

Convoy HI-72: U.S. Submarines versus Japanese Escorts in the Pacific War

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Convoy HI-72 departed Singapore for Japan on 6 September 1944, transporting raw materials, Japanese troops and passengers including Allied prisoners of war. I believe convoy HI-72's fate provides a window on both the effectiveness of U.S. submarines and the factors which limited Japanese antisubmarine efforts at this stage of the war.

I

HI convoys were convoys between Singapore and the Japanese home islands. Convoy HI-72 initially consisted of ten ships.¹ Additional ships from Manila joined the convoy on 11 September, so that the combined convoy included 9 transports and 5 escorts. The convoy proceeded north across the South China Sea at 10.5 knots, taking a zigzag course to discourage submarine attack.

In the early hours of 12 September, only a couple of hours after midnight, the convoy suffered the first of a series of attacks by a wolf pack of American submarines including USS *Growler*, USS *Sealion II* and USS *Pampanito*. The escort ship *Hirado* was the first ship sunk. The escort force's commander, Admiral Sadamichi Kajioka, was lost with the ship. So from the outset the convoy was deprived of its escort commander. By daybreak on 12 September the transports *Nankai Maru* and *Rakuyo Maru*, as well as the destroyer *Shikinami* were also sunk or sinking.²

¹ An eleventh ship, *Kimikawa Maru*, was detached from the convoy shortly after its departure due to engine trouble. Combined Fleet, *Kimikawa Maru*, <http://www.combinedfleet.com>

² USS *Sealion* Second War Patrol Report, 12 September 1944, Attack Data, Disc 22, SM; USS *Growler* Tenth War Patrol Report, 12 September 1944; John D. Alden and Craig R. McDonald, *United States and Allied Submarine Successes in the Pacific and Far East during World War II* (Jefferson, N.C.: McFarland and Company, 2009), p. 203; Eli T. Reich, *The Reminiscences of Vice Adm. Eli T. Reich* (Annapolis: Naval Institute Press, 1982), vol. 1, p. 201.

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The diminished convoy continued sailing, but came under attack again that evening when approximately 200 miles east of Sanya, the southernmost city of Hainan Island. USS *Pampanito* sank two more convoy ships. Captain Sukehiko Hosoya, the convoy commander, went down with the transport *Kachidoki Maru*, depriving the convoy of its commander in addition to the already lost escort commander who went down with *Hirado*.

The surviving ships headed for sanctuary at Sanya, where the fast ships reorganized into the first echelon or subgroup and the slower ships combined into a second echelon. Both groups sailed separately from Sanya on 16 September. In the early hours of 20 September, the fast ship group was attacked by a formation of American B-24 bombers. Three more transports and an escort were damaged by the bombers. The following day, the group of slower ships also came under attack from China-based B-24 bombers on 21 September. The tanker *Shincho Maru* was hit by a bomb and lost all power. It was towed to Takao, Formosa.

On 25 September the two remaining freighters and three escorts set sail from Keelung Harbour, Formosa, but came under attack two days later by the submarine USS *Plaice*. The escort ship *CD-10* was torpedoed and sunk. The remaining ships in the group dispersed and made their way independently to Japan, arriving at Moji on 28 September.

II

The fate of convoy HI-72 illustrates just how effective American submarines had become by this stage of the war, as well as the increasing role of aircraft in disrupting Japanese supply lines. Of the ten ships that departed Singapore, six were sunk on 12 September, while most of the remaining ships from the convoy subsequently sustained damage or were sunk. The only transport to survive the convoy unscathed was *Kibitsu Maru*.³

³ Shinshichiro Komamiya, *Senji Yuso-sendan-shi* (History of Wartime Transport Convoys), Kyodo Shuppansha, 1987, pp. 246-249.

As a result of the attacks, at least 12,500 tons of bauxite (used for the production of aluminium) and over 12,000 tons of oil were lost.⁴ There was also a heavy loss of lives, both Japanese and Allied prisoners. Some 1,453 POWs lost their lives, and probably about half that number of Japanese crew, troops and passengers.

To some extent Japan had become numbed to such losses. In the month of September 1944 alone, submarines claimed 68 Japanese ships totalling nearly 329,000 tons.

III

Despite an apparent dearth of official military documents, the battle reports of two of the convoy ships, *Nankai Maru* and *Asaka Maru*, did survive. Both reports included a section on “lessons learned” which is highly instructive on Japanese views of the submarine war being waged against them. Their assessment of U.S. submarine strengths and the weaknesses of Japanese protection for shipping, is worth considering in some detail.

The battle reports attributed much of the American submarine success to their use of electronic equipment, specifically radar and wireless telephones. In the case of radar, the Japanese were certainly correct in identifying one of the Americans’ principal assets at this stage of the war. SJ surface search radar was arguably the most important technical development of the submarine war.⁵ The Japanese had entered the war with night-vision superiority, due largely to the quality of their binoculars.⁶ But SJ radar

⁴ Komamiya, *Senji Yuso-sendan-shi*, pp. 247-248.

⁵ Robert Dienesch, “Radar and the American Submarine War, 1941-1945: A Reinterpretation”, *The Northern Mariner*, vol. 14, no. 3, July 2004, pp. 29, 31-32, 39.

⁶ Mochitsura Hashimoto, *Sunk: The Story of the Japanese Submarine Fleet 1942-1945*, trans. E. H. M. Colegrave (London: Hamilton and Company, 1955), p. 56; William Bruch Johnson, *The Pacific Campaign in World War II: From Pearl Harbor to Guadalcanal* (London: Routledge, 2006), p. 181; Ian Pfennigwerth, “A Novel Experience: The RAN in 1942 Defending Australian Waters” in Peter J. Dean (ed.), *Australia 1942: In the Shadow of War* (Cambridge: Cambridge University Press, 2013), p. 184.

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allowed the Americans to turn the tables, providing them with a clear advantage in night actions and low visibility conditions.

USS *Growler*, the first submarine to attack convoy HI-72, initially made radar contact from almost 30,000 yards (fifteen miles).⁷ Before *Pampanito* sank *Kachidoki Maru*, it was also able to make radar contact with the ship from fifteen miles.⁸ Without radar, it is highly unlikely that *Pampanito* would have sunk *Kachidoki Maru*, at least on 12 September.

For American submariners, the use of radar provided a huge advantage in making night surface attacks. The equipment included a Planned Position Indicator (PPI) display which enabled submarine crews to not only track a prospective target, but to monitor the position of its escorts. This in turn facilitated both making an attack and planning an escape.⁹ The use of radar in mounting night attacks was further enhanced by the introduction of the Target Bearing Transmitter (TBT), essentially a device that allowed submariners to place binoculars in a bracket on the bridge and easily transmit a target's bearings to the Torpedo Data Computer. By 1944, well over half of U.S. submarine attacks were being carried out on the surface at night.¹⁰

Japanese development of radar failed to keep pace with the Americans. The battle reports of *Nankai Maru* and *Asaka Maru* criticized an overreliance on visual efforts to spot enemy submarines at night.¹¹

⁷ USS *Growler* Tenth War Patrol Report, 12 September 1944.

⁸ USS *Pampanito* Third War Patrol Report, 12 September 1944, Disc 25, SM.

⁹ Dienesch, "Radar and the American Submarine War", pp. 31, 33; Kenneth Poolman, *The Winning Edge: Naval Technology in Action, 1939-1945* (Annapolis: Naval Institute Press, 1997), p. 196.

¹⁰ Dienesch, "Radar and the American Submarine War", p. 36.

¹¹ "Showa 19-nen 9-gatsu 27-nichi HI-72 Sendan Hibakugeki Sento Shoho Unso-sen Asaka-Maru" (27 September 1944, Detailed Battle Report of Bombing of HI-72, Transport Asaka-Maru), NIDS Library; "Showa 19-nen 10-gatsu 12-nichi Asaka-Maru Hi-rai-baku Chinbotsu Sento Shoho Unsosen Asaka-Maru" (12 October 1944, Detailed Battle Report of the Torpedoing, Bombing, and Sinking of the Asaka-Maru, Transport Asaka-Maru), NIDS Library; "Showa 19-nen 10-gatsu Toka Tokusetu Unsosen Nankai-Maru Sento Shoho Showa 19-nen 9-gatsu 12-nichi Minami-shina-kai ni okeru Tai-sensuikan-sen Tokusetu Unsosen Nankai-Maru" (10 October 1944, Detailed Battle

In contrast to their assessment of radar, it appears that the Japanese battle reports over-estimated the benefits of wireless telephones on board U.S. submarines. By mid-1944 short-distance VHF radio telephones allowed submariners to use voice contact, with less danger of being detected by enemy direction finders.¹² The Japanese believed that this innovation allowed submarines to communicate and coordinate with one another very effectively. In reality, the submarines which attacked convoy HI-72 used this technology in a very limited capacity. When the VHF radios were tested by the U.S. wolf pack after it departed Midway, they were reported as “not very satisfactory”. Many American skippers suspected that their transmissions might be intercepted or make their submarines vulnerable to enemy direction finding and avoided using VHF radios. Before attacking convoy HI-72, *Sealion*, *Growler* and *Pampanito* made a rendezvous at sea on the evening of 11 September with the boats coming together within about twenty-five yards of one another. For “security”, a discussion was then conducted by voice through megaphones rather than by radio.¹³

IV

In contrast to the putative advantage of U.S. submarine communications, the battle reports of *Asaka Maru* and *Nankai Maru* considered their own ship-to-ship communications as deficient. They relied heavily on signal blinkers, which increased the likelihood of detection by the enemy. The poor quality of intra-convoy signals handicapped the convoy’s manoeuvrability, especially in the event of attack. There had been some belated success in introducing intra-convoy radio telephones for

Report of Converted Transport Nankai-Marū: Anti-Submarine Battle on 12 September 1944, in the South China Sea, Converted Transport Nankai-Marū, NIDS Library.

¹² See Jonathan J. McCullough, *A Tale of Two Subs: An Untold Story of World War II, Two Sister Ships, and Extraordinary Heroism* (New York: Grand Central Publishing, 2008), p. 172; Carl Boyd, *American Command of the Sea: Through Carriers, Codes and the Silent Service* (Newport News, VA.: The Mariners’ Museum, 1995), p. 36.

¹³ Reich, *Reminiscences*, p. 200; USS *Sealion* Second War Patrol Report, 11 September 1944; USS *Growler* Tenth War Patrol Report, 11 September 1944; USS *Pampanito* Third War Patrol Report, 11 September 1944.

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communication between escort ships, but merchant ships remained without the equipment.¹⁴

As recognised by the battle reports, the success of American submarines in making night surface attacks was greatly aided by their high-speed performance. On the other hand, the reports pointed out that convoy HI-72 was handicapped by combining fast and slow ships. The *kaibokan* often used as escorts were typically capable of top speeds ranging from 16 to 19.5 knots.¹⁵ A surfaced U.S. submarine could make about 20 knots and could often even outrun the escorts.

Japan entered the war with few escort ships specifically designed for antisubmarine warfare. The Japanese Navy *kaibokan*, or sea defence ship was often described by the Allies as a “frigate”. In reality, these ships were originally designed to protect fishing craft in the Kurile Islands. At least initially, their antisubmarine capabilities were limited. Each *kaibokan* carried only twelve depth charges, until the fall of 1943 when the number of allocated depth charges was increased to sixty.¹⁶

Between March 1943 and May 1944, construction began on an additional 26 *kaibokan* of the *Etorofu* and *Mikura* classes.¹⁷ By the end of the war Japan had produced a total of 169 *kaibokan*.¹⁸ It was also relatively late in the war when the Japanese Navy began building lighter destroyers of the *Matsu* and *Tachibana* classes specifically for antisubmarine warfare. The first of the *Matsu* class was commissioned in April 1944. By the end of the war, a total of 32 of these smaller destroyers were built, fitted with sonar, radar and up to sixty depth charges.¹⁹ So their anti-submarine capabilities were improving, but as with other aspects of protecting merchant shipping, however, this proved too little too late.

As noted by some contemporary commentators, the Japanese Navy’s preoccupation with a decisive fleet battle meant that inadequate resources were provided to effectively protect transport ships and conduct antisubmarine warfare.

¹⁴ Oi, “Why Japan’s Anti-Submarine Warfare Failed”, pp. 596, 598.

¹⁵ Parillo, *Japanese Merchant Marine*, p. 103.

¹⁶ Atsushi Oi, *Kaijo Goei-sen* (Maritime Protection War), Asahi Sonorama, pp. 95-96.

¹⁷ Graham, *Japan’s Sea Lane Security*, p. 86.

¹⁸ Parillo, *Japanese Merchant Marine*, p. 103.

¹⁹ Polmar and Whitman, *Hunters and Killers*, p. 50.

Responsibility for maritime escort was initially handled by one subsection within the Naval General Staff, and there was no one at a higher command level to make a case for enhanced escort services.²⁰ To some extent the situation improved from 15 November 1943 when the Grand Escort Command Headquarters was established. In practice, however, the Grand Escort Command remained reliant on the Combined Fleet to release its ships for escort duty. Inevitably the Combined Fleet refused to release the number of ships requested.²¹

The command and organizational problems at fleet level were replicated in the case of individual convoys. Escort groups lacked unified training and doctrine, but were temporarily assembled as needed. The *Nankai Maru* and *Asaka Maru* battle reports referred specifically to the lack of unit training for escorts as a reason for their shortcomings in antisubmarine warfare. They recommended that escorts should be organized into fixed rather than ad hoc formations under a regular commander, and that they should also undergo unit training in antisubmarine tactics and convoy escort.²²

In light of the decimation of Japanese shipping, the battle reports of *Nankai Maru* and *Asaka Maru* recommended foremost the discontinuation of forced passages through submarine-infested waters. Instead, it was recommended that efforts should be made to suppress as many submarines as possible.²³ Presumably what the action reports had in mind were offensive sweeps by hunter-killer groups. In the meantime, however, the number of American submarines in the Pacific was increasing along with forward bases (including Subic Bay, Guam and Saipan) which placed them closer to Japanese shipping lanes. In the fifteen months from February 1943 the number of U.S. submarines patrolling the Pacific more than doubled (increased from 47 to 104).²⁴ At the time of the attack on convoy HI-72, the Americans had also recently established a submarine base at Saipan.

²⁰ Oi, *Kaijo Goei-sen*, pp. 144-145.

²¹ Oi, *Kaijo Goei-sen*, pp. 146-147 ; Polmar and Whitman, *Hunters and Killers*, p. 61.

²² Asaka Maru and Nankai Maru Detailed Battle Reports.

²³ Asaka Maru and Nankai Maru Detailed Battle Reports.

²⁴ Parillo, *Japanese Merchant Marine*, p. 98.

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V

Just as important as the observations made by the *Asaka Maru* and *Nankai Maru* battle reports were the omissions, because these disclose that the Japanese were still not fully aware of how heavily the odds were stacked against them. Most importantly, the Japanese remained unaware of Allied signals intelligence collectively known as “Ultra”. The Allies managed to conceal that they were breaking the Japanese codes. From early 1943 the Allies were able to read the Japanese Maru Code and thus track shipping routes and schedules, obviously a huge advantage.²⁵ By late 1944, Pearl Harbor could despatch intelligence information to U.S. submarines on patrol within thirty minutes of receiving it.²⁶ Not only did intelligence facilitate the interception of Japanese shipping, but Allied code-breakers often had a much clearer idea of the results of attacks than the submariners making them. For example, within six hours of the first HI-72 convoy ship being attacked, *Hirado*, code breakers knew that one hundred survivors had been rescued and that the ship’s captain had been killed.²⁷

While the Japanese battle reports appreciated the surface speed of U.S. submarines, they underappreciated their diving capabilities. The Japanese had no way of determining the depth of Allied submarines.²⁸ As a result, Japan’s antisubmarine forces tended to set their depth charges to explode too shallow. After *Sealion*’s attack on the convoy on 12 September, although the crew could hear the sonar echo ranging of escorts and the dropping of thirty-one depth charges, the submarine remained safely submerged, at times over 500 feet below the surface.²⁹

In 1944 American submarines reached the zenith of their effectiveness. The battle reports of *Asaka Maru* and *Nankai Maru* indicate an appreciation of some of the key elements which contributed to this success. While the reports over-estimated the

²⁵ Edwin T. Layton, “*And I was There*”: *Pearl Harbor and Midway – Breaking the Secrets* (Annapolis: Naval Institute Press, 2006), pp. 471-473; McCullough, *A Tale of Two Subs*, pp. 162-163; Padfield, *War Beneath the Sea*, p. 391.

²⁶ Reich, *Reminiscences*, p. 224.

²⁷ Combined Fleet, *Hirado*: Kachidoki Maru.

²⁸ U.S. Naval Technical Mission, *Japanese Anti-Submarine Warfare*, p. 11.

²⁹ USS *Sealion* Second War Patrol Report, 12 September 1944.

importance of short-distance communications between submarines, they were certainly correct in highlighting the significance of radar. The failure of Japan to develop radar of comparable efficiency for the use of escorts was a major reason for the vulnerability of their convoys.

Nevertheless, there is at least some evidence that Japanese antisubmarine warfare was improving by this stage of the war. The Americans' lost nineteen submarines during 1944, including five in the month of October alone, their worst year of the war.³⁰ But ironically, just as Japan was devoting more resources to cope with American submarines, the battlefield shifted as Allied aircraft increasingly took the initiative in destroying Japan's merchant marine. By the end of 1944 aircraft and air-dropped mines displaced submarines as the main threat to shipping.³¹

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³⁰ Rick Cline, *Submarine Grayback: The Life and Death of the WWII sub, USS Grayback* (Placentia, CA: R. A. Cline Publishing, 1999), p. 219; Parillo, *Japanese Merchant Ships*, p. 122.

³¹ Oi, "Why Japan's Anti-Submarine Warfare Failed", p. 601.