Washington Treaty and the growing concern of a Japanese naval presence, a letter in a local Sydney paper editorial page noted that the presence of the Japanese fleet had also contributed to the defence of Australia during WW I and lamented that Australia would have been better served in the long run by continuing the alliance treaty with Japan than entering into the Washington Treaty (Argus 17/1/1924:4). This prophetic remark would be realised with startling accuracy when Japan entered World War Two against the allies.

Final Post War Service Years

HMAS Australia's role was downgraded somewhat in post war years. On 19 August 1919, she left Sydney for Jervis Bay in the company of two destroyers, *HMAS Torrens* and *HMAS Swan* (Sydney Morning Herald 19/8/1919:7). They returned a month later, and after saluting the Commodore's flag aboard *HMAS Sydney*, she returned to her mooring in Farm Cove where the vessel was opened briefly for public visits (Sydney Morning Herald 23/9/1919:16).

On 16th January, *HMAS Australia* departed Sydney for Hobart (Argus 16/1/1920:9). *HMAS Australia* visited Port Arthur in Tasmania on a goodwill tour where the vessel was opened for visitors. The crew were given leave ashore, and several cricket matches and local dances were organised (Mercury 19/1/1920:4). The vessel then joined the scheduled summer cruise fleet (light-cruiser *Brisbane*, T.B. Destroyers *Swan*, *Torrens*, *Huon* and *Warrego*, and sloops *Marguerite* and *Geranium*) and visited Hobart on 23 January where they took part in the regatta. The fleet left Hobart on 29 January to undertake manoeuvres and gun practice off Tasmania, before finally departing Tasmanian waters on March 3 for Melbourne (arriving March 5) minus the cruiser *HMAS Brisbane* which stayed behind to undertake gunnery practice. The fleet was then scheduled to leave Melbourne after an eleven day stopover bound for Jervis Bay, with a final arrival date in Sydney of March 23 (Argus 24/1/1920:19; Mercury 29/1/1920:5; Sydney Morning Herald 4/3/1920:6).

Due to the impending visit of the HRH Prince of Wales in 1920, the timing of the routine summer cruise was rescheduled, and a proposed visit to Adelaide was scrapped (to enable the vessel to be admitted to dry-dock for maintenance, repairs and painting at the end of March 1920, Argus 24/1/1920:19). *HMAS Australia* was admitted to Sutherland Dock in late March 1920 where maintenance and painting were carried out. During this time, a young 17 year old seaman (George Johnson) from the vessel was killed after he slipped and fell 50ft whilst painting one of the turrets. Statements were given at a Coroners Court that the boy had just stepped out of a safety harness, when he fell and landed on his head. The Coroner later concluded that the death was accidental (Barrier Miner 27/4/1920:3). The vessel was eventually released from dry dock on 28 April 1920, and observers on Sydney Harbour commented that she now looked like a new ship (Sydney Morning herald 29/4/1920:7).

By the early 1920's, the RAN was at its post-war peak, and boasted 5350 personnel, manning one battlecruiser, four cruisers (with another in construction), 12 destroyers, six submarines and many auxiliary vessels. Australia sent the cruisers *HMAS Melbourne* and *Brisbane* to the former Germanic provinces around New Guinea to demonstrate Australia's dominance of the area. The importance of maintaining an effective Australian Naval presence in the Indian and Pacific regions was reiterated by Rear-Admiral Sir Percy Grant (First Naval Member) in April 1920:

> *It must therefore be evident to all thinking people that it is essential not to lose command of the sea and that every endeavour should be made to keep command of the sea and to hamper and harass the enemy until Great Britain can come to the assistance of the Commonwealth with her sea forces. To delay the enemy in any projected attack on Australia should be our object and the best means of doing this is to keep in being the largest efficient Naval force that is possible* (cited in Stevens 2001:55, 56).

However, since the end of the war, rapid increases in warship technology meant that battlecruisers, light cruisers and River Class destroyers were being surpassed with

more effective vessels, which meant that most of the Australian fleet was now obsolete in design. Although the country was proud of its independent fleet, funds to upgrade the navy were not forthcoming in the post war era, where other competing priorities such as support for returned servicemen, social reform and payment of war debts were taking precedent (Stevens 2001: 56).

For the latter half of 1920, *HMAS Australia* acted as the flagship of the fleet which escorted HRH the Prince of Wales on a tour of the eastern states of Australia. The fleet, which consisted of *the* light battle cruisers *HMAS Sydney*, *Melbourne* and *Brisbane*, six destroyers led by *Swan* and *ANZAC*, and minesweepers *Marguerite* and *Geranium* left Sydney on May 17 to rendezvous with the Prince's battle cruiser *HMS Renown* at Port Phillip (Sydney Morning herald 18/5/1920:7). Beginning in Melbourne on 26 May 1920, the Prince of Wales visited Melbourne where *HMAS Australia* and three destroyers acted as a guard of honour and gave the Prince a 21 gun salute as he reviewed the fleet. *HMAS Australia* also hosted an official luncheon onboard (Argus 28/5/1920:6; Sydney Morning Herald 29/5/1920:13; West Australian 25/5/1920:4). *HMAS Australia* accompanied the Prince to Sydney Harbour, arriving June 16, where further festivities for the Prince had been planned, including another 21 gun salute and a spectacular illumination of the warships at night (Sydney Morning Herald 17/6/1920:7, 8; 18/6/1920:7). On June 28, *HMAS Australia* and her fleet then left for Adelaide to again take part in welcoming ceremonies for the Prince (Sydney Morning Herald 29/6/1920:8). The fleet arrived on July 2 to prepare for a welcoming ceremony ten days later, and later departed for Hobart on July 15 (Advertiser 2/7/1920:7).

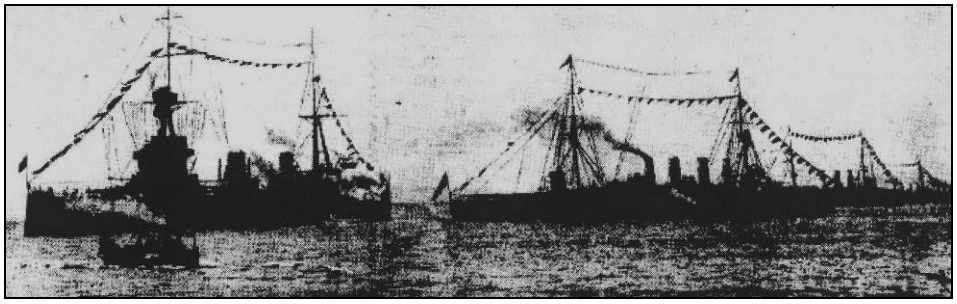

Figure 8: *HMAS Australia* firing salvo as the Prince of Wales (in pinnace on left) leaves to board HMS Franklin (Photo: Argus 29/5/1920:21)

The Prince arrived in Hobart on June 20, where the fleet again acted as an honour guard as the Prince's vessel *HMS Renown* entered the Derwent River estuary (Sydney Morning Herald 20/4/1920:8; Mercury 21/7/1920:5; Morning Bulletin 20/7/1920:9). The fleet left Hobart again on July 23 and proceeded north to Queensland via Sydney, where she was given a resounding farewell by the Australian Navy and local residents (Morning Bulletin 24/7/1920:9; Sydney Morning Herald 24/7/1920:13; 20/8/1920:9; Western Argus 27/7/1920:17). In August 1920, the Prime Minister Mr Hughes was scheduled to visit Rabaul aboard *HMAS Australia* to personally inspect Australia's new territory of Papua New Guinea (Mercury 30/7/1920:5).

Post Decommissioning Use and Controversy

By September, a debate about the disposal of *HMAS Australia* was reignited after an article in the Sydney Morning Herald suggested that the vessel was obsolete. These comments drew an immediate response from the Ministers of Navy (Cook) and Repatriation (Millen) who said that this comment was wrong as the vessel was only 9 years old and that "the idea of scrapping her is absurd". A newspaper account stated

that the government intended to de-commission older and smaller war vessels (West Australian 6/9/1920:6).

By mid September, newspapers speculated that *HMAS Australia* would be decommissioned and replaced with the Light Cruiser *HMAS Melbourne* as flagship of the fleet. The reasoning given for changing flagships was that *HMAS Melbourne* offered more accommodation space for the forthcoming Parliamentary Cruise to New Guinea. *HMAS Australia* would be used primarily as a gunnery training and torpedo drill ship, and secondarily as a fixed battery at Westernport (Victoria), where the naval gunnery depot which was formerly based at Williamstown was also transferred. However, despite transferral of the Flagship responsibilities from *HMAS Australia* to *HMAS Melbourne*, the planned Prime Ministerial tour to New Guinea was never undertaken, which, along with the cancelled Royal tour of *HMS Renown* led to suspicion by the Indigenous population (fuelled by local German residents) when *HMAS Melbourne* finally arrived at Rabaul during the extended Pacific Cruise by Admiral Dumaresq in late 1920 (Sydney Morning Herald 17/9/1920:8: Argus 17/9/1920:6; Mercury 7/12/1920;8; Stevens 2001: 65).

The Navy Office formally confirmed the speculation that *HMAS Melbourne* would become the flagship on 21 September, and that *HMAS Australia* would be used as a gunnery training ship based at Westernport (Examiner 20/9/1920:6; Mercury 20/9/1920:5). *HMAS Australia* left Sydney Harbour for Westerport on October 1 1920 (Sydney Morning Herald 2/10/1920:12), but was scheduled to return again on December 4 for refitting, where she was destined to stay for several months (Sydney Morning Herald 7/10/1920:7; 3/12/1920:8). The vessel was admitted to the Cockatoo Island Dock on December 13 for a three day overhaul, before again returning to Westernport on February 26 1921 to continue her role as a training ship (Sydney Morning Herald 16/12/1920:10; 28/2/1921:6). She remained until at least October 1921, when it was announced that the 400 officers and crew of the vessel would be "paid off" (Sydney Morning Herald 25/5/1921:11; Argus 15/10/1921:19).

HMAS Australia left Westernport on 12 November 1921 on her last voyage, arriving in Sydney two days later where she proceeded to an anchorage off Garden Island (Sydney Morning Herald 12/11/1921:14; 15/11/1921:8). The imminent disposal of the vessel was lamented by local newspapers:

> *As she came through the Heads yesterday she looked just as powerful as when she first arrived here, and it was almost impossible to believe that she had ceased to be an active fighting unit of the Royal Australian Navy and had become obsolete (Sydney Morning Herald 15/11/1921:8).*

On 17 November 1921, the paying off pennants (which had been made on board from funds subscribed by the ratings) were hoisted. This signified that the vessel's commission was about to end on December 12, when she would be placed into reserve along with 11 other ex naval vessels (Advertiser 17/11/1921:9). Many of the men who were formerly from the Royal Navy returned to England after this time, and Australian personnel were transferred to other vessels or depots (Sydney Morning Herald 22/11/1921:8). It was reported that the decommissioning and laying up was devoid of ceremony, and that a number of the crew were retained for about a fortnight afterwards to remove stores from the ship (Sydney Morning Herald 13/12/1921:10).

On 1st May 1922, during his retirement speech whereby he relinquished command of the Australian Navy, Admiral Dumaresq criticised Australia for failing to realise the importance of maintaining an efficient unit of the Empire's Defence, and that Australia was a member of a society to which it was not paying its full dues:

> *In leaving Australia, I have nothing in my mind so much as the unpleasant fact that Australians generally do not seem to realise the importance of maintaining the minimum naval force which will preserve the soul of anything that could be called a fleet or a navy, and it must be preserved in bad times as well as good…. I can only observe that if the total sum spent and risked by sport-loving Australians on racing and other sport were assessed, I am convinced that it would amount to many times the cost of a tactically efficient fleet… When I am in England, I cannot help feeling I shall be ashamed of my Australian country on account of the attitude it takes up, though I shall, of course, endeavour as far as possible to explain the matter, difficult as that will be. On no account must the Australian navy fall below three light cruisers and a small number of destroyers and submarines that all may be trained together as a model farm. Should the number fall below that, in my opinion the sole of the Australian Navy will have expired* (Sydney Morning Herald 1/5/1922:8).

Dumaresq further lamented that if the size of the Australian Navy was allowed to fall below three light cruiser and associated support craft, then it was in danger of collapsing, and that his comments were directed both at politicians and the Australian people, as the people got the government they deserved (Sydney Morning Herald 1/5/1922:8; Advertiser 1/5/1922:7). Rumours circulated the next day that *HMAS Australia* would be dismantled and sunk by gunfire (Camperdown Chronicle 2/5/1922:3). The Prime Minister Billy Hughes criticised Dumaresq for improperly speaking out against naval policy (Advertiser 2/5/1922:7). However, Dumaresq was lauded by some newspapers for his service in establishing discipline to the Australian Navy under often difficult conditions, whilst championing the welfare of the lower deck crews, and blamed the government for prompting his comments (Sydney Morning Herald 2/5/1922:8).

The next day newspapers reported that the Federal Parliament was acting against Navy Board advice with their plans to reduce the size of the Australian Fleet to two light cruisers, and sources within the Navy reported that Dumaresq was supported by his colleagues in his stance (Sydney Morning Herald 3/5/1922:12; West Australian 3/5/1922:10). Prime Minister Hughes indicated that the decision to scrap *HMAS Australia* would only be made after the Washington Pacific Treaty Agreement was ratified, under whose conditions the battle cruiser would be rendered immobile within six months, along with a general downgrading of the defence forces (West Australian 3/5/1922:10). This stance was confirmed by the Defence Minister (Mr Greene) who reiterated that scrapping would not need to take place before 6 months it was take about 1 year to complete the process (Advertiser 6/5/1922:11).

On 13 May, the Prime Minster released the new Defence policy document, which outlined that nearly £2 Million would be saved as a result of the Washington Treaty by reducing Defence expenditure, but that a further £20 Million would also be saved from interest payments for war debts. The scrapping of the warships *HMAS Australia* and *HMAS Brisbane* would save £200 000 each a year (West Australian 15/5/1922:8). By late May, the Defence Minister stated that if the treaty was ratified, then the government had 18 months to adhere to the scrapping of the vessels, and that three cruisers (*HMAS Melbourne*, *Sydney* and *Adelaide*) would be retained in service (Advertiser 31/5/1922:9). By late August, rumours circulated that an official report had recommended the immediate scrapping of the vessel (Argus 28/8/1922:7).

By September 1922, action to dismantle *HMAS Australia* had been deferred due to defence concerns in Turkey that a Kemalist attack was about to take place at the Dardanelles. British reinforcements were marshalled in the Chanak Region near

Gallipoli, and there were calls for *HMAS Australia* to be placed on standby in case she was needed in any further action in the area (Sydney Morning Herald 19/9/1922:9).

Newspapers called for Australia troops to sign up to guard Gallipoli:

> *The Government of the greatest Empire of the world does not seek aid from the dominions without urgent cause. The dominion governments do not undertake to despatch troops to parade among the graves, which consecrate Gallipoli, without cause. We face grave issues of concern of the Empire, with its Moslem hegemony, with the Gates of India, and with the Suez Canal. It is the manifest concern of Europe. Either Insurgent nationalism on the one hand, militarist Bolshevism on the other, is not less obvious* (Sydney Morning Herald 19/9/1922:9).

But others called for restraint not to continue hostilities in the area:

> *We were through our flighty Prime Minister, the instigators of the war made by the Greeks. If the consequence is humiliation we must bear it. "Not a man, not a ship" ought to be the British determination* (Sydney Morning Herald 19/9/1922:9).

The situation was so dire that the Australian Prime Minister Hughes sought the assistance of the League of Nations to intervene to bring about peace in the region, and consideration was given to sending a division of Australian soldiers (Sydney Morning Herald 19/9/1922:9).

In October 1922, the Federal Parliament passed the Defence Estimates without amendment which indicated that *HMAS Australia* was no longer listed as part of the fleet (Sydney Morning Herald 16/10/1922:9). By January 1923, the Washington Disarmament Conference Treaty had still not been ratified by France or Italy, and the fate of *HMAS Australia* remained in limbo. Although some of the lighter secondary armament guns had been removed, the rest of the vessel remained intact (Argus 19/1/1923:10). No decisions had been made by February (Mercury 22/2/1923:9).

Alternative Use Proposals and Dismantling

By July 1923, The Prime Minister (Mr Bruce) reiterated to Parliament that ships were required to be scrapped under the Washington Treaty, that they had to be rendered incapable of war service after 6 months, and disposed of within 18 months. Consideration was being given to the method to be used for *HMAS Australia*, which included breaking up or sinking off the eastern Australian coastline (Sydney Morning Herald 21/7/1923:13; Brisbane Courier 21/7/1921:7). Various suggestions were raised for possible alternative uses of the ship's hulk, which included use as sleeping accommodation for the unemployed (Sydney Morning Herald 26/7/1923:10), a breakwater (Barrier Miner 26/7/1923:3), a hospital ship for Australia's Navy, a training ship (Barrier Miner 24/8/1923:1; Advertiser 24/8/1923:16), or to be used as a memorial at either Botany Bay or Cooktown after the hull had been reinforced with cement Brisbane Courier 6/8/1923:6).

The excessive cost of dismantling the vessel, along with a shortage of suitable facilities in Australia (and a glut of other vessels congesting UK shipbreaking facilities) led to the Government considering the must cheaper option of sinking the vessel in deep water (Barrier Miner 26/7/1923:3). The Defence Minister announced on August 22 that the vessel would be scuttled rather than broken up, as the latter option was too expensive (Barrier Miner 22/8/1923:1). The cost of removing each

gun for remounting ashore was cited as c £20 000 (Advertiser 24/8/1923:16) which made their remounting ashore impracticable (Western Mail 4/10/1923:28).

The press lamented the imminent loss of the vessel:

> *HMAS Australia is to be destroyed. Why is this to be done? Most Australians who think a little of their own safety ask this question, for did not this battleship prevent harm being done to our shores. The ship may be out of date, but so is the old Victory, yet she is kept to remind people of bygone battles. Why can not the Australia be made into a memorial too?* (Advertiser 25/8/1923:22).

On August 29, *HMAS Australia* was moved from her mooring (at No. 1 Naval Buoy) to a berth at Garden Island naval yard, in preparation for scrapping and removal of fittings and turbines. This process was due for completion within 3 months to meet the deadlines of the Washington Treaty (Argus 31/8/1923:9; Sydney Morning Herald 31/8/1923:8). The impending scrapping of the vessel prompted many attempts to save the vessel. The Minister of Works suggested that the vessel could be used by the Public Works Department as an extension for the northern breakwater at Newcastle thus saving enormous planning expenditure for the project (Advertiser 4/9/1923:16).

The press even attempted to give the vessel a voice to express its own displeasure at its fate:

> *HMAS Australia speaks: "So I am to be sunk. The grey iron plates that are my sides and the white wood that is my deck will soon be lying beneath the waves. Mine is not a glorious death in action that came to many of my companions. I have to stand up while shots are put into me, unable to volley forth my thunder in return…If women were in Parliament and took an interest in public affairs that they should as joint rulers of the country, memories would not be so short and I should be treated in my old age with the reverence I deserve, no matter what the cost. It is over now, and I am to be consigned to the deep. I wonder if Australia realises how it hurts me!"* (Written by E.H.M ,Country Women's Association representative, Sydney Morning Herald 1/10/1923:3).

The public expressed outrage in the press at her proposed fate, some considering the issue as "a point of National Honour". Suggestions for other uses were raised in an attempt to avoid sinking the vessel including use as a breakwater at Coffs Harbour (Sydney Morning Herald 3/10/1923:12; Western Argus 6/11/1923:13) or Glenelg in South Australia (Advertiser 26/11/1923:15); sinking her on Sow and Pigs Reef, where she could act as base for the proposed memorial to the seamen who served in the Great War (Advertiser 3/10/1923:12), or used to house the Australian War Museum (Sydney Morning Herald 18/10/1923:13).

The breakwater proposal was dismissed as impracticable by the Minister of Defence, as the depth of water at the proposed site was too shallow and the vessel would not have enough depth to sink (Sydney Morning Herald 5/11/1923:8). This statement was challenged by the Coffs Harbour Chamber of Commerce, who further reiterated that the British Navy had used former naval vessels filled with rubble to reinforce the seawall at Dartmouth (Sydney Morning Herald 16/11/1923:9). Although the use of a breakwater was expressly permitted under the Washington Treaty (Sydney Morning Herald 28/11/1923:19), the venture was eventually rejected on the ground that it would be too expensive (c £200 000 to fill her with rubble/ concrete) and too risky in case the vessel moved during the sinking operation (Sydney Morning Herald 28/11/1923:16; 13/12/1923:9). The returned Soldiers League suggested if the vessel

were sunk, a floating light should be placed over it so that the ship would never be forgotten (Argus 3/12/1923:13).

Machinery and other gear were being removed from the ship by the beginning of December. The work was due to be completed by 15 December, after which time tenders were invited for the removal of the remaining fittings (Argus 4/12/1923:16; 11/12/1923:17). The rights to strip the vessel were bought by a syndicate of Melbourne businessmen, led by professional wrecker Mr G.C. Wright, for £3000 (Brisbane Courier 27/12/1923:7; Advertiser 28/12/1923:8). In addition to salvaging the ship's metal for scrap value, the syndicate planned to also sell souvenirs from the warship (Examiner 28/12/1923:5). The fighting top, secondary armament and engines had been removed by mid January 1924 (Brisbane Courier 18/1/1924:5). The hull was left intact and was due to be scuttled in April during the visit of the British Squadron (Brisbane Courier 27/12/1923:7; Advertiser 28/12/1923:8).

Further criticism of the scrapping continued into February, where one newspaper editorial stated:

> *One wonders what kind of fools we had looking after our interests at the Washington Conference. Australia is a country with a greater coastline than any other country in the world…with a small fleet of about half a dozen ships to look after our long coastline, with the Australia as flagship. We send a representative … and instead of fighting for Australia's interest it appears he did not know his job and let us down. .. Australia's little fleet is weakened to the extent of doing away with the only battle cruiser she ever had. The Australia saved us during the war... the Australian public should have a say. We pay the piper, and should call the tune* (Advertiser 6/2/1924:18).

The Australasian Society of Engineers also protested that the valuable material was being sent to the bottom for the "sport of a few individuals" and that dismantling the vessel could provide work for 300 men for nearly a year (West Australian 21/3/1924:8). Further agitation from the Parliamentary opposition stated that the Japanese people were approaching the Americans to support the preservation of Admiral Togo's battleship as a national memorial, and that the Australian Government should be doing the same (Brisbane Courier 28/3/1924:5). It appeared that public opinion was against the scuttling of the ship (Sydney Morning Herald 4/4/1924:5), but when the opposition formally moved in the Senate that the vessel should not be sunk, but be fitted out as a war memorial, the motion was not carried (Mercury 4/4/1924:9). Any notable controversy concerning the ship was considered newsworthy, including a story that insinuated that the contractors who had been awarded the dismantling rights had been accused of securing more profitable material than had been previously stated (Barrier Miner 15/5/1924:1).

The Scuttling Event

Although ANZAC day was originally proposed as the scuttling day, it was postponed to April 12 when the British Squadron would leave Sydney Harbour for Brisbane (Argus 19/2/1924:10; 11/3/1924:15). With the imminent disposal date approaching, the scuttling took on an air of sobriety akin to a funeral. An appeal for flowers for the vessel was printed in local newspapers (Sydney Morning Herald 10/4/1924:10), and hoards of naval personnel visited the vessel to pay their respects and place wreaths on the deck (Brisbane Courier 12/4/1924:7; Western Argus 22/4/1924:12).

At 7am on April 12 1924, *HMAS Australia* was towed 24 miles out to sea by several tugboats on a bearing of 095 degrees to her final resting place. The vessel was awarded full naval honours and was accompanied by most of the vessels of the Australian Navy and six aeroplanes. Also in attendance were Vice Admiral Patey and four other rear admirals, some aboard four Royal Navy light cruisers. Led by the flagship *HMS Dehli, HMS Danae, Dauntless* and *Dragon* formed an honour guard on either side of the vessel on he last voyage to the scuttling site (Sydney Morning herald 14/4/1924; Western Argus 8/4/1924:16; RAN 2011:09). The ship was sunk with all her main guns on board, as well as her three spare gun barrels lashed to the deck (Cassells 2000:17). Parts of her superstructure had already been demolished, and the amidships funnel lay partially dismantled on the deck between the P and Q turrets (see Figure 9).

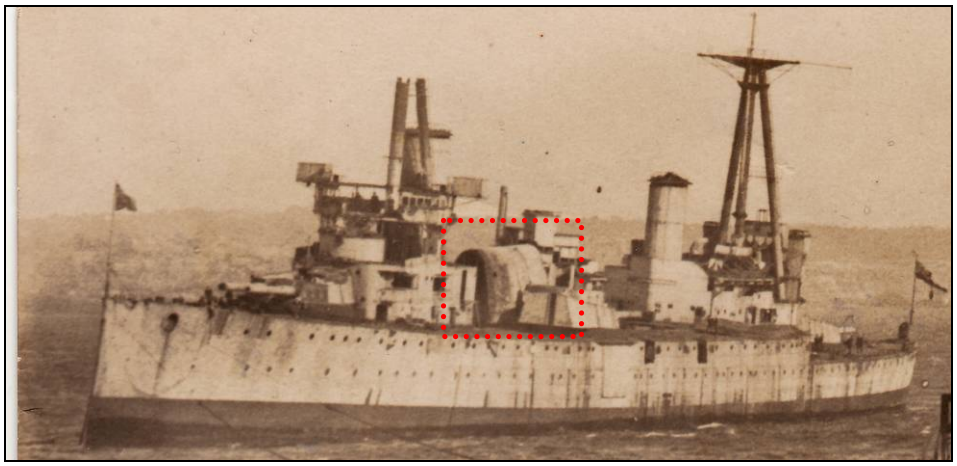

Figure 9: *HMAS Australia* being towed to the scuttling site in 1924, showing amidships funnel partially dismantled on the deck (Photo: Carl Veen Collection)

In tribute to the doomed vessel, *HMS Delhi* fired a 21 gun salute, which was answered by the three pounder guns of the *HMAS Brisbane..* At her final resting place, *HMAS Australia* was joined by *HMAS Melbourne, HMAS Brisbane*, *HMAS ANZAC* and *HMAS Stalwart*, along with several steamers crowded with sightseers who were there to pay their last respects. At 2.19pm, the scuttling party signalled that they were opening the scuttle-cocks, and by 2.31pm after the scuttling party had left the vessel, the scuttling charges placed in the forward hold exploded (Sydney Morning Herald 14/4/1924). The vessel turned over on her port side, whereby the spare guns broke their lashings and along with the amidships funnel rolled off the deck (Brisbane Courier 12/4/1924:7; 24/4/1924:8; Cassells 2000:17). The ship slipped beneath the waves by the stern within 15 minutes with the white ensign still flying, to the thunderous salute of the guns of *HMAS Brisbane.*

The scene was recorded by a reporter:

> *Shortly after half-past 2 o'clock, amidst tense silence, a long sullen roar rose from the Australia. Like some sad lament, like a threnody, it rang out across the sea. Smoke poured from the funnel. The old ship, with a list to port was dying. A gapping hole had been blown in her hull. Ever so gradually she heeled over. The sea seemed reluctant to bring within its embrace this once proud ship, until a hatchway touched the water line. Then the water rushed in and the end was quick. The Australia turned completely over and plunged stern first into the deep. In 21 ½ minutes from the time of the explosion she had disappeared. There was no whirling suction of water. The sea just swept calmly over her.. An airman cast on to the calm waters … a simple wreath, and the old ship was left to the*

> *companionship of the sea…Like pilgrims that had come to bow their heads at the passing of a great figure, the ships of the Royal Australian Navy turned in stately single file in the setting sun* (Sydney Morning Herald 14/4/1924:1).

The flagship *HMAS Melbourne* with the Prime Minister aboard, accompanied the vessel out to the sinking (Western Argus 22/4/1924:12), along with five light British cruisers of the Special Service Squadron (Western Argus 11/3/1924:30; Brisbane Courier 12/4/1924:7).

Prime Minister Stanley Bruce gave the following eulogy:

> *In the prime of her service, this, the first great ship of the young Australian Navy, was our contribution into the defence of civilisation. In her passing, she symbolises out contribution to the cause of peace. We sacrifice her with a regret rendered poignant by our memory of her great service, but tempered with the hope that the world will see the magnitude of our offering, and the manner in which we make it, a measure of our practical belief in the principles enunciated at the Washington Conference, which constitute the only hope of a permanent international peace. The passing of the Australia closes a glorious chapter in the history of the Australian Navy. We shall never forget that in the eventful days of 1914, when the fate of civilisation hung in the balance, it was the presence of Australia, manned with Australian seamen, that saved our shores and our shipping from the fate which overtook less fortunate nations* (RAN 2011:9).

The Commander of the naval escort, Captain Feakes later observed that:

> "*Strong men were wet-eyed. Many Cursed. It was a tragic blunder*" (Cited in Stevens 2001:65).

A sermon for the vessel was later presented in St Peter's Cathedral (NSW) by *HMAS Australia*'s chaplain (Canon Riley), who lamented the loss of the vessel:

> *I have seen her play her glorious part in both peace and war, and now her duty nobly done, she has gone to her last resting place…To us who knew her, there wells up a feeling of sadness. She is gone, but a higher and even grander role strikes. She, a weapon of war, has become a worthy contribution to the sacred cause of peace* (Mercury 22/4/1924:6).

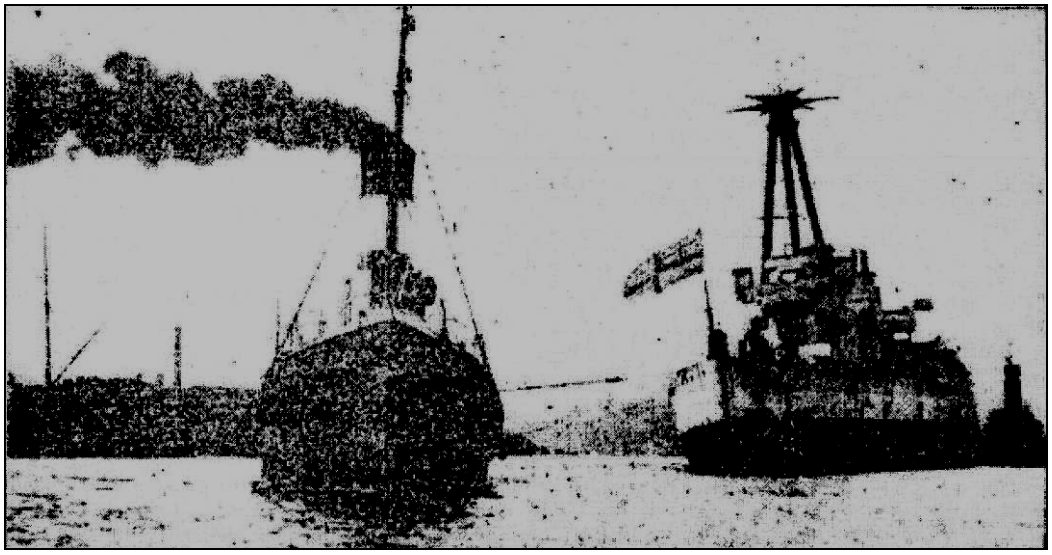

Figure 10: *HMAS Australia* being towed in Sydney Harbour (Photo: Brisbane Courier 16/4/1924).

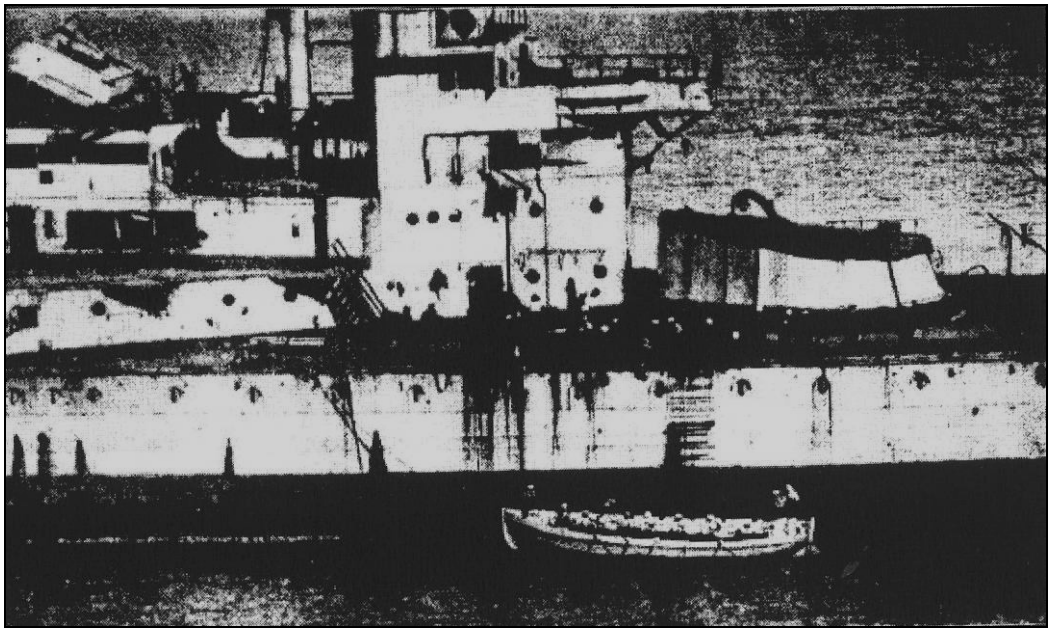

Figure 11: Scuttling party leaving *HMAS Australia* (Photo: Brisbane Courier 24/4/1924:8)

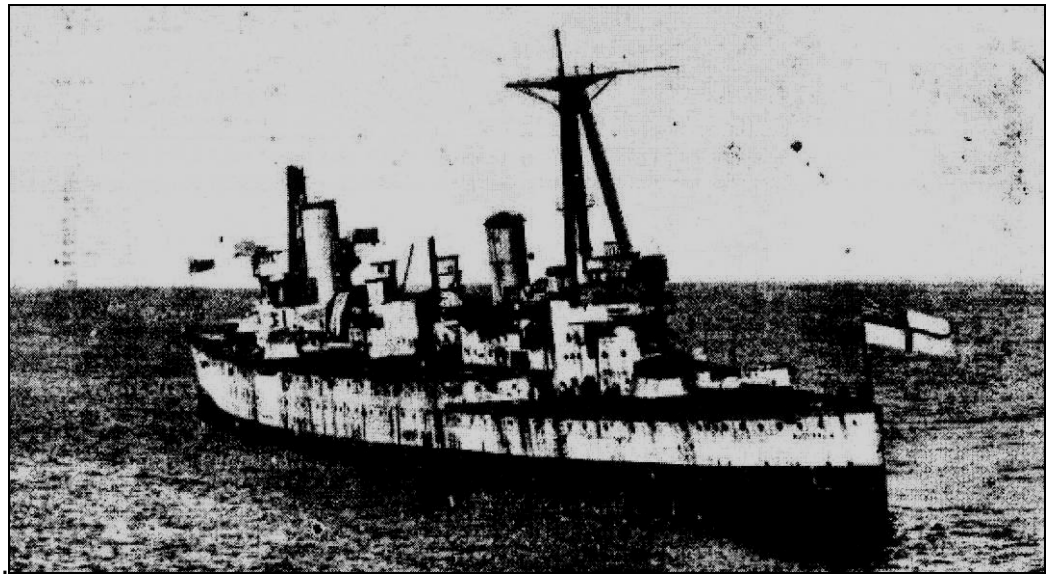

Figure 12: *HMAS Australia* at scuttling site from the stern(Photo: Brisbane Courier 24/4/1924:8).

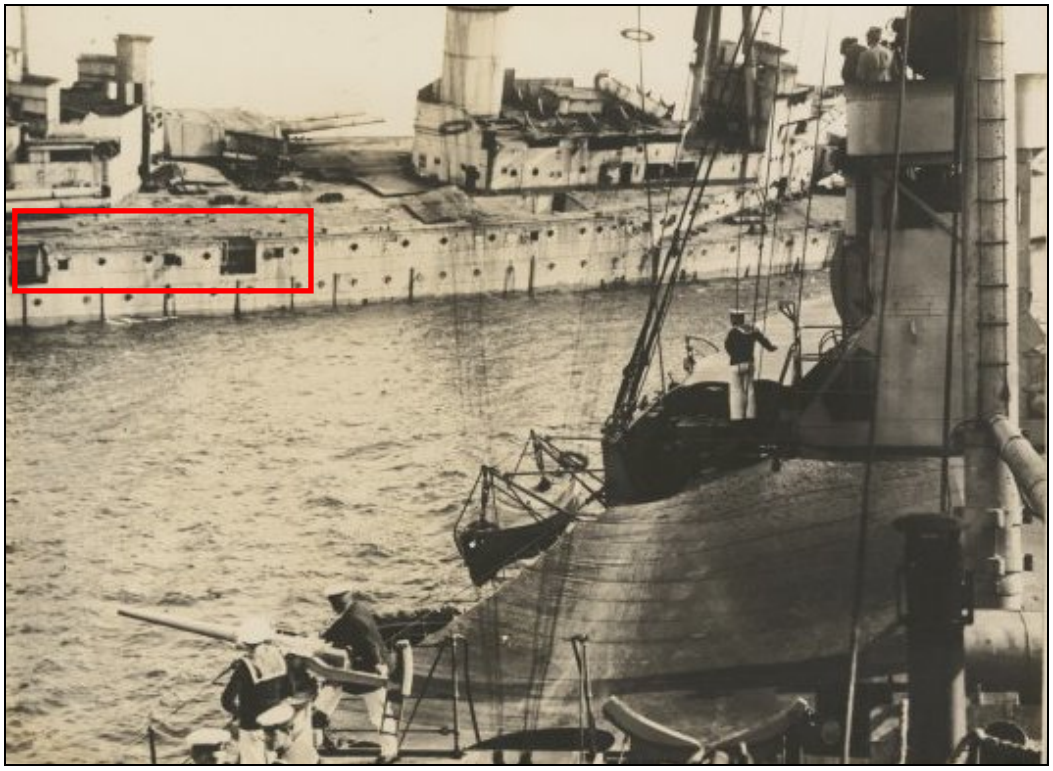

Figure 13: View of *HMAS Australia* during scuttling event showing scuttling holes on port side (Photo: pic-vn4655992v , Searle Collection, National Library of Australia Collection)

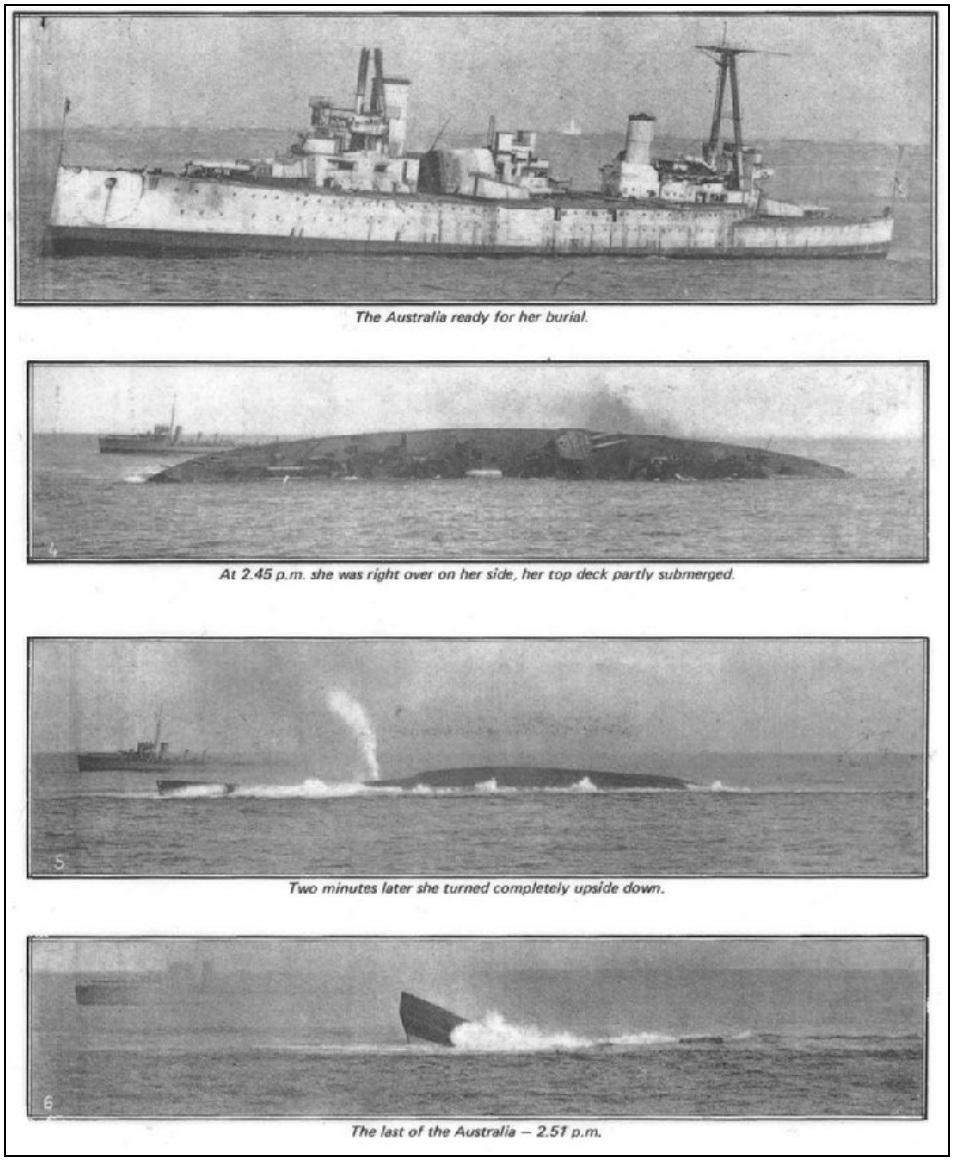

Figure 14: The final moments of *HMAS Australia* (Sydney Morning Herald 14/4/1924).

Memorials and Relics

Despite the sinking of the vessel, the memory of *HMAS Australia* lived on. Although out of sight in deep water, *HMAS Australia* was commemorated in many places around the country. Prior to the announcement of the vessel intended scuttling, the RAN had already begun removing £30 000 worth of valuable fixtures or reusable equipment for use in other ships, and a further £35 000 worth of fittings were donated to universities and technical colleges around Australia (Navy 2011). Many States also requested souvenirs of the vessel for their regions (Advertiser 23/11/1923:13). Local councils also requested mementoes of the vessel, for which purpose the government had already stockpiled many items removed during the dismantling process, including gun breech blocks and pictures framed with teak decking (Advertiser 20/4/1924:17; Brisbane Courier 25/6/1924:6: Western Argus 29/7/1924:18).

The Returned Services League (RSL) suggested that the conning tower be taken off the vessel to be placed at a prominent point around Sydney Harbour (Sydney

Morning Herald 11/1/1924:10; Advertiser 17/1/1924:13), a suggestion that was later used when the tripod tower from *HMAS Sydney* was placed as a memorial at Bradley's Head. Her steam siren was used for many years at the top of the Powerhouse (Sea Power Centre-Australia) in Canberra, and the Admiral's table is displayed in the Senate Opposition Party Room at Parliament House, Canberra (RAN 2011:9). Still other relics were removed to become permanent memorials such as one of the ships propellers which is currently on display at the Australian War Memorial in Canberra (see Figures 15, 16). Three 12 inch shells were placed on display at Garden Island, and another 30 were retained in the Naval Heritage Collection at Spectacle Island, along with tankards, drinking mugs, and trophies. The Ward-room dining table was retained in the Junior Officers Mess at *HMAS Kuttabul* (Commander Moore Shane, Naval Heritage Centre, pers. comms.).

Other institutions in Sydney hold historic relics from the vessel. The Australian National Maritime Museum holds brass and glass signal lanterns; a rating's straw hat (see Figures 17) a copper alloy souvenir dish, a wooden nut bowl and a timber gavel made from metal and timber (respectively) taken from *HMAS Australia* during dismantling, along with glass plate negatives of the scuttling event. The Australian War Memorial also holds an extensive collection of photographs and other memorabilia, including a torpedo tube and a replica scale model of the vessel (see Figures 18-23), propeller, and other ship's components. A full list of the relics held by the Australian War Memorial is included in Appendix One. All these collections offer the opportunity for further research potential on life aboard the vessel and its social significance to the wider community.

Figure 15: Outer port side propeller from *HMAS Australia* currently housed outside of the Australian War Memorial (Photo: Tim Smith 2007)

Figure 16: Twelve inch gun tampion – AWM Collection (Photo: B. Duncan)

Figure 17: Rating's hat, ANMM Collection (Photo Tim Smith)

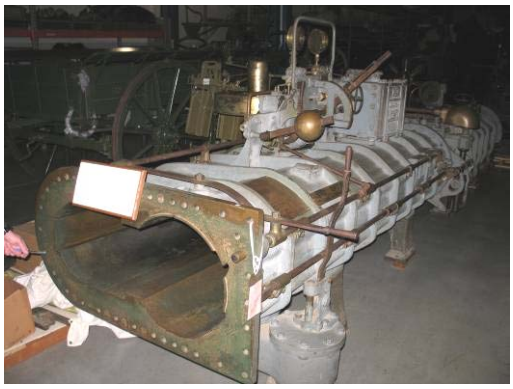

Figure 18: *HMAS Australia* torpedo tube– AWM Collection (Photo: Brad Duncan)

HMAS Australia Historically Listed Location

At the time of the sinking, the RAN recorded that *HMAS Australia* was scuttled in the area known as the ships graveyard, approximately 50km east of Sydney Heads, which was a well used naval dumping ground that often used to dispose of military hardware (Plunkett 2003; RAN 2011:09). The original location for the wreck was listed as 24 miles out to sea on a bearing of 095 degrees by several tugboats to her final resting place (Sydney Morning herald 14/4/1924). The official location listed in the Commonwealth Government Gazetteer was in 150 fathoms of water (270m) at 33˚53' 25" S, 151˚ 46' 5" E (CGG 1924:17). Plunkett's (2003) database of wrecks dumped at sea lists its position as 33˚53' 24" S, 151˚ 20' 42" E. Although the RAN recorded the general location of the area in which the *Australia* was scuttled, the exact location of its final resting place was not known, with significant discrepancies in the available sources.

Vessel Specifications

HMAS Australia carried eight breech loading 12 inch Mark X guns (which were the biggest guns ever fitted to an Australian warship) mounted in four BVIII twin turrets. Two fore and aft turrets were mounted in the bow and stern which were designated "A" and "X" respectively. The other two turrets were wing mounted amidships and staggered diagonally; with the port turret "P" mounted port of the centre funnel and "Q" turret to starboard and aft. Each wing turret had the ability to fire across the opposite beam. Secondary armament consisted of sixteen breech loading (BL) 4 inch Mark VII guns located in the superstructure, and two submerged 18 inch torpedo tubes, one on each side of the "X" Turret, with 12 torpedoes onboard. A 9ft (3m) rangefinder was equipped on the rear of the "A" turret roof, which could act as a secondary fire control centre for the entire main armament if the primary range fire centre was disabled (Cassells 2000: 16-17; Wikipedia 2011g).

Over time, *HMAS Australia* was modified with many additional features including a single quick fire (QF) 3 inch 20 cwt (76mm) anti-aircraft gun on a Mark II mount in March 1915, which had a maximum ceiling of 23 500 ft (7200m). The 4 inch guns were enclosed in casemates and fitted with blast shields in December 1915, and the two aft guns were also removed at this time. An extra 4 inch gun was added in 1917 as an anti-aircraft gun, and was mounted on the Mark II high angle mounting. The vessel was fitted with a centralised fire control director around 1915-16, along with an extra inch of armour around the amidships turrets following the Battle of Jutland. In 1920 the anti-aircraft guns were replaced with QF 4 inch Mark V guns on manually operated high-angle mounts (Cassells 2000: 16-17; Wikipedia 2011g).

Name:	*HMAS Australia*
Class:	Indefatigable
Type:	Battlecruiser
Displacement:	18,800 tons
Length:	590 feet (179.8m)
Beam:	80 feet (24.4m)
Draught:	30 feet 4 inches (9.2m)
Builder:	John Brown & Co Ltd, Clydebank, Glasgow, Scotland
Laid Down:	26 June 1910
Launched	25 October 1911
Completed:	21 June 1913
Horsepower:	44,000

Speed:	25 knots
Armament:	8 x 12” guns 14 x 4” guns 1 x 4” anti aircraft gun 1 x 3” anti aircraft gun 4 x 3 pdr gun 2 x 18” torpedo tubes (submerged broadside
Armour:	6“ armour belt amidships 4” armour belt bow and stern
Fuel:	3170 tons of coal (maximum) 840 tons of oil (maximum)

Table 1: Specifications of HMAS Australia (Source: Moore 1990: 95)

Figure 19: AWM Model of *HMAS Australia* at the Australian War Memorial, Canberra, showing the 'A' turret with 12 inch guns (Photo: Tim Smith 2007)

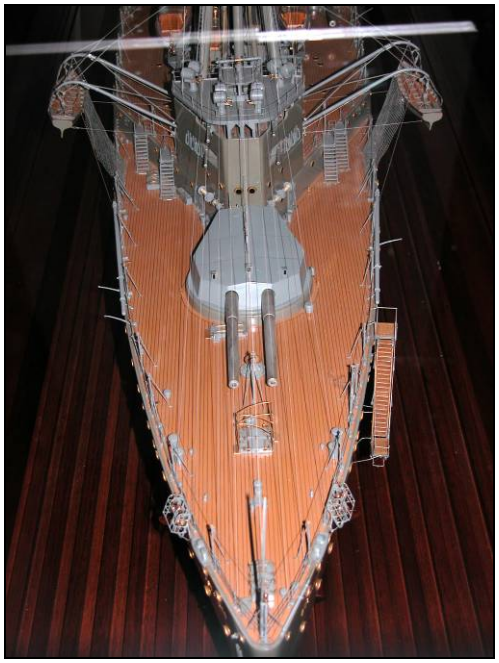

Figure 20: AWM Model showing stern of *HMAS Australia* (Photo: Tim Smith 2007)

Figure 21: AWM model of *HMAS Australia* showing bridge and forward range finding station (Photo: Tim Smith 2007)

Figure 22: AWM model of *HMAS Australia* showing aft control tower top (platform) and ladder (Photo: Tim Smith 2007)

Figure 23: Forward tripod control station on AWM Model (Photo: Tim Smith 2007)

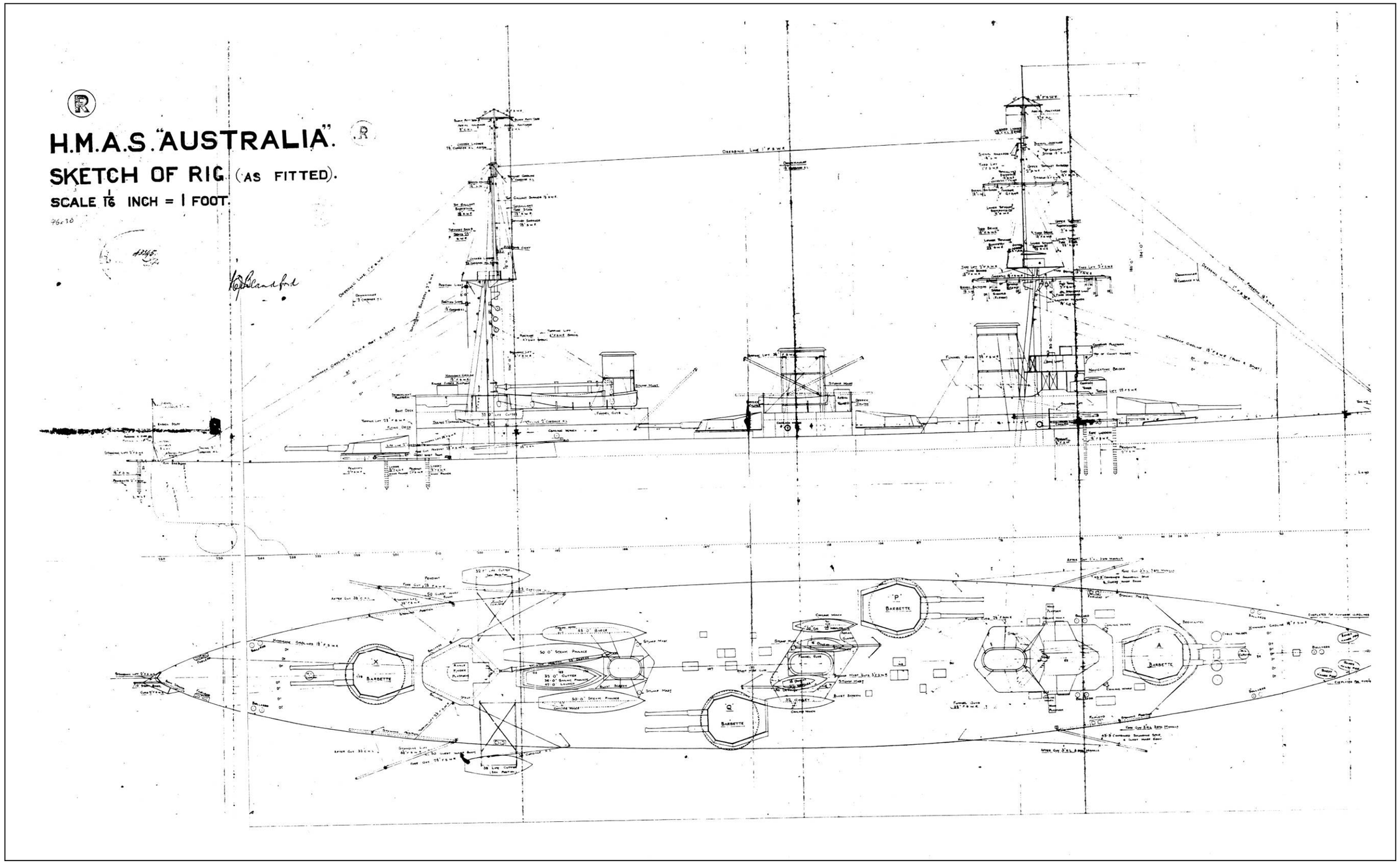

Figure 24: *HMAS Australia* deck and rig plan (Image: Beandford n.d., AWM Collection)

INSPECTION METHODOLOGY

Fugro Side-scan Sonar Survey (1990)

In 2002, the former Heritage Office became aware of the discovery of a wreck which was thought to be *HMAS Australia*. Tim Smith, (now Deputy Director of the Heritage Branch) attended a conference in Fremantle where Fugro Australia Pty Ltd presented on the past discovery of a sizable unknown wreck off Sydney in 1990. At the time, it was suggested by one person aboard the survey ship that it may be *HMAS Australia*. Smith requested further data from Fugro and was given an image of bathymetric data for where the ship lay, sourced from the company's archives in Seattle, Washington, USA..

The wreck had been accidentally found between March–April 1990 during a surface side-scan remote sensing survey undertaken by the *M/V Moana Wave I* as part of the Pacific Rim West Submarine Telecommunications Cable Route Survey Project by Fugro Seafloor Surveys International Inc. The side scan sonar survey had used 500m transect swaths which accidentally located a 590 ft (177m) long vessel which lay near the edge of the Continental Shelf in 390m of water, along with an extensive debris field scattered up to 600m to the south eastern quadrant from the main wreck site. The sidescan image also revealed that the vessel appears to have impacted on the seabed above the main wreck site, and has slid approximately 400m down the slope to its current location (see Figures 25-28). The location given for the Fugro survey location for the wreck was:
33˚51' 54.21" S, 151˚ 44' 25.11" E. (Datum: WGS 84, Projection: Transverse Mercator).

The new accurate position for the wreck placed it away from previous historically recorded positions and at almost double the water depth.

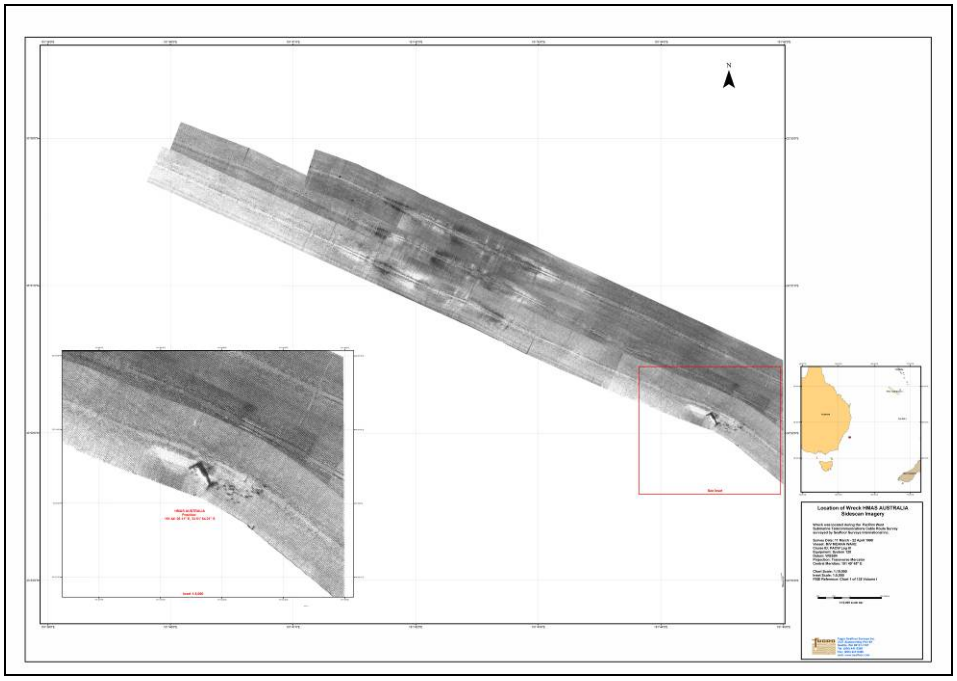

Figure 25: Location of the side scan survey of the *HMAS Australia* site (Image: Fugro Seafloor Survey Inc.)

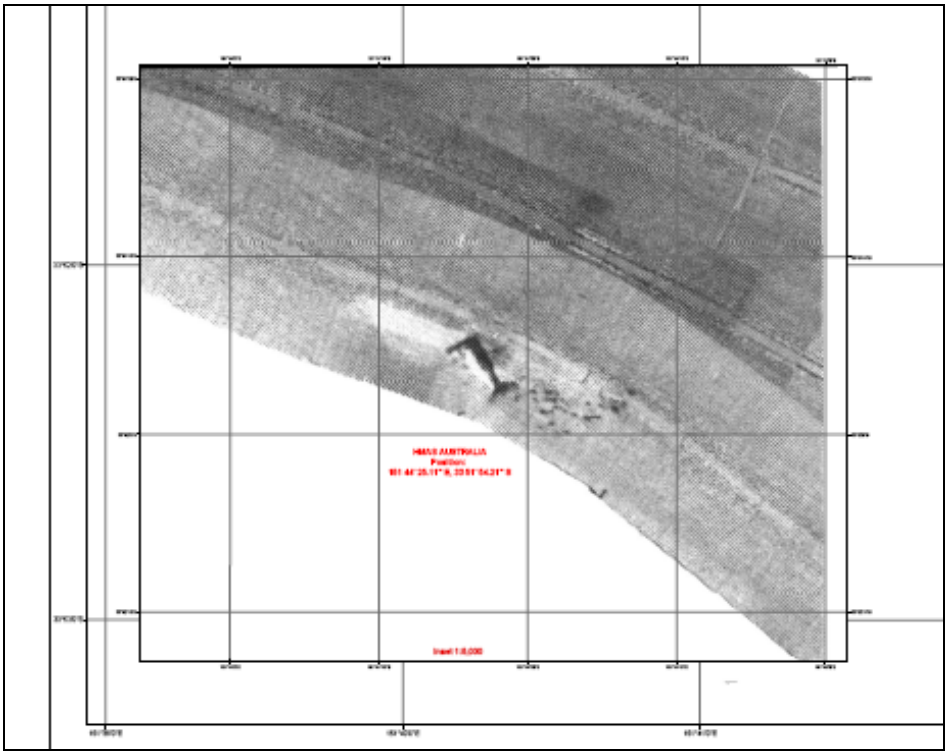

Figure 26: Side scan image of *HMAS Australia* and associated debris field laying on the seafloor (Image: Fugro Seafloor Survey Inc.)

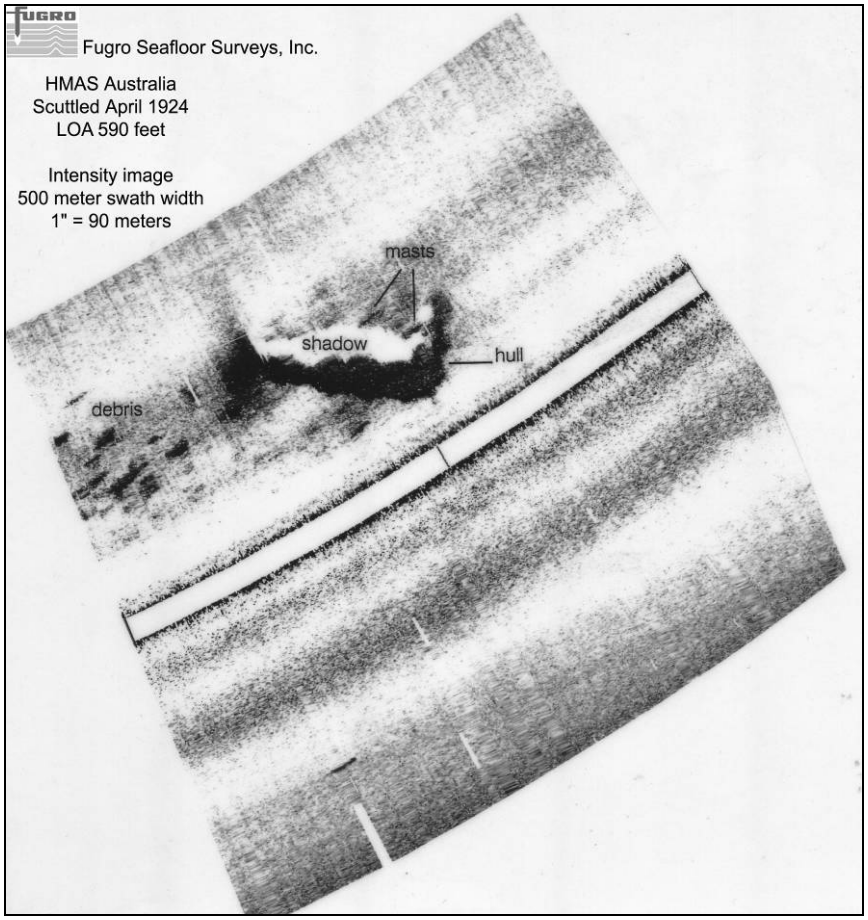

Figure 27: Side scan survey of the *HMAS Australia* wreck site and associated debris field site (Image: Fugro Seafloor Survey Inc.)

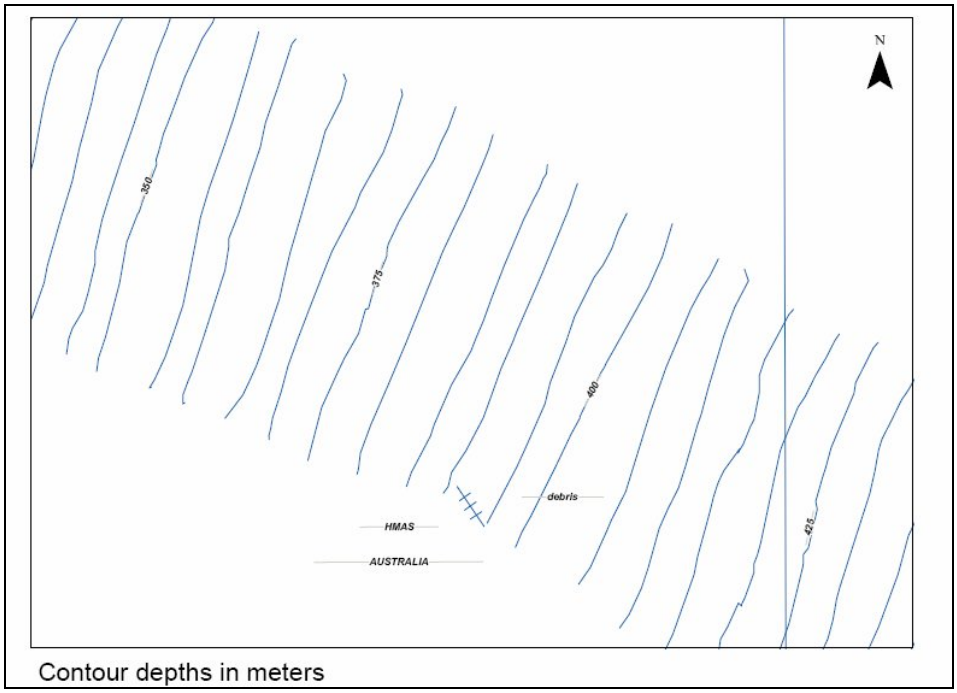

Figure 28: Bathometry chart for *HMAS Australia* site (Image: Fugro Seafloor Survey Inc.)

Background to ROV Inspection

A search of the NSW Shipwreck database revealed that, based on the size and location of the wreck, the only vessel known to have sunk in this area was *HMAS Australia*. Due to the extreme depth of the wreck (390m), the vessel lay well outside the limits of technical diving and a Remotely Operated Vehicle (ROV) unit would be required to further investigate the site.

On 7 February 2007, Deputy Director Tim Smith approached the (then) Chief of Navy, Vice Admiral Russ Shalders (AO CSC RAN) and Rear Admiral Daffyd Thomas (Maritime Commander) aboard *HMAS Newcastle* during a commemorative service to honour the loss of the Japanese midget submarine *M24* in World War Two at the wreck. It was suggested that the RAN assist in the first ever filming of the wreck using an ROV. Although the Navy supported the project in principle, at the time they did not have the equipment which could reach the depths at which the wreck lay.

An opportunity arose on 18 March 2007, when a United States Navy (USN) deep sea ROV was contacted by the RAN to recover a downed Blackhawk helicopter lost in the sea near Fiji. At the request of the Heritage Office, the RAN agreed to direct the *USN ROV CURV 21* (see Figure 29) aboard the platform *MV Seahorse Standard* (Defence Maritime Services - DMS) to visit the site to undertake a photographic survey of the wreck after they had finished the operations in Fiji. The *MV Seahorse Standard* was equipped with a 100 ton crane to launch the ROV.

The *USN CURV 21* is an ROV capable of reaching depths of 20 000ft (6000m). The system uses a fibre optic cable and a shared handling system which can switch between side scan sonar and ROV operations. The vehicle is equipped with side scan sonar for target location and pinger direction; high resolution digital stills camera; and black/white and colour television cameras. Specifications of this unit are included in Appendix Two.

On 18 March 2007, the first ever visual inspection of the site was undertaken, but, as the search vessel was in transit from Fiji and had not yet cleared Australian Customs, no members of the Heritage Office maritime archaeology programs team were permitted aboard. The vessel spent several hours onsite and captured video footage and stills camera images of the wreck site. Approximately 10 hours of footage was released by the RAN to the Heritage Office on 27 March 2007 to be refined for television broadcasting. A significant portion of this footage was not specific to the wreck, with a large amount taken on the way down to the wreck, and of the vehicle navigating along the sandy sea floor.

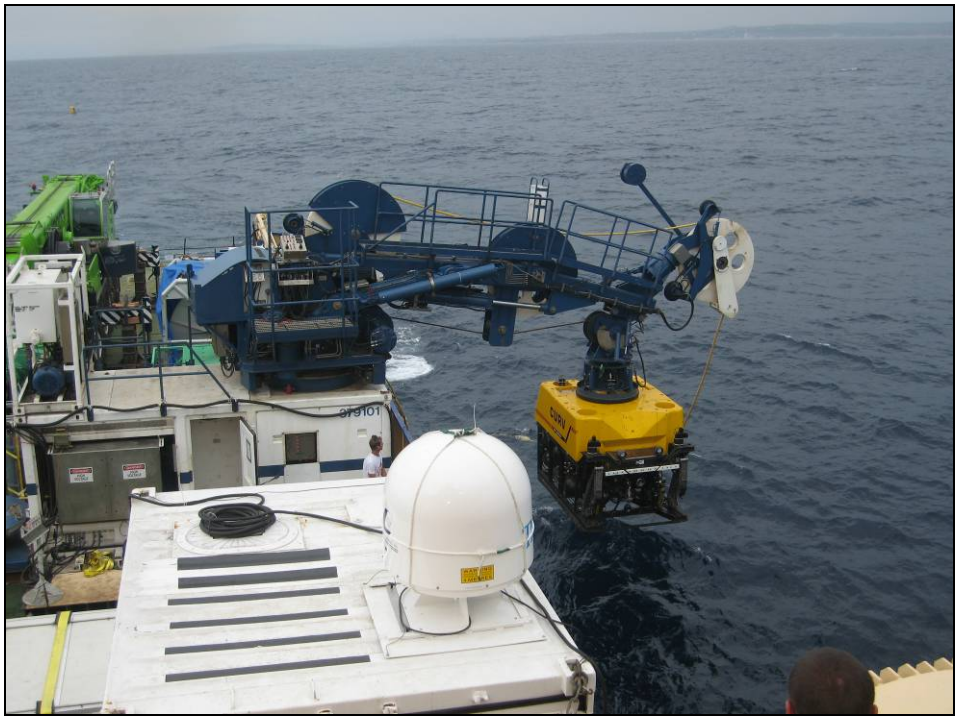

Figure 29: ROV *USN CURV 21* being launched for a similar photographic survey of the *M24* Japanese midget submarine (Photo: David Nutley 2007)

Survey Limitations

Several factors limited the extent of the survey area and the effectiveness of the inspection.

- That maritime archaeologists were not present during the survey, and hence could not direct survey operations or inspect targets of interest. As such, the ROV interrogation was not an archaeologically controlled operation.
- The area lies in the region of the East Australian Current (EAC), a strong boundary current which runs from Queensland to Tasmania and results in strong offshore seawater movement from north to south (and vice versa) with sporadic strong localised eddies. The current is strongest during the summer months, and is characterised by large scale meso-eddies dominating the flow (Ridgway and Hill 2009: 1, 5).

- The current's presence led to difficulty in manoeuvring the ROV onsite due to strong lateral currents and localised eddies, and also stirred up seabed sediments obscuring vision. The current also supports increased prolific marine

life, which was observed during the footage on site, and small microorganisms (probably plankton) often obscured video coverage as they moved across the screen (with an appearance not unlike small hot cinders darting across the screen).

- The extreme depth of the wreck (up to 400m) limited the technology that could be used to inspect the wreck. There was a limited window of availability for use of the CURV ROV as the unit was assigned to other commitments, which resulted in approximately 10 hours of onsite video coverage.

- Due to heavy fouling by fishing nets, the stern area of the vessel was not investigated in great detail due to the danger of potential snagging hazards for the ROV.

It should be noted that:

- most of the video footage covers the starboard side of the vessel, although some footage was recorded immediately around the port sides of the bow and stern;
- as there are gaps between coverage in the video footage provided to the Heritage Branch, it was sometimes not possible to estimate the exact location of some structural features observed in the film, estimate their relative locations to other features or give exact distances between features;
- the majority of the vast debris field (up to 600m long) which was identified during the 1990 survey was not inspected due to time restrictions on site and strong currents;
- as the ROV was an American vessel, all measurements taken on site were recorded in feet, and:
- the video data captured was not in high definition digital format, which has limited subsequent broadcasting opportunities.

RESULTS / INTERPRETATION

Site Description and Identification of Wreck Features

The wreck consists of a completely intact upside down hull, with the deck resting on the seabed. The bow section lies on the seabed with a slight list (of less then 2 degrees) to the starboard side. The amidships section of the hull is slightly elevated off the seabed (in some places 1-2m) and supported by the vessel's crushed superstructure. The stern area has sustained some buckling damage from descent collision with the seabed, but is substantially intact and rests on the seabed. An extensive debris field is evident on the starboard side of the wreck. Several features have confirmed the identity of the vessel as *HMAS Australia,* outlined below.

Intact Hull

- Bow Section and Starboard Side Features: The stem post of the wreck is very fine in profile, and exhibits a pronounced turn to aft approximately 2m vertically from the keel. The stem post showed signs of fresh corrosion and scraping, which might be consistent with damage attributed to commercial fishing nets and ropes scraping over the hull (see Figures 30, 31). A mooring port is visible approximately 1 metre aft of the bow at deck level on the port side.

- Two large hawseholes are located on the starboard side approximately 2-3m aft of the stem post (see Figure 32). No mooring port was visible on this side as it appears that this area is partially buried in shallow silt. A distinct band of oysters and/or barnacles were evident still adhering along the former waterline edge in this area of the bow.

- The first of six scuttles were sighted approximately 8m aft of the last hawsehole, with the scuttles spaced approximately 2 m apart along the hull side approx 0.5m below the deck. A square escape hatch was visible approximately 1m to aft, with what appears to be a fairlead on the deck above, followed by another scuttle (see Figure 33).

- Two mounts for an antisubmarine net or boarding/ landing stage support were noted approx 2m from the scuttle, followed by an undersized and two regular scuttles (see Figure 34).

- Below the last scuttle, the end of a hollow cylindrical iron/steel mast with an internal ladder was observed protruding approximately 3m horizontally from underneath the hull at an angle of approximately 45 degrees towards the bow. This mast is probably the vertical mast from the forward mast tripod (see Figure 35).

- Rusticles were evident adhering to the deck edge and on some sections of plating in this area. Large sections of fresh iron corrosion were evident on the hull plating approximately 3m above this location, suggesting that there may have been recent damage to this section of the hull.

Figure 30: Photomosaic of starboard stem and keel of bow (Photomosaic: Brad. Duncan after DMS 2007)

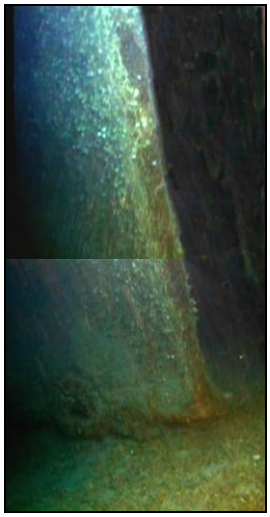

Figure 31: Photomosaic view of port bow and mooring port, showing recent corrosion probably caused by net abrasion (Photomosaic: Brad Duncan after DMS 2007)

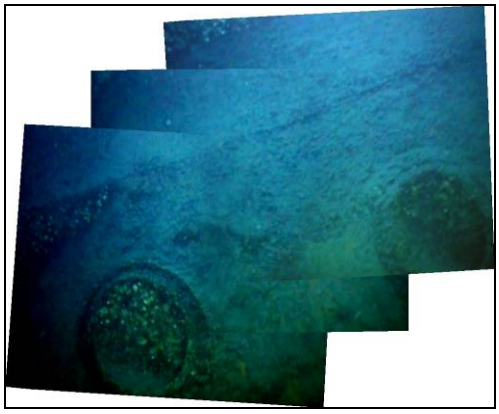

Figure 32: Hawse pipe in bow section (Photomosaic: Brad Duncan after DMS 2007)

Figure 33: Starboard deck edge with scuttles and escape hatches, fairlead and rusticles (Photo: DMS 2007)

Figure 34: Landing stage bracket supports, starboard side (Photo: DMS 2007)

Figure 35: Part of forehead tripod mast trapped under the hull on starboard side (Photo: DMS 2007)

- Stern Scuttling Holes: A large rectangular shaped hole approximately two- three metres square was evident cut at deck level in the hull at a depth of 1315 ft (394m), with two scuttles evident approximately 1m directly above and to the right side of the opening (see Figure 36). A progression of a scuttle, and an escape

hatch followed by two more scuttles were evenly spaced just below the deck level on the right side of the inverted hull. The large hole is consistent with one of two scuttling holes known to have been cut between the P and Q gun mounts (located amidships) which were cut into the hull and deck to allow air to escape from the hull during scuttling were observed. Identification of these features in a contemporary photograph of the scuttling show that the scuttling hole is located just aft of the amidships funnel. A section of overlapping/protruding hull plates were observed just aft of this area approximately 2m higher on the hull, as were several rusticles and freshly rusted areas at a depth of 1316ft (395m).

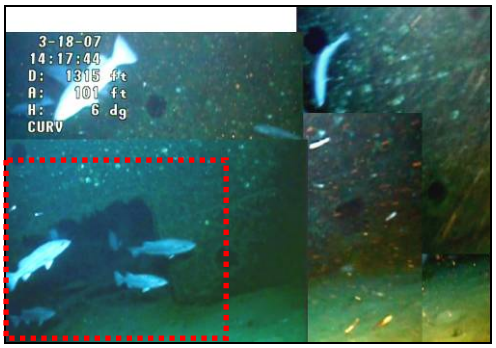

Figure 36: Scuttling hole in hull at deck level (Photomosaic by Brad Duncan after DMS 2007)

- Stern Area – Torpedo Tube/ Cruiser Stern: A section of bilge keel extends longitudinally for at least 10-15m towards the stern on the hull. A section of possible stern tubing is also evident on the inner side of this feature at the torpedo tube end, probably from the inner starboard propeller (see Figures 37, 38).

- A small attached section of iron on the port stern side at 1298ft (389m) may be the remains of the port propeller stay (see Figures 39, 40). Sections of what appears to be a collapsed walkway (evidenced by what appears to be staunchioned handrails) lie further aft close to the edge of the hull (see Figure 41).

- This area lies close to a large rectangular aperture located near the rear of the cruiser stern and approximately 1m below the stern extremity of the keel/ stern tube (at a depth of 1279ft – 384m), which reduces in size as it penetrates perpendicularly (to the keel) into the hull. The location and appearance of this feature is consistent with the aft submerged torpedo launch tube (see Figure 42, 43). This area is heavily entangled with demersal (bottom trawling) nets.

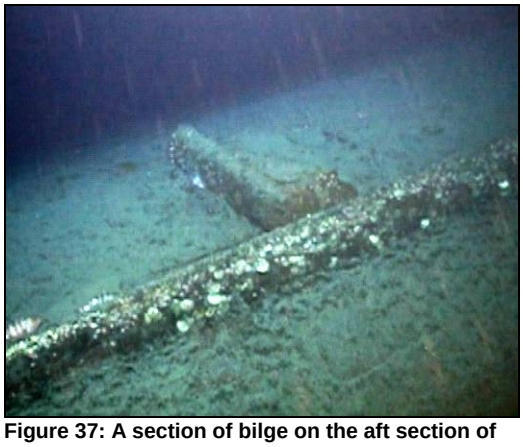

Figure 37: A section of bilge on the aft section of the wreck (Photo: DMS 2007)

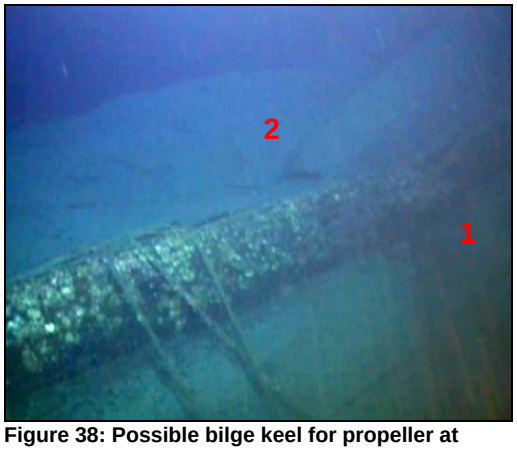

Figure 38: Possible bilge keel for propeller at stern end. Note broken/ creased section (1) and a stern tube (2) (Photo: DMS 2007)

Figure 39: Port propeller stay (Photo: DMS 2007)

Figure 40: Close-up view of port propeller stay (Photo: DMS 2007)

Figure 41: Unidentified piping wreckage alongside starboard hull (Photo: DMS 2007)

Figure 42: Starboard torpedo tube draped in nets (Photo: DMS 2007)

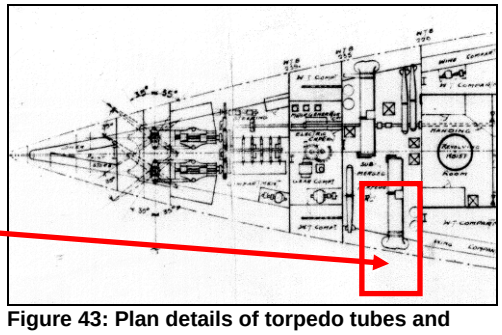

Figure 43: Plan details of torpedo tubes and rudders, platform deck (Image: Beandford, n.d.)

- Paddle Rudders/ Propeller Stay: Two vertical elliptical shaped plated objects, standing approximately 2m apart, were discovered still attached to the wreck (at depths of 1291-1302ft (387-391m)) just aft of the torpedo tube (see Figure 44). Video footage of this area was obscured due to dense waterborne sediment. However the production of a photomosaic image from video footage enabled interpretation of these features, which are consistent with the paddle type rudders used on *HMAS Australia*.

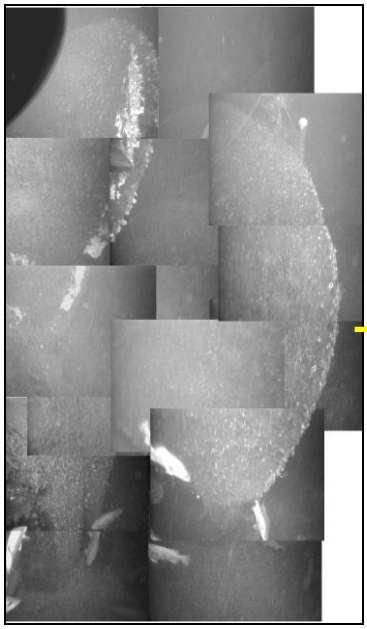

Figure 44: Paddle rudders (Photo: DMS 2007)

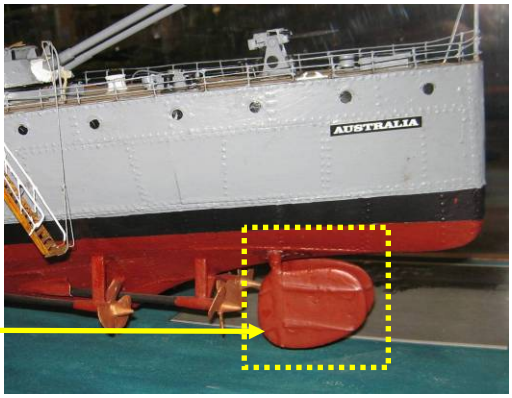

Figure 45: Model of *HMAS Australia* showing stern tubes and paddle rudders (Image: Brad Duncan - Ballina Naval and Maritime Museum Collection).

- Sternpost: What appears to be the sternpost area is vertical and is located at 1300 ft (390m). The metal is relatively free of marine growth, except for what appears to be a band of oyster shells still adhering at what appears to be the former waterline level (see Figures 46).

Figure 46: Sternpost (Photo: DMS 2007)

Debris Field

- Funnel: The remains of a section of a large metal funnel lie at a depth of 1295-1302 ft (388– 390m) just aft of the stern (see Figure 47). The funnel appears to be constructed of plate steel using overlapping joints, and has a pipe along the forward edge which may be a steam pipe. Analysis of the contemporary pre-scuttling photographs revealed that the amidships funnel had been completely dismantled from its original position and was lying flat on the deck inside of "P" gun turret, and that it was pictured falling across the deck as the vessel heeled over to starboard. It is probable that this is the amidships funnel.

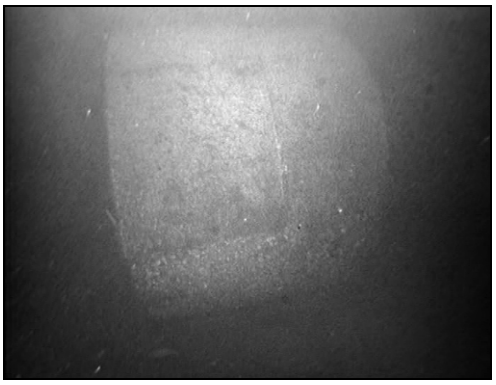

Figure 47: Amidships funnel in debris field (Photo: DMS 2007)

- Aft Lifeboat Cradle: What may be an aft life boat cradle lies upside down at a depth of 1320 ft (396m) and is entangled with nets (see Figure 48). The structure consists of two parallel inverted "U" shaped steel structures approximately 3-4m wide linked by perpendicular longitudinal bracing. A recess in the centre of the "U" section may have been used to rest the lifeboat keel. The size of the structure is consistent with the main ships boats stored aft of the rear funnel on the boat deck (2 x 50 ft (15m) steam pinnaces and 45 ft (13.5m) barge).

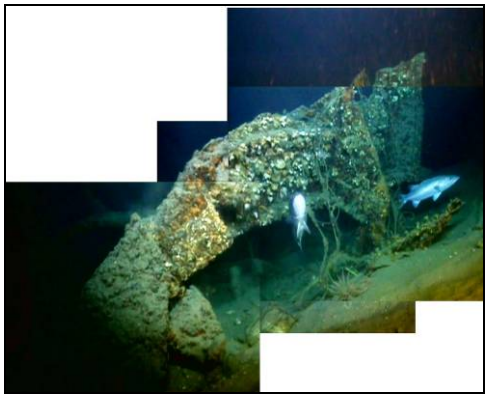

Figure 48: Photomosaic of lifeboat cradle (inverted) in debris field (Photomosaic: Brad Duncan after DMS 2007)

- Aft Control Tower Tripod Mast/ Box/ Debris Field (Starboard Side): This debris field is located on the starboard side of the wreck travelling from the stern and bow. The remains of the aft tripod mast were evident on the starboard side. The two rear angled mast sections were still attached to the upper cap/section of the forward horizontal mast/cap of this structure. Sections of the top (platform) cheeks are still attached. A one section of the mast column exhibits a vertical jackstay rail, which confirms that that section is a rear mast of the tripod (see Figures 49, 50).

- Close by (within 5m) to this structure is a rectangular riveted steel box (possibly a water tank?) with a large circular hole in the end (lying in 1348 ft (404m) of water). The box lies in a large depression on the seabed, which may have been caused by localised scouring (see Figure 51).

- Approximately 20m away in 1348 ft (404m), lies a large sheet of steel plating, which may be a section of deck plating from near the rear funnel to facilitate the scuttling (see Figure 52).

- Another unidentified piece of structural steel with two smaller box like structures lies within 10m of the plating (see Figure 53).

- An unidentified piece of structural awning with a circular cap and a recessed opening for a doorway, possibly the roof a section of the range-finding structure, lies approximately 5m up the slope away at a depth of 1347ft (404m) (see Figure 54).

- Further along the slope at 1348ft (404m) another large box like structure was encountered which was slightly elliptical at the top end and rectangular at the base - possibly another section of the funnel? (see Figure 55).

- Proceeding along the slope towards the bow, a small section of bracket was encountered at approximately 1350ft (405m - see Figure 56).

- Further unidentified structural members and hull/ deck plating (possibly with light deck beams) were found approx 20m away along the slope. Heavy structural frames and a square box was evident at 1345ft (403.5m - see Figure 57).

- The missing section of the vertical mast of the aft control tower tripod lies further down the slope approx 15 m away. The end section of this mast is jagged, suggesting it has been torn from its cap end fitting. Several lugs for attaching

pulley blocks to the mast (to operate the lifeboat gooseneck boom) are evident on this feature (see Figure 58).

- A structure with a circular base (approx 2-3m in diameter) and reinforcing lugs for a central (square?) pillar was observed upright on the seabed several metres from, and perpendicular from the starboard bow. The top half of this feature was covered in fishing nets, but a square shape is distinguishable underneath. The section through the structure is square with a square interior hole. This feature is possibly the 4 inch BL gun pillar from the starboard side Boat Platform deck or part of the aft range finding mount station. It is located approx 10m away from the mast and 10m perpendicularly from the starboard bow (see Figures 59, 60).

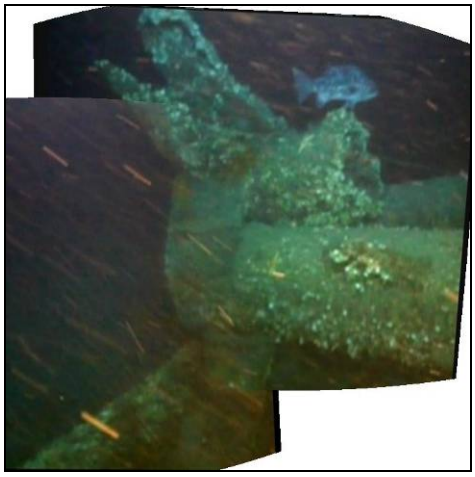

Figure 49: Photomosaic of cap section, top (platform) and spreader bars of aft control tower tripod masts (Photomosaic: Brad Duncan after DMS 2007)

Figure 50: Jackstay rail on aft control tower tripod mast (DMS 2007)

Figure 51: Riveted tank in debris field (Photo: DMS 2007)

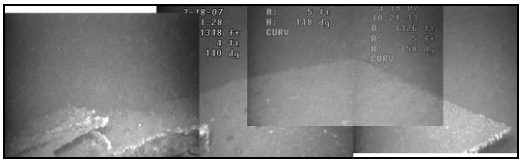

Figure 52: Hull or deck plating (Photomosaic: Brad Duncan after DMS 2007)

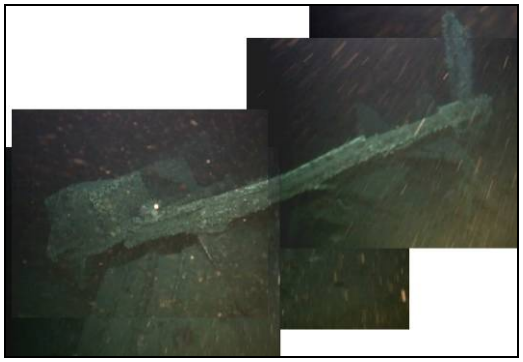

Figure 53: Unidentified structure with boxes (Photomosaic: Brad Duncan after DMS 2007)

Figure 54: Unidentified awning structure with column capping and doorway in debris field (Photo: DMS 2007)

Figure 55: Curved box section in debris field - possibly section of a funnel? (Photo: DMS 2007

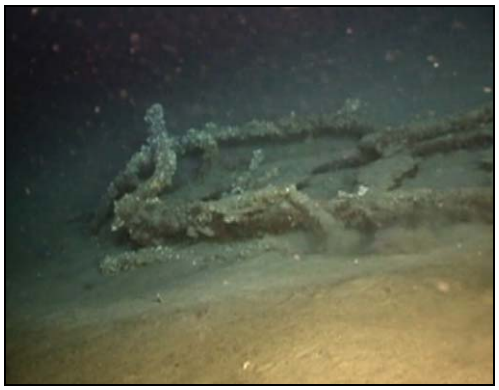

Figure 56: Bracket in debris field (Photo: DMS 2007)

Figure 57: Unidentified superstructure amidships in debris field (Photo: DMS 2007)

Figure 58: Section of centre aft control tower tripod mast in debris field (Photo: DMS 2007)

Figure 59: Photomosaic of starboard 4 inch BL gun pillar mount or range finding station) draped in fishing nets (Photo: DMS 2007)

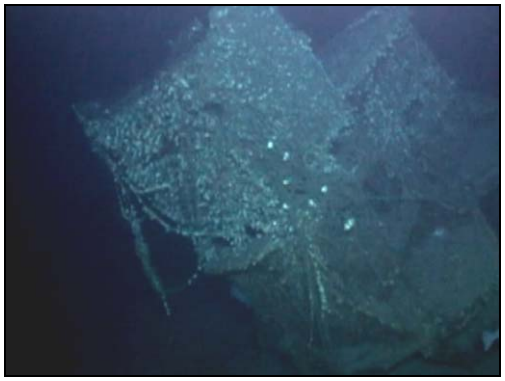

Figure 60: Side view of superstructure possibly from BL gun pillar mount, range finding station or amidships superstructure (Photo: DMS 2007)

Aft Range Finding Station

- Superstructure/ Unidentified Superstructure: A large section of superstructure with a rectangular hole (possibly a window?) and open portico (?) section with attached ladder (to access the next deck) was evident on the starboard side of the vessel several metres from the stern. This jagged edge on the bottom of the structure suggests that this feature was violently torn from its footings. The enclosed section of the feature, which appears to be of the same size as an outdoor toilet with an overhanging eave, evidenced a large round pipe underneath. The roof of the rear of this structure has what resembles cross tree spreader bars approximately 2-3m in length. The structure lies in 1337ft (401m) of water (see Figures 61, 62). This structure is consistent with the appearance of the rear range finding superstructure.

Figure 61: Possible aft rangefinder station structure (Photo: DMS 2007)

Figure 62: Possible aft rangefinder station structure (Photo: DMS 2007)

- A section of superstructure ceiling with hanging knees was located nearby (see Figure 63).

- At another point probably in the forward section of the debris field of (which could not be accurately determined from the footage), a large iron structure was discovered which may be part of the bridge, based on the windows sized apertures (see Figure 64).

Figure 63: Superstructure deck with hanging knees (Photo: DMS 2007)

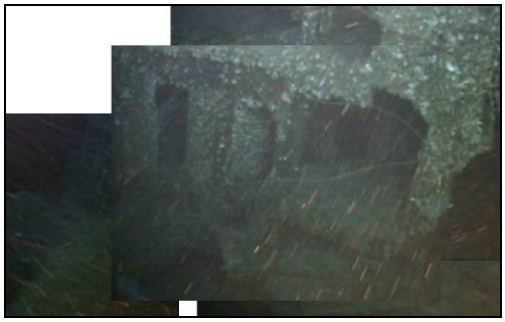

Figure 64: Possible bridge structure in debris field (Photomosaic by Brad Duncan after DMS 2007)

DISCUSSION

Site Identification

The underwater ROV video footage of the site provided enough evidence to be able to positively identify the vessel as *HMAS Australia* based on comparison with historical photographs. Figure 65 shows the scuttling holes which were cut in the side of the vessel to facilitate air to escape rapidly from the hull, along with the remains of the aft lifeboat cradle for one of the steam pinnaces.

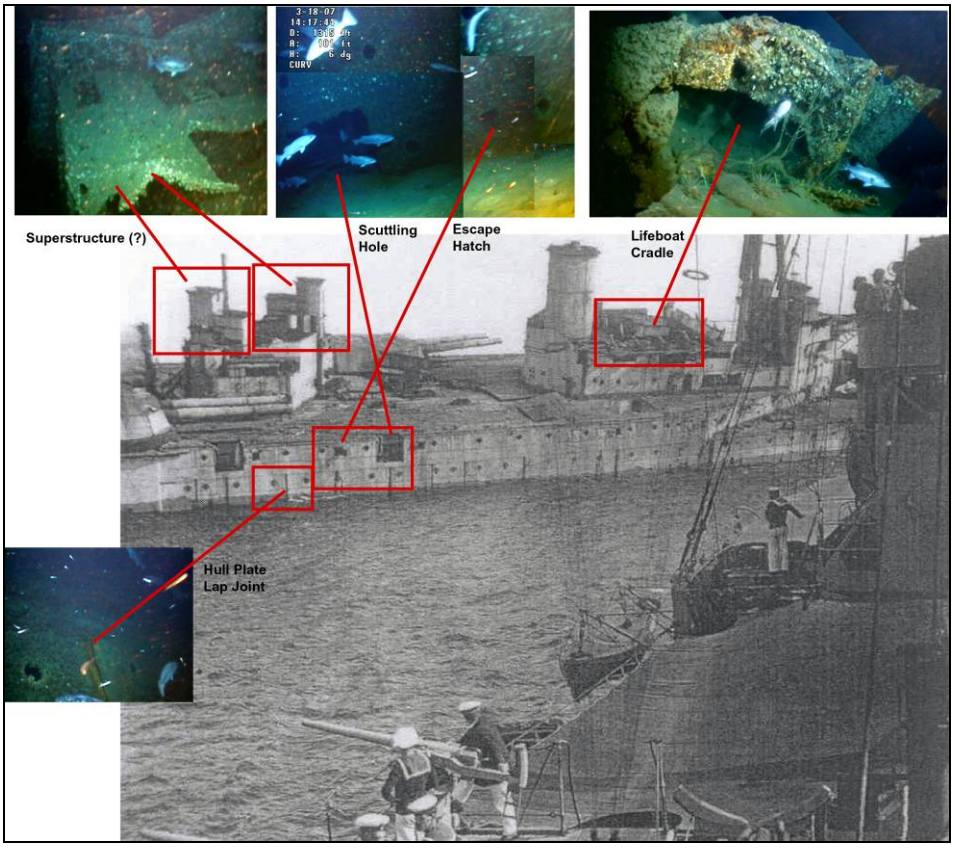

Figure 65: Feature identification points confirming identity of wreck as *HMAS Australia* (Image by Brad Duncan after DMS 2007)

Figure 66 shows the fore mast section of the aft control tower, which has been split off just below the top platform. The lugs for attaching pulley sheathes (probably associated with the gaff boom for lifting the amidships lifeboat) are still evident along the length of the mast. This section would have fitted into the cap at the apex of the two aft masts (see Figure 49) to form the tripod of the aft control station.

Figure 67 illustrates the locations of identified stern features on *HMAS Australia* from Australian War Memorial (AWM) plans, including the bilge keel, the torpedo tube and propeller shaft stay. Figure 68 demonstrates conformity between the sections of the hull on the seabed and features identified on historical photographs. Beginning at the bow: the stempost, mooring port, and two hawseholes are consistent with historically documented features. Similarly, a section of hull parallel to the A turret on the starboard hull including the location of several scuttles, a pair of boarding stair brackets and an square escape hatches match exactly to historical photographs from 1914. Sections of the aft steam pinnace lifeboat cradle, the aft control tower aft mast

cap and superstructure (possibly from the rear range-finding station) also confirm the vessel's identity as that of *HMAS Australia*.

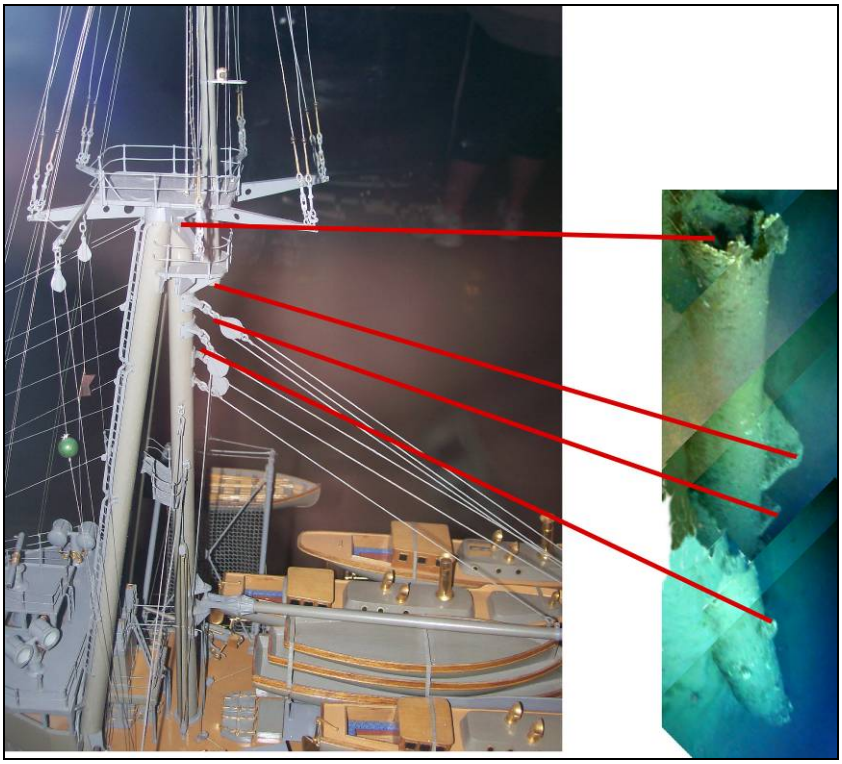

Figure 66: Identification features on a section of the aft control tower mast showing pulley block lug points and broken section from below top platform (Image by Brad Duncan after Tim Smith 2007 and DMS 2007)

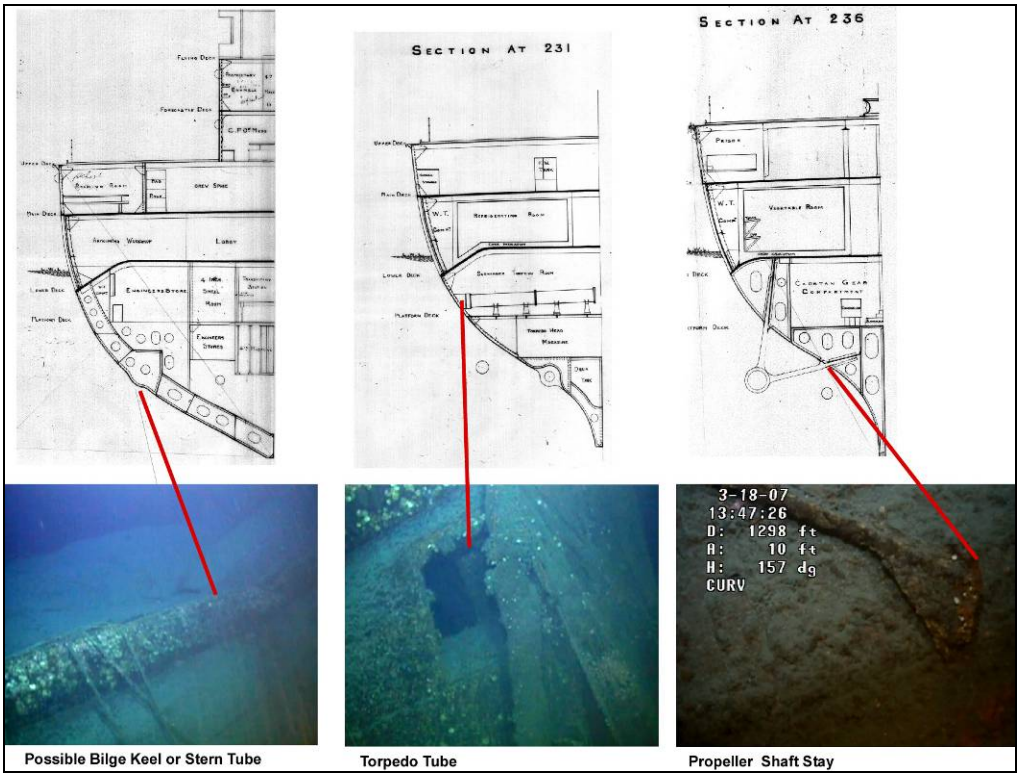

Figure 67: Stern features identified from *HMAS Australia* (Image: Brad Duncan after DMS 2007 and Beandford n.d. - AWM Plans)

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Heritage Branch
NSW Office of Environment and Heritage

Figure 68: Features confirming the identity of *HMAS Australia* (Image: Brad Duncan after DMS 2007)

Location:

Previous official listings for the location of the *HMAS Australia* wreck site have been given as:
33˚ 53' 25" S, 151˚ 46' 5" E in 150 fathoms (Commonwealth Government Gazette, 1924);
33˚ 53' 24" S, 151˚ 20' 42" E, 24 miles from South Head (Plunkett's 2003)

The location given for the Fugro survey location for the wreck was:
33˚ 51' 54.21" S, 151˚ 44' 25.11" E in 390-400m depth (Datum: WGS 84, Projection: Transverse Mercator)

The unidentified wreck lies 50 km from Sydney Heads. As none of the positions given have nominated a datum for the coordinates, it is assumed (for the sake of comparative simplicity) that all positions used the same datum (but this may not necessarily be the case). Comparison of these locations reveals that Plunkett's location is approximately 44km west of the actual location, whereas the Commonwealth Government Gazette location is approximately 4.1 km south east of the actual wreck site.

No other wrecks of this size are recorded on the NSW Historic Shipwreck Database anywhere in the State, except for *HMAS Australia*. This location was sufficiently close enough to the location of the unidentified wreck to deduce that it was *HMAS Australia*. The 2007 archaeological inspection confirmed the wreck to be HMAS Australia based on size and other diagnostic features.

Comparative Sites

HMAS Australia was Australia's only battlecruiser, and as such, there are no other comparative sites in Australia. In order to assist with identification of the site, on site formation processes and significance, an overview of WWI battlecruisers is presented below, which focuses on the remaining battlecruiser shipwreck resource. Although there were a number of other battlecruiser wrecks in the world's oceans, and some of these have been relocated, relatively few WW I battlecruisers wrecks have survived (largely due to their subsequent salvage – particularly at Scapa Flow after the war). Of those that have remained as wreck sites, few have been adequately documented (McCartney 2001). Hence there is also a dearth of international comparative sites. Therefore this précis also examines a limited range of WW I & II battleships wrecks (which are similar in size and armament), predominantly to assess possible site formation processes which might demonstrate analogous processes on the *HMAS Australia* wreck site. It also provides an overview of the historical international development of the battlecruiser type.

World War One Vessels

- ***Indefatigable* Class Battlecruisers**

Only three *Indefatigable* Class battlecruisers were ever constructed: *HMS Indefatigable (1909)*, *HMAS Australia (1911)* and *HMS New Zealand (1911)*. The vessels were designed to carry two wing turrets to give a greater arc of fire, but were not an appreciable improvement on the earlier *Invincible* class of battlecruisers. The vessels were smaller and not as well protected as their contemporary rivals in the German Imperial Fleet (*SMS Von Der Tann* and subsequent designs – see below). The design of *HMAS Australia* and *HMS New Zealand* were altered to incorporate new knowledge of the *SMS Von der Tann* (Wikipedia 2011e).

HMS Indefatigable was sunk during the Battle of Jutland on 31 May 1916, when she was hit by two shells from the *SMS Von der Tann*, which caused two explosions which ripped a hole in her hull, and sent debris 60m into the air (Wikipedia 2011f).

After war service, in accordance with the terms of the Washington Treaty (which led to the scrapping of *HMAS Australia*), *HMS New Zealand* was sold for scrap in 1922 (Wikipedia 2011e). Though *HMS New Zealand* was funded by New Zealand, it was presented to Britain for use in the Royal Navy (Moore 1990: 44). The warship visited New Zealand and the Pacific for 10 months in 1913. However, the vessel was back in British waters before the start of World War I, and as such was not present for the defence of southern waters (Waters 1956: 541-43; Wikipedia 2011e).

The *HMS Indefatigable* wreck site has been subject to unauthorised salvage for at least fifty years. The wreck was officially rediscovered in 2001 by Deep Blue Expeditions. Little remains of the site, which is in pieces no larger than a car, and it has been suggested that the site has also been subject to extensive disturbance by divers, along with commercial salvage in the 1950s (McCartney 2001; Henneman 2011g). Therefore the wreck of *HMAS Australia* is the only *Indefatigable* class battle cruiser left intact in the world as an archaeological wreck site.

- **British Battlecruisers**

There were eight classes of WW I battlecruisers. The first class of British battlecruisers was the *Invincible* Class, which included *HMS Invincible* (1907), *HMS Inflexible* (1907) and *HMS Indomitable* (1907). Four sets of twin turrets carrying eight 12 inch guns were mounted for and aft, and amidships between the funnels. The next generation was the *Indefatigable* class battlecruisers. These were closely followed by the construction of two *Lion* Class battlecruisers, *HMS Lion* (1910) and *HMS Princess Royal* (1911), which each carried eight 13.5 inch guns in 4 x twin turrets mounted fore (2), amidships (1) and aft (1). Two dreadnought class battlecruisers, *HMS Queen Mary* and *HMS Tiger,* were built from 1911-1912 and 1913-1914 (respectively), and were equipped with eight 13.5 inch guns mounted in twin turrets fore and aft. The *Renown* class produced *HMS Renown* (1915) and *HMS Repulse* (1916), which included six 15 inch guns in twin turrets (one fore and two aft (Moore 1990: 42-45)).

The world's first battlecruiser *HMS Invincible* lies in 177 ft (53m) of water after being sunk at the Battle of Jutland by shell fire. The wreck lies in two pieces side by side situated close together with the stern section upright and the bow section inverted. *HMS Queen Mary* was the second battlecruiser to blow up at Jutland. She now lies in two pieces in 196ft (59m) of water upside down with guns/ turrets buried in sand. Both sites are deteriorating rapidly (Moore 1990: 313; Henneman 2011e; 2011f; McCartney 2001).

HMS Repulse was sunk by torpedoes in 1941 off the south eastern coast of Malaysia in the South China Sea. The wreck is intact in 57m water and lies upside down on its superstructure with the turrets intact (Allen 2009; Henneman 2011k).

- **British Battleships**

The battleship *HMS Audacious* was lost during manoeuvres in 1913, after she hit a mine which caused her to list to the port side. When water was pumped into the starboard side to counteract the list, the vessel flooded throughout and eventually capsized and sank. The vessel lies up side down in 216ft of water, and as it was not discovered until 1995, it is relatively undisturbed (Hinneman 2011h).

- **German Battlecruisers**

Germany had four classes of battlecruiser which were used in WW I in the Imperial Navy. In order of evolution, the first generation of German battlecruisers was the *Von der Tann* (1907) of which only one class of its type was made. It housed eight 11 inch guns in twin turrets located fore and aft, and amidships, with the starboard guns located forward of those on the port side. The Moltke Class vessels *SMS Moltke* (1909-1911) and *SMS Goeben* (1911) carried ten 11 inch guns in a similar arrangement to the preceding class, with the exception of an extra gun turret aft. The *SMS Seydlitz* (1911-1913) with a similar setup to the Moltke class, was the second generation of battlecruisers introduced, with the *Derfflinger* class battlecruisers (*SMS Derfflinger*, *Lutzow* and *Hindenburg*) built 1915-17 to counter the British Lion Class battlecruisers. They carried eight 12 inch guns in twin turrets fore and aft (Moore 1990: 107-108; Wikipedia 2011a; 2011b; 2011c; 2011d).

The *SMS Lutzow* was scuttled by her German crew immediately after the Battle of Jutland (Wikipedia 2011d). The wreck lies in 144ft (43m) of water and is almost completely upside down, with the hull resting on the conning tower and three turrets, with the fourth turret upside down nearby the wreck (Henneman 2011a). The *SMS*

Von der Tann, SMS Seydlitz, *SMS Moltke*, *SMS Derfflinger*, and *SMS Hindenburg* were also scuttled at Scapa Flow to prevent being used by the British (Moore 1990:318).

Many of the battlecruisers of the German Imperial Fleet scuttled at Scapa Flow at the end of WW I were subsequently raised and scrapped (e.g. German battlecruisers *SMS Seydlitz*, *SMS Moltke*, *SMS Derfflinger*, *SMS Hindenburg, SMS Von der Tann* (Wikipedia 2011b; 2011c, 2011d). The few that were not scuttled (e.g. *Moltke* Class *SMS Goeben* and light cruiser *Bresleau*) were transferred to the Turkish Navy prior to the end of the war and were later scrapped (Moore 1990: 318; Wikpedia 2011b).

- **German Battleships and Light Cruisers**

The 162m long German heavy cruiser *SMS Blucher* was sunk in the battle of the Dogger Bank (North Sea) and was discovered by the National Underwater and Marine Agency (NUMA). The vessel rolled over onto her side as she sank (Delgardo 2001:151; Wikipedia 2011a).

The German battleship *SMS Thuringen* was built 1908-1911 to the second dreadnought design, and carried twelve 12 inch guns. After the completion of the war, she was ceded to France and was scuttled for gunfire practice in 1923. The wreck now lies in shallow water with her turrets exposed at low tide (Henneman 2011b).

The battleship *Ostfriesland* was built in 1908, and saw action at the Battle of Jutland. Although the vessel was interned at Scapa Flow she was awarded to the United States as a War Prize and was commissioned into the United States Navy where she was subsequently used as a live fire vessel, and sunk using aerial bombing in 1921. The vessel lies upside down 60 miles off Virginia Capes resting on its turrets in 380ft (114m) of water and was located in 1990.

The three battleship sites at the Scapa Flow (*SMS Markgraf*, *Kronprinz Wilhelm* and *Konig)* were of similar dimensions to *HMAS Australia* (Forbes n.d.:24). They lay upside down on their decks with their superstructure impacted into the seabed, and their bows were broken just forward of the forward gun turret, with the bow settled onto the seabed. In the case of the 4 (lighter) cruisers (*SMS Cöln*, *Karlsruhe*, *Brummer* and *Dresden*), these vessels all lay on their sides (Forbes n.d.:32).

- **Japanese Battlecruisers**

Japan built three classes of battlecruiser during the period up to WW I. Numerous battlecruisers were introduced into service between 1905-1907, including the cruisers *Katori* , *Kashima*, *Ibuki*, *Kuruma*, *Tsukuba* and *Ikoma* in 1905 which housed four twelve inch guns in twin turrets. In 1907, the *Kurama* and *Ibuki* battlecruisers were constructed with four twelve inch guns in twin turrets (fore and aft) and eight 8 inch secondary guns. These were superseded by the Dreadnought *Kongo* Class battlecruisers *Kongo* and *Hiei* in 1912, and *Haruna* and *Kirishima* in 1913, which carried eight 14 inch guns in twin turrets in fore and aft configuration (Moore: 1990:165, 167).

The battlecruiser *Tsukuba* was destroyed by an internal explosion in 1917 (Moore 1990: 316). The vessel was subsequently raised and used for naval aviation target practice, and later broken up in 1918 (Allen 2008a). The Kongo Class battle cruisers *IJN Hiei* and *IJN Kirishima* were both subsequently sunk at Guadalcanal in 1944 (Allen 2011b; 2011c). The *Hiei* sank by the stern after being scuttled by her crew as

she was sinking by the stern (Ballard 1993: 142-143). The *Kirishima* was sunk during a barrage of 14 inch shells. The *Kirishima* now lies in 4000ft (1200m) of water, with the stern upside down, and the bow and tip of the stern gone, possibly as the result of a magazine explosion (Ballard 1993:188-191, 206; Friedman 2007; Hibbs 2009). The wreck of the *Hiei* has not been found (Tulley 1997). Ballard commented that it was unusual that the *Kirishima* lay upside down, as it was unlike every other vessel he had encountered in deep water (Ballard 1993: 188-190).

- **Japanese Battleships**

The *IJN Nagato* was built from 1917-1920 and was the first battleship in the world equipped with 16 inch guns. The vessel was modified in 1924 and then extensively rebuilt in 1934-35. She was used as Admiral Yamamoto's flagship for the attack on Pearl Harbour in 1941, and was given to the Americans as a war prize after the Japanese surrender. The ship was used as a target for nuclear tests at the Bikini Atoll in the 1940's where she sank during the atomic tests in 1946. The vessel lies upside down in 180ft water resting on her superstructure, with the turrets are still in situ (Delgardo 1996: 157; Henneman 2011j).

- **Russian Battlecruisers**

Two classes of Russian battlecruisers existed in this period. The first included the *Gangŭt*, *Poltava*, *Petropavlovsk* and *Sevastopol* (all built between 1909-1915), which carried twelve 12 inch guns mounted in triple mounted turrets fore and aft. These were replaced by the later battlecruisers *Ismail* and *Kinburn* (1915), *Bordino* and *Navarin* (1917) which carried twelve 14 inch guns in a similar arrangement to the previous class (Moore 1990:235).

The *Petropavlovsk* was torpedoed by the British in 1919 and sank in shallow water, but was later raised (Moore 1990: 235, 318).

- **USA Battleships**

The USA did not construct battlecruisers of comparable vintage to the British. The closest vessels constructed at this time were the *Dreadnought* battleships. Four classes of vessels were constructed between 1906 – 1910, the first being the single calibre *South Carolina* Class vessels *USS South Carolina* (1908)and *USS Michigan* (1908) which carried eight twelve inch guns in twin turrets fore and aft. These vessels were superseded by the *Delaware* class vessels *USS Delaware* (1909) and *USS North Dakota* (1908) which carried ten 12 inch guns in twin turret – 3 aft and 2 forward. Two *Utah* class Dreadnoughts were constructed in 1909 (*USS Utah*) and 1910 (*USS Florida*), and were equipped with ten 12 inch guns in a similar arrangement to the previous class. The *Arkansas* Class Dreadnoughts, saw a massive increase in firepower, and the *USS Arkansas* (1911) and *USS Wyoming* (1912) carried twelve 12 inch guns in two fore turrets and four aft turrets (Moore 1990: 133-136).The *Texan* Class built in 1912 (*USS Texas* and *USS New York*) and later Nevada Class Dreadnoughts built 1914 (*USS Oklahoma* and *USS Nevada*) carried twelve and ten 14 inch guns mounted fore and aft respectively. These were later superseded by the *Pennsylvania* Class Dreadnoughts of 1915 (*USS Pennsylvania* and *USS Arizona*) and the New Mexico Class Dreadnoughts of 1917 (*USS New Mexico*, *USS Idaho* and *USS Mississippi* both of which carried twelve eighteen inch guns in twin turrets fore and aft (Moore 1990 : 133 – 136).

The *USS Utah* had undergone modifications in the late 1920s and 30s and her guns were removed in 1931 when she became a target ship. The *USS Arizona* was rebuilt

in 1931. Both vessels were both sunk in Pearl Harbour by Japanese aircraft in 1941. The *USS Arizona* sank in shallow water, where she remained upright and is now protected as a war memorial and war grave. After being attacked by torpedo bombers the *USS Utah* rolled over on to her side, where she blocked the shipping channel. After several attempts at salvage, the *USS Utah* was eventually declared a war memorial in 1970 (Lenihan et al 1990:24-48).

The *USN Massachusetts* (an all steel 107 m long battleship built in 1890) was scuttled in 1921 in shallow water near the entrance to Pensacola, USA. The vessel was equipped with four 13 inch guns twin mounted in two turrets and a secondary battery of eight 8 inch guns, which were removed before she was sunk. The vessel was considered obsolete in 1919 (Delgardo 2001: 133. 134). The vessel was stripped of her fittings and lies upright on her keel in 25 ft (7.5m) water. The site was nominated as the fourth underwater preserve in Florida (Florida Bureau of Archaeological Research, 1993:2).

Table 2 provides a summary of the remaining known battlecruiser wrecks left in the world as comparative archaeological sites for *HMAS Australia*. Table 4 provides a list of all known battlecruisers ever built (Appendix Three).

World War Two Vessels

- **Australian/ US Cruisers**

The light cruiser *HMAS Sydney* sank in 1941 after being extensively damaged by gunfire and a torpedo attack to the bow inflicted by the *HSK Kormoran* off the Western Australian coast. The ship lies in 2468m of water, with the detached bow inverted and the remaining hull upright. A large debris field is scattered across a 1200m wide area. The hull section sank quickly as the bow detached and water immediately filled the air cavities inside, allowing it to remain upright on the seabed (Buckland et al 2009:144-149).

The wreck of the heavy cruisers *HMAS Canberra* and *USS Quincy* lie in deep water (approx 2500ft – 750m) at near Savo Island, Guadalcanal. The vessels lie upright with their turrets intact and the *USS Quincy* is missing her bow. *HMAS Canberra* was scuttled using 5 inch shells and torpedoes after becoming disabled in battle. As *USS Quincy* sank after being shelled by the Japanese, she listed to port and raised by the stern during her final moments (Ballard 1993: 61-67, 71-93).

- **British Battleship**

HMS Royal Oak, a battleship built in 1914-16 was sunk at anchor at Scapa Flow by a German submarine in 1939. The vessel now lies resting on her superstructure in 93ft (28m) water and is protected as a War Grave (Henneman 2011d).

- **German Battleships**

Ballard and Archbold (1991:43) estimated that the German battleship *Bismarck*, which sank in 5km of water in May 1941 would have a debris field of at least a mile long (1.6km). They also observed that the larger 14 inch turrets of the vessel were all missing, suggesting that the vessel had turned over before re-righting itself to sit upright on its keel on the seabed. They postulated that the cause may have been that, as the vessel sank, the weight of the heavier guns above the centre of gravity combined with the air in the lower holds, caused the vessel to flip over (which dislodged the heavier guns and loose debris from the decks. As the vessel sank

deeper, the holds filled with water, equalising the weight distribution, thus causing the vessel to again flip into an upright position as it submerged further. As the vessel hit the sloping seafloor, it caused an underwater landslide which carried the ship and other heavier debris further down the slope. The debris rained down on either side of the vessel, and one of the heavy turrets was located downhill from the hull. The smaller anti-aircraft guns were still in-situ (Ballard and Archbold 1990:177-78, 218-19; 1991:51, 57).

In many ways the sinking of the *Bismarck* and the resulting debris field pattern has parallels with the wreck of the *HMAS Australia*. Although the vessel is upright on the seabed and in much deeper water, it demonstrates an extended debris field, detached main gun turrets, and an underwater landslide resulting from the vessel's collision with a sloping seabed.

The pocket battleship German battleship *Admiral Graf Spee* was scuttled by her crew following the Battle of the River Plate, and now lies upright in and settled to starboard in shallow water near Montevideo. The wreck has been surveyed by Mensun Bound in 1997 and part of her superstructure has previously been removed (Henneman 2011l).

- **Japanese Battleships**

IJN Nagato battleship lies in 180 ft (54m) of water at Bikini atoll and was scuttled as part of the Bikini Atoll tests. She lies upside down, with turrets still in place, although her bridge has snapped off and lies to one side of the wreck. The battleship *USS Saratoga* also was sunk during the tests and is the deepest wreck in this area (Delgardo, 1996).

Ballard and Archbold (1991:43) have further observed that all wrecks leave a debris field when they sink, and that the size of the field is affected by such factors as underwater currents, the weight of the debris and the depth of the water in which they sank.

Ship	Class	National-ity	Built	Gun Size (bore/#)	Lost	How Lost	Where	Intact	Depth (ft)	Depth (m)
HMS Indefatigable	Indefatigable	British	1909	12" x 8	1916	Bombarded	Jutland	No - extensively broken up by salvers	183	55
HMAS Australia	Indefatigable	Australian	1911	12" x 8	1924	Scuttled	Sydney	Yes - Upside down	1327	398
HMS Invincible	Invincible	British	1907	12" x 8	1916	Bombarded	Jutland	No - two pieces - stern upright, bow inverted	177	53
HMS Queen Mary	Tiger	British	1911-12	13.5" x 8	1916	Bombarded	Jutland	No - in two pieces- stern upside down	196	59
HMS Repulse	Renown	British	1916	15" x 12	1941	Aerial torpedo attack	Malaya	Yes - upside down	190	57
IJN Hiei	Kongo	Japanese	1911-14	14" x 8	1944	Scuttled after battle	Guadal-canal	Not known	Not Known	Not Known
IJN Kirishima	Kongo	Japanese	1912-15	14" x 8	1944	Bombarded	Guadal-canal	No - Stern upside down with tip bow missing	4000	1200
SMS Lutzow	Derfflinger	German	1912-15	12" x 8	1916	Scuttled immediately after battle	Jutland	Yes - upside down	144	43

Table 2: Table of remaining international WWI battlecruiser wrecks

Battlecruiser and Battleship Site Formation Processes

Analysis of the battlecruiser, battleship and cruiser wrecks (as presented above) has demonstrated a number of consistent observations.

- Most battleship and battlecruiser wrecks now lie upside down resting on their superstructure or turrets if they have sunk in water that is deep enough to allow the vessel to first roll over. The only exception to this rule are:
    - those that have sunk in very shallow water (i.e. less than 10m - e.g. *USS Arizona*, *USN Massachusetts, SMS Thuringen*) which normally remain upright, or
    - those which have sunk in very deep water (e.g. *Bismarck* – 5000m deep) which normally right themselves again as air exits cavities in the hull thus equalising the weight distribution and re-establishes an even keel. This process seems to occur somewhere below depths of 1200m (as the *IJN Kirishima* was still inverted at that depth).
- Where warships are fitted with gravity mounted turrets, these usually fall out of their mountings as the vessel sinks. Where gravity mounts are not used, the vessels are usually positioned upside down on the seabed resting on their turrets.
- During damage to heavily armed warships resulting in large splits in the hull or disarticulation, the remaining wreck sections with the heavy guns may lie upright, as air cavities quickly escape the hull and the vessel sinks upright to the seabed (e.g. *HMAS Sydney*, *Bismarck*).
- Most wrecks appear to have associated debris fields, which extend on each side of the wreck, and that usually consists of loose materials which have become detached during the wrecking event which have rained down over the wreck after it has struck the seabed. Furthermore, if the vessel sinks on an inclined seabed, then it may also cause an underwater landslide, resulting in an impact point on the seabed and movement of the hull and debris field down the slope (e.g. *Bismarck*, *HMAS Australia*).
- From the evidence at hand, when light cruisers sink in shallow water (<200m), they usually come to rest on their side on the seabed (e.g. Scapa Flow light cruisers *SMS Cöln*, *Karlsruhe*, *Brummer* and *Dresden*).

- **Comparative Sites and *HMAS Australia***

A key feature identified during this survey was that the vessel was inverted when it hit the seabed, and was now lying on its decks on the seabed. This suggest that the vessel capsized during the sinking process, and that did not re-right itself on its descent to the seabed. This observation is consistent with contemporary historical photographs of the sinking of *HMAS Australia*, where the vessel was photographed rolling completely over on the surface before sinking. Additionally, as outlined above, comparative sites of other battlecruiser and battleship sites worldwide show that at this depth, the wrecks of warship type were most likely to capsize on the surface and be found upside down on the seabed. This is due to the great weight of the guns and upper superstructure.

Although there were a number of battlecruiser wrecks, *HMAS Australia* is one of only two surviving examples of an *Indefatigable* Class battlecruiser wreck. As the only relatively intact hull of a battlecruiser of this class (despite some limited salvage prior to scuttling), it is the best archaeological example of this class, and the only example to be undisturbed since it was sunk. Analysis of other comparative sites worldwide has revealed that it is one of only 8 surviving WW I battlecruiser wrecks in the world

(out of a total of 40 originally constructed) and is probably the most intact and undisturbed battlecruiser wreck in the world.

HMAS Australia is probably the best surviving archaeological example of any battlecruiser wreck internationally. As such, it represents an archaeological benchmark or reference site for further studies of other battlecruiser sites worldwide, and for the interpretation of the broad scale international development of the battlecruiser. *HMAS Australia* is unique as Australia's largest intact historic wreck site and the only battlecruiser wreck in Australian waters.

Site Formation Processes On Site

The analysis presented above of battlecruisers and ship losses provides a critical background to interpret site formation processes on *HMAS Australia*. The wreck of *HMAS Australia* lies with the bow at a depth of 1332 ft (400m) on the seabed on the starboard side and at 1327ft (398m) at the hawsehole port side. The depth of the stern is between 1273ft (382m - torpedo tube) and 1302ft (391m) on the seabed near the rudders. This indicates that the wreck lies with the bow orientated down the slope towards the south east.

Analysis of the position of wreckage around the wreck enabled an interpretation of the wrecking site formation process to be understood. The orientation and current position of the vessel on the seabed is consistent with reports and photographs from the scuttling, where the vessel capsized to port before sinking by the stern. It appears that the vessel has completely inverted on the way to the bottom, and that the turrets have probably fallen out during this time. The location of the top section of the aft tripod mast (lying oriented towards the stern), and a section of the forward mast lying under the starboard side suggests that ship probably struck the bottom first in the area of the aft control tower tripod mast, forcing it backwards towards the stern and completely snapping off the vertical forward mast of the aft tripod.

The two remaining forward masts of the forward control tower then struck in deeper water, snapping it off and driving it forward under the hull as the vessel slid down the slope. The collapsing masts appear to have swept through areas of other upper superstructure (bridge/ amidships structure, and aft rangefinder superstructure and unidentified other superstructure) and other deck furniture, breaking them off the vessel (e.g. lifeboat cradle, gun pillar mount), some of which came to rest close to the side of the vessel (see Figure 69). The stern also appears to have sustained some damage during this process, as evidenced by a crumpling around the keel area at the very stern extremity, but the extent is currently unclear due to inadequate filming of this area.

The starboard side of the bow is very lightly buried (to a maximum of approximately 10cm) suggesting that the wreck is lying diagonally across the slope, with the starboard side on the lower slope. As the top of the main deck level is visible at many points around the starboard side of the wreck, it appears that the wreck is resting predominantly on the upper superstructure, which has been compressed into the sandy seabed during the wrecking event and in subsequent settling over time.

No signs of the gun turrets/ loose gun barrels were noted during the survey, suggesting that they have fallen out of their gravity mounted pillars during the vessel's decent to the seabed. As the wider debris field was not examined (except close by to the wreck), it is probable that these features lie both further up and down the slope from the main hull. The debris field presents valuable opportunities for

future examination of loose relics and detached sections of the superstructure; deck furniture and main hull.

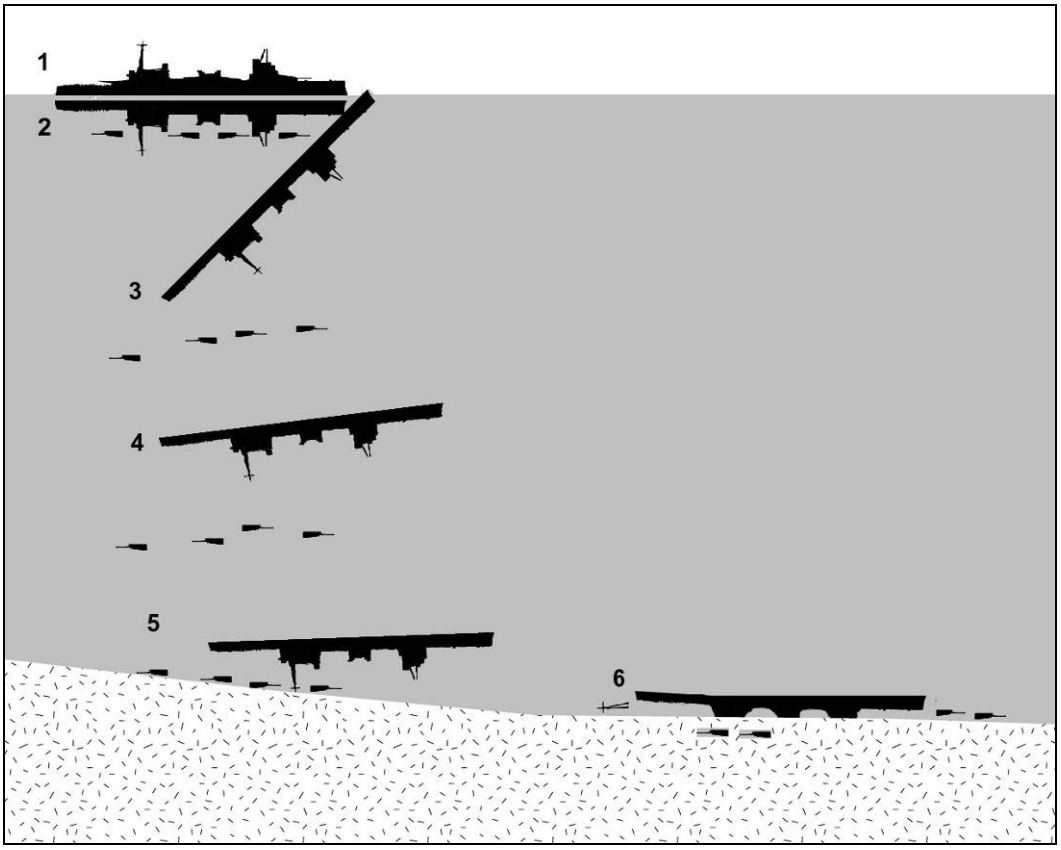

Figure 69: Schematic of sinking process. 1) Ship on surface. 2) Ship capsizes to port - gun turrets fall out. 3) Vessel sinks by stern. 4) Vessel begins to level out as it sinks. 5. Vessel hits seabed on aft tripod tower – mast breaks off and stern is bent on impact. The vessel then strikes on forward mast, which also breaks off and is driven forward under hull near bow. Turrets strike seabed. 6) Vessel slides approx 400m down slope and turrets slide near/past vessel (Image: Brad Duncan)

Wreck Site Integrity

During the photographic survey, areas of rusticles (a formation of rust similar to stalactites in appearance that occurs underwater when iron is oxidized) were observed. The video footage indicates that the iron has been actively corroding (similar to other deepwater wreck sites (e.g.: *RMS Titanic* - see Lynch 1992:199). Several patches of fresh rust (iron oxide) where observed at the bow (stermpost and starboard side – see Figures 31, 70) and stern area (see Figure 71), which are probably associated with damage from fishing nets and ropes.

The weight of the wreck (approximately 18000 tons) is currently supported by the former upper superstructure of the vessel. It is highly likely that over time this supporting material will lose its structural strength, and the hull will begin to settle lower onto the seabed. This is likely to place further strain on the hull's structural integrity, and will cause eventual catastrophic failure of the hull itself, firstly in the amidships region.

It is likely that due to demersal net fishing in the area (as demonstrated by the presence of fishing nets on the wreck) that relics lying in the debris field have been disturbed over time. There is also evidence of movement in the area, as evidenced

by fresh scrape marks on the sea floor, although it is unclear if these were caused by fishing nets or the ROV vehicle itself (see Figure 72).

Figure 70: Rusticles on starboard bow section (Photo: DMS 2007)

Figure 71: Rust around stern quarter area (Photo: DMS 2007)

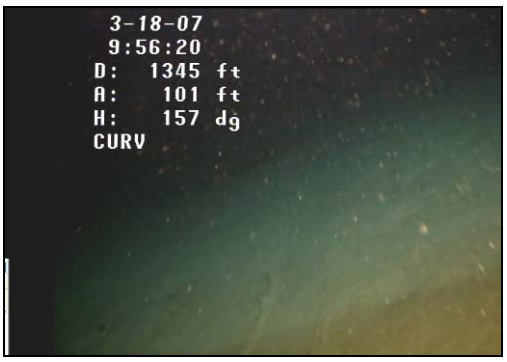

Figure 72: Scrape marks on the seafloor (Photo: DMS 2007)

Legislative Protection

HMAS Australia is protected as a Historic Shipwreck under the *Commonwealth Historic Shipwrecks Act 1976*. Any disturbance or damage of the wreck site can only be undertaken in accordance with the conditions of a valid Permit issued by the NSW Commonwealth Shipwrecks Delegate (Director Heritage Branch - Ms Petula Samios).

Assessment of Significance

The wreck of *HMAS Australia* demonstrates significance in a number of areas:

- It was the first flagship of the RAN fleet, and was a significant departure from previous naval strategies used in the defence of Australia which had concentrated on defence of coastal harbours;
- It was one of two flagships to lead the parade of interned German vessels into the Scapa Flow, a high naval honour;
- It was largest heavy armament Capital ship and the only battlecruiser in the history of the RAN;
- It is one of only two surviving archaeological sites of the *Indefatigable* class of battlecruiser in the world, and the most intact example of its type.
- It was the most significantly armed vessel of any Australian warship
- The presence of this vessel prevented the WWI German fleet from invading and bombarding Australian, East Indies and Pacific coastal cities, and was instrumental in driving the German Fleet out of the Pacific region;
- The vessel was a symbol of extensive national pride for the community when it first entered service
- *HMAS Australia* played a significant role in the experimental development of mounting non-seaplanes on warships. It was the first battlecruiser ever to mount the two seater Sopwith Strutters 1 ½ aircraft type during WWI (non-seaplane aircraft). The success of these experimental testing exercises was instrumental in the mounting of these craft on many other vessels throughout the Imperial fleet.
- The vessel saw the first British Knighting ceremony on the deck of a ship of the Commanding Officer since the time of Sir Francis Drake.

Attributes of Significance
Significance has been assessed in accordance with the nature and degree of significance of the sites' primary attributes. These include attributes related to historical, social, archaeological, scientific and interpretative significance as specified in the NSW Heritage Office Assessing Significance Manual (2001).

Criterion (a): An item is important in the course, or pattern, of NSW's cultural or natural history.

	Include		*Exclude*
x	• shows evidence of a significant human activity		• has incidental or unsubstantiated connections with historically important activities or processes
x	• is associated with a significant activity or historical phase		• provides evidence of activities or processes that are of dubious historical importance
	• maintains or shows the continuity of a historical process or activity		• has been so altered that it can no longer provide evidence of a particular association

Comment
The wreck of the former *HMAS Australia* is remarkable for its early associations with the establishment of the Royal Australian Navy (RAN). *HMAS Australia* was the only battlecruiser ever built for the RAN, and one of only three ever built of this class internationally. It was the first flagship and the largest ever heavy gunned Australian

capital ship in the history of the RAN, and the largest capital ship in the RAN until the introduction of the *HMAS Melbourne* in 1955. For its time, was a significant departure from previous naval strategies used in the defence of Australia which had concentrated on defence of coastal harbours and provided an external strike capacity.

The former *HMAS Australia* was a tangible symbol of Australia's nationhood in the post Federation period and signalled the departure from British naval control of Australian waters. The new Australian owned and operated fleet was greeted with celebration by an enthusiastic nation.

The former *HMAS Australia* is strongly associated with the significant activity of establishing Australia as a key regional naval force in the Asia Pacific Region. Its presence posed such a threat to enemy forces during WWI that it was directly responsible for driving the German Imperial Navy from the Australasian Pacific Region. The vessel was a key component of the first Australian expeditionary force which was involved in the liberation of New Guinea and New Britain. *HMAS Australia* sank a freighter in the eastern Pacific, and served honourably in the northern Atlantic during WWI.

The former *HMAS Australia* is strongly associated with the significant activity of acting as leading port side flagship in the parade of interned German warships into Scapa Flow in 1919.

Criterion (b): An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history.

	Include		***Exclude***
	• shows evidence of a significant human occupation		• has incidental or unsubstantiated connections with historically important people or events
x	• is associated with a significant event, person, or group of persons		• provides evidence of people or events that are of dubious historical importance
			• has been so altered that it can no longer provide evidence of a particular association

Comment

The former *HMAS Australia* is strongly associated with Rear-Admiral George Edwin Patey, who her first commander and became first Flag Officer of the Australian Fleet in 1913. The former *HMAS Australia* is strongly associated with the significant activity of the first knighting ceremony on the deck of a ship since the time of Francis Drake, when King George V knighted Rear- Admiral Patey at Spithead in 1913.

The former *HMAS Australia* is strongly associated with the formation of the Royal Australian Navy, and was the flagship of the fleet.

HMAS Australia acted as the flagship of the Australian fleet escort for HRH The Prince of Wales during a royal visit in 1920.

Criterion (c): An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW.

	Include		*Exclude*
x	• shows or is associated with, creative or technical innovation or achievement		• is not a major work by an important designer or artist
x	• is the inspiration for a creative or technical innovation or achievement		• has lost its design or technical integrity
	• is aesthetically distinctive		• its positive visual or sensory appeal or landmark and scenic qualities have been more than temporarily degraded
x	• has landmark qualities		• has only a loose association with a creative or technical achievement
x	• exemplifies a particular taste, style or technology		

Comment

The former *HMAS Australia* is associated with significant technical innovation and was an inspiration further technical innovation as this was the first battlecruiser to ever mount two seater Sopwith Strutter 1 ½ (non- seaplanes) aircraft during WW1. The success of these experimental testing exercises was instrumental in the mounting of these craft on other vessels throughout the British Imperial fleet.

The former *HMAS Australia* exhibited landmark qualities as a tangible symbol of Australia's nationhood and nationalistic pride, and independence from British naval control of Australian waters in the post Federation period. The vessel was an iconic fixture in Sydney Harbour both before and after WWI, at its permanent Flagship mooring at Garden Island, NSW.

HMAS Australia was the only battlecruiser ever built for the RAN, and one of only three ever built of the *Indefatigable* class. The vessel incorporated later modifications for use in the southern seas. It was the largest Australian warship of its time, and was a significant departure from previous naval strategies used in the defence of Australia which had concentrated on defence of coastal harbours. It also housed the biggest fire power of any Australian warship in history.

HMAS Australia exemplifies the most intact surviving example of an intact *Indefatigable* Class battlecruiser wreck left in the world, and is the most intact known battlecruiser warship wreck internationally as an archaeological site.

Criterion (d): An item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons.

	Include		*Exclude*
x	• Is important for its associations with an identifiable group		• is only important to the community for amenity reasons
x	• is important to a community's sense of place		• is retained only in preference to a proposed alternative

Comment

The former *HMAS Australia* is important because of its associations with the formation of the Royal Australian Navy, and being the flagship of the fleet. It remains an iconic symbol of pride for all Australian Naval personnel. The social significance of the vessel was demonstrated by the contemporary ceremonial scuttling of the vessel when it was sunk with full military honours and wreaths laid, and by the later commitment of the RAN to organise a complex and very expensive inspection of the site.

The mutiny aboard the former *HMAS Australia* resulted in sweeping improvement to the working conditions of the naval ratings that effectively gave the lower ranks a system to voice concerns about shipboard conditions to their immediate superiors and senior ranking officers within RAN and Admiralty.

Criterion (e): An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history.

	Include		***Exclude***
x	• has the potential to yield new or further substantial scientific and/or archaeological information		• the knowledge gained would be irrelevant to research on science, human history or culture
x	• is an important benchmark or reference site or type		• has little archaeological or research potential
x	• provides evidence of past human cultures that is unavailable elsewhere		• only contains information that is readily available from another resource or archaeological sites

Comment

HMAS Australia has the potential to yield new or further substantial scientific or archaeological information as it is the only surviving example of a relatively intact *Indefatigable* Class battlecruiser worldwide, and the only example to be undisturbed since it was sunk. It is probably the best surviving example of any battlecruiser wreck in the world. As such, it represents a benchmark or reference site for further studies of other battlecruiser sites worldwide. *HMAS Australia* is unique as Australia's largest intact historic wreck site and the only battlecruiser wreck in Australian waters.

The wreck of *HMAS Australia* has the potential to provide unique insights into past defence technology, onboard social organisation, and military scuttling techniques which contribute to our understanding of the naval history of NSW and Australia.

The wreck of *HMAS Australia* has the potential to contribute to our understanding of natural history, through its ability to provide new insights into deep water shipwreck marine life colonisation processes, and further research into corrosion processes on deep water wrecks (in particular the formation of rusticles).

Criterion (f): An item possesses uncommon, rare or endangered aspects of NSW cultural or natural history.

	Include		***Exclude***

x	• provides evidence of a defunct custom, way of life or process		• is not rare
x	• demonstrates a process, custom or other human activity that is in danger of being lost		• is numerous but under threat
x	• shows unusually accurate evidence of a significant human activity		
x	• is the only example of its type		
x	• demonstrates designs or techniques of exceptional interest		
x	• shows rare evidence of a significant human activity important to a community		

Comment
The wreck of *HMAS Australia* is unique as the only surviving example of an intact hull of an *Indefatigable* Class battlecruiser worldwide, and the only example to be undisturbed since it was sunk. The only other international example is *HMS Indefatigable*, which has been largely destroyed by unauthorised salvage. It is one of only 8 surviving WW I battlecruiser wrecks in the world (out of 40 originally constructed) and is probably the most intact and undisturbed battlecruiser wreck the world.

HMAS Australia is unique as the Australia's largest intact wreck and the only battlecruiser wreck in NSW or Australian waters. Accordingly, *HMAS Australia* provides rare evidence of redundant naval and warfare technology and shipboard organisation of a significant activity which has exceptional value to the NSW and Australian community.

The wreck of *HMAS Australia* is also a rare example of a large deep water shipwreck of natural historical value, due to its probable unique marine ecosystem and presence of rare rusticle corrosion features. It is the only battlecruiser in the world known to exist at this depth range, which provides a unique opportunity to study onsite deterioration processes.

Criterion (g): An item is important in demonstrating the principal characteristics of a class of NSW cultural or natural places; or cultural or natural environments.

	Include		***Exclude***
x	• Is a fine example of its type		• is a poor example of its type
x	• has the principal characteristics of an important class or group of items		• does not include or has lost the range of characteristics of a type
x	• has attributes typical of a particular of way of life, philosophy, custom, significant process, design, technique or activity		• does not represent well the characteristics that make up a significant variation of a type
	• is a significant variation to a class of items		
x	• is part of a group which collectively illustrates a representative type		

	• is outstanding because of its setting, condition or size		
x	• is outstanding because of its integrity or the esteem in which it is held		

Comment

The former *HMAS Australia* wreck site is the only relatively intact *Indefatigable* class battlecruiser that has survived from the British Navy period and the only Australian example of its class and type. It is representative of the type of large bombardment vessel then built for the British Navy that saw active and useful service. It retains elements of naval design and construction employed immediately prior to the Great War.

Statement of Heritage Significance

HMAS Australia wreck site and associated relics are considered to be of State and National heritage significance and meets all seven (7) significance thresholds. The vessel's history has been adequately covered through the Royal Australian Navy, Australian War Memorial, the Sea Power Centre - Australia, Australian National Maritime Museum and others. The wreck site has not received adequate coverage to date because of its relative isolation (50km east of Sydney) and extreme depth (400m) which requires highly technical and expensive marine technology to access. The numerous relics and memorials associated with *HMAS Australia* have potential to promote this key component of Australian naval history through integration with other existing displays featuring *HMAS Australia* (e.g. those at the Australian National War Memorial, the Sea Power Centre - Australia, Australian National Maritime Museum).

Statement of Significance

The Heritage Branch, Office of Environment and Heritage considers the former *HMAS Australia* historic shipwreck site to be of State and National heritage significance as the only surviving example of a battlecruiser from the RAN. The remains represent pre-Great War technology and materials for warship construction. As part of the new fleet ordered from British dockyards built and commissioned in 1913, *HMAS Australia* was of the *Indefatigable* battlecruiser design, and was the first battlecruiser to mount two seater Sopwith Strutters non-seaplane aircraft on gun turrets. *HMAS Australia* had a successful military service during World War One. The vessel participated in the 1914 naval engagements in New Guinea, and also sank the enemy ship *Eleonora Woermann* in January 1915.

HMAS Australia is a symbol of the fruition of Australian nationhood. It demonstrated Australia's transition, from a colonial minion, to an independent regional power that was able to defend its own mercantile and naval interests. The site is a physical reminder that marked the country's post-federation nationhood.

The ship was a major deterrent to plans for a German military presence in the Asia Pacific region, and effectively drove the German Imperial Fleet out of the Pacific during WWI. The vessel had an admirable war record, serving in campaigns around New Guinea and the Pacific, until she was reassigned to the northern Atlantic.

The 2007 archaeological inspection and comparative analysis has demonstrated that the wreck of *HMAS Australia* is potentially the most intact example of all the battlecruiser sites left in the world. As such, it has been identified to have high research value as a benchmark archaeological reference site for further studies of other battlecruiser sites worldwide, and for the interpretation of the broad scale international development of the battlecruiser. *HMAS Australia* is unique as Australia's largest intact historic wreck site and the only battlecruiser wreck in Australian waters.

Management Issues

Cultural Risk and Impacts on the Wreck

- **Recreational Diver and Commercial Salvage Access**

Access to this site is restricted by its location. The wreck is located approximately 50km east of Sydney heads at a depth of 390m. Due to the distance from land, the exposed nature of the area, and the substantial depth (which is beyond the limits of recreational and technical sports diving), the site is not (currently) subject to interference by sports divers, but this may change in the future as advancements in diving technology allow access to greater depths.

Should the wreck ever become accessible to divers through advancement in diving technology, the wreck is protected under the *Commonwealth Historic Shipwrecks Act 1976*, which specifies that it is an offence to interfere with, damage or destroy an historic shipwreck. This legislation also restricts commercial salvage activities on the site, unless they are undertaken under the auspices of a valid Permit.

- **Shipping Disturbance**

The depth and remote location off the coast also restricts the effects of passing shipping on the site. The site is too deep to be affected by turbulence generated by passing vessels, and its depth and location (50km off the coast) mean that it would be unlikely that the site would be impacted by anchoring (unless in an emergency).

- **Commercial Fishing**

During the ROV survey a number of demersal (bottom trawling) nets were observed entangled on pieces of the wreck, which confirms that the site is subject to damage from deep sea fishing activities. The robust nature of the vessel (as a former warship) and the fact that the hull is lying upside down may limit the extent of damage which may be caused by fishing nets. However, the (as yet) unexplored debris field may contain relics of a more delicate nature, which may be impacted more severely by net fishing.

It is currently unclear whether the wreck site is currently used as an active fishery. It is recommended that the Heritage Branch investigate the need to establish a fishing exclusion zone around the site to prevent damage from fishing nets. This might include the inclusion of the historic shipwreck area marked on Hydrographic charts and mentioned in Notices to Mariners to warn fishers of the presence of the wreck.

It is therefore suggested that the video footage from this inspection be analysed to detect the presence of economic fish species. Heritage Branch should investigate

the level of commercial fishing operations in the area through liaison with government agencies and commercial fishing organisations.

Malcolm et al (n.d.:2) have demonstrated that large wrecks (e.g. *Yongala*) create their own eco-environments that are often unique from those in the surrounding regions. Church et al (2007:221-225) have observed what they call the *Artificial Reef Effect in Deep Water* on WWII wrecks in the Gulf of Mexico in wrecks ranging from 87 – 1974m. Although the attraction of very deep wrecks as artificial reefs decreased in wrecks over 1000m deep, they observed that shallower wreck (up to 550m deep), demonstrate appreciable characteristic for marine species colonisation that was often better than surrounding locales. The Heritage Branch is currently embarking on a study of marine life associated with key shipwreck sites in the Sydney region to determine the research potential, and this study will include *HMAS Australia* and *M24* Japanese midget submarine.

It is therefore probable that the wreck has acted as an artificial reef and hence has generated its own ecosystem of marine life. This raises the possibility that the wreck may also retain significant natural significance values, and may present opportunities for further cooperative ventures with maritime biologists both interstate and worldwide.

- **Aggregate Mining/ Oil/ Gas Exploration/ Mining**

It is apparent from the circumstances of the discovery of the wreck that the site may be subject to impacts from telecommunications/ electrical cables and/or oil/ gas pipelines. Furthermore, with the ongoing development of international underwater seismic testing associated with oil and gas exploration, these activities have the potential to one day impact upon the site.

Furthermore there is also the potential for oil and/or gas mining in the future, although the extreme seabed depth may limit these activities. Any management plans must take these possible future impacts into consideration.

- **Conservation Issues**

Rusticles were first observed by Ballard on the *RMS Titanic* (Lynch 1992:199), but have also been subsequently observed on a number of other wrecks around the world (Ballard and Archbold 1990; Warren et al 2004; Church et al: 2007: 205- 207; Lunze et al 2007; Cullmore and Johnston 2008).

The study of their composition is a currently evolving field of research. Latest studies on this phenomenon indicate that they consist of a mixture of approximately 35% iron oxides, carbonates and hydroxides, with the remaining volume constituted by symbiotic or mutualistic microbes and fungus, which feed on the iron compounds to produce the distinctive stalagmite shaped structures. These features are structurally porous, which admit seawater through them, and demonstrate rings suggesting that they grow over time. However, the rusticles are extremely fragile and readily break apart when touched (Sánchez-Porro et al 2010). As many shallow water wrecks are subject to disturbance during to natural and cultural impacts, the evidence of rusticles on wrecks is comparatively rare to date, predominantly due to a lack of investigation of deep water wrecks (Overfield 2005:6). Their structural formation may also be affected by the presence of lead, strontium and phosphorous present in wrecks from paint, explosives, flares and other metals present in cargos and the wreck itself (Church et al 2007: 205-207: Warren et al 2004).

The presence of rusticles suggests that parts of the site that have not been physically affected by fishing net movements have not been subject to recent disturbance, as these features take many years to form. Rusticles on *HMAS Australia* wreck site also offer the potential for further collaborative research with other corrosion specialists worldwide. Further liaison with specialists in marine conservation (e.g. Department of Conservation, Western Australian Maritime Museum) is recommended to examine this phenomenon on the wreck site.

- **Future Archaeological and Commercial Salvage Impacts**

The shipwreck site holds significant potential for future archaeological investigation. Further pre-disturbance investigation of the wreck site is required to document the hull and extensive (currently unexplored) debris field in further detail.

Although the remote location of the wreck restricts the ability to effectively monitor unauthorised on site disturbance of the wreck, the extreme depth effectively restricts access to only those with significant technological maritime resources. As the wreck is protected under the *Commonwealth Historic Shipwrecks Act 1976* (which restricts any onsite disturbance without a valid permit), the risk to the main site from commercial salvors is therefore limited. The main risk of commercial salvage exists in the debris field, where loose relics might be opportunistically salvaged by high tech marine operators installing pipelines or cables using ROV vehicles.

Future archaeological projects may also impact the site. There is the potential for future limited/ controlled excavation and recovery of small sections of the hull or loose relics in the debris field. The recent work on *HMAS Sydney* and *HKS Kormoran* wrecks and associated debris fields has demonstrated the potential to extract meaningful data from archaeological documentation of deep water wrecks, and in particular the importance of the very significant debris fields. Consideration of raising larger relics from the debris field (e.g. gun turrets) should only be undertaken after the entire field has been adequately documented in a pre-disturbance survey. To this end, it is recommended that further opportunities be explored for future collaborative research projects in conjunction with marine research institutions and multinationals corporations to document the wreck and the associated debris field in greater detail.

RECOMMENDATIONS / CONCLUSION

HMAS Australia site has been demonstrated to be of State and National significance. As a result of the historical research, wreck site inspections, and subsequent assessment of significance, it is recommended that:

1. protection of the site continues to be managed under the *Commonwealth Historic Shipwrecks Act 1976*;

2. consideration should be given to the effects of any future archaeological work onsite. Any archaeological work onsite should be guided by established and ethical archaeological standards, and in particular should adhere to the practices and principles outlined in the *UNESCO Convention for the Protection of the Underwater Cultural Heritage (2001)*. Consideration of any proposals for recovery of any relics from the debris field (e.g. gun turrets) should only be undertaken after the entire site has been adequately documented in an archaeological pre-disturbance survey;

3. the Heritage Branch investigate further funding/ sponsorship opportunities to undertake a more detailed remote sensing recording of the site using multi-beam sonar/ ROV and/or monitoring of the site. Potential sponsors may include:
   - US/ British Navy;
   - NOAA
   - Woods Hole Institute
   - Fugro
   - Multinational oil search / telecommunications companies

4. the Heritage Branch investigate and monitor the effects of commercial fishing around the site, along with ways to prevent damage from fishing nets. This might include marking the historic shipwreck on Hydrographic charts and inclusion in Notices to Mariners. An analysis of commercial fish species observed during the ROV survey should be undertaken in collaboration with marine biological specialists to:
   - assess the likelihood that the site is being currently being actively used as a commercial fishery, and;
   - to investigate the range and diversity of marine life on the wreck.

5. options for further interpretation of the wreck should be investigated. These might include:
   - shipwreck plaque at an appropriate location along the coastline closest to the wreck site;
   - virtual underwater trail and development of a site specific web exhibition incorporating video/ stills footage of the wreck site;
   - The development of a *HMAS Australia* themed touring trail, incorporating the wreck site and significant artefacts located around the country. This could include key museum artefacts and extant memorabilia collections currently located at Garden Island, Cockatoo Island, the Australian War Memorial, and the Australian National Maritime Museum;

6. the Heritage Branch liaise with key leading institutions in regard to future enhancement of *HMAS Australia* collections and based on archaeological interpretation of the wreck;

7. investigate options for the production of publications about the wreck, which could include:
   - an online information leaflet;
   - educational packages for school curricula;
   - a glossy brochure and/or booklet;
   - a detailed report of the history and survey of the site;
   - a glossy coffee table book on the history of the vessel;
   - investment in a three dimensional model of the site;
   - video production of the history and archaeology of the wreck site.

8. an online collection of research facilities holding artefacts from *HMAS Australia* should be established to record the location and condition of relics from the wreck;

9. copies of this report should be forwarded to, the Royal Australian Navy, Australian Sea Power Centre – Australia, Defence Maritime Services the Australian War Memorial, and any other party which has assisted in this project. The Heritage Branch should continue to liaise with these groups and seek to promote ongoing interpretative projects which promote the maritime heritage of *HMAS Australia*.

10. the Heritage Branch support further historical research of *HMAS Australia* and the development of the Royal Australian Navy. This research should also contrast the significance of *HMAS Australia* in relation to other warships worldwide, and investigate the potential for establishing cooperative research projects with other international defence researchers and other management authorities.

11. the Heritage Branch recommends that *HMAS Australia* and the debris field be nominated for inclusion on the National Heritage List under the *Environment Protection and Biodiversity Conservation Act 1999* for its outstanding and universal cultural and natural heritage values.

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APPENDICES:

Appendix One:

Appendix One: HMAS Australia Relics Held in the Australian War Memorial Collection

* Accession Number	* Object Type	Name/Title	Description
REL/00760	Maritime Vessel or Watercraft	PLAQUE , HMAS AUSTRALIA ,	
REL/18224.001	Flag	Flag : RAN : 1918-34 : White ensign in a carved wooden casket presented to HMAS Australia in 1918	Ensign in a carved wooden casket presented to HMAS Australia in 1918 by the South Australian Branch of the Navy League, to the Officers and men of the ship
REL22285	Communications equipment	Australia : RAN : Voice Pipe : HMAS Australia : 1912-24	no restrictions
RELAWM01529	Flag	Flag from HMAS Australia	Flag flown on HMAS Australia on 21 November 1918 when the German fleet surrendered to the grand fleet. HMAS Australia led the second battle cruiser squadron.
RELAWM04469	Heraldry	Ship's bell : HMAS Australia (1912-1924)	Brass bell from battle cruiser HMAS Australia. Black lettering on both sides of the bell reads 'H.M.A.S. AUSTRALIA 1913'. The headstock is painted grey and part of the attachment point has broken off and is missing.
RELAWM04471	Maritime Vessel or Watercraft	HMAS Australia 12 inch Gun Muzzle Cap	
RELAWM04472	Maritime Vessel or Watercraft	HMAS Australia - Scroll	
RELAWM04473	Maritime Vessel or Watercraft	HMAS Australia - Brass Letters	
RELAWM04474	Maritime Vessel or Watercraft	Advance Australia - HMAS Australia - Brass Letters	Motto "ADVANCE AUSTRALIA" (Brass letters), taken from the quarter deck of H.M.A.S. "AUSTRALIA".
RELAWM07873A	Flag	Silk ensign : HMAS Australia : Rear-Admiral's flag	Ensign HMAS "Australia" Rear-Admiral's
RELAWM07939	Artillery	Brass tampion for 12 inch naval gun : HMAS Australia	Brass tampion from one of the 12 inch guns of HMAS 'Australia'.

RELAWM07947	Munition	12 inch armour piercing shell : HMAS Australia (1912-1924)	12 inch armour piercing shell. The shell is painted black with the words 'ARMOUR PIERCING' painted in white around the midsection. A white band is painted around the midsection and nose. There is a driving band near the base of the shell. Stamped on the base is '12" I A/ H/ 1.4.13/ P/ CAMMELL'.
RELAWM07948	Munition	SHELL HMAS AUSTRALIA	
RELAWM07949	Munition	SHELL HMAS AUSTRALIA	
RELAWM07950	Munition	SHOT PRACTICE HMAS AUSTRALIA	
RELAWM08093	Artillery	12 inch Mk X Gun Breech Mechanism HMAS Australia	
RELAWM08097	Munition	18 inch Mk VII Torpedo HMAS Australia	
RELAWM08099	Technology	Decapping Plates HMAS Australia	2 Decapping plates, 12 inch, turret mounting, ex HMAS Australia.
RELAWM08099.001	Maritime Vessel or Watercraft	Decapping Plates HMAS Australia	2 Decapping plates, 12 inch, turret mounting, ex HMAS Australia.
RELAWM08099.002	Maritime Vessel or Watercraft	Decapping Plates HMAS Australia	2 Decapping plates, 12 inch, turret mounting, ex HMAS Australia.
RELAWM08170	Flag	White ensign : HMAS Australia, Royal Australian Navy	Royal Australian Navy (RAN) white ensign.
RELAWM09096	Model	Ship model : HMAS Australia I	Scale model of the Indefatigable class battlecruiser, HMAS Australia, built by John Brown and Co Ltd, Sheffield and Clyde Bank in 1:64th scale. Most of the small fittings are made from soldered brass or cast white metal, and the deck from wood. The model is almost 2.8 metres long.
RELAWM09719	Maritime Vessel or Watercraft	KEYS : HMAS AUSTRALIA	
RELAWM09809	Flag	ENSIGN : HMAS AUSTRALIA : 1914 - 1918	
RELAWM09810	Flag	ENSIGN : HMAS AUSTRALIA : WWI	
RELAWM09868	Heraldry	Brass tampion crest : HMAS Australia	
RELAWM09997	Maritime Vessel or Watercraft	Tread plate : HMAS Australia	
RELAWM12220	Flag	UNION JACK : HMAS AUSTRALIA 1914 - 1918	

RELAWM12524	Maritime Vessel or Watercraft	HMAS Australia Propeller	
RELAWM12524.002	Maritime Vessel or Watercraft	HMAS Australia Propeller Nut	
RELAWM12526	Maritime Vessel or Watercraft	TORPEDO TUBE and Ratchet handle : HMAS AUSTRALIA	
RELAWM12526.001	Maritime Vessel or Watercraft	Ratchet handle for torpedo tube : HMAS Australia	
RELAWM12526.002	Maritime Vessel or Watercraft	Torpedo tube : HMAS Australia	18-inch submerged broadside torpedo tube only firing mechanism, ex HMAS Australia. Tube in two sections.
RELAWM15659.001	Firearm Accessory	Pellets moulds : HMAS Australia	
RELAWM15659.002	Firearm Accessory	Pellets moulds : HMAS Australia	
RELAWM15886	Flag	PENNANT : ADMIRAL SIR LIONEL HALSEY HMAS AUSTRALIA : 1918-11-21	
RELAWM16078	Heraldry	Relic of HMAS Australia: Calculator for giving speed of ships	
RELAWM19249	Flag	White Ensign: HMAS Australia	
RELAWM30668	Communications equipment	Speaking Tube HMAS Australia	
RELAWM31835.001	Artillery	Gun Tampion 12 inch HMAS Australia	
RELAWM31835.002	Artillery	Gun Tampion 12 inch HMAS Australia	
RELAWM31836.001	Artillery	Gun Tampion 12 inch HMAS Australia	
RELAWM31836.002	Artillery	Gun Tampion 12 inch HMAS Australia	

Table 3: HMAS Australia Relics Held in the Australian War Memorial Collection

Appendix Two

Specifications of CURV 21 – Remotely Operated Vehicle

CURV 21 - Remotely Operated Vehicle

Description

CURV-21 is a 6,400-pound Remotely Operated Vehicle (ROV) that is designed to meet the US Navy's deep ocean salvage requirements down to a maximum depth of 20,000 feet of seawater. This vehicle is loaded with a host of new technologies and was built as a direct replacement for CURV-III but with a smaller overall system footprint.

Features

Orion and CURV-21 can be combined into a single integrated search & recovery system capable of being deployed on a USNS T-ATF. The system is based on a .680 fiber-optic umbilical cable and a shared handling system that can switch at sea between side-scan sonar and ROV operations. The system is self-contained and fly-away transportable for world wide response on vessels of opportunity. The ROV can be controlled in all six degrees of motion with auto-control functions for depth, altitude, and heading. An integrated DVL allows 1 and 2 meter incremental movements as well as cruise control for extended axial movements. The vehicle is equipped with CTFM sonar for target location and pinger detection. The ROV uses two seven function rate manipulators. It has a high-resolution digital still camera, black and white, and color television cameras. The system includes a load bearing, pressure compensated, Electro-Optical Umbilical Swivel. The fiber optic multi-plex system can combine up to eight channels of video, sonar, USBL, RS-232/422/485 data communications, and navigation data on a single fiber. 2 spare fibers are available subsea for additional sensors. A digital communications network with a data capacity of 400 MHz controls the vehicle and has significant capacity for future expansion. The system is designed to interface easily with additional sensors or tool packages using standard data formats. For special operations, the ROV can accommodate customized tool packages. These packages can include, but are not limited to specialized salvage tools, instrument packages, or other mission-oriented equipment.

Background

GENERAL SPECIFICATIONS Vehicle Length - 8 ft Width - 5 ft 0 in Height - 7 ft 0 in Weight - 6,400 lbs Performance Depth -
20,000 ft of seawater Speed - 2.5 knots Power - 45 Hp Auto Controls - Depth, altitude, heading, cruise, auto translate Lift
Capacity - 4,000 lbs via ROV frame & umbilical (releasable) Payload - 240 lbs.

Point Of Contact

Naval Sea Systems Command
Office of Corporate Communications (SEA 00D)
Washington, D.C. 20376

Last Update: 13 September 2010

(From: United States Navy: Fact File Webpage, http://www.navy.mil/navydata/fact_display.asp?cid=4300&tid=50&ct=4 22/03/2011)

Appendix Three

Appendix Three: Chronology of Known Battlecruisers (after Moore 1990)

Ship	Class	Nationality	Built	Guns (size / #)	Lost	How Lost	Where	Raised ?	Intact	Depth (ft)
HMS Indefatigable	Indefatigable	British	1909	12" x 8	1916	Bombarded	Jutland	No	No - extensively broken up by salvors broken	?
HMAS Australia	Indefatigable	Australian	1911	12" x 8	1924	Scuttled	Sydney	No	Yes - Upside down	398m (119m)
HMS New Zealand	Indefatigable	British	1911	12" x 8	n/a	Scrapped				
HMS Invincible	Invincible	British	1907	12" x 8	1916	Bombarded	Jutland	No	No - two pieces - stern upright, bow inverted	177ft (53m)
HMS Inflexible	Invincible	British	1907	12" x 8	n/a					
HMS Indomitable	Invincible	British	1907	12" x 8	n/a					
HMS Lion	Lion	British	1910	13.5" x 8	n/a					
HMS Princess Royal	Lion	British	1911	13.5" x 8	n/a					
HMS Queen Mary	Tiger	British	1911-12	13.5" x 8	1916	Bombardment	Jutland	No	No - in two pieces- stern upside down	196ft (59m)
HMS Tiger	Tiger	British	1913-14	13.5" x 8	n/a					
HMS Renown	Renown	British	1915	15" x 12	n/a					
HMS Repulse	Renown	British	1916	15" x 12	1941	Aerial torpedo attack		No	Yes - upside down	57m
IJN Katori	Katori	Japanese	1905	12" x 4	n/a					
IJN Kashima	Katori	Japanese	1905	12" x 4	n/a					
IJN Ibuki	Katori	Japanese	1906-1910	12" x 4	n/a					

IJN Kuruma	Katori	Japanese	1905-1909	12" x 4	n/a					
IJN Tsukuba	Katori	Japanese	1905-1907	12" x 4	1917	Internal explosion	Yokosuka	Yes - used as target practice and then broken up		
IJN Ikoma	Katori	Japanese	1906	12" x 4	n/a					
IJN Kurama	Katori	Japanese	1907	12" x 4	n/a					
IJN Ibuki	Katori	Japanese	1907	12" x 4	n/a					
IJN Kongo	Kongo	Japanese	1911-13	14" x 8	n/a					
IJN Hiei	Kongo	Japanese	1911-14	14" x 8	1944	Scuttled after battle	Guadalcanal	No		Unknown
IJN Haruna	Kongo	Japanese	1912-15	14" x 8	n/a					
IJN Kirishima	Kongo	Japanese	1912-15	14" x 8	1944	Bombarded	Guadalcanal	No	No - Stern upside down with tip bow missing	4000ft (1200m)
SMS Von der Tann	Von der Tann	German	1907	11" x 8	1919	Scuttled	Scapa Flow	Yes		
SMS Moltke	Moltke	German	1909-11	11" x 10	1919	Scuttled	Scapa Flow	Yes		
SMS Goeban	Moltke	German	1911	11" x 10	n/a	Scrapped	Turkey			
SMS Seydlitz	Seydlitz	German	1911-13	11" x 10	1919	Scuttled	Scapa Flow	Yes		
SMS Derfflinger	Derfflinger	German	1912-14	12" x 8	1919	Scuttled	Scapa Flow	Yes		
SMS Lutzow	Derfflinger	German	1912-15	12" x 8	1916	Scuttled immediately after battle	Jutland	No	Yes - upside down	144ft (43m)

SMS Hindenburg	Derfflinger	German	1913-16	12" x 8	1919	Scuttled	Scapa Flow	Yes		
Gangŭt	Gangŭt	Russian	1909-14	12" x 12	n/a					
Poltava	Gangŭt	Russian	1909-15	12" x 12	n/a					
Petropavlovsk	Gangŭt	Russian	1909-14	12" x 12	1919	Torpedo	Kronstadt	Yes		
Sevastopol	Gangŭt	Russian	1909-15	12" x 12	n/a					
Ismail	Ismail	Russian	1915-?	14" x 12	n/a					
Kinburn	Ismail	Russian	1915-?	14" x 12	n/a					
Bordino	Ismail	Russian	1915-?	14" x 12	n/a					
Navarin	Ismail	Russian	1915-?	14" x 12	n/a					

Table 4: Table of Known WWI Battlecruisers