

DoD photo 050612-N-3557N-107



A U.S. Navy Landing Craft Air Cushion (LCAC) manoeuvres to enter the well deck of the amphibious assault ship *USS Kearsarge* in June 2005.

REVIVING THE *PRINCES*¹ – SOME THOUGHTS ON A CANADIAN STANDING CONTINGENCY TASK FORCE

by Major Les Mader

Introduction

In its *Defence Policy Statement* (DPS) of April 2005,² the Canadian government announced a radical shift in the political direction that has guided the Department of National Defence (DND) and the Canadian Forces (CF) for decades. The changes contained therein are even greater than those found in the post-Cold War *1994 Defence White Paper* that continued the ‘stove-pipe’ commitment of forces to overseas missions.³

The major change from such ‘stove-piping’ is the DPS requirement for a Standing Contingency Task Force (SCTF) of air, land and sea forces, to be available upon 10 days notice to deploy on expeditionary operations under a single commander.⁴ Although the DPS does not say so specifically, it is clear, from comments made by the Minister of National Defence (MND) and the Chief of the Defence Staff (CDS), that the SCTF will have an amphibious capability.⁵

Given that Canada has shown little interest in amphibious operations since the Second World War, developing the SCTF will be a significant undertaking.

Its required high level of readiness will create heavy demands for personnel, maintenance, and spare parts for its equipment, not to mention the tempo and scope of single-component training.

Further, the force’s worldwide responsibility will require a sophisticated supporting intelligence system and a responsive cartographic/hydrographic capability. Otherwise, the SCTF commander and staff will not have the necessary tools for planning a broad range of possible missions.

Finally, the non-traditional (in Canadian terms) joint nature of the SCTF will impose major training and societal changes. The establishment of joint operating procedures, education of personnel in the use of solid doctrine, as well as frequent joint training will be required to ensure

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Another shot of a LCAC being directed into the well deck of the *USS Iwo Jima* as it steams toward the Gulf Coast in August 2005.

- d. A discussion of the conduct of amphibious operations;
- e. Some suggestions for the SCTF; and finally
- f. Conclusion.

Possible SCTF Missions

The missions that a contingency force might have to conduct are inherently difficult to specify, as they depend upon unknown events. However, two likely missions for the full SCTF that immediately come to mind are: reacting to a short-notice humanitarian crisis in a failed/failing state that involves internal conflict; and carrying out a Non-combatant Evacuation Operation (NEO).

that the force has the skills and cohesion needed to succeed during difficult missions, given the limited time available for final preparations and deployment. The resolution of these and other issues will necessitate a concentrated effort by the Canadian Forces for years to come.

However, in spite of, or, perhaps, due to the complexity of the issues to be resolved, comments have been made in various fora that cause one to wonder what kind of SCTF is sought. Some have suggested that the SCTF needs only one amphibious ship, which could simply be a modified civilian vessel. It has even been implied that the SCTF will not be required to deliver its troops into a ground battle. The situation in which they would be placed is not described, but the image brought to mind is that of a robust administrative delivery.

An SCTF created and based upon such minimalism might find itself to be a force lacking flexibility and combat capability. Thus, it might be envisaged as simply a 'flag-waving tool'. This article will identify what this writer believes is the minimum SCTF requirement, and the case for this requirement will be developed as follows:

- a. Some missions that the SCTF might be called upon to conduct;
- b. The required nature of its landing force;
- c. The estimated composition required of the landing force;

The international operation conducted in Somalia in 1992 is an example of the first type of contingency. Climate change and the continued existence of failed/failing states make another such mission probable, in this writer's view.

The requirement to be able to conduct NEOs is found in both the *1994 Defence White Paper*⁶ and the DPS,⁷ and it is supported by Canadian Forces doctrine.⁸ The relevance of a sea-based NEO capability is confirmed by information found in the Canadian Navy's *Leadmark* 'way-ahead' document,⁹ and in an article by Doctor Sean Maloney of the Royal Military College of Canada.¹⁰ These sources demonstrate that, on at least 14 separate occasions since 1949 – or roughly once every four years – Canada has planned NEOs/evacuations of deployed Canadian troops that have involved the use of naval forces. In nine cases, ships actually sailed, and, for at least two of these operations, land units were alerted to deploy with the ships. It is also likely that the less structured post-Cold War world could lead to more such requirements.

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The Required Nature of the Landing Force

A review of Canadian NEO doctrine provides guidance on the type of landing force that the SCTF must be able to put ashore. While our doctrine emphasizes the importance of keeping a NEO force as small as possible, and of respecting the sovereignty of the host nation,¹¹ it also recognizes that evacuations can be conducted in

varying threat environments.¹² Thus, the landing force must be able to react to rapidly evolving situations and changing threat levels. This argues for a force that is trained to carry out tasks ranging from negotiations with local forces, through to combat operations. Conducting a NEO with a landing force clearly able to fight might actually provide sufficient deterrence to prevent violence.

At the same time, the SCTF's contingency role makes clear that it, as well as its landing force, must have great inherent flexibility in order to be able to respond to various types of crisis. There will be little opportunity to redesign and rebuild either the landing force or the SCTF itself once a crisis materializes. Thus, the landing force must contain all the elements and equipment needed for a range of contingencies, including NEOs and humanitarian intervention.

The Estimated Required Landing Force Composition

Being a mission for which Canadians have doctrine and precedent, it is now appropriate to use the NEO task to illuminate the rest of this article. Considering a hypothetical NEO conducted from the sea allows one to estimate the composition of the landing force required, and to identify – in turn – the remainder of the SCTF components likely needed.

A NEO, other than a simple withdrawal of staff from an embassy, will typically require the establishment of at least one assembly point, as well as an evacuation centre or an evacuation site.¹³ Convoys may be required to move the evacuees between the two locations. From this, one can estimate a need to deploy at least one sub-unit-sized element to each site, and to escort convoys. However, committing the entire SCTF landing force to two sites and the convoys would leave the commander without any reserve or flexibility. Thus, it appears reasonable that the SCTF contain at least one additional combat sub-unit (for a minimum of four), as well as a deployable command element and supporting arms and services. While not every NEO will require four sub-units deployed in country, being able to do so would permit the conduct missions of varying levels of difficulty.

The requirement to be ready to escort evacuee convoys means that the SCTF must be provided armoured fighting vehicles (AFVs) for this task. These vehicles could be armoured utility vehicles, such as the G-Wagon, and/or LAV III armoured personnel carriers. A battalion-size force, with the ability to mount at least one sub-unit in AFVs, would provide a robust and reasonable capability to conduct a Canadian-only NEO, or to contribute effectively to a larger coalition operation.

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The Conduct of Amphibious Operations

The term ‘amphibious operations’ likely brings to mind various images for different readers, leading to confusion when discussing or contemplating this topic. Therefore, it may be helpful to provide a common reference point

by suggesting that amphibious operations be thought of as, “operations launched from ships at sea, using some combination of landing craft and/or aircraft, to place a tactically ready force ashore to carry out a mission that involves (at least potential) danger.”¹⁴

History has witnessed examples of ill-equipped, *ad hoc* forces that conducted successful amphibious operations.¹⁵ However, these tend to be the exception to the general rule that, in addition to a trained, suitable landing force, successful amphibious operations must include:

- a. Capable landing craft and/or aircraft to move the landing force from the ships to the mission area;
- b. Sufficient ships of the necessary types to carry and support this force; and
- c. Adequate supporting forces – including air and firepower – to assist the landing force in its mission and to protect the amphibious ships.

Helicopter and Landing Craft Requirements

The Need for Transport Helicopters – Transport helicopters have become an instrument of choice for landing troops ashore. No modern landing ship is designed without some capability to operate helicopters – some ships are almost exclusively helicopter-oriented. Capable helicopters provide the ability to move troops quickly, over impassable coasts, from ships located beyond the horizon. This affords surprise while providing a speedy response, a significant range of action, and flexibility. These elements, in turn, generate a certain ‘shock effect’. Helicopters are particularly useful during NEOs conducted within large countries, with scattered groups of individuals needing evacuation. The absence of such a class of transport helicopters can seriously influence the planning for an amphibious operation.¹⁶ Medium-lift helicopters typically can carry half a platoon of troops – for example, the S-92 helicopter, from which Canadian Forces *Cyclones* are derived, can transport some 22 combat-ready soldiers.¹⁷ Heavy-lift helicopters, such as the CH-53 and the CH-47, can carry approximately 33 to 55 troops.¹⁸

The Value of Air Support – Air support contributes to the success of amphibious operations in two different ways. Firstly, the air component helps protect the amphibious ships and their disembarked landing force from enemy air power. Secondly, it assists the landing force in the accomplishment of its mission. During the



LCACs prepare to enter the well deck of amphibious assault ship, the *USS Kearsarge*, during exercises off the coast of Jordan in August 2005.

AFVs. This latter requirement highlights the need for some ships to have a floodable well deck (dock), where the landing craft can be stored. This will allow troops and vehicles to enter the landing craft safely and under cover while the dock is dry. When it is time to move towards the shoreline, sea conditions permitting, the ship can ‘dock down’ to flood the dock, open its rear door, and the landing craft can then motor out of the dock and towards their assigned tasks under their own power.

In addition to being able to launch helicopters and landing craft, the SCTF ships must be flexible enough to permit the undertaking of various missions in different sea, climatic and operational

conditions, with minimal changes to the forces deployed. This requires that they be able to undertake operations in rough seas and in bad weather, while maintaining a relatively high transit speed to crisis areas. Finally, they must be able to sustain and build up the landing force once it is ashore – particularly during an independent operation, either one undertaken by Canada alone or as an adjunct mission carried out by the Canadian Forces as part of a coalition operation.

Meeting the Requirement

Having identified the theoretical requirements, one can now examine how they could be met. This will be accomplished in terms of suitable ship and landing craft types.

Types of Ships

A broad array of specialized amphibious ships has evolved since the commencement of the Second World War. Various ship types that could meet the SCTF requirement are described below.¹⁹ Table I, presented later in the article, will provide some data for representative ships of the different types.

Landing Platform Dock (LPD) – LPDs typically carry a battalion of troops equipped with vehicles. They use a dock to launch their embarked landing craft. Such ships do not emphasize the use of helicopters.

Landing Platform Helicopter (LPH) – LPHs are helicopter aircraft carriers that can transport a battalion of troops and sufficient helicopters to land a sizeable portion of them in a single lifting operation. No dock is provided, and little use is made of landing craft.

post-Cold War world, it is probable that any mission in which the SCTF is involved will benefit from Allied air support, or it will be a specialized NEO mission, where hostile air forces are not a significant consideration. Clearly, however, even in such benign circumstances, the ability to provide appropriate and intimate air support to the landing force would be very useful in some tactical situations. The intimacy of the working procedures required of this support argues in favour of it actually belonging to the SCTF. Given the likely low risk from the enemy air threat, having a number of attack helicopters travelling with the transports would be a simple way of providing such support.

The Need for Landing Craft – While capable and popular, helicopters have their limitations – a few shoulder-launched air defence missiles can make their use problematic – they are limited by some flying conditions – and they cannot lift many heavy loads efficiently. Thus, they would be unable to carry the AFVs that will be required in at least some contingencies. Therefore, they must be supported by landing craft to enhance their mission flexibility. While such craft need a suitable beach or port, and cannot move as quickly as aviation, they can carry supporting vehicles and heavy logistic loads ashore easily, and they are unaffected by some weather conditions that would ground a helicopter-based force.

Ship Requirements

The operational advantages offered by having both helicopters and landing craft available to transport and support a landing force clearly indicate that the SCTF requires ships with large flight decks, as well as the ability to launch landing craft loaded with troops and/or

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Royal Navy

A Royal Marine LCVP (Landing Craft Vehicle Personnel) approaching the beach during a Beach Assault Exercise.²⁰

Discussion of Landing Craft

As with amphibious ships, a variety of landing craft classes have evolved.

Landing Craft Vehicle and Personnel (LCVP) –

These craft are relatively small and have an operating speed of some 22 knots. They can carry approximately a platoon of troops or several tons of cargo.²⁴

Landing Craft Mechanised (LCM) –

These craft are larger and slower than LCVPs.²⁵ And they can carry heavier loads (for example, 80 to 200 troops or a tank).²⁶

Amphibious Assault Ship (LHA) – The United States Navy (USN) and the United States Marine Corps (USMC) use a mixture of ships to form Amphibious Ready Groups (ARG). Each ARG is able to transport, land, and support a Marine Expeditionary Unit (MEU) of task force strength. For illustrative purposes, the ARG that supported the 1983 Grenada invasion included five amphibious ships.²¹ Such a variety of ships provided redundancy and a broad range of capabilities, but the force was costly in terms of personnel. In order to reduce the number of ship types required, the USN developed the LHA, which combines the roles of four types, including the LPD and LPH.

Landing Ship Helicopter/Dock (LHD) – The USN developed LHDs as ‘follow-ons’ to the LHAs. Its *Wasp*-class LHDs displace approximately the same tonnage. The French Navy is also pursuing utilization of LHDs – but variants (*Mistral*-class) that generate only half the displacement.²²

Joint Support Ship (JSS) – The Canadian Forces have planned to procure JSSs to replace its existing naval supply ships. It will also be able to carry out a broader range of tasks than the replenishment ships it will replace. This increased capability will permit each JSS to carry out a company-sized helicopter-based amphibious operation in some circumstances.²³

Landing Craft Utility (LCU) – These vessels are small ships. They are not very fast, but they are able to carry either several tanks or 350 troops.²⁷

Landing Craft Air Cushion (LCAC) – These hovercraft are relatively large, can carry either 24 troops or a tank, and, contrary to the other craft, they are fast – the USN’s variant can travel 200 miles at 40 knots.²⁸ They are, however, noisy and generate a great amount of dust while on land, and spray while on the water. However, their air cushion makes them much less dependent on the physical attributes of the landing beach. They can also carry troops directly inland without dismounting their human cargo, if the terrain relief, vegetation conditions, an absence of obstructions (such as buildings), and the enemy situation permit.

A U.S. Navy LCAC enters the surf from the island of Jolo, Philippines, in March 2006.²⁹DoD photo 060303-N-4778-93 by Petty Officer 2nd Class Brian Biller, U.S. Navy

Class name	Country	Type	Tonnage (Full load)	Max Speed (kts)	Crew	Normal Troop Lift	Helicopter Capability	Landing Craft
<i>San Antonio</i>	USA	LPD	25300	22	362	720	4 x Medium (Med). Some hangar space	2 x LCAC or 1 x LCU
<i>Albion</i>	UK	LPD	19560	20	325	305	Platform only – 3 x Med	4 x LCVP + 4 x LCU or 2 x LCAC
<i>Galicia</i>	Spain	LPD	13815	20	115	543	Platform only – 4 x Med	6 x LCVP or 4 x LCM or 1 x LCU + 1 x LCVP
<i>Rotterdam</i>	Netherlands	LPD	16680	19	146	547	6 x Med. Hangar space provided	6 x LCVP or 4 x LCU or 4 x LCM
<i>Ocean</i>	UK	LPH	20700	18	491	784	12 x Med + 6 x Attack	No dock. 4 x LCVP + 2 x hovercraft
<i>Tarawa</i>	USA	LHA	39967	24	930	1703	19 x heavy or 26 x Med. Harrier jets can be carried in lieu of some helicopters	4 x LCU or 2 x LCU + 2 x LCM8 or 17 LCM6. Can carry 1 x LCAC
<i>Wasp</i>	USA	LHD	40532	22	1077	1870	42 x Med or equivalent	12 x LCM6 or 3 x LCAC
<i>Mistral</i>	France	LHD	21500	19	160	450	Up to 16 x Med	4 x LCM or 2 x LCAC
JSS	Canada	Supply	Not Given	21	241	210	4 x Med. Some hangar space	2 x LCVP

Table 1 – Key Data on Some Representative Modern Amphibious Ships.³⁰

Landing Craft Balance – The trade-off among the various landing craft types is between cost, speed, carriage capacity, seaworthiness, the number that can be transported, and their ‘stealth’ characteristics. LCVPs and LCMs are relatively small, inexpensive and quiet, but they have limited seaworthiness, speed, and lifting capabilities. LCUs have greater capacity and seaworthiness, but they cost more and they cannot be transported in as great a quantity. LCACs offer high speed, good capacity, and easy transition between sea and land, but they are noisy, expensive, and, again, limited in the quantity that can be transported.

Recommendations for a SCTF

Having looked at the general requirement for transporting a SCTF’s landing force and the means available to accomplish this, some specific recommendations can now be made.

General Lift Requirement – In order to conduct a NEO such as described herein, a SCTF requires a sufficient lifting capability to be able to land two companies and a tactical headquarters (HQ) ashore – the striking element of a battalion – in a single wave. This would permit the rapid establishment of an assembly point and an evacuation centre. The reserve and convoy escort forces could be brought ashore in subsequent waves. These waves would have to be able to transport AFVs.

Helicopters – Meeting the lift requirements of two companies and the battalion HQ would necessitate either 17 medium-capacity helicopters, or nine to 12 heavy-capacity helicopters, assuming a 75 percent availability rate.³¹ Such a number of relatively large helicopters, each full of soldiers, argues for intimate support to protect them both en route and at the landing zone. A minimum of six attack helicopters, embarked upon the SCTF’s ships, should ensure that at least four (two pairs) are available to escort and support the transports.

Landing Craft – These helicopters must be supported by landing craft. An amphibious force needs a mixture of craft to permit commanders to select the best combination of landing assets to meet the requirements of each mission. Given a battalion-size force conducting a NEO, sufficient landing craft should be available to transport at least two companies – one of which should be mechanized. This would permit the landing of either the NEO security force, when helicopters cannot be used, or reinforcing elements and vehicles in subsequent waves. Having at least two LCVPs, two LCUs, and two LCACs available would permit two platoons to be moved ashore very quickly (in the LCACs), with two more platoons close behind (in the LCVPs), while the remainder of the two companies and remaining vehicles follow along in the LCUs. Such a combination would also support the conduct of specialized missions, as a selection of landing craft with differing speed, size, and stealth characteristics would also be available to commanders.

“The reserve and convoy escort forces could be brought ashore in subsequent waves.”

Overall SCTF Requirement for Sealift – Drawing from this analysis of requirements, it can be concluded that the SCTF’s ships must be able to transport at least:

- A battalion-size landing force that is equipped with some AFVs;
- Seventeen medium or nine to 12 heavy transport helicopters;
- Six attack helicopters; and
- Six landing craft (in a mixture of LCVPs, LCUs and LCACs).

Ship Needs – Such a combination of troops, landing craft, and helicopters means that the Canadian Forces must deploy LHAs, LHDs, or a mixed LPH/LPD flotilla. Large LHAs and LHDs are probably too expensive for the Canadian Forces to acquire and to maintain in peacetime. However, as can be seen from Table I, no other existing, modern ship design can provide the needed lift on its own. Thus, the CF needs several ships to meet the theoretical requirement. Having two ships would also permit the peacetime deployment of vessels on both coasts to support amphibious training by both fleets and troops in eastern and western Canada. Basing ships on both coasts would reduce the time needed for at least part of the force to sail to a crisis area, at the cost of dispersed SCTF training and reduced cohesion. Finally, having three ships would provide enhanced lift and flexibility, while allowing one to be deployed to each coast, even with one of them in refit status. Several options exist to provide these ships.

Overseas Purchase or Lease – This option would procure at least one LPH and one LPD from an overseas supplier. These could be supported by a Joint Support Ship, capable of providing additional helicopters and troop billeting, as well as normal underway replenishment. This option obtains ships quickly and without the need to build a specialized national shipbuilding capability. However, it may not provide many offsetting benefits to Canadian industry.

LHD-oriented Overseas Procurement – This approach is similar to the first option, but it would substitute *Mistral*-like LHDs for an LPH and an LPD. This would provide greater ship homogeneity, as well as vessels that can use both helicopters and landing craft without external assistance. It

“There might also be some potential for purchasing some *Cyclones* in the S-92 transport version...”

has similar non-operational benefits and disadvantages to the previous option.

Canadian Production – Under this option, Canadian industry would be asked to produce LHDs, LPHs and LPDs, utilizing existing designs. It would bolster Canadian industry, but it would take much longer to accomplish, as a specialized shipbuilding capability would have to be developed.

JSS Variants – The final option would involve the development of a number of ship types that together would provide the necessary lift, through adaptation of the JSS design. This would require incorporating a dock into at least one of the designs. The modified JSS ships might not be able to conduct naval resupply, once the amphibious portion of their design expanded. This option would also provide Canadian jobs at the offsetting cost of time. Having a common JSS baseline design might afford some logistics savings during the in-service life of the ships.

Provision of Aircraft – The required transport and attack helicopters would have to be purchased from Canada’s allies. The use of the S-92 for the transport role might provide some logistics savings through commonality with the *Cyclone*. There might also be some potential for purchasing some *Cyclones* in the S-92 transport version, or for making the full *Cyclone* fleet easily convertible between roles.

Conclusion

The DPS has generated a period of great changes for the Canadian Forces, partially embodied in the requirement for a Standing Contingency Task Force. Unfamiliarity with such an asset appears to have led various individuals to propose a minimalist approach to meeting the requirement. If such an approach were implemented, this could lead to a force with limited operational capability. An integrated amphibious capability with the ability to conduct NEOs, as a minimum, requires a broad range of capabilities, including trained and equipped personnel, specialized supporting doctrine, capable ships, a mixed landing craft fleet, transport helicopters, and integral air support – such as attack helicopters. Therefore, it is recommended that the Canadian Forces establish a SCTF consisting of the following components:

- An all-arms landing force of at least battalion size, equipped with AFVs;
- Two (preferably three) amphibious ships, possibly based upon modified JSS designs, to transport, land, and sustain this force;

- c. Sufficient medium- or heavy-lift helicopters to transport at least two companies;
- d. A mixed landing craft fleet of LCVPs, LCUs and LCACs to enhance operational flexibility and to facilitate back-up support to the initial wave of the landing force; and
- e. A sufficient cadre of attack helicopters to permit at least six of them to be deployed with the SCTF.

Providing such a full range of assets will not be inexpensive. However, developing a flexible, robust capability will offer a formidable range of options to decision-makers during a crisis that cannot be provided by a token force, nor is it a capability that can be improvised at the last minute.

The author would like to thank Mr. Ken Mader for his editorial advice.



NOTES

1. HMCS *Prince David* and HMCS *Prince Henry* were passenger ships taken into the Royal Canadian Navy during the Second World War. They were converted into landing ships and became two of the most decorated vessels in Canadian naval history (HMCS *Prince David* – five battle honours, HMCS *Prince Henry* – three). Information from Gilbert Norman Tucker, *The Naval Service of Canada, Its Official History, Volume II – Activities on Shore During the Second World War*, (Ottawa: DND, 1952), p. 520 and David J. Freeman, *Canadian Warship Names*, (St. Catharines, Ontario: Vanwell, 2000), p. 327.
2. See *Canada's International Policy Statement – A Role of Pride and Influence in the World – Defence* (hereafter the *DPS*), (Ottawa: DND, 2005), as accessed on the Defence Intranet (DIN), 20 April 2005.
3. See *Canadian Defence White Paper*, (Ottawa: DND, 1994), pp. 22, 35, 38 and 39.
4. See *DPS*, pp. 2 and 13.
5. See the comments of the MND and the CDS in their press conference of 19 April 2005, as accessed in the DND ADM(PA) *Transcript of the Media Availability: Bill Graham and General Rick Hillier (19 12h45 April 05)*, as accessed on the DIN, 20 April 2005, pp 4, 6, 8, 9, 14 and 15.
6. See *Defence White Paper*, p. 38.
7. See *DPS*, p. 28.
8. See B-GJ-005-307/FP-050 Joint Doctrine Manual *Non-Combatant Evacuation Operations*, (Ottawa: DND, 2003).
9. See *Leadmark: The Navy's Strategy for 2020* (hereafter *Leadmark*), (Ottawa: DND, 2001), *Annex C Canadian Naval Operations, 1945 – 2000*, as accessed on the DND website.
10. See Sean Maloney, "Never Say Never: Non-Alliance Operations in the Canadian Context," in *Army Doctrine and Training Bulletin* (ADTB), Vol. 2, No. 2, (Kingston, Ontario: DND, 1999), pp. 29-34. Further amplification is provided by Lieutenant-Colonel D.J. Goodspeed, *The Armed Forces of Canada 1867-1967 – A Century of Achievement*, (Ottawa: DND, 1967), p. 231, and J.D.F. Kealy and E.C. Russell, *A History of Canadian Naval Aviation 1918-1962*, (Ottawa: DND, 1965), p. 83.
11. *Non-Combatant Evacuation Operations*, pp. 4-1 and 4-2.
12. *Ibid.*, p. 1-1.
13. *Ibid.*, p. 1-13.
14. This description is the author's own and is based upon the ideas in various references including: Colonel Michael H.H. Evans, RM, OBE, *Amphibious Operations: The Projection of Sea Power Ashore* (hereafter *Amphibious Operations*), (London: Brassey's (UK) Ltd, 1990), p. 9; Major Robert Bradford article, "Reconsidering Amphibiosity: A Canadian Construct," (hereafter *Reconsidering Amphibiosity*), in *Army Doctrine and Training Bulletin* (ADTB), Vol. 2, No. 1, (Kingston, Ontario: DND, 1999), p. 40; and Major RD Bradford, *Sea-Based Expeditionary Joint Operations Study Main Report*, (Halifax: CF Maritime Joint Warfare Centre, 2004), p. 6.
15. See the description of the government forces' amphibious operations during the Irish Civil War of 1922-23, in Aidan McIvor, *A History of the Irish Naval Service*, (Dublin: Irish Academic Press, 1994), pp. 42-49.
16. The lack of helicopter lift significantly affected the British plan for the amphibious landing at San Carlos Water. See Michael Clapp and Ewen Southby-Tailyour, *Amphibious Assault Falklands – The Battle of San Carlos Water*, (Annapolis, Maryland: Naval Institute Press, 1996), p. 117.
17. Information found in *Jane's All the World's Aircraft Yearbook* (hereafter *All the World's Aircraft*), as accessed on the DIN.
18. Information is from *All the World's Aircraft and Jane's Fighting Ships Yearbook* (hereafter *Fighting Ships*), as accessed on the DIN.
19. Unless noted otherwise, this overview is based on information found in *AMPHIBIOUS OPERATIONS; Fighting Ships*, as accessed on the DIN; the RN's website, and Charles Messenger, Anthony Preston and Anthony Robinson, *Armed Forces of the World*, (London: Bison Books Ltd, 1985), pp. 225-228, 231 and 233.
20. Extracted from the Royal Navy's (RN) official website.
21. Information derived from Major Mark Adkin, *Urgent Fury – The Battle for Grenada*, (Lexington, Massachusetts: Lexington Books, 1989), p. 240, and Christopher Chant, *Naval Forces of the World*, (Secaucus, New Jersey: Chartwell Books, 1984), pp. 183, 185, 187 and 190.
22. Extracted from the French Navy's official website.
23. Based upon information contained in the *Statement of Operational Requirement – Joint Support Ship Project* (hereafter *SOR JSS*), as accessed on the DIN, (Ottawa: DND, 2004), pp. 13-19, and upon advice from Lieutenant Commander Cooper of the JSS project office during several telephone conversations conducted in early December 2004.
24. This information is based upon Australian and British LCVPs, as described in *Fighting Ships* on the DIN.
25. Extracted from *Fighting Ships* on the DIN.
26. This information is based upon the French Navy's CTM, and the USN's LCM6 and LCM8, as described in *Fighting Ships* on the DIN.
27. This information is based upon the USN's LCU 1600, as described in *Fighting Ships* on the DIN.
28. Information on the USN's LCAC was extracted from *Fighting Ships* on the DIN.
29. Also extracted from *Fighting Ships* on the DIN.
30. Information is based upon *Fighting Ships*, as accessed on the DIN; Lieutenant-Colonel David C. Fuqea article "The Royal Navy and Marines Boldly Advance Into the 21st Century," in March 2000 *Marine Corps Gazette*, (Quantico, Virginia: Marine Corps Association, March 2000), p. 34; information on the websites of the RN, USN and French Navy; *SOR JSS*, pp. 15, 17 and 22, and advice from Lieutenant Commander Cooper of the JSS project office.
31. This quantity is calculated on the basis of landing 132 troops per company in an initial wave, while providing one additional aircraft for the tactical headquarters.