

# The Superior-Simple Ship Fleet Construct

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On 23 March 2007, 15 Royal Navy and Royal Marines personnel from the 'stretched' Type-22 frigate HMS *Cornwall* were captured off the Al Faw Peninsula. They were returning from an inspection of a small Indian merchant vessel in two ship's boats when they were 'swarmed' by six larger and more heavily armed motor patrol boats from the Iranian Republican Guard Corps Naval (IRGCN). Seeing no reasonable chance for success in resistance, the British contingent surrendered without a shot being fired by either side. *Cornwall* did not intervene in the event and the Iranians departed uncontested with their prisoners.

Post-event analysis indicates that *Cornwall* was unable to come to the assistance of her boats because the boarding took place in shallow inshore waters where the frigate's draught would not allow her to venture. In addition, *Cornwall* had recovered her helicopter just minutes before the swarming, eliminating that option for intervention. It appears that the timing and execution of the action were the result of meticulous Iranian planning.

The captives were released on 5 April. British media sources levelled very heavy criticisms against Commodore Nick Lambert, RN, for allowing the boarding to take place while the boats were out of sight from his flagship. The incident and the behaviour of the captured personnel also received criticism within the armed forces. Retired British General Sir Michael Rose said, "the navy is no longer fit for modern warfare" and "the captured sailors and marines displayed a woeful lack of military fibre." Retired American Admiral James Lyons, a former commander of the US Pacific Fleet, said, "Winston Churchill and Lord Nelson were turning in their graves."<sup>1</sup> American reports indicate that the US Navy is now conducting a thorough review of its boarding procedures and the RN will also do so.<sup>2</sup> But it is not just the RN and USN that will feel pressure to change – ripple effects will be felt in other navies too.

All rhetoric aside, this incident provides many doctrinal lessons. But, as usual, none of them are new. The fact the IRGCN employed swarming tactics should not have come as a surprise; they had been observed practising them for some time. Moreover, warnings that operations by large destroyers and frigates (over 2,000 tonnes) inshore are impractical and unadvisable have been in the professional literature for years. This author raised

both these points during the Dalhousie Maritime Security Conference in June 2005.<sup>3</sup> In that presentation, it was noted that a superior ship-simple ship surface fleet construct for an effective, efficient and economical two-armed force structure has been rejected repeatedly by Canadian naval force planners. The navy's dogged objections to the idea of small warships in the 'regular force' fleet stem from a historical penchant for uniformity among its principal warship types. Since the failure of the Royal Canadian Navy's (RCN) homogeneous fleet structure during the Second World War has already been analysed, some examples of effective mixed-ship force structures from that same period in history will be instructive. The doctrinal theory that underpins these observations can be applied to both the historical examples and the current situation.

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The key to understanding whether or not a uniform fleet structure is appropriate to the strategic circumstances is in knowing which of the naval functions a fleet will be required to fulfil (Table 1). If the strategic context is stable and only one or two closely related functions are called for, then a uniform fleet structure is adequate, but only so long as that condition persists. If the strategic context is complicated, changing, or uncertain, a diversified fleet structure is required.

The maritime threat assessment for Canada in 1939 envisioned the following: incursions by major enemy warships or auxiliary cruisers for shore bombardments; attacks on merchant shipping and engagement of local naval forces; attacks on shipping and naval forces by submarines; occasional bombing raids by enemy aircraft (seaplanes launched from warships or auxiliary tenders) against shore facilities, shipping and naval forces; and sea mines laid by enemy vessels. It was thought that these attacks would occur in 'focal areas' near major ports or in geographic chokepoints that would have a 'funnelling effect' on merchant shipping.

The RCN had to maintain sufficient naval strength to act as a deterrent to enemy incursions, however sporadic they might be, and to counter them if they did occur.

**Table 1. Military Functions of Naval Forces**

Functions	Capabilities	Missions	Tasks
Power Projection	Strike/Move/Impose	Capture/Secure/Invade/Raid/ Evacuate	Sink/Disable/Land/ Withdraw
Fleet Engagement	Attack/Defend	Destroy/Protect	Engage/Patrol/Screen
Fleet-in-Being	Attack/Defend	Contain/Protect	Distract/Patrol/Engage
Trade Warfare	Attack/Defend	Destroy/Protect	Sink/Escort/Patrol
Exclusion	Prohibit	Intercept/Inspect	Stop
Support	Sustain	Replenish	Provide
Sealift	Move	Transport	Embark/Carry/Disembark

In other words, Canada's warships were expected to perform two of the functions of naval power – trade warfare and exclusion – but not fleet engagement (although the naval leadership pursued it covertly), power projection, fleet-in-being, support, or sealift. Accomplishment of the associated missions and tasks required proficiency in several warfare areas – anti-surface, anti-air, anti-submarine and anti-mine. Because of the nature and location of the focal points, the RCN was required to operate both inshore and on the open ocean, either close to or at moderate distances from a sustaining base.

To satisfy this diverse set of requirements, on 6 August 1939 the First Sea Lord, Admiral Sir Ernle Chatfield, recommended to Prime Minister Mackenzie King a superior-simple ship fleet construct based on a combination of a few cruisers and several escort sloops. The Chief of Naval Staff, Rear-Admiral Percy Nelles, argued for a uniform fleet of 16 destroyers on the basis of economy and efficiency. Although Nelles won the argument, he was wrong on both counts.

The types of vessels used in other navies for trade warfare tasks were high endurance cruisers, sloops and cutters. The broad range of operating conditions required a balancing act among high-capability major warships and low-capability minor ones. The main question for both types was: How much capability is enough for the cost? For the superior ship, it proved to be nearly impossible to provide an ideal balance between speed, endurance, protection, armament, sea keeping and habitability within the 10,000-ton limit. The *Kent*-class was the first British attempt to build a long-range 'heavy' cruiser under the Washington Naval Treaty limits.<sup>4</sup> The first generations of heavy cruisers built by all states were considered disappointments, being either too costly or much too heavy.<sup>5</sup> While their armament, protection and speed varied sig-

nificantly, the common factors were their high endurance (about 7,000 nautical miles at 15 knots) and good sea keeping qualities.

The perennial problem in cruiser design was how to provide such essential characteristics while balancing off other demands. By reducing the main armament from 8-inch to 6-inch guns, the *Leander*-class light cruisers probably represented the ideal cruiser for the RN. They possessed excellent endurance (7,000 miles at 14 knots on 1,800 tons of fuel), a good balance of speed and armament, superb sea kindliness, and some armour, all on a displacement of only 7,000 tons. Significantly, both the Royal Australian (RAN) and New Zealand Navies selected *Leanders* (or derivative sub-classes) as their superior ship.

At an average cost of \$6.6 million, the *Leander*-class cruisers were expensive, making large purchases prohibitive. To complement their few cruisers (earlier, the RAN also acquired *Kent*-class heavy cruisers), inter-war Australian and New Zealand fleet planners chose sloops, rather than destroyers, for their simple ship. The origins of these utilitarian vessels dated back to the Victorian era. Arnold Hague described them as:

... small, relatively long endurance, steam warships with, initially, sail as auxiliary propulsion, which were extensively employed on distant stations to supplement the small cruisers operated there; the smaller version of the type enjoyed the even more evocative term of "gunboat". The second half of the 19<sup>th</sup> Century history of the Royal Navy contains innumerable examples of the employment of these vessels overseas where they provided reasonably economic examples of seapower in the colonial era.<sup>6</sup>

In order to remain outside of the Washington Treaty tonnage allocations for destroyers, sloops could not have a maximum speed of 20 knots or torpedo armament. However, they were built entirely according to naval standards and were armed with 4-inch and 3-inch dual-purpose guns plus some anti-submarine sensors and weapons. Their propulsion was by a low temperature and pressure steam-turbine system. They were equipped for service in the tropics. All sloops had endurance superior to that of contemporary destroyers.

The American equivalents to sloops were cutters built for the US Coast Guard (USCG). They were designed to commercial standards with a fuller hull form that allowed a large fuel capacity. They had a less powerful but highly fuel-efficient turbo-electric propulsion system, giving them very high endurance. Their strengthened hulls made them suitable for service on the Newfoundland-Greenland Ice Patrol. They were armed with fewer but more powerful 5-inch guns. The General Board of the USN, which was the approving authority for all USCG designs, insisted on space being reserved for additional armament and an increase in crew size to satisfy their military role in times of war. The *Lake*-class cutters built in the mid-1920s cost about \$900,000 each.

Both the British sloops and American cutters were in the 250- to 265-foot range for length. Pre-war sloops displaced just less than 1,000 tons while cutters, due to their sturdier and fuller hull forms, displaced around 2,000 tons. The much longer (327 feet) and more modern *Secretary*-class cutters cost \$2.5 million in 1935, but displaced a comparable 2,000 tons. The endurance of the *Tampas* was very good, at 8,000 miles at 10 knots on only 335 tons of fuel, while the *Secretarys* could make an extraordinary 12,300 miles at 11 knots on 572 tons of fuel. The theoretical endurance of Canadian destroyers was 5,500 miles at 15 knots on 450 tons of fuel, but a variety of factors that did not affect sloops and cutters as severely (principally, hull form and propulsion) reduced this figure considerably.

The first class of inter-war sloop was designed in 1924, following the Admiralty's appreciation that "building

vessels of the minimum size compatible with their duties permitted the maximum number to be built during times of financial stringency."<sup>7</sup> Treasury restrictions imposed a dual-purpose design capable of functioning as both a minesweeper and a patrol vessel in distant waters. In subsequent versions, a non-minesweeping patrol sloop had a deeper hull form, higher endurance, more powerful engines, improved anti-submarine sensors and weapons, plus modern weapon direction equipment. Both sloops and cutters had a smaller crew than destroyers.

By 1936, a *Grimsby*-class patrol sloop cost \$772,000 while a *Bramble*-class minesweeping sloop cost \$525,000. Both of these vessels were considered for acquisition by the RCN but were rejected in favour of purchasing second-hand destroyers. Admiral Nelles substituted less capable corvettes and minesweepers for sloops in an attempt to save human and capital resources for destroyers. This was false economy (see Table 2).

*A uniform fleet structure is only appropriate in times of strategic political stability.*

The cost of two complete eight-destroyer flotillas (two leaders plus 14 others) was significantly higher than other fleet options. The eight A-, C- and D-class destroyers purchased by the RCN cost \$8,489,377. To add another eight used destroyers, at an average cost of \$1,061,172 each, would have raised the total cost to \$16,978,752. However, Admiral Nelles was adamant about acquiring *Tribal*-class destroyers, which he viewed as 'mini-cruisers.' The average cost for Canadian- and British-built *Tribals* was \$3,017,391. To add eight *Tribals* would have totalled \$32,628,504. This figure compares very poorly with the cost of two *Leander*-class light cruisers (flotilla leaders) and 14 *Grimsby*-class patrol sloops, or two *Secretary*-class cutters (leaders) and 14 *Lake*-class cutters.

Destroyers were by far the heaviest consumers of fuel. They were also less effective in both the anti-raider and anti-submarine roles than a cruiser-sloop force, and vast-

**Table 2. Cost Comparisons of Fleet Plans**

	River-Class	Tribal/River	Cruiser/Sloop	Cutters
Numbers	16	16	16	16
Cost	\$16,978,752	\$32,628,503	\$24,008,000	\$17,600,000
Personnel	2,320	2,725	2,540	1,604

ly less effective in the anti-submarine and anti-air roles than the cutter force. Patrol sloops also earned a good reputation for combat effectiveness, due in large part to their high endurance and sea kindliness, making them the favourite platform for escort group commanders.

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While the strategic posture of the Canadian government in the late 1930s was decidedly defensive, the navy was soon engaged in deployed operations from foreign locations, which led to employment in the power projection function. Once deployed and engaged, the requirement for the sustainment and sealift functions became obvious. The RCN's involvement in fleet engagement was peripheral, at best. The degree of capability required within each of these functions increased as the war progressed. Clearly, a uniform fleet structure could not satisfy all of these demands and, as a result, the fleet grew phenomenally in size and diversity.

Admiral Nelles, if the historical record is to be believed, could not conceive of viable roles for the employment of naval patrol craft in naval service. This lack of Canadian imagination stands out in sharp contrast with the wide range of naval tasks that the General Board of the USN conjured for naval gunboats and USCG cutters in both peace and war. Instead, successive Canadian Chiefs of Naval Staff stubbornly defended the acquisition of a homogeneous force of expensive, short-legged destroyers.

It has been argued that even if trade warfare had been given higher priority before the Second World War the result would have been escorts of limited endurance.<sup>8</sup> This assertion contains the same error in logic as the RCN's flawed assumption about the endurance characteristics of minor warships, which ignored the existence of inter-war British sloops and American cutters. The endurance requirements that were so important in the trade warfare function grew out of the range and sea kindliness needed to satisfy peacetime sovereignty patrol tasks. Sloops or cutters presented force structure options for the RCN that merited serious consideration. The *Secretary*-class cutters proved to be capable command and control ships, able to coordinate the activities of a small escort group. Their unrivalled rate of success as U-boat killers has gone unnoticed. Cutters were the epitome of Canada's need for a simple and robust platform appropriate for rapid construction by unsophisticated shipyards.

What doctrinal lessons can be drawn from this history? First, a uniform fleet structure is only appropriate in times of strategic political stability. In the Cold War, when a formal alliance led to a policy of niche-capability, it was sensible to concentrate naval resources and strive for superlative tactical proficiency within one naval functional area. Because of the catastrophic consequences of failure, the diplomatic and constabulary roles of the navy could be relegated safely to a secondary status. However, a uniform fleet structure will not be as cost-effective as a more diversified one.

Second, the unpredictability of war can lead to unforeseen circumstances, rendering a uniform fleet structure less combat effective than anticipated. In such cases, it will be difficult for political and senior military leaders to resist accepting missions and tasks for which their fleet's capabilities are unsuited. The superior ship must, therefore, encompass as many advanced capabilities as the state can afford as it will be the major enabler for new missions.

Third, it is a myth that simple ships designed primarily for the constabulary role can have little utility in war. It is possible to design durable, effective, high-endurance and sea kindly vessels of both limited tonnage and length. These ships make it possible for fleets to operate in areas and in ways that are both inappropriate and unsuitable for superior ships.

The incident off the Al Faw Peninsula illustrates to naval planners the limitations of a 'one-size-fits-all functions' approach to fleet design. Naval history contains many similar examples. When these incidents are related to naval functions, the doctrinal lessons are timeless. 🍷

#### Notes

- \* The views presented here are the author's own and do not represent the views of the Canadian Navy or the Department of National Defence.
1. James Lyons, "Commentary," *The Washington Times*, 4 May 2007, available at <http://www.washingtontimes.com/commentary/20070503-084344-6415r.htm>.
  2. Andrew Scutro, "US Revisits Procedures after Hostage Ordeal," *Navy Times*, 9 April 2007, available at [http://www.navytimes.com/news/2007/04/navy\\_britain\\_iran\\_070406w](http://www.navytimes.com/news/2007/04/navy_britain_iran_070406w).
  3. Kenneth Hansen, "Starting Over: The Canadian Navy and Expeditionary Operations," available at <http://centreforforeignpolicystudies.dal.ca/pdf/msc2005/msc2005toc.pdf>.
  4. Under the theory of warship employment of that era, 'heavy' cruisers were intended primarily for trade warfare, while 'light' cruisers were used as leaders of the scouting and screening forces in fleet engagement.
  5. Anthony Preston, *Cruisers* (Prentice-Hall, 1980), pp. 96, 108-109. See also Roger Hayward, *Cruisers in Camera* (UK: Stroud, 2000), pp. 85-86.
  6. Arnold Hague, *Sloops, 1926-1946* (London: World Ship Society, 1993), p. 9.
  7. H.T. Lenton, *British & Empire Warships of the Second World War* (UK: Greenhill, 1998), p. 241.
  8. Christopher Bell, *The Royal Navy, Seapower and Strategy between the Wars* (Stanford, CA: Stanford University Press, 2000), pp. xvi, 112.

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