First the Bollocking

Got a conscience call this morning not to assume that people know the acronyms; in this case it was OODA and was specifically directed at young people. As always it was a pertinent reminder; because the doings in the projects indicate that 'young people' in this bloke's mind were anybody under 60! So the wikipedia short course follows

The **OODA loop** is the cycle *observe–orient–decide–act*, developed by military strategist and United States Air Force Colonel John Boyd.(look him up he is my source of 'choose to be a be'er or be a do'er' statement) Boyd applied the concept to the combat operations process, often at the operational level during military campaigns. It is now also often applied to understand commercial operations and learning processes. The approach explains how agility can overcome raw power in dealing with human opponents. It is especially applicable to cyber security and cyberwarfare.[1]

The OODA loop has become an important concept in litigation,[2] business,[3] law enforcement,[4] and military strategy. According to Boyd, decision-making occurs in a recurring cycle of observe–orient–decide–act. An entity (whether an individual or an organization) that can process this cycle quickly, observing and reacting to unfolding events more rapidly than an opponent, can thereby "get inside" the opponent's decision cycle and gain the advantage.

I notice that the Mullets are having a WATSON week of 'Shape - Deter - Respond' which, due to my many years of exposure to that mind numbing softcore don't say nuttin' we can be held to jingoism, probably means that OODA today means OVERSTATE -OBFUSCATE- DENY-ABSCOND - please know when I use it; it is in the heritage sense.

The Disney Bomb

https://www.youtube.com/watch?v=mA1kWMLudvU 10 mins if you can tolerate the narrative -but interesting

and while we are on the subject of bombs:

Lets's do a bit of carpet bombing

Hunter-class frigate report indicates Australian naval shipbuilding in disarray

2 Feb 2022|Marcus Hellyer

I'm thinking Marcus wasn't allowed to title this one **Hunter-class frigate report indicates Australian Defence Hierarchy in disarray.**

The gunnies are only as bad as you let them be; or, in the ADO's case, as you encourage them to be by repeatedly issuing the system requirements as a matrix of pretty much mutually exclusive parameter sets. I recall Col Milne calling me into his Project Police office as I passed on my way to Tim Tam the Project Policeman for my project into submission. He showed me the TDRLs for the Frigate UP (wonderfully named), written by various elements in the Department, that, when compiled, simply contradicted each other all over the place. That is why the Pass Fail test plan for the T-26 Superior ASW performance could be achieved by pitting a TYPE 26 against one of my TimTams in a winner take all ASW play off. Yep superior. To what? At least the biscuit wouldn't leave as bitter a taste in the mouth.

This is the price the nation pays for Defence letting foreign consultants and then the Primes do all its thinking for it.

The latest revelations about the Royal Australian Navy's Hunter-class frigates confirm much of what we knew about the problems besetting the program, but add a level of granularity far beyond the general admissions made by Defence Department officials at earlier Senate committee hearings.

This new evidence is contained in the system design review exit report written by the Hunter program's own engineering team in November 2021. It's coming from the coal face and is as close to the ground truth as you can get.

A system design review is a key milestone that is meant to demonstrate that the project will meet the system's requirements—or, in other words, that the elements of the ship make a coherent whole that will deliver the capability the navy seeks.

Unfortunately, the exit report indicates that the design is far from coherent. We've known that the substantial modifications that Defence imposed on what was an immature design to start with have driven substantial problems. First among these is a growth in the size of the vessel from around 8,000 tonnes to over 10,000 tonnes. The laws of physics mean that if you increase the size of the vessel by 25% without increasing the power plant, performance will suffer. The exit report puts some detail around that, stating that 'maximum speed will be lower than comparable RAN surface combatants' and the vessel will face 'increased fuel consumption and running costs'.

Lack of power also has a direct impact on warfighting capability, with the commander needing to 'prioritise power allocation to either the CEAFAR2 radar or the propulsion system depending on the ship's operational requirements'. In the middle of a fight when you need to go fast and run your radar at full power to detect incoming missiles, you can't do both. The list of problems goes on, suggesting that ultimately a feasible ship design may not be possible.

The future frigate selection process was meant to pick a mature design that was in the water and in service. Instead, it picked an immature design as its reference ship (the UK's Type 26 frigate) that had barely started construction and was far from being in the water, let alone in service. The government also agreed to five major changes to the design, including installing the Australian-made CEAFAR radar and the US Aegis combat system. There's no such thing as a completely off-the-shelf warship design, but the point of picking a mature, in-service design is to minimise changes and the

technical and schedule risks that accompany them. Instead, the path Defence has taken has generated risks that are now being realised.

One key irony is that the now-cancelled Attack-class submarine program had completed its system functional review—a milestone further along the design path than the system design review—and was ready to commence detailed design. In essence, the Attack class was considerably more mature than the Hunter and its technical, cost and schedule risks better understood.

Senior Defence's leaders are predictably saying that solutions to the Hunter's design problem are well underway. However, Defence's assurances have minimal credibility in the shipbuilding space. For years Defence assured Senate committees that the Attack class would provide a regionally superior capability throughout its life, yet after the cancellation the prime minister stated that the Attack class would have been obsolete almost the minute it went in the water and 'we formed the very strong view, the unanimous view of all the Chiefs of our services and Defence Force, that this was a capability that was not going to meet our needs'.

So, where does that all leave us? The delays in the Hunter program mean that the start of construction has slid from 2020 to 2022 and now to 2024, with the exit review warning of further possible delays. At the business end of the project, initial operational capability—when the first vessel is ready to fight—is now 2034. Even the most optimistic view of the nuclear submarine program doesn't see it delivering any capability any earlier than that, and unless AUKUS finds a way to short circuit usual project timelines, it could be considerably later.

The government's $575 billion expenditure on defence in the 2020s, which includes $270 billion on new capability, will not get any frontline warships to sea this decade and likely none until the middle of next decade. Meanwhile, the Anzac and Collins fleets will need to serve on into the 2040s, hopefully (but not assuredly) ageing gracefully. But if the brand-new Attack class wasn't going to be the undersea warfare capability we need, it's hard to see the 40-year-old Collins providing it.

The RAN's entire warfighting capability is at risk.

We simply can't afford to cross our fingers and hope that Defence can sort out the problems in the Hunter-class program. Even if it can, the capability it delivers is too little, too late, at too great a cost—and may be irrelevant in the face of future threats. ASPI and others have suggested alternative and complementary courses of action, from building more of the proven Hobart-class air warfare destroyers, to arming the Arafura-class offshore patrol vessels (which don't even have a main gun) with anti-ship missiles, to investing more heavily in lethal uncrewed and autonomous systems, to acquiring strike systems such as the B-21 bomber.

So far, Defence's focus has doubled down on the shipbuilding program; indeed, the SSN program is sucking even more people and attention into that space. But anybody with a basic familiarity with crew resource management will tell you that if everybody in the cockpit focuses on the flashing red light on the panel in front of them, the aeroplane will fly into a mountain.

Author

Marcus Hellyer is ASPI's senior analyst for defence economics and capability. He is on Twitter at @Marcus_ASPI. Image: BAE Systems.

Dutton allays Hunter Class frigate fears, BAE responds

02 February 2022
By: Charbel Kadib
I can recall my Captain Geoff Rose lamenting, about a year after construction started in Feb 90, so say 1991, that everybody was all too willing to have a piece of us for all the 'wrong' things we were doing in what would be Collins, but no one would even countenance admitting the good things. That was circa three years after contract signature; and, in less than another 3 years, the first big black one would be on the shiplift with the late Oscar waving to her as she descended into the Port River. We are now 3 years in since the Hunter Contract signature in Dec 18 and three years before they might start building her.

Put that in your coffee cup and stir it around for a minute: 30 years of Defence reforms mean : everybody from the Chief bottle washer to to the doggie doo picker upper needs a degree and certification in D.I.E. to hold down their job (instead of actually doing it) and we end up here; where, if the good Minister would care to cast his mind back to being in the construction industry with his dad, he'd just know he'd better wander across to the site manager's office and take some drug swabs.

The minister has responded to criticisms of the $45 billion project following what has been described as a “low level” internal assessment.

On Tuesday (1 February), findings from a classified ‘Engineering Team Assessment’ of the Commonwealth government’s $45 billion Hunter Class frigate program were leaked to *The Australian*.

The report, presented to the Department of Defence, suggested the next-generation BAE Systems-built anti-submarine vessels would be “substantially” slower than initially anticipated, operating across a shorter range and leaving ships vulnerable to detection.

The 36-page report, tabled in November, also raised crew safety concerns, claiming personnel could be trapped below deck by floodwaters in “credible damage conditions”.

However, Minister for Defence Peter Dutton has dismissed fears of a systemic issue with the project, stating the assessment is “only accurate in part”. 100% is always a part

“…Unfortunately, the most important part has been left out, and that is that, yes, concerns are raised, but they are being addressed,” he told *Sky News.*

“When you look at the complexity of these programs — I mean trying to build frigates or submarines or putting together a helicopter fleet, the weapon systems, the millions of componentry parts and decision-making points — it’s quite phenomenal.”

Minister Dutton stressed there would always be “an element of risk” involved in major defence projects, acknowledging “things will go wrong”.

He also downplayed the weight of the assessment, describing it as a “low-level report”, which has been “exaggerated”.

"…the fact is that the concerns that have been raised are being addressed, and the Chief of Navy has been very clear about that," he added. Looks like one of the happy snaps from the Tiger Team has made it into the public domain!

Minister Dutton went on to acknowledge there may be further issues identified over the course of the program, including challenges associated with the integration of new technologies.

According to the minister, such issues have been baked into the $45 billion price tag for the nine next-generation frigates.

Minister Dutton ruled out project cancellation as an option, confirming Defence would not ditch the project in favour of a "plan B" alternative.

"[We] looked very carefully at this project and we've decided that we will proceed with it," he said.

In a statement to Defence Connect, BAE Systems Australia revealed it is yet to receive a copy of the report.

But a company spokesperson stressed that identifying risks is “part of a normal design risk management process”. 'especially in our company' seems to be missing

“All large projects go through an engineering phase to identify and mitigate potential issues and we’re working to deliver the best outcome for our customer,” the spokesperson added.

“The Hunter Class frigate program is making strong progress towards the delivery of a superior anti-submarine warfare capability for the Royal Australian Navy.”

In October, the company completed the structural manufacture of the first steel prototype unit.

The 217 square metre steel unit, produced at Osborne Naval Shipyard in Adelaide, was moved from the shipyard’s primary manufacturing hall for the next phase of the production process, which involves outfitting and consolidation with three other units as part of the first prototyping block.

The Hunter Class program is currently employing more than 1,300 staff, including 35 apprentices and 26 graduates, and is tipped to create and sustain 5,000 jobs over the life of the program.

BAE Systems Australia, which secured the SEA 5000 contract in 2018, is scheduled to deliver the first Hunter Class frigate in 2033.

I have to ask again - why do we go to these people for advice. https://www.gao.gov/products/gao-22-104344

I can only guess it is to validate the chosen ones' approach to life.

US Spy Chief Warns Government Is Classifying Too Much Data

As the amount of data soars, so does the burden of reviewing classified data for its eventual declassification.

By Frank Konkel

Executive Editor, Nextgov
February 1, 2022
If I had to pick a subject the ADO is excellent at it would be OVERclassification -in my game anyway. Hear the sound of the sea in a conch - UNCLASSIFIED, hear the sound of the sea by sticking head in Ogin - CONFIDENTIAL. yeah right. Who says it better than Sir Humphrey?

"The Official Secrets Act is not there to protect Secrets, it is there to protect Officials."
— **Sir Humphrey**, *Yes, Minister*

In reality it means that minor errors that anywhere else in the universe would be in the public domain, can be hidden behind the bodyguard of national security protection for no other reason but to protect, in most cases, the lazy. That means that somebody putting a decimal point in the wrong place caused a lot of grief in the S.81 submarine, and I heard in Wedgetail for a long time,

somebody specced the T471 with an operationally inappropriate specific gravity number for seawater -something caught before DDR3. The last one wouldn't have been found maybe till too late unless Dr John Ritter asked an unclassified welding question about depth cycles and the recipient treated it as an interesting question because it was looking at anechoic compressibility and impact on Reserve of Buoyancy. And as I have said before the best way to keep most secrets is to hide them in plain sight - Modern ASW and why the T-26 is not the skimmer ASW answer is out there, in plain sight, the size of the Pyramid of Cheops - and yet they cannot see it. If they could they wouldn't be talking about VLS shortages, too slow, too noisy -none of which have anything to do with ASW really. REALLY! (and before the sneak up on 'em in a skimmer set get uppity - is not that huge tonnage of CAPTAS transmitter the bit that is supposed to make you superior- but in reality is the shoot me first beacon because I am the easiest?) Riddle me that batman.

The federal government's tendency to over-classify data is harming national security and "erodes the basic trust that our citizens have in their government," said Avril Haines, U.S. director of national intelligence, in a letter to two senators.

Haines' letter follows sustained pressure from Sens. Ron Wyden, D-Ore., and Jerry Moran, R-Kan., to reform the country's declassification system, which they—along with privacy and government transparency advocates—have long argued is overly broad and antiquated.

"It is my view that deficiencies in the current classification system undermine our national security, as well as critical democratic objectives, by impeding our ability to share information in a timely manner, be that sharing with our intelligence partners, our oversight bodies or, when appropriate, with the general public," Haines said. "This reduces the Intelligence Community's capacity to effectively support senior policymaker decision-making, and further erodes the basic trust that our citizens have in their government. It is a fundamentally important issue that we must address."

Emerging technologies have had a direct impact on how the government classifies data. The intelligence community—comprising 18 agencies including the CIA, NSA and FBI—recently awarded two multibillion-dollar cloud computing contracts in part to manage the growing deluge of data collected by those agencies.

"The volume of classified material produced continues to grow exponentially in a digital-first environment, bringing with it the expanding burden of mandatory declassification requirements," Haines said. "The current prioritization given to remediating these issues and the resources dedicated to making tangible progress are simply not sufficient. I think this is something we can work on together."

In joint statements, Wyden and Moran welcomed Haines' offer to "work together" with the intelligence community.

"Director Haines clearly recognizes that the current broken classification system harms U.S. national security while eroding the public's trust in government. The DNI has offered to work with us to reform the system and, as members of the Senate Intelligence and Appropriations Committees, we intend to do so," the senators said.

The senators also expressed optimism regarding non-public ongoing efforts shared by Haines whereby intelligence agencies have initiated programs to speed up declassification reviews. In addition, Wyden and Moran expressed intent to "fix the executive orders that control classification and declassification."

"We have asked the DNI to coordinate with the National Security Council to make needed updates and we intend to reach out to the administration to address this critically important reform," the senators said

How Irish Fishermen Took on the Russian Fleet and Won

The action illustrates how the private sector can help governments respond to Russian gray-zone aggression.

the low end prevails against the high end again - the story of our wars since 1964.
By Elisabeth Braw

Senior Fellow, AEI
January 31, 2022

For months—years, in fact—the learned men and women in the corridors of Western powers have been putting their heads together to stop Russia from acting provocatively. Think-tankers such as me have written endless op-eds, reports, and books for the same purpose. We have, alas, been depressingly unsuccessful. A few days ago, another group altogether showed how it's done.

When Russia announced its intention to conduct a naval exercise off the coast of Ireland, Irish fishermen came up with a deterrent so surprising and so powerful that the Russian navy moved the exercise. We should learn from them.

Last Sunday, the government of Ireland passed the word that starting on Feb. 3, Russia would hold a naval exercise in Ireland's exclusive economic zone. Irish officials declared the exercise "not welcome and not wanted," but had clearly been unable to convince their Russian counterparts to hold it elsewhere. Indeed, despite continuing to plead with Russia to move the exercise – noting, for example, the area's unique marine wildlife – the Irish government got nowhere. As Russia's ambassador to Ireland, Yuri Filatov, said last week, "There is nothing to be disturbed, concerned, or anguished about and I have extensively explained that to our Irish colleagues."

The exercise was terrible news for Ireland's fishermen, who stood to lose one million tons of fishery, said Patrick Murphy, the chief executive of the Irish South and West Fish Producers Organisation. "This is the livelihoods of fishermen and fishing families all around the coastline here," Murphy told RTE radio. "It's our waters. Can you imagine if the Russians were applying to go onto the mainland of Ireland to go launching rockets, how far would they get with that?"

Murphy said the fishermen would be making a coordinated effort to head off the Russian fleet. "Our boats will be going out to that area on the first of February to go fishing," he told Politico on Jan. 25. "When one boat needs to return to port, another will head out so there is a continuous presence on the water. If that is in proximity to where the [military] exercise is going, we are expecting that the Russian naval services abide by the anti-collision regulations." By constantly having their boats in the exercise waters, the fishermen would—peacefully—prevent the Russians from conducting the exercise.

Their action worked. On Jan. 29, Filatov issued a statement announcing that Russia's defense minister, Sergey Shoigu, had decided, "as a gesture of goodwill, to relocate the exercises by the Russian Navy, planned for February 3-8, outside the Irish exclusive economic zone (EEZ), with the aim not to hinder fishing activities by the Irish vessels in the traditional fishing areas."

The Irish fishermen didn't just humiliate Moscow: they also put Western capitals' deterrence efforts to shame. And they did so by announcing asymmetric deterrence. The Irishmen would clearly not been able to sail to key Russian fishing waters to take revenge by harming fish there, and doing so would have at any rate been provocative. But they could go about their peaceful business in the Irish EEZ in such large numbers that the Russians would struggle to carry out their exercise. It was an action more creative than the threats Western governments typically think up – and that creativity created such a surprise factor that the Russians had to back down. Yes, it is possible that the Irish government made concessions to Moscow that the Ambassador's statement didn't mention, but it stands to reason that if there were any concessions he would have mentioned them so as to minimize Russia's humiliation.

In deploying this asymmetric deterrence, the fishermen unwittingly created a template Western governments could study, adapt, and adopt. In *The Defender's Dilemma* and elsewhere, I've proposed that Western governments should team up with their private sectors to create powerful deterrents. If, say, China continues to coerce Western companies, Western governments could collectively team up with their countries' luxury brands to threaten a luxury embargo against China. Why would Western companies want to cooperate? Because they suffer when other countries engage in coercion, IP theft, and similar practices.

Indeed, the Irish fishermen's success should teach Western governments that clever strategy is not a government monopoly. Businesses and business associations in lots of Western countries would, I venture to suggest, put forward excellent ideas for how threatening behavior by Russia, China, and other countries can be deterred without targeted countries having to resort to the threat of military force—if governments only asked them. Governments may in fact be discovering this untapped resource: one NATO member state is, for example, in the process of setting up pioneering national-security consultation with its private sector.

In the White House, there's a man with special fondness for Ireland: the president himself. May I humbly suggest that the Biden administration would be well-advised to issue an invitation to Patrick Murphy and his men—an invitation to thank them for preventing another standoff with Russia, and perhaps also to ask them for advice about asymmetric deterrence in other parts of the world. A reminder, and only half in jest: they've got a better track record than most of us.

Cornered at the Bottom of the East China Sea

On her tenth war patrol, the USS Tambor survived one of the worst depth-charge attacks experienced by an American submarine during World War II. In one of the most complete accountings of such an event, her crew provided a compartment-by-compartment report.
By Robert Schultz and James Shell
December 2009
Naval History Magazine
Volume 23, Number 6

Robert Hunt, veteran of 12 consecutive war patrols as a torpedoman in the USS Tambor (SS-198), did not expect to survive World War II. "I was just sure I was going to die," he recounted as he neared his 90th birthday. "So many of our subs were being lost and so many of my friends were gone. I assumed I'd go, too, sooner or later. But I knew it would be fast. And that was okay with me. I didn't want to come home wounded."

Postwar analysis supports Hunt's claim. Fifty-two American submarines-18 percent of those that saw combat-were destroyed, most of them with the loss of the entire crew of 75-85 men.

The Tambor came close to joining them. The boat survived 17 hours submerged beneath a skilled destroyer skipper who pinpointed the sub at the bottom of the East China Sea because of air and oil leaks. Years later, when the crew wrote letters to compile a room-by-room report of the action, they made possible a compelling story for two reasons: No other crew had written coordinated letters about such an event, and most who had undergone a similar experience died in their subs.

It was during the Tambor's tenth war patrol, at 2035 on 28 January 1944, that a convoy heading north was spotted. Visibility was poor, however, and it was difficult to fix its position and course to plan an attack. But finally, at midnight, her captain, Lieutenant Commander Russell Kefauver, latched onto the convoy and approached it on the surface from astern of port.

There were seven ships-three large transports escorted by four patrol boats-and Kefauver diagrammed the formation in his patrol report. As the Tambor maneuvered to attack the nearest maru-a 10,000-ton freighter-crewman Tom Lampley stood a lookout post and gunner's mate Carlos Clifton "Nip" Howard was assigned to the 20-mm gun, in case a "battle surface" was called. Bob Hunt manned the phones in the forward torpedo room, prepared to fire a spread of three torpedoes on orders from the conning tower. In the tower, the captain stood near Bob Dye as the radar officer monitored range from the target. Kefauver asked Executive Officer Ed Spruance, son of Admiral Raymond Spruance, to man the bridge, explaining later, "I didn't want to scare myself by seeing the ships so close."

It would be a close shot-closer, even, than Kefauver intended. He brought the sub to within 1,650 yards of her target when the freighter zigged 45 degrees to the left, unwittingly nearing the Tambor. When the captain gave his order to fire, the range was just 600 yards, near the minimum for the torpedoes to arm before they struck their target. No sooner was the first fish away than one of the convoy's escorts turned on her red truck light, increased speed, and headed for the Tambor. Kefauver ordered the second torpedo away and then turned the boat hard to port to evade the onrushing escort. In the forward room, water flew as the tubes vented into the bilges, sucking air bubbles and seawater back into the boat to prevent detection and maintain the sub's trim. Then the reload process began, but Bob Hunt knew something was happening above when the boat went to left full rudder and all-ahead full.

Close Call

Both torpedoes ran properly, and when they hit their target smoke and fire shot from the freighter. At such close range, the impact knocked the Tambor's lookouts back against the periscope shears. Tom Lampley, the starboard lookout, saw bodies and debris spinning in the flash. The patrol boat, however, continued on, her bow pointed straight at the Tambor, her searchlight probing for the sub. As she loomed, gunner's mate Howard saw Japanese sailors in white uniforms on board her running to man their deck guns. Kefauver, who had stepped to the bridge to fire the torpedoes, reported, "[A]ll hands . . . were convinced that ramming amidships was inevitable."

Tom Lampley, on his lookout perch, braced for impact. "I considered that [the patrol boat was] 12-15 feet from hitting us," he recalled. "I know when their searchlights hit me I thought they were bullets and I thought, well, it really don't hurt to die, after all." The bullets, however, were flying in the other direction. Firing in a continuous burst, Nip Howard raked the deck of the patrol boat, knocking out the searchlight, sending a hail of fire into the bridge, and stopping the sailors racing for their guns. As the 20-mm gun blazed, the escort was so close that Kefauver read the numbers on her bow by the light of the tracers. Bullets may have struck the Japanese helmsman, because the patrol boat veered off course and passed within a mere 20 yards of the Tambor's stern. Lampley, with a front-row balcony view, later said: "I believe that when Nip was shooting out the searchlights and raking the bridge with his fire that the helmsman was knocked down while holding onto the wheel, and as he went down he put right full rudder on his craft."

Bob had listened to the gunfire from below in the forward room, and once he had secured from battle stations learned the full story of the encounter. "We are very lucky to get by with this deal we just pulled," he wrote in his diary. "This guy on the machine gun will probably get a medal, as he really saved us from getting rammed."

When daylight arrived, the Tambor submerged and patrolled southward along the Ryukyu Islands, surfacing in the evening and heading west to intercept convoys at the mouth of the Formosa Strait. At dawn, 2 February, her radar detected ships that proved to be a freighter and tanker escorted by what appeared to be a brand new destroyer. Timing and plotting the ships' maneuvers, Kefauver and his tracking group planned an approach that would allow the Tambor to fire at both the freighter and tanker with the destroyer on the far side of them. "We sure have a lot of nerve cruising with this can [destroyer] all night," Bob wrote in his diary, "but he still doesn't know we're here."

At 0400 3 February, the boat finally made her approach. Bill Reynolds, the portside lookout, faced the Japanese ships. "As always, the queasy feeling in my stomach and the trembling of my legs and hands returned when I heard the target ranges shorten up and eventually when the targets were discernable," he recalled. In the forward room, Bob and his crewmates had readied all six tubes. At 0416 Bob heard through his headset the order to commence firing a spread of three torpedoes. Everyone in the boat felt the familiar, gentle tug as a burst of compressed air sent each fish out of its tube. As soon as they were on their way toward the freighter, Kefauver turned the boat and fired a spread of three at the tanker.

On the bridge, as soon as the first torpedo left its tube, Kefauver saw the destroyer turn, and Red Mayo heard her change the sonar pinging to a short scale. What happened next the captain recorded tersely in his patrol report: "Saw and heard two hits amidships in freighter followed immediately by one hit just forward of tanker's stack. Swung right with full rudder and increased speed to flank. Passed 400 yards abeam of tanker. Saw men on fantail of tanker in light of huge fire, which followed explosion on tanker. Intense light silhouetted Tambor, and destroyer began closing the range."

The lookouts remembered that the tanker's explosion was like nothing they'd seen before. First, Bill Reynolds had his binoculars trained on the freighter, Ariake Maru, when the torpedoes struck. A plume of seawater flew up, followed by the boom of the explosion that would send it to the bottom. Next he shifted his glasses to the tanker:

> . . . the same geyser, the same report. A flicker of flame came from the stack and completely died down. Then a sight I'll never forget. Suddenly night turned into day. The tanker exploded and [it looked] as though the noon-day sun was shining in the East China Sea.

> . . . In that hellish light I felt like a naked person on a crowded street with no place to hide. Dive! Dive! All hands below! The claxons [sounded and] I was the last man down and closed the hatch. Vents were open, all eyes were on the depth gauge, it just hung there, finally a down angle on the bow and [from] there on my memory is vague. I think I was on the stern planes until we hit bottom. I honestly can't remember.

The Initial Attack

As the Tambor dove, the destroyer passed directly overhead, and the crew heard splashes when the depth charges hit the water. Three exploded close by, shattering gauges and sending cork insulation flying, then three more boomed just as close, then two more. Reynolds remembered a momentary panic in the control room-the explosions were closer than anything he'd experienced. But Kefauver gave orders calmly, and due to the captain's demeanor, Reynolds said, "discipline was returned and we were a crew again." Kefauver took the sub to the bottom at 268 feet, and the boat went quiet.

The Japanese captain pummeling the Tambor knew his business. Methodically, the destroyer made pass after pass, dropping two charges at a time, all of which exploded extremely close by. Each time the crew heard the ship's approach, a rumble that grew louder until it roared like a steam locomotive crossing a trestle directly overhead. Then, through the hull, they heard the splash of the charges, waited as they sank, then heard and felt the explosion. The shock was like an immense hammer striking the hull. It shattered glass, sent paint fragments and cork flying, and loosened pipe fittings, causing leaks throughout the boat. A bad leak in the conning tower flooded the control room bilges and ran down to fill the bilges in the pump room below.

Enginemen Ray Bouffard and Warren Link, standing in the engine room's throttle area, felt a blast and saw a wall of water. Their first thought was that the hull had been breached and their boat was finished. Jack Semmelrath and John Scaduto were there, too, and threw out their arms, but the wall of water, instead of flooding over them, persisted eerily in the room. Their arms had passed through a veil of water backlit by a lantern. A cooling water gasket flange on one of the engines had been jarred loose, sending the thin stream across the entire room. As soon as the men realized what had happened, Ray Bouffard tightened the connection and stopped the leak-but there was a more serious problem. The men heard the unmistakable sound of air escaping the boat and quickly concluded that a ruptured line in a nearby ballast tank was leaking. Rising bubbles, they knew, would give away their position to the relentless destroyer.

Back in the control room, Nip Howard and Bill Reynolds were sitting on the deck with broken cork lying all around them. "Hey Bill," Nip said, "are you scared?"

"No," Bill lied.

"Me, neither," Nip replied. Perhaps saying it would make it so.

After an hour of listening to the destroyer churn over them and absorbing the blows of her depth charges, the crew heard a new sound through the hull. It was a loud crackling noise that the long-timers recognized as the sound of a ship's hull breaking up. One of their targets was imploding as she sank. Then the destroyer passed again and two more close charges banged the Tambor. When one of them exploded, Bob Hunt was standing on a crossbeam used as a support during reloading. The vibration burned his feet as if he stood on hot coals.

After two hours there was a lull in the attack, and no sound of the destroyer's screws came through the hull or sound gear. Kefauver decided to make a move. But that involved starting the loud drain

pump to clear the flooded pump room bilges so the boat could be properly balanced. Kefauver later wrote in his report, with heat, "This pump is a menace." Within minutes the destroyer was upon them again-she had stopped to conceal her presence and listen. Red Mayo, on the sound gear in the forward room, yelled: "The guy is right on the track and coming like hell." When the sound of the screws came through the hull, Bob felt like they were drilling right into his head. "A very bad moment for all hands and about that time we got what we knew was coming," he wrote. In 268 feet of water the depth charges sank for 30 agonizing seconds while the crew waited for the inevitable explosions. Two went off close to the Tambor, and minutes later another pair exploded even closer to starboard, causing the sub to hog and sag. Bob's diary says, "This old boat just about broke in half and didn't seem like she would ever stop shaking." Kefauver quickly ordered the Tambor back to the bottom.

During this action Claude Brown, who had celebrated his 16th birthday earlier in the patrol, met Johnny Scaduto in the engine room. Brown remembered: "We stopped, facing each other, and he had his right hand on the cover of the Kleinschmidt salt water evaporator while I clutched the railings beside the engines. [The destroyer] roared over and dropped two . . . . I saw a streak of blue fire start from the forward bulkhead, travel the length of the electric cable, and shatter the light bulb over Scaduto's head raining pieces of glass down into his hair-then he took off running aft as the deck plates shifted under our feet, and I took off running forward to the aft battery compartment."

Two Hours

It was now 0655, and the Tambor had been under attack for more than two hours. As the depth charges continued to explode around them, one crewman shook his head, saying, "Some boat-she sure can take it." But they had to wonder how much more she could take. The Tambor was the first of her class, an older "thin-skinned 250," which meant that her steel pressure hull was rated to a maximum depth of 250 feet, compared to the 400-foot rating of the later, thicker-skinned subs. Sitting on the bottom at 268 feet, absorbing blow after blow, the Tambor had taken damage in every compartment.

In the maneuvering room, near the back of the sub, water leaked through the packing glands around both screw shafts. When close charges exploded near the boat's stern, Rex Harvey and Robert Galloway swore they could see flashes around the shafts, followed by the scent of cordite. In an attempt to stem the leaking, Roy "Foo" Rausher fastened a wrench to the tightening nuts and cranked hard. The crew had a saying about Foo, the strongest man on the boat, "When Foo tightens something it takes two men and a boy to loosen it." But he couldn't stop the leaks around the shafts. If water overflowed the shallow maneuvering-room bilges and rose above the deck plates in the motor room below, the main motors would get wet. So, between depth-chargings, the men formed a bucket brigade, frantically transferring water to the deeper bilges in the aft torpedo room. With every approach of the destroyer, they stopped, closed the water-tight doors between compartments, and sat out the attack.

And the attacks kept coming, sometimes 30 minutes apart, but for one terrifying hour they arrived every ten minutes. The destroyer crossed them from port to starboard, then back again, then down the port side, then down the starboard side. She had a fix on the Tambor. With air leaking from the boat, and given good depth and current charts, the Japanese captain could pinpoint the sub's location. At 0840, Kefauver recorded: "Destroyer ran down the port side, close aboard and dropped two duds. These were labeled Tambor and were close enough to be heard falling through the water." Some crew members recalled hearing these charges land on the deck, roll off, and bounce against the side of the boat.

The forward torpedo room was crowded. With the sub sitting on the sea floor, the main sound receiving heads on the bottom of the boat were useless, so radiomen Bill Shoop and Red Mayo were using the auxiliary sound gear there. And since this was the only way to track the destroyer-except when her screws were audible through the hull-the captain was there, too. Bob, in charge of the room, tried to keep his team occupied between attacks, instructing them to shut down leaks, mop up water, and sweep up debris. It was better than having everyone just standing around waiting for the next big jolt.

Then a big blast came. It sheared a pair of bolts from the overhead and sent them ricocheting through the compartment like rifle bullets. One bolt with its nut still attached struck Bob Dye, but most of its energy was spent and he was not badly hurt. Bob Hunt knew that the bolts held motors to the overhead, and if more of them were blown off the heavy machines would crash down. He told the men in bunks under them to move so they wouldn't get hurt when the motors fell. "This did scare the hell out of them," he wrote in his diary, "but it [got] them moving rather than laying in a bunk and getting smashed by [a] motor."

As the attack wore on, Kefauver made his way from room to room, assessing the Tambor's condition. As he went, he made a point of speaking with every man. And as he departed each compartment he said the same thing, over and over: "I am honored to have served with you."

If it sounded like the captain was preparing for the end, it only made plain what everyone was thinking. Nevertheless, the crew kept working, and gradually the air leaks were brought under control. One daring effort was made by machinists Gus Builder and William Wood, who crawled across the top of the sub's powerful batteries on a rubber blanket to get into the pressure hull and tighten fittings inside the Number 1 air bank.

During the long ordeal, there were periods of quiet when the men tried to get some sleep. One lull persisted for three hours, raising hopes that the destroyer had finally departed. Bob wrote in his diary:

> Most of us had turned in for some rest as best we could at depth charge stations with water and cork all over everything. About noon we came out of our bunks like divers as the can had eased in and laid one right on top of us. It looks like the end as we thought he was gone and can't figure out how he found us there on the bottom. It could only be one thing?oil leaks. . . .
>
> After that, he turned around and headed back?so close we could hear those screws right through the hull. Right over us again, up one side and down the other letting us have a pasting that we were sure the boat wouldn't stand. We just stood around and waited.

Eight Hours

It was now past noon, and the Tambor had been under depth-charge attack for eight hours. And still the destroyer dropped charge after charge, all of them on target. Then, in a pause between blasts, Commander Kefauver turned to his long-time crewmate, looked him in the eyes, and asked, "Bob, did you ever hear depth charges this close before?"

"Not that close, captain," Bob replied.

Then Kefauver said, "We've got to get out of here."

Immediately, he turned and headed to the control room, making his way as quickly as possible through the closed watertight doors of each compartment. Once there, he ordered Chief Bill Blakenbaker to start pumping so the Tambor could get under way. He warned the men, "We may have to surface and fight it out." A destroyer, bristling with guns, would make short work of a sub, but the alternative was waiting for the charge that would breach the Tambor's hull.

Checking the depth gauge, diving officer Blakenbaker saw that the boat had settled 12 feet into the sea bottom. The explosions had churned up sand and muck, and the boat's vibrations had settled her downward. As he gave instructions, the control room became a hive of activity to break the sub free. The trim manifold men pumped bilges into the sea to lighten the boat, the man on the hydraulic manifold opened and closed valves to shift weight from tank to tank, the men on the blow and vent manifolds did the same, and the crew in the maneuvering room applied power to the screws, running them forward and reversed, one at a time or both at once. The idea was to shift the boat from side to side, forward and back, like rocking a car stuck in mud.

Jack Semmelrath, in the forward engine room, watched anxiously as the lights dimmed with every attempt to break free. He was concerned about the waning battery power. "That was the real danger at this point," he thought, "NO BATTERY, NO PUMPS." The Tambor was stuck fast with dwindling air and power, and making a lot of noise for the destroyer above.

The crew on a submerged sub after 14 hours begins to experience shortness of breath as the oxygen content of the air diminishes. During the near-fatal East China Sea depth-charging, the Tambor remained submerged for 17 hours.

Methodically, Blakenbaker searched for just the right combination of weight distribution and thrust to free the boat. Bob remembered the ordeal of freeing the sub from the bottom lasting for about two hours. Clarence Erich thought it was five.

When at last the sub broke free, the crew was in for a white-knuckle ride. With flooded rooms, the boat-badly out of balance-tipped side to side and nosed upward, out of control. The control room gauges no longer worked, or flying debris had knocked their indicators out of calibration, so Blakenbaker worked by feel, continuing to pump water and air among various tanks. The trick was to keep the Tambor more or less upright and to keep her from broaching the surface where the destroyer would finish her off with gunfire. Blakenbaker called for full power on both screws to steady the boat, but trim was hard to establish. With great expertise and quick responses in the control and maneuvering rooms, he gradually brought the sub under control and kept her beneath the surface. Given a stabilized boat, Kefauver maneuvered, running for deeper water. The destroyer dropped another charge, and Red Mayo, still in the forward room, listened intently to its movements.

Breaking Free

For another two hours the Tambor took evasive action, listening for the destroyer and waiting for full darkness. Finally, at 2100, Kefauver dared to surface the boat while improvising a tactic to conceal his position. On the way up, the helmsman fought to maintain his given heading, indicating a strong underwater current. Observing this, Kefauver ordered him to steer directly into the flow, causing any leaks of air or fuel oil to be carried far behind.

When the Tambor reached the surface, Kefauver couldn't be sure he'd lost the enemy, and even opening the conning tower hatch would be a risky venture. Without functioning gauges, equalizing the pressure in the boat with the pressure outside was a matter of guesswork, and when the hatch

popped it nearly carried a man up the ladder. In the burst of decompression, the air in the conning tower turned smoky and blue. When the lookouts ran topside and scanned the area, however, they were relieved to see that a surface battle was not necessary. The East China Sea was dark around them. The Tambor had escaped.

By daylight the next morning, repair parties examined the sub topside and were shocked by what they found. Jack Semmelrath marveled at the white blotches on the superstructure that smelled like TNT. Jagged pieces of depth-charge shrapnel were embedded in the wooden decking. On the aft deck, the heavy 5-inch gun had been knocked off its trunnions, despite the bracket that held its barrel in place. The conning tower had been driven back three inches against the pressure hull and was misaligned. And, most disturbing, a 21-inch-long crack was visible in the outer hull. From the split, thousands of gallons of fuel oil leaked from the port-side fuel ballast tank.

The Tambor continued to trail oil, her ability to dive was compromised, she could not radio her location or condition and was nearly blinded by the damage to her periscopes and radar, and her only remaining weapons were the 20-mm gun, small arms, and the forward tubes. But without a working Torpedo Data Computer, it would be hard to hit anything with the remaining fish. Again, the crew went to work.

To reattach the turbo blower to its base, Gus Builder and Warren Link used the boat's lathe to fashion new bolts from raw stock. Builder hand-filed the bolt's hexagonal heads and retapped the old holes, and the blower was soon back in place. Chesty DeBay then rebuilt the blower motor, restoring it to use. Builder and Art Strickle cannibalized the two ruined compressors to make one good one, and the Tambor could once again jam air for future dives.

Bill Shoop, Harvey Refensterf, and Red Mayo worked to re-establish radio communication, drying the transmitter and running a lead up through the control room and the conning tower hatch to serve as an antenna. In case of a crash dive, a man was stationed at the hatch with an axe to chop through the lead. In this radio work, Red Mayo was hampered only slightly by the deafness in one ear caused by the explosions that had boomed in his headset. The radiomen managed to achieve a short-range signal, but it was not strong enough to reach an American outpost. So they did not hear that Tokyo Rose reported the Tambor's destruction, a report that did reach Gunnery Officer Vito Vitucci's wife, who worked at the Naval Communications Station in Washington, D.C.

Combat Ready-Almost

As repairs continued, Bob Dye sat on the control room deck, examining the burned out leads on the tube that drove the SD radar coils. Without radar, there would be no advance warning of aircraft. And without the Torpedo Data Computer, their most potent weapon was compromised, so a plan was devised to retrieve its dials from the bottom of the periscope well. Warren Link was the skinniest man on board, and he agreed to be lowered into the narrow well. Walter Post and Elmer Atchison fashioned a yoke out of heaving lines and a pillow, and Link went down head first, with ropes tied to his ankles and a flashlight hanging from his neck. It was a tight fit, and only the grease smeared on his skin allowed Link to slide 35 feet down the dark well. When they pulled him out after several tense minutes he was holding the crucial dials. Then, after 14 hours of continuous work, Post had the TDC working again.

The boat would have no aft protection, however. Neither the deck gun nor the aft torpedo tubes could be repaired, and no matter what Carl Johnson and his men tried, both of their hatches continued to leak. More serious than the leaking hatches was the cracked fuel ballast tank. After three days of repair work, on 7 February, Bob wrote in his diary:

> Still have an oil leak and we're spreading oil all over the ocean-tried again to send the message but can't get it through. . . . [H]ave all repairs made in the forward room and are now looking for the Jap again-we're in very bad shape to be operating out here, but if we can get the oil leak stopped we won't be in so much danger.

Two days later, the leak was finally located and a repair plan devised. After the remaining fuel was shifted to other tanks, the damaged tank had to be flushed to fully stop the trail of remaining oil. Its pumps had to be converted to draw and expel seawater as in a regular ballast tank. The task required two men to go under the main deck, crawl through a jumble of lines, and remove a set of plates. This could only be done with the boat on the surface in broad daylight. Warren Link and John Scaduto, nicknamed "the Oil King" for his work with the fuel supply, volunteered for the job. Kefauver warned them: He would not jeopardize the boat and the entire crew if the Tambor was spotted. He would have to dive, even if the two men could not crawl out and reach the hatch in time.

Working in close quarters by the light of a lantern shone down through the slats of the topside deck, Scaduto and Link worked quickly but carefully, tucking nuts and bolts into their breast pockets as they went. Deep in enemy waters, just miles from Japanese territory, a plane could appear at any moment, especially with the early-warning SD radar out. The duo understood the situation and finished their work with dispatch. When, at last, they tightened the final bolts, the converted valves were tested and they roared, producing the same sound the boat made when it dove. Scaduto got out of the cramped space and ran for the hatch, shouting as he went: "Don't get in my way!"

The job was completed just in time. "[S]ighted a periscope quite close and really got out of there in a hurry," Bob wrote in his diary. "[W]e figured he was ready to fire when we sighted him." That day-8 February-Kefauver wrote in his patrol report: "All vital repairs completed. All tubes will fire by hand; continued electrical work. Considered boat to be in fighting trim again. Commenced patrolling an easterly course."

The Tambor and her crew had been at sea for 36 days, nearly all of that time in enemy waters. After the boat's near destruction, first by ramming and then during the long depth-charging-and operating now with extensive damage that included foggy vision through her single remaining periscope-the Tambor resumed her mission.

Four days later she sank the Ronsan Maru, a 2,700 ton passenger-cargo ship, and then survived another 17 depth-charges.

When the sub arrived back at Midway-ten days late-the crew learned that their mail had not been forwarded from Pearl Harbor. The Tambor had been presumed lost with all hands, but after extensive repairs she would go on to complete three more missions.

Robert Schultz, a novelist and poet, is the John P. Fishwick Professor of English at Roanoke College, Virginia. James Shell, a freelance writer, is working on a memoir of his family set in Roanoke. This is an excerpt from their book, We Were Pirates (Naval Institute Press, 2009).