# SECTION VIII

## U.S.S. GRENADIER (SS210)

Loss in Action

Off Malaya
22 April 1943

Class.....SS198

Builder..... U.S. Navy Yard, Portsmouth, N. H.

Commissioned..... 1 May 1941

Length (Overall)..... 307 ft. 2 in.

Beam (Extreme)..... 27 ft. 3 in.

Submergence Depth (Designed Maximum) (Axis) ..... 250 ft.

Displacements

Standard..... 1475 tons

Emergency Diving Trim..... 1980 tons

Submerged..... 2359 tons

Draft (Mean, Emergency Diving Trim)..... 16 ft. 8 in.

Type of Propulsion.....Diesel Electric Reduction Drive

Main Engines (4)..... Fairbanks-Morse 38-D-8-1/8

Main Motors (4) and Generators (4).....Elliott Co.

References:

(a) Enclosure (C) to ComSubPacAdmin ltr. FF12-10(A)/A4-1 (1)/A16-2, Serial 00349 of 21 September 1945 (Commanding Officer GRENADIER Statement Concerning Loss of Vessel).
(b) Account of Loss of GRENADIER as Related to Cdr. I.F. Duff, (MC), USNR, by Lt. Cdr. A. Toulon, Jr., USN (Engineer Officer) on 7 February 1946.
(c) ComSubPac Report Entitled "Enemy Anti-Submarine Measures", no date or file number given (Account of Loss of GRENADIER).

Photograph No. 8 - 1

8-1. On 21 April 1943, while operating off the Malay Peninsula during her sixth war patrol, GRENADIER sustained heavy damage to the after portion of the ship as the result of a Japanese aircraft depth bomb attack. The most serious casualty which occurred, and which directly caused GRENADIER's loss, was the complete immobilization of her propulsion plant due to derangement of the main control cubicle and severe misalignment of the propeller shafting. All efforts by ship's force to effect emergency repairs were unsuccessful. Early the next morning, GRENADIER was abandoned and scuttled by her own crew to prevent imminent capture by an approaching Japanese merchant ship. This report is based on the information contained in the references. The references are accounts furnished from memory by various survivors upon their release from Japanese prisoner of war camps at the end of the war, nearly two and one half years after the action occurred. Therefore, the source data are not as complete and cannot be considered to have the same degree of accuracy as formal war damage reports written shortly after actions occurred.

8-2. The sixth war patrol of GRENADIER was conducted in the waters of the Indian Ocean off the west coast of the Malay Peninsula. Late in the evening of 20 April 1943, while making a surface search of an area about ten miles to the west of Lem Voalan Strait, GRENADIER sighted two Japanese merchant vessels. The moon being full and visibility conditions excellent, GRENADIER proceeded to circle astern of the ships with the intention of determining their course and speed. While still eight or nine miles away, however, she was detected and the enemy ships thereupon made a radical course change.

8-3. GRENADIER then proceeded to a position ahead of the target ships and submerged to await their arrival, but at early dawn of 21 April the Japanese again changed course before the range had been closed sufficiently to permit torpedo fire. When only the smoke of the ships was visible on the horizon, GRENADIER surfaced and commenced a run to a point which it was estimated would place her in a favorable position for attack if the enemy ships next changed course in conformance with known Japanese convoy doctrine.

8-4. At 0836, when still about 15 minutes running time from the intercept position previously selected to await the enemy, a Japanese single-engined plane was sighted approaching from the port quarter. GRENADIER thereupon made a quick dive.

8-5. When GRENADIER reached 90 foot depth, 15 degrees right rudder was ordered. At 0837, as the ship was passing 120 feet depth, a tremendous detonation occurred close over the maneuvering room and heeled the boat 10 or 15 degrees to port.[1] Lighting, auxiliary power and main propulsion were immediately lost. Emergency lighting was switched on and functioned satisfactorily. GRENADIER continued on down while attempts were made aft to regain power. When a depth of about 200 feet was reached, word was received that a fire had started in the maneuvering room so the boat was set on the bottom in about 260 feet of water.

8-6. The bomb detonation was reported to have been centered about 30 degrees to starboard from the vertical above and abreast the after

[1] Japanese records obtained at the end of the war contain no mention of this attack.

bulkhead of the maneuvering room. The severity and extent of the damage indicate that the weapon was probably a 250 Kg. Mk. 2 anti-submarine depth bomb containing 317 pounds of Type 98 explosive. This is the largest depth bomb known to have been developed by the Japanese and was commonly used for anti-submarine work. The depth setting employed in this instance was probably that corresponding to the standard "25 meter" fuzing frequently used by the Japanese. This should have caused detonation in the vicinity of 70 to 80 foot depth or about 40 feet above and to starboard of GRENADIER's pressure hull abreast the after end of the maneuvering room. The Commanding Officer stated that the noise and jarring effect of the detonation on the ship were as though "two express trains collided". Beyond a few superficial lacerations and bruises there were no personnel casualties.

8-7. The fire in the maneuvering room was reported to have started as a result of the cutting and short-circuiting of the main motor power cables above the control stand when the pressure hull overhead dished in sufficiently to come in contact with the power cage of the main control cubicle, and also by arcing of contactors in the control stand itself. The burning material consisted of the hull insulation cork sheathing, electric cable sheathing, stores, cleaning rags and paint. Dense noxious smoke was generated in large quantities. When it became apparent that no immediate headway was being made in attempts to extinguish the fire, and with smoke spreading throughout the boat, the Commanding Officer ordered the maneuvering room sealed. About one-half hour later, the compartment was re-entered by a firefighting party using escape "lungs" as respirators to filter out the smoke and the fire was smothered with $CO_2$ from portable fire extinguishers. At some time during this period two men were overcome by smoke. The escape "lungs" were used since rescue breathing apparatus was not available. It was reported that the "lungs" were clumsy and that difficulty was experienced in keeping the mouth-pieces in place.

8-8. The pressure hull plating and frames were severely dished inward from the after bulkhead of the engine room to the after bulkhead of the after torpedo room. Maximum dishing was sustained in way of the bulkhead separating the torpedo room and the maneuvering room, four to six-inch indentations occurring at the starboard forward end of the after torpedo room. The bulkhead itself was distorted and forced to port, apparently bending the port and starboard propeller shafts at both stern tubes, and the watertight door seat was sprung so that the door could not be completely closed. The maneuvering room control cubicle cage was twisted out of shape and deck plates and support frames were bent.

8-9. Although in no place was the pressure hull proper reported to have been torn or ruptured, there were at least three sources of major leakage into the interior of the boat. The first was through the maneuvering room air induction hull valve, its seat being so badly distorted that a two-inch stream of water poured through from the flooded topside engine induction piping onto the electrical equipment of the main propulsion control cubicle beneath. The second source of leakage was through the distorted riveted joints of the maneuvering room hard

patch and this also resulted in sea water spraying onto the control cubicle. It was reported that this hard patch was partially separated from the hull. The third source of major leakage was through the after torpedo loading hatch. The bossing structure supporting the hatch seat was distorted to such an extent that the torpedo loading hatch transverse compression strut was bent about 10 to 15 degrees from its normal centerline and the hatch opening became elliptical in shape rather than circular. The hatch cover lacked seating to the extent that the Commanding Officer reported he could insert his hand between the seat and the hatch cover. Almost half of the circumference of the hatch gasket was badly cut.

8-10. Upon extinguishing the fire in the maneuvering room, a bucket brigade was formed between the maneuvering room and the forward torpedo room in an attempt to keep the water level below the level of the main motors. Many men lost consciousness from heat prostration and physical exertion. Eventually, a jury rig was established so that electrical power for the drain pump could be taken from the forward battery and incoming water was thereafter kept to a satisfactory level by pumping alone. Every effort was made to protect the control cubicle and other electrical equipment in the maneuvering room from the shower of sea water through the hard patch and induction valve, but shields could not be effectively rigged due to overhead interference between the control cubicle and the hull. As a result, all vital electrical equipment in the control cubicle became saturated with salt water.

8-11. In the after torpedo room, all torpedo tubes were put out of commission, presumably due to misalignment of the entire tube nest and damage to stop bolts, torpedo guide studs, gyro setting spindles and blow and vent piping systems and fittings. Steering system hydraulic lines were ruptured. Many gauges were dismounted and deranged. Bunks and torpedoes were dislodged and thrown about.

8-12. Damage forward of the maneuvering room was apparently relatively minor. In the engine room, hydraulic lines to the main vent valves carried away. No other damage was reported in this compartment although there must have been at least considerable minor derangement of equipment, piping systems, gauges and instruments. In the crew's messroom, dishes and phonograph records were thrown about and broken. In the radio room, the radio receivers were dislodged from their mountings and the transmitter was knocked over. The radio gear was subsequently put back in commission. The insulators in the radio antenna trunk were also found to have broken.

8-13. The ship's force worked all day attempting repairs and restoring order where possible. No more enemy attacks were received. Efforts to restore propulsion power were considerably hampered by the continued intake of water over the control cubicle and by several minor electrical fires which started at various times.

8-14. During this period, breathing conditions became very trying for the eight officers and sixty-eight men aboard. The air conditioning

and ventilating systems were not working. The maneuvering room fire had created large quantities of irritative smoke and in addition had consumed some of the available oxygen from the atmosphere. About eight cans of carbon dioxide absorbent were spread out in the after battery compartment and oxygen was bled into the boat. Men not working were encouraged to lie down. Despite these measures the ship became very hot and humid and headaches were common.

8-15. At 2130, after 25 hours submerged, GRENADIER surfaced under cover of darkness in order to ventilate the boat and aid repairs by stopping the maneuvering room leakage. The ship was cleared of smoke at this time by running the main Diesel engines. After several hours' work a jury rig was established which enabled power to be supplied to the motors of one shaft. However, the shaft could be turned over only at very low speed, apparently due to severe stern tube or strut bearing misalignment or bending of the shaft itself. It was impossible to move the control stand levers into the second stage resistance. Approximately 2750 amperes were required to turn the shaft although the current normally required was only 450 amperes.

8-16. By about 0400 to 0500 the next morning, 22 April, all efforts to restore propulsion had proved of no avail and it became apparent that nothing further could be accomplished in view of the magnitude of the damage and the limited repair facilities available to the ship's force.

8-17. Plans were then made to rig a sail with the intent of moving the ship closer to the shore where the crew could be disembarked and the ship blown up. This scheme, however, was soon shown to be futile and was abandoned.

8-18. At about 0600 a ship was sighted proceeding from the northwest out of Lem Voalan Strait and shortly afterwards smoke from what appeared to be a patrol craft was sighted to the southeast. At this time GRENADIER could neither run nor fight. It was considered inadvisable to resubmerge since a stationary dive would have been required without power, there were several leaks of serious nature through the hull and the true trim of the boat was not known due to having transferred large quantities of water and the loss of fuel oil through ruptures in external tanks. Offensive action against the enemy was not possible since the three-inch deck gun had been damaged and torpedoes apparently could not be fired. The decision was therefore made to scuttle the ship. Classified papers were destroyed and radar, radio, sonar and TDC equipment was demolished.

8-19. While preparations were in progress for abandoning ship, a single-engined Japanese plane, similar to the one of the preceding day, commenced a run on GRENADIER from the port side but was forced away by the return fire from the two 20mm and two .30 caliber machine guns. The plane then made a second run on GRENADIER's port side and was again fired upon. When directly overhead, the plane dropped an aerial torpedo which struck and detonated in the water about 200 yards from the ship. Subsequent information indicated that the pilot of the plane died that night as a result of wounds received from GRENADIER's fire and a crash when landing at Penang.

8-20. The crew was then lined up at quarters forward of the conning tower, leaving one man below to open the tank vents. There being an insufficient number of life jackets available for all hands, mattress covers were inflated with air prior to abandoning ship. In addition, one rubber life raft was available for the sick and those who could not swim. When the ship from the northwest, an 1800-ton converted merchant vessel, arrived within two miles distance, all hands were ordered over the side and the man below opened the vents. GRENADIER sank quickly, stern first.

8-21. The entire complement, seventy-six men and officers, were taken aboard the Japanese merchant ship and subsequently landed at Penang, Malay States. Of these, seventy-two men survived to the end of the war. Prior to her loss, GRENADIER was officially credited by ComSubPac with sinking six ships (3 AK, 2 AP and 1 AO), a total of 40,700 tons, and damaging two ships (both AK), a total of 12,000 tons.