I. *USS S-49* 12/9/41 to 1/19/42

1.

A billion pinpricks of light lit up the dome of the moonless night sky. The waters of the Makassar Strait stretched out before the boat like a gently swelling sheet of pure onyx, the only visible disturbances in the water the boat's bow wake and the phosphorescent gray foam of its following trail.

For the first time in recent memory, both power trains were working, and the submarine was making maximum speed on the surface – just over 14 knots – so when she struck the reef, she struck hard.

Nobody knew exactly what had happened when the boat suddenly shuddered, stopping dead in her tracks with that awful crunching, tearing, sound of metal rending against unyielding rock. Lieutenant Junior Grade (LTJG) Stetson had the deck and enough presence of mind to sound the collision alarm immediately. Automatically, the watch section and men ripped from their bunks in panic set Condition Zed throughout the boat and she was buttoned up. All water-tight doors between the compartments were secured, as were all ventilation flapper valves between compartments, effectively shutting down all ventilation in the boat. Only the closed-cell ventilation in the battery remained active.

It was immediately reported to the control room that the door between the torpedo room and the battery compartment was sprung, probably from the force of the grounding, and could not be secured. The crewmen forward reacted quickly to the sudden flooding of the torpedo compartment, forming a damage control (DC) team under the direction of Chief Torpedoman Floyd Sweat, and going to work immediately to staunch the flow of seawater with whatever was at hand. But the rip in the pressure hull was not only huge, it was also almost inaccessible because of the large upright impulse air tank right in the way, and because of the tight spaces between the torpedo tubes. The DC team stuffed the hole as best they could with mattresses held in place by wood shoring, and while the flow of seawater into the boat was significantly slowed, it could not be staunched. Seawater continued to flow into the torpedo room.

The pressure hull let out an unnerving, grating shriek with each gentle swell of the surrounding sea, as her pierced plating ground itself against the razor-sharp coral of the reef. With each swell, the boat shifted, and the gash in the grounded hull opened just a little wider, just a little longer, and more seawater gushed into the *USS S-49*. The upward angle of the boat allowed seawater to enter the battery compartment through the sprung doorway, and the 120-cell Exide battery was slowly flooding, releasing chlorine gas into the living spaces. The gas would eventually drive the crew out of the boat and onto her deck, heaving in time with two-foot swells.

Lieutenant (LT) Harry Loveless, commanding officer of *S-49*, thought at first that the boat might have struck a submerged wreck, but the chart showed hundreds of feet of water beneath *S-49's* hull. Further, the Admiralty charts for this part of the Makassar Strait showed no underwater obstruction within a hundred miles, and while submerged

reefs this far from any shoreline were not unheard of, they were hardly common. Yet here it was. It was painfully obvious that *S-49* had struck an uncharted reef, had struck hard, and was now held fast by it. For the second time on this, the boat's first war patrol, her Captain ordered life preservers issued to all personnel.

All efforts to back off the reef using the ship's propulsion failed. All the backing succeeded in doing was enlarging the hole in the pressure hull, and disturbing the damage control patch, such as it was.

Loveless ordered the radioman, 27-year-old second-class petty officer Hal Wentworth, , to send an urgent encrypted message to Pacific Submarine Command, or COMSUBPAC, giving the *S-49's* position, and describing the boat's predicament:

1901421812Z. AT 1901421740Z, S-49 STRUCK AN UNCHARTED REEF IN THE MAKASSAR STRAIT POSIT 04.57.17S, 18.33.04E. BOAT HELD FAST, BUT ATTEMPTING TO FREE. NO PERSONNEL LOST OR INJURED, BUT SITUATION CRITICAL. LOVELESS.

Twelve hours of useless struggling later, Loveless realized the situation was completely hopeless. All crew not actively engaged in damage control were already on deck, and seawater had completely compromised the battery. The battery compartment and the torpedo room were inundated with chlorine gas. Loveless ordered all hands still below to secure any belowdecks activity and to get on deck. Last out, just before Loveless himself, was Wentworth, whom Loveless had just ordered to send a Mayday in the clear. Then they both scrambled out of the boat through the bridge access trunk, securing the bridge hatch behind them. All the hatches were shut, thus trapping as much air inside the boat as possible, but that only delayed the inevitable. *S-49* was sinking. Eventually, the only thing holding her on the surface would be the reef, but when the boat got heavy enough, or the sea violent enough, even the reef would have to let her go. Hopefully, she would stay on the surface long enough for the 36 officers and men on deck to be safely evacuated. If the Mayday had been ever received. And if whoever received it was friendly.

2.

LT Jake Lawlor, U.S. Naval Academy,'33, served as Executive Officer aboard the *USS S-49,* which was home-ported in Cavite, Luzon, U.S. Commonwealth of the Philippines. Now he sweltered on her deck, witnessing her death throes, and his biggest disappointment was that the old girl had barely begun to bloody the nose of the enemy. And now she was dying, not because of any enemy action, but because of an unmarked reef on an outdated chart.

Jake was not a tall man; at 5-foot-nine-inches he wasn't exactly short, but he was certainly not, he felt, tall enough to impress anyone with his height. That is, of course, until you saw that Jake was powerfully built, with a barrel chest, and muscular arms and legs.

Jacob Julius Lawlor was born in Des Moines, Iowa, on May 8, 1911, the youngest child of five children born to Gregory and Cynthia Lawlor, and the only boy. Jake was more or

less a surprise; Cindy Lawlor thought surely she was past having children, her last daughter had been produced a full five years earlier.

And Greg Lawlor was delighted to at last have a son. Greg was a talented machinist, who managed to work steadily, even through the Great Depression that gripped the country through the 1930's. The Lawlors were hardly wealthy by any measure, but they lived simply, there was always enough to eat, and Zeke and Sally were loving parents. The Lawlors were also devout Presbyterians, and the entire family attended services every Sunday.

Jake's parents were worried about him during his babyhood. He never crawled, and was showed no inclination to begin walking. He was a rather chubby baby, who was also slow to begin talking, and even after his first birthday, verbalized very little. What they didn't realize was that Jake was surrounded by five adoring women, all of whom were at his beck and call. He had only to point and sniffle and his every need was satisfied. So everyone was taken by complete surprise when, not long after his first birthday, Jake suddenly got up on his feet without hesitation, walked confidently, and began to speak in complete sentences. He thereafter developed quite normally, even precociously, his fat turning to muscle, and his intelligence blossoming. But he was also shy and introverted, especially around any female outside of his immediate family.

Why, despite being raised in a house full of them, Jake became painfully shy around all other females was a complete mystery to his parents and his sisters. Although far less withdrawn when dealing with other boys, he was still socially awkward overall, and compensated with his studies, and especially with sports. He excelled at both. He was an A-plus student, a creditable forward in basketball, and eventually the starting halfback for the West High School Dragons. As his peers grew more and more interested in, and confident around, the opposite sex, Jake shared their interest but never matched their confidence. He was simply insufficiently courageous, for example, to ask a girl out to his high school senior prom, so he just stayed home.

Jake had wanted to go on to college, but there was no way his parents could afford it. An education at the Naval Academy or at West Point, however, was free. Jake wrote an appeal to his Congressman seeking an appointment to one of the academies. He was overjoyed when he received an appointment, applied to, and was accepted at Annapolis. He had never seen an ocean, could barely swim, but he was going join the Navy!

His Academy classmates were surprised that despite his physique and boyish good looks, Jake wasn't cutting large swaths through the field of young women that visited the Academy regularly. But their classmate seemed oblivious to the admiring stares from the ladies. He seemed normal enough, and no one would dare question his manhood. He was, after all, starting halfback on the varsity football squad for three seasons.

After graduation, and his commissioning as Ensign, USN, Jake was assigned duty aboard the destroyer *USS Adrian Long* out of Norfolk, Virginia. It was on the *Long* that ENS Lawlor volunteered for, and was assigned to Officer's Submarine School, in

Groton, Connecticut. The *USS S-12*, one of the six 'Sugar-Boats' home ported in Pearl Harbor, Hawaii, was Jake's first boat right out of Sub School. It was during his year in *S-12* that he qualified in submarines and pinned on his gold dolphins. There then followed two years aboard the *USS Blem*, one of the sixteen newer fleet-type *Sargo*-class boats also operating out of Pearl. In *Blem* he served first as Engineering Officer, and then as Navigator. Jake then received his assignment as XO aboard *S-49*.

And now, almost two years later, his boat was stuck on a reef in the middle of nowhere. Serving as XO on *S-49* had put him in line for command of a boat of his own, but now, with *S-49* running aground and most likely lost, chances looked bleak that Jake would ever get a command, certainly not in submarines. The Navy was, if nothing else, unforgiving of a major screw-up – such as losing a boat to what appears to be simply lousy seamanship. He was sure he could also kiss goodbye that next half-stripe, and possibly even his career in the Navy. What Jake did not fully realize was that the peacetime Navy was not the same service as the wartime Navy.

3.

"Execute unrestricted air and submarine warfare against Japan." – Admiral Harold Rainsford Stark, Chief of Naval Operations, December 7, 1941.

S-49's Captain, LT Harry Loveless, USNA '31, was a tall, gaunt, man, with a serious-looking face, one that was a perfect clue to his nervous disposition and an almost complete lack of a sense of humor. Jake could never say that had a warm relationship with his Skipper. Their relationship, rather, would be better described as one of mutual respect, and Loveless frequently consulted with his XO before deciding on a particular course of action. Jake and the crew of *S-49* regarded Harry Loveless as an extremely competent submarine commander, a person who was also very cautious, and who would never subject his boat to unnecessary risk. And so, nobody in the crew, including Jake, would ever question any order Loveless gave, and every man aboard *S-49* had confidence in his ability to lead them into battle.

When Loveless received *S-49's* orders in port in Cavite, on December 9, 1941, to *"put to sea at the earliest and to proceed to the East China Sea shipping lanes off Okinawa, there to seek out and destroy all shipping flying the flag of the Empire of Japan, or that of any of its allies,"* he regarded his orders with both exultation and trepidation. He was eager to defend his country's wounded honor, but *S-49* was an old boat. Her keel had been laid in 1919 and she had been in commission since the '20's. Keeping her ancient Busch-Sulzer diesels running was a continuous challenge, and her seals on both power trains had a tendency to leak on the surface, never mind when she was submerged.

But orders are orders, and Loveless immediately dispatched *S-49's* Chief of the Boat, or COB, Chief Boatswain's Mate Wendell Buckner, to the two sub tenders *USS Holland* and *USS Canopus,* and to the base shore facilities. There 'Bucky' was to scrounge whatever extra niceties he could beg, barter, or steal (this function usually described as the ability to 'cumshaw,' with Bucky acknowledged fleet-wide as an accomplished 'cumshaw artist'). Other crewmen and officers saw to expediting repairs: both the starboard engine and all the seals – as always – badly needed attention. Crew, base,

and *Canopus* personnel labored around the clock. Submarine-qualified Torpedoman Chief – TMC(SS) – Floyd Sweat and his team set about loading *S-49's* full complement of fourteen Mark-10 torpedoes and all the ammunition the boat could carry for her 4-inch .50-caliber forward deck gun, and her little 20mm Oerlikon gun which could be set in a mount aft of the bridge.

4.

The Japanese invasion of the Philippines and Guam began on December 10, 1941, the day after *S-49* received her orders. As the boat was still being readied for sea, two nights later, Japanese planes bombed and strafed Cavite, mortally crippling the submarine *USS Sealion*. There were also reported troop landings elsewhere in Luzon and Mindanao. The bulk of Japanese efforts in the Philippines were concentrated to the north of the island of Luzon, where the U.S and Philippine armies under General Douglas MacArthur began their slow and painful retreat southward to the Bataan peninsula and the fortress at Corregidor. For *S-49,* and the other twenty-six boats capable of leaving Subase Cavite, it was time to get out of Dodge.

Five days after receiving orders, on Saturday, December 14th, with two men short of her total complement of 38, a full load of water, fuel, torpedoes (twelve forward and two aft), and a full magazine of shells for her guns, *S-49* set out for her patrol area. The boat had barely passed muster on her trim and test dives in the waters just outside of Manila Bay only the day earlier. The crew had packed whatever personal belongings they could into any nook and cranny not already filled with provisions, because they knew they wouldn't see Cavite again anytime soon – maybe not ever. So whatever personal possessions were still ashore they reluctantly wrote off.

In transit to the patrol zone, and after clearing the Philippines, the crew settled into the boat's at-sea routine. Watches were in three sections of twelve men each, four hours on and eight hours off, with only the Captain not standing watches.

And life aboard a boat at sea, moreover, was not exactly comfortable. Space was at a premium, filled with equipment and material of every sort, and living spaces appeared to be an afterthought for the boat's designers. Sleeping racks for crew forward were wedged between torpedoes. Water was in limited supply, and the boat's distiller unit, which made fresh water from seawater, was there mainly for providing distilled water for the batteries. Only then were the crew's needs for drinking water and cooking met. There was a little water for shaving and brushing teeth, but none for bathing (excepting only the cooks), and certainly none for washing clothes. After two days at sea, bodies were ripe – never mind by the end of a patrol. Luckily, the stench of diesel fuel and stale cigarette smoke permeated the boat at all times, and helped cover up the stink of unwashed bodies.

Arriving on station a week later, *S-49* began her first – and last – war patrol. There were two Jap airfields on Okinawa, and any close approach to the island on the surface was dangerous at night and suicide during daylight. But for *S-49*, remaining submerged for any length of time was a challenge. The shipfitters at Cavite had done their best to repack and tighten down her seals in the limited time they were allotted, and they had

held during her test dive back off Manila Bay, but at her 200-foot maximum operating depth she had once again begun to ship copious amounts of water. Loveless was therefore not inclined to spend much time going deep.

At periscope depth, the boat was fairly tight – the shipfitters had been able to accomplish at least that much. At periscope depth however, in these waters and in most sea conditions, the boat was also very detectable from the air as a slowly-moving dark shadow, 266 feet long. So Loveless, on Jake's advice, compromised by cruising during daylight at 90 feet. There the boat's drain pump could mostly stay even with the incoming seawater, and she *had* to be less visible from the air. He would routinely surface the boat after dark each night, well out of sight of land, and run the diesels to charge the battery. Only when the can (battery) was fully charged, would Loveless venture his boat near land.

The Japanese on Okinawa were apparently unconcerned about any Allied attack. As far as Jake could tell, they had made no attempt to hide themselves from seaward, and while the principal port of Naha was hardly as brightly lit as a major port in the States, it was still very easy to distinguish its location over the horizon as a gentle glow in the night sky. Furthermore, no attempt whatever had been made to extinguish lighted navigational aids.

5.

S-49 was into her third week on patrol. The crew had spent Christmas Day submerged. The cooks served turkey and all the fixings, and the men did their best to celebrate the holiday, but everyone missed home and family. Loveless held a brief prayer service, but attendance was optional, and with a third of the crew on watch anyway, only seven men attended including the XO and the COB. New Year's Day came and went, practically unnoticed, just another uncomfortable day on patrol.

Mechanical and electrical problems quickly began to plague the boat. Lubrication failures became common, particularly on the starboard drive train. The Sugar-Boats had no air conditioning and humidity levels inside the boat while submerged were uncomfortable for the crew, and, despite cork insulation, the pressure hull bulkheads were constantly dripping with condensation. Worse than the crew's discomfort, the humidity was causing frequent electrical shorts, and blowing fuses.

Naha was a fairly busy port, but thus far any tempting target presented no firing solution. Ships were always too far away, or traveling either too fast or on the wrong course for Loveless to maneuver *S-49* into firing position. Invariably, had the potential target passed just a half-hour, or even a few minutes earlier, or just 1,000 yards closer, the boat would have been in perfect position to take a shot. The Mark-10 torpedo was the only torpedo currently in the Navy's arsenal that *S-49* was able to fire (her tubes were too short to accommodate the newer Mark-14s). The Mark-10 was gyroscopically-controlled, but unlike the Mark-14, it could only travel in straight line. So Loveless and his firing team, headed up by his XO Jake Lawlor as Assistant Approach Officer, had to attain a firing solution, and then maneuver *S-49*, actually aiming the boat so that its course coincided with the torpedo track required for the weapon to intercept the target.

S-49 had no radar. Radar equipment, newly invented by the British, was an installed innovation on the new fleet boats, and some air defense SD radar sets had been backfitted onto other, older boats, those who had actually been given names instead of numbers. But, at this point in the war, neither did any of the enemy ships have radar; in fact, right up to the end of the war, only Imperial Japanese Navy (IJN) capital ships and some escort vessels were ever radar-equipped.

S-49 did have good sonar capability. Unlike most of her sister boats, and none of the still older O and R-class boats, S-49 had been fitted with a JK hydrophone, capable of listening underwater. But the boat had no active sonar capability, that is, she could not project and receive returning sound signals (ping) to locate targets. Her acting sonarman, Michael Frayson, who was actually a submarine-qualified third-class Electrician's Mate, or EM3(SS), could say if he heard another ship out there, and provide its general direction, but without an active sonar capability, he could not give any accurate estimate of bearing or range. But even that crude sonar gave *S-49* an edge, since IJN ships also had little sonar capability at that point in the war. IJN ships were equipped with excellent passive sound gear, but the sound operators were poorly trained, and most of their commanders oblivious to its utility. Active sonar capability came to the IJN later in the war, but, again, commanders of escort ships so equipped were never well-versed in its capability or usefulness.

On a submerged approach, it was up to the periscope operator, at general quarters always Loveless himself acting as Approach Officer, to provide a range to the target. This was done on later boats using a stadimeter, a device built into the periscope. Unfortunately, *S-49's* periscope had no such device, and Loveless could only estimate the range based on his experience. The Approach Officer would also estimate the target's angle-of-the-bow (AOB), which was the angle between the target's bow and, left or right, to the line of sight.

Using his estimates, the fire control team, headed up by Jake with the assistance of the boat's navigator, LTJG Joseph Stetson, and his quartermaster QM1(SS) Silvio Bertone, used relative bearing worksheets (known as maneuvering boards), a position chart, and a hand-held, slide-rule-like device known as an 'Is-Was,' to compute target course and speed. The solution was checked and rechecked each time Loveless made an observation. Jake acted as liaison between the Captain in the conning tower and the firing control team in the control room. When Stetson had some confidence in his solution, and Lawlor had evaluated the team's efforts and confirmed Stetson's confidence, then, and only then, would Loveless bring the boat onto final firing course. One last observation, a quick 360-degree look-around to insure there were no surprises from any other surface contacts, one last quick check of the firing solution, and a torpedo was launched at the target. Given the operational range of the torpedo, the ideal firing position was from between 750 and 1,500 yards from the target. The shorter the distance, the less time the target would have to maneuver away from the torpedo.

Surface attacks were simpler, if only because *S-49* was far more maneuverable on the surface. Bearing to the target was determined from the bridge, using a pelorus, an optical device with a bezel-mounted aiming telescope; it could be swiveled around and brought onto the target, giving the target's relative bearing. Without radar or active

sonar, range estimates were still judgment calls, as were angles-on-the-bow, and these data were conveyed to the fire control team belowdecks in the control room. Otherwise the procedure was the same, with the fire control team providing a calculated course for the boat so that the torpedo would be on track to hit the target.

6.

On that particular night, January 4, 1942, *S-49*, was cruising on the surface with her battery fully charged. According to a fleetwide report intercepted that evening, Japan had captured Manila two days earlier. But on this night, outside the Port of Naha, Okinawa, *S-49* was presented with a sitting duck. Loveless could hardly believe his good fortune. A fully-loaded Jap cargo ship, about 5,000 tons displacement, was moored near the breakwater, apparently awaiting transit to the port loading docks the next morning. Oblivious to any danger, her anchor lights were lit and clearly visible. Loveless had only to line the boat up with the target, and, making bare steerageway, launch a torpedo straight ahead from 1,500 yards – actually a long torpedo run, but Loveless was leery of venturing too close to shore, and a 1,500-yard run was within the torpedo's advertised capability.

The night was overcast, and while the moon had been full only two nights earlier, that time of night it shed little light. Loveless sounded "General quarters, surface action torpedo," and brought the boat around to head 009 degrees, the target's compass bearing. He cautioned the four lookouts, each on his perch alongside the masthead: "Forget what I'm doing. Keep a sharp eye out. Make sure we don't get any unexpected company."

"Aye, aye, Sir," the lookouts answered in unison, and they continued to scan the horizon with their binoculars for any contacts, either on the sea or in the air.

Loveless passed the word to the forward torpedo room to prepare tubes one and two for firing. He only needed one fish, but it never hurt to have a second ace up your sleeve. The water was relatively shallow here, and he was unsure of the cargo ship's actual draft, so he ordered the torpedoes set for shallow running – six instead of the usual twelve feet. He checked his heading; it was still at 009, and the boat was pointed straight at the unmoving target. All the Mark-10 torpedo would be required to do to hit the target was go straight ahead and stay on course. Loveless passed the word to the engine room, "All stop." Then, "Fire one." The boat lurched, and the torpedo was on its way, trailing a wake of fine bubbles behind it.

At 46 knots or about 77 feet per second, Loveless worked out in his head that the torpedo would take just under a minute to travel the 1,500 yards to the target. Exactly 58 seconds later, Loveless first saw the splash and the flash as the torpedo struck the target just aft of amidships. Just over a second later he heard the explosion. It was 0057 hours, January 5th.

The target ship began to sink quickly and spectacularly. Her cargo was obviously something incendiary, and, ablaze, the doomed ship quickly lit up the harbor. Instead of

immediately clearing the area, Loveless stayed to watch the terror that S-49 had wrought.

He had thought only of sinking a ship, and had not allowed himself to consider that human lives were lost in the process. Now he watched, sickened, as men, some aflame, jumped over the side of their ship into the sea. And yet, despite the horror of what he had done, he knew he would do it again, to other ships and to other men, given the chance. And as he watched, the clouds above had slowly parted unnoticed, and a barely waning full moon lit up the night.

7.

If Loveless was slow to react and clear the area, the Japanese were quick enough in their response to the violent explosion and a ship aflame in the harbor. It was fortunate for Loveless that the forward starboard lookout had followed orders and stayed sharp. When he reported "Surface contact! Just forward of the starboard beam!" Loveless looked away from the burning hulk and could just spot the surface contact. Like a ghost on the horizon, it was coming on fast out of Naha port, just about 5,000 yards away.

Almost simultaneously, sonar reported "Contact to starboard! Fast screws and closing!"

Loveless, guessing that the contact bearing down on them was either a Japanese motor patrol boat or, worse, a destroyer, quickly ordered a course to clear the harbor and make maximum surface knots: "Full speed ahead! Left full rudder! Come about to course 265!"

Loveless maneuvered the boat to put the contact dead astern, in position to possibly fire the boat's after torpedo tube at his new tormentor, now clearly a destroyer, silhouetted against the burning, sinking, cargo ship. And she was coming on *very* fast.

Almost immediately, the boat was in trouble. Before Loveless could order the boat's single after tube to be prepared for firing, the engine room reported lubrication oil failure on the starboard engine. Loveless had no choice but to immediately switch tactics and crash dive the boat, switching to battery power. Then, and only when the boat was settled out on depth, could he attempt, with the target dead astern, to fire a torpedo at the pursuing destroyer from the after tube.

Because of constant practice, the orders came by rote, quickly given and quickly executed: "Clear the bridge!" the lookouts scrambled from their perches and disappeared fast down the bridge access hatch. Sounding the claxton and yelling "Dive! Dive!" Loveless followed them down, securing the hatch behind him. "All hands forward! All ahead full! Take her to 100 feet! Prepare to fire from the stern tube!"

Men at GQ or general quarters, fleeing an enemy bent on their destruction, reacted even more quickly, their training kicking in, performing automatically. Anyone without a critical GQ post scrambled forward to the torpedo room to put as much weight as possible in the bow.

The moment the claxton sounded the diving alarm, the engines were shut down, the engine intake manifold was closed, and propulsion was manually switched over to battery power. In the interim, there was no power to the screws, and only the boat's forward momentum propelled the dive. The starboard engine's oil lubrication problem could be ignored for the moment. All buoyancy vents were opened, allowing the buoyancy tanks, always open to sea at the tank bottom, to flood with seawater, making the boat heavy, giving the boat negative buoyancy. The planesmen put both the bow and stern diving planes on full dive. When the drive at last was switched over to battery power, the boat's twin screws began driving *S-49* under.

The Engineer Officer, LTJG Bill Burke, was GQ diving officer, and in the control room called off the boat's depth to the keel. The COB was at the indicator panel announcing "Green board," meaning that the indicator panel lights showed that all buoyancy tank vent valves were open, and all hatches were shut, all in the correct position for the dive. The ship's crew had practiced this continually, and the boat was below the surface in just over a minute. Jake, at Loveless' direction, relieved Burke as diving officer and sent him aft to see to the problems with the starboard drive train.

Now the problem was how quickly the rarely-used after torpedo tube could be made ready to fire.

The after torpedo tube was almost an afterthought on the few S-bouts equipped with them. *S-49's* was installed on her last refit in Mare Island Naval Shipyard, Vallejo, California, three years earlier. The tube was fitted in the aftermost compartment, known as the Stoker's Mess, and was located on the starboard side, astern of the motor control switchboard. The Stoker's Mess hatch had to be modified, so it would tilt forward, enabling the loading of torpedoes on an angle from the deck above into the compartment below. One torpedo was kept loaded in the tube, and a second torpedo was stored on the port side of the compartment.

To fire the after tube, Loveless had to maneuver to boat to insure that the target was dead astern. But as quickly as the boat might have been in accomplishing this, the destroyer was quicker. Before the boat could line up and fire its after tube, the destroyer rolled a depth charge on the spot where *S-49* had last been seen, which exploded off the port quarter as the boat passed 100 feet.

Jake had known simulated depth charging in fleet exercises, grenades dropped overboard by the hunters on the surface to simulate the real thing. But nothing could have prepared him for this. Seconds passed, another explosion sounded. It seemed to be inside the boat itself, and the boat lurched violently, first away and then toward each explosion, as if doing some jerky, violent dance. Jake was knocked off his feet and slammed into the chart table. He grabbed for anything to steady himself, finally finding some piping, grasping and holding on, waiting for another explosion to be the last thing he would ever hear. He could not know that none of the depth charges was near enough to deal a mortal blow. What damage they did do, however, was bad enough.

Immediately, the bow planesman reported "Lost power to the bow planes, bow planes not responding!"

Getting to his feet, Jake ordered “Shift to hand control of the bow planes,” and the bow planesman began opening and closing hydraulic valves to switch to the cumbersome hand control.

Bucky Buckner then reported: “The gyrocompass is out. Its lights are out, and it sounds like it’s winding down.”

Then fuses blew on the starboard lighting circuit, and first-class motorman Greg Dansforth in the motor room reported broken lights.

“What’s the sounding here, Joe?” Loveless asked Stetson, on the chart plot.

“210 feet, Captain,” he replied.

“Good,” Loveless said, “Make your depth 150 feet.”

“150 feet, aye, Sir,” Jake acknowledged the order, ordering the planesmen to “Make your depth one-five-zero. Five degrees down bubble.” The planesmen manipulated the diving planes until the bubble in the level indicator showed that the boat was on a five-degree down angle. As the boat approached the ordered depth, they eased off on the planes, bringing the bubble back to zero degrees.

“At 150 feet, Captain,” Jake announced.

“Very well.” Loveless acknowledged. But he worried about the increased depth’s affect on his leaky boat.

By the time the boat reached 150 feet, the gyrocompass somehow began working again on its own. “At least something was going their way,” thought Jake.

Loveless slowed to one-third speed, and began a slow turn to starboard, a conscious effort to keep the destroyer astern. But the boat’s depth control and trim was shaky.

Then Bill Burke reported from the motor room that the starboard motor bearing had begun to smoke, and that Dansforth was applying oil to the bearing by hand, with a squirt can. Burke also reported that the shaft seals were now leaking very badly, and the boat was taking on “a lot” of water, that the bilge was quickly filling, and the water was just four inches below the deck plates. Jake couldn’t hold the boat at 150 feet and the boat began going ever deeper. Jake knew the drain pump was already running, and began pumping the trim tanks to sea. Soon the depth gauge read 170 feet.

“I can’t hold depth at this speed, Captain,” Jake reported, “And the trim tanks are almost dry.”

“Very well,” Loveless said. “All ahead two-thirds.” With the increased speed, Jake was able to bring the boat back to 150 feet.

Sonar reported the destroyer’s screws slowing, as it continued the hunt. It dropped another depth charge, but was well astern and to port. Jake, now far less terrified, shook off the admittedly muted explosion with a defiant grimace.

About 45 minutes into the dive, the boat began to lose depth control entirely, and the boat really began to sink. Jake helplessly watched as the depth gauge indicated greater and greater keel depth. Apprised of the situation, Loveless again asked Stetson for the sounding shown on the chart for their current position. “250 feet, Sir,” was the answer.

At 230 feet, in desperation, with Loveless in agreement, Jake ordered “Bucky, put a bubble in number two main ballast tank.” The COB first shut the tank vent, and then released a small amount of compressed air into the tank. The boat, now lighter, steadied somewhat on depth, but still refused to rise. Five minutes later, *S-49* started to sink again. “Captain,” Jake called out to Loveless at the conn, “Permission to blow number two main ballast dry.”

Loveless nodded, “Do it.”

Jake nodded to Bucky, “Blow number two ballast dry.” and the COB hit the tank with another, longer blast of compressed air. The air expanded inside the tank, pushing out the water in the tank, and releasing excess air from the bottom of the tank into the ocean, making tell-tale bubbles on the surface, marking the boat’s position. If the crew of the destroyer seeking them was near enough to see, and were on the ball, then *S-49* was in for more serious trouble. But Jake couldn’t worry about that now – if he could not bring the boat under control, they were all dead anyway. Finally the boat, now much lighter, began to rise: first imperceptibly, and then quickly.

Then too quickly. As the boat rose, the compressed air inside the tank expanded against reduced sea pressure, pushing still more water out of the tank, making the boat all the more buoyant. To avoid broaching, Jake ordered “Cycle the vent on number two ballast tank.” More bubbles of air were released to the surface, this time from air vented at the top of the tank. Finally, with the ballast tank alternatively vented and reflooded in stages, the boat eventually settled out at 95 feet.

Meanwhile the destroyer above continued to hunt, but it apparently had not been close enough, or its lookouts not astute enough, to spot the telltale bubbles. Sonar reported the sound of the destroyer’s screws alternately fading and getting louder. And the boat kept fluctuating in depth from 100 to 200 feet. As a precaution, Loveless ordered life jackets and escape lungs issued to everyone. Sonar continued to report hearing, however faintly, the screws of the hunter above.

8.

By 0515, January 5th, thanks to the feverish efforts of Bill Burke’s electricians and machinist mates, control over all the boat’s systems was reestablished. Sonar reported, finally, that the destroyer’s screws were no longer audible. The trim was still out of whack, and the lubrication system was still out. Loveless ordered the boat eased to periscope depth, and, with a 360-degree sweep with the search periscope, saw that *S-49* was alone in the sea.

Loveless surfaced the boat, and, ordering a battery charge on the port engine, cleared the area as quickly as possible. The lookouts were cautioned once again to keep a sharp eye out for contacts of any kind. There were, thankfully, none for the rest of the

day, and by nightfall, the lubrication system was repaired. There was no telling, however, how well the starboard motor would function, her main bearing having been operated for hours being lubricated only by Greg Dansforth's steady hand with the squirt can. The starboard power train was at last fired up, and appeared to be operating normally. By dawn, however, even though the lubrication system was still working, the starboard motor bearing started smoking again, if not nearly as badly as before. With the battery charge secured, the boat submerged for the day. That afternoon, the entire starboard motor lubrication system failed again.

On surfacing that night, Loveless reported his condition to SUBPAC. Hours later, in the wee hours of January 6th, orders were received, that, since Cavite was now under Japanese control, that *S-49* was to proceed instead to the Dutch submarine base in Surabaya, Netherlands East Indies, for repairs. Now all Loveless had to do was figure out how to get his crippled boat to Surabaya, almost 3,000 miles away through enemy-controlled open water.

Joe Stetson plotted out, and Loveless approved, a route passing east of the Philippines and then proceeding southwest, entering the Celebes Sea, on through the Makassar Strait, and then more or less southward to Surabaya. *S-49* carried excellent charts for the Philippines and surrounding waters, and very good charts for Okinawa. But the charts she carried for the Celebes Sea, the Makassar Strait, and NEI waters were older British Admiralty charts. Loveless was worried about their accuracy, but not overly so. He was more concerned about the condition of his boat.

9.

It was an interesting passage, skirting around the Philippines. Japanese activity was everywhere, and was especially intense around Luzon. What shipping they saw was too far out of position to even contemplate an attack, which would have been foolhardy in any case, considering the boat's mechanical problems. Aircraft activity was especially heavy. They apparently went unnoticed, however, as long as they stayed submerged during daylight hours. Each day, however, presented another engineering challenge. The starboard drive train continued to malfunction, and the leakage around the shaft seals grew worse daily.

Enemy activity diminished considerably as the boat the proceeded further south. The crew continued repairs to the starboard motor, but they were unable to keep it running for more than a few hours at a time. With only the port drive train functioning reliably, the boat was averaging a mere six knots, or 144 nautical miles a day. It took ten days, but on the morning of January 16th, *S-49* reached the Celebes Sea. Submerging, she set a course for the Makassar Strait.

Mechanical problems continued to plague the boat. At noon on January 16th, fire broke out in the starboard main motor auxiliary circulating pump, but it was quickly extinguished. Again, the apparent cause was a lube oil circulation failure. Still, the engine gang managed to get the starboard power train running again, and when the boat surfaced at dusk it began making good time. At dawn *S-49* submerged again after a good night's run.

When the boat surfaced after dark on January 17th, they were entering the Makassar Strait. Both drive trains came on line flawlessly and the boat began averaging just over 14 knots. Loveless remarked to Lawlor that they had just experienced their first 24 hours straight since departing their patrol zone “without a major mechanical failure.” At 0540 local time, *S-49* struck the reef.

10.

After a sweltering day on deck with their boat sinking beneath them, a Dutch motor patrol boat out of Makassar, NEI, evacuated the crew. *USS S-49* was then scuttled, and sunk quickly behind them, finally freeing herself from the reef.