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Fighting Fit: Sustaining the Force by Fixing Afloat Health Service Support on the Joint Support Ship

By/par

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ABSTRACT

Detailed planning is underway for the Canadian Navy's Joint Support Ship (JSS), a replacement for the aging Preserver Class Auxiliary Oil Replenishment (AOR) vessels. The JSS will be a multipurpose ship that will provide surge sealift, underway replenishment, and support to forces ashore. It will include a level of medical coverage that exceeds anything currently provided by the Canadian Navy. This paper looks at operational planning factors that must be considered prior to locating or deploying a sea - based joint, Role 3 Health Service Support facility on the JSS. Specific focus will be given to the impact of adhering to the concepts of health service planning and delivery on the multipurpose function of the JSS.

Regardless of the location of medical support facilities in any littoral strategy, however, a historical perspective remains: the sick and injured are perishable cargo and the ordinary rules of logistics cannot be applied to them.[1]

Captain (Ret'd) Arthur Smith, Medical Corps, US Naval Reserve

INTRODUCTION

Detailed planning is underway for the Canadian Navy's Joint Support Ship (JSS), a replacement for the aging Preserver Class Auxiliary Oil Replenishment (AOR) vessels. The JSS will be a multipurpose ship that will provide surge sealift, underway replenishment, and support to forces ashore. It will include a level of medical coverage that exceeds anything currently provided by the Canadian Navy.[2] With the first of three vessels scheduled for completion in 2011, the JSS is expected to provide a comprehensive joint capability to a Canadian Forces Task Group. The JSS has the potential to serve as a leader in the drive towards establishing Canadian Forces (CF) joint operational capability. [3] Dr. Paul Mitchell underscored the potential significance of the JSS when he stated, " the JSS may mark the transition of the Navy…to a more land-support-oriented mission. It also may drag the entire Canadian Forces kicking and

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1 Arthur M. Smith. "Care Delayed is Care Denied! Casualty Handling in Littoral Operations, " *Naval War College Review* 52 no. 4 (Autumn 1999). [journal on line]; available from http://www.nwc.navy.mil/press/Review/1999/autumn/art6-a99.htm; Internet accessed 24 September 2004.

2 Michael Gardner, Eric Dudley and David Sanschagrin, "The Joint Support Ship for the Canadian Navy – Medical Capability" (Presentation, Shipboard Medical Facilities Workshop, Toulon, France, May 2004). 2. The AOR's current medical capability can be expanded to include a limited life and limb saving surgical and post operative care for up to 4 patients of varying degrees of illness and injury.

3 Ann L. Griffiths, ed. *The Canadian Navy and the New Security Agenda: Proceedings of the Maritime Security and Defence Seminar.* Halifax, NS: Centre for Foreign Policy Studies Dalhousie University, April 2004, 18.

screaming into being a fully fledged joint institution." [4] With the existing AORs rapidly reaching the end of their life cycle, combined with uncertain sustained funding, the JSS project, as the vanguard of future CF jointness, is facing considerable pressure to meet the timelines for the production of the first ship.[5]

The JSS Medical Capability Working Group identified an operational requirement for an enhanced surgical and hospital capability on the JSS from what is currently available on the existing AORs. A limited Role 3 capability,[6] in the form of an integral JSS Afloat Advanced Surgical Centre (AASC)[7] has been identified to meet the potential force planning scenarios of the future. This capability can be increased to accommodate a scalable, modularized, joint Enhanced Afloat Advanced Surgical Centre (EAASC)[8] should the operational requirement exist. The delivery of sea – based joint limited Role 3 health service support (HSS) of this scalability and capability is a new and exciting venture for both the Navy and the CF. [9]

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[4] Paul T. Mitchell, "Joint Support Ship: Transformation or White Elephant," *Proceedings of the United States Naval Institute*, Vol 130, Issue 3 (March 2004). [journal online]; available from http://www.navalinstitute.org; Internet; accessed 29 September 2004, 64.

[5] *Ibid…,* 64.

[6] Role 3 – The minimum capabilities of this role include resuscitation, initial surgery, post-operative care, and short-term surgical and medical in-patient care. Diagnostic services such as x-ray and laboratory, and limited internal medicine and psychiatric services are also available. This typically includes HSS elements that are operationally responsible to a Canadian Task Force Commander (e.g. field hospital, advance surgical centers, JSS surgical centre).

[7] The AASC will be built in to the ship and will contain one operating room and 15 beds that are able to care for both critically and seriously ill and injured patients.

[8] An EAASC includes an additional operating room (OR) and 15 additional critical and intermediate care beds. These elements will be in a modularized, scalable containerized system that can be utilized on the JSS deck or taken ashore.

[9] With recent changes to NATO definitions of the capabilities provided at each role, it is most likely that the enhanced JSS medical capability will be re classed as a NATO Role 2+ facility. As the term 'limited Role 3' has been used exclusively throughout the JSS project documentation, 'Role 3' will be used in this paper for consistency.

The challenge to effectively utilize this resource and space intensive capability will be directly impacted by the multipurpose function of the JSS. Multiple, divergent taskings required from a single JSS will result in competing and sometimes incompatible demands being placed on the platform. This will be particularly true if a role 3 HSS capability has been committed to a Joint Task Force (JTF) operation. The JTF Commander must exercise extreme caution when assigning other tasks to the JSS to prevent the undermining of the theatre HSS, as the JSS based Role 3 capability will likely be the only CF capability of this type in the Area of Operations (AO). [10] Resolving the debate of how and when the sea-based Role 3 HSS capability is to be employed will be essential to prevent the afloat medical facility from becoming, in Dr. Mitchell's words, a "white elephant" that consumes limited financial and human resources while offering little added value. [11]

Enhanced joint sea-based medical capability will be an efficient use of scarce HSS resources if HSS planners and JTF Commanders adhere to the concepts of operational HSS planning and delivery and commit, prior to construction, to utilize the capability. This paper will demonstrate that adherence to these concepts has the potential to impact on the multipurpose function of the JSS by limiting its mobility, and therefore, its ability to carry out other activities for the Naval Task Group. These limitations must be acceptable to the JTF Commander prior to leaving the homeport in order to ensure that

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[10] Captain (N) Jung, former Chief of Maritime Staff Medical Advisor and architect of the JSS medical capability, in a conversation with the author 5 October 2004. He stated that the AASC will be an HSS asset utilized for all sea, land and air based CF troops in the AO, reflecting the joint nature of sea - based HSS.

[11] Paul T. Mitchell, "Joint Support Ship …, 64.

joint, sea-based Role 3 HSS is an operational capability rather than an operational liability to the JTF Commander.

Operational commanders forecast battle casualty rates and exercise responsibility for the health and welfare of the force as part of Force Health Protection. They exercise this responsibility through the HSS supporting elements. The primary objective of force health protection is to conserve the fighting strength of the force through the spectrum of health services - from preventive health measures to delivery of advanced medical and surgical care for the sick and wounded.[12] During expeditionary operations, health service support, with few exceptions, is provided by CF Health Services personnel and equipment because relying on other nations to provide operational HSS is, in general, neither reliable nor morally acceptable for the CF. [13] All attempts are made to provide CF based health care, and the JSS has the potential to be a more efficient platform to deliver this care from when compared to the existing land based Advanced Surgical Centres (ASC) or the minimal capabilities existing on the current AORs.

In order to provide context for the discussion, this paper will provide an overview of the current status and issues surrounding the JSS project and briefly address the future of modern littoral warfare. This paper will not address either the issues concerning the utility of other JSS capabilities or the integral sick bay capabilities of the JSS. This paper will focus exclusively on the issues surrounding sea – based joint Role 3 HSS capabilities as the size and extent of this capability is a new venture for the CF. A background discussion of factors related to the threats, risks and benefits of situating Role 3 HSS on a

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[12] Department of National Defence, B-GJ-005-410/FP-000 *Health Services Support to Canadian Forces Operations (Ratification Draft)*. (Ottawa: DND Canada, 2004), 1-5.

[13] David Salisbury and Dr. Allan English, "Prognosis 2020: A Military Medical Strategy for the Canadian Forces." *Canadian Military Journal* 4, no.2 (Summer 2003): 47.

sea – based platform that must be considered by JTF Commander prior to deploying the JSS on a medical mission. This will include a discussion on the issues surrounding employment of a large medical capability on a non Geneva Convention protected platform, as the JSS will not be designated as a hospital ship. A brief discussion about the future of sea – based HSS will be provided, followed by a review of the concepts of HSS planning that will impact on the multipurpose function of the JSS, if properly adhered to. These critical concepts include timely access to health care, the golden hour for surgical intervention, and evacuation of casualties to and from the JSS platform. Risk mitigation strategies will be briefly discussed, with the aim to suggest ways in which to support the multipurpose function of the JSS without unduly placing casualties at risk of increased mortality or morbidity. The context of this paper is based on the worst - case non-article 5, Peace Support operational scenario where land and sea – based threats place the JSS at risk, as this will be the situation when multi tasking capabilities will be critical to the CF. It will also serve to illustrate the identification of conditions that must exist in order to make sea-based Role 3 HSS a force enabling capability rather than liability.

THE JSS CONTEXT

Knowledge of the JSS outside of the Navy is limited. An understanding of the issues surrounding the JSS concept and employment will provide context for the operational requirement for sea - based Role 3 HSS. The Navy has envisioned the JSS as a multipurpose, combat capable ship that can provide strategic sealift, underway replenishment and a command and control capability for a variety of joint and combined

operational scenarios. [14] The JSS will be capable of contributing to operational requirements for the full spectrum of domestic, continental and international planning scenarios, including Arctic operations as a result of first year ice breaking capability. Most importantly, the JSS will " contribute significantly to the modern task –tailored and globally deployable combat capable forces " [15] by meeting the replenishment and sustainment requirements of both the Canadian Naval Task Group and joint air and land based forces.

Conceptually, the joint multipurpose function of the JSS is sound but, as is often the case with complex capability issues, the 'devil is in the detail' when it comes to operationalising how these concepts are going to apply and how the JSS will function in a joint operating environment. Lack of joint doctrine compounds the challenge of realizing the full extent of the JSS supporting capabilities, especially for the Army.[16] Though the Army continues to question the utility of the JSS as a result of the limited capability to lift equipment and personnel at the same time, [17] both the Army and Air Force have committed to the conceptual utility of the JSS. This conflict between conceptualization and employment is most clearly highlighted by a dichotomy between the requirement for a high readiness fleet support ship and a low readiness Army cargo ship.[18] As will be identified later in the paper, utilizing a sea- based EAASC will significantly impact on

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[14] Paul T. Mitchell, "Joint Support Ship …, 65.

[15] Department of National Defence, *Statement of Operational Requirements.* (Ottawa: Project Management Office Joint Support Ship DSP 2673, May 2004), 2.

[16] Ann L. Griffiths, ed. *The Canadian Navy*…,106.

[17] *Ibid*…, 66.

[18] Robert H. Edwards, "The Future of Canada's Maritime Capabilities: The issues, Challenges and Solutions in a New Security Environment 18-20 June 2004: Conference Report" (Rough Draft, Centre for Foreign Policy Studies, Dalhousie University, Halifax, 2004), 34.

the flexibility of the JSS to be used for other tasks, such as sealift capability for forces ashore. [19] To be a truly cost- effective, multipurpose, joint capability the JSS must be capable of performing more than one task concurrently when deployed in all but exceptional circumstances, such as the EAASC role. Until Canadian joint doctrine is developed to explain how the JSS will be integrated into the Task Group and how the Task Group will "transport[s], protect[s] and support[s] land and air units ashore," [20] ability to determine the exact requirement for a JSS - based Role 3 HSS capability will prove challenging.

FUTURE BATTLESPACE

The characteristics of the post 9/11 security environment will impact on the ability of the JSS to carry out a multipurpose function by placing restrictions on mobility and by increasing requirements for external force protection. The future battle space must also be a key risk management consideration for operational planners when determining the employment of sea- based Role 3 HSS. The "inextricable relationship between events on the land and those at sea" [21] can place the JSS in an increased threat situation and therefore, risk the HSS capability. This relationship was clearly illustrated by Commander Steve Bell when he stated that:

> Most of maritime warfare in the near term is likely to take place in coastal or littoral zones as it has for most of history. In the past, littoral zones were interpreted to be the narrow strip of water bordering a state's coast. That definition, however, has evolved to the point where littoral areas are now considered to extend from well

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[19] Department of National Defence, *Statement of Operational Requirements* … Annex A ,18.

[20] Robert H. Edwards, "The Future of Canada's Maritime Capabilities ..., 36.

[21] Arthur M. Smith, " The influence of Medicine on Strategy", *Naval War College Review* 41, no2 (Spring 1988), 26.

> inland out over the continental shelf and in some cases to the limits of the national economic zone… These zones create unique challenges – manoeuvre room is limited, warning times are reduced, and acoustic conditions are difficult…In this new security environment naval forces will face threats from asymmetrical weapons and forces…these are all serious threats and are extremely difficult to protect against. [22]

The JSS will be "a large and high value unit that is likely to be a primary target for such attacks. As a result… JS vessel(s) would need adequate self-protection capability to provide warning and defence." [23] As the vast majority of the world's population lives within reach of a coastline, the ability of the JSS to operate within the littorals will place it in high demand to fulfill multiple tasks. The risk to the JSS operating in an environment characterized by unconventional strategies and the unprecedented reach and lethality of weapons will form a key aspect of determining when sea based Role 3 HSS can and should be utilized.

Smith summarized the threats to naval forces when he stated that "in future littoral warfare, air, sea and ground launched missiles, as well as mines and other familiar weapons, will create a tactical environment of unparalleled complexity".[24] As advances in technology are made threats, such as those from 'smart mines', anti ship missiles, torpedoes, tactical aircraft, and weapons of mass effect, [25] may result in large slow sustainment ships moving seaward to protect against an "enemy who sees sustainment as the assault forces' Achilles heel". [26] This comment is well supported by history and can be highlighted by the experience of the Royal Navy during the Falklands conflict. Out of

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22 Ann L. Griffiths, ed. *The Canadian Navy*…,72-3.

23 Department of National Defence, *Statement of Operational Requirements* …,12.

24 Arthur M. Smith. "Care Delayed … , 2.

25 Ann L. Griffiths, ed. *The Canadian Navy …,* 73.

26 Arthur M. Smith. "Care Delayed … , 2.

twenty- three Royal Fleet Auxiliary (RFA) vessels in theatre, six were successfully attacked by either shore - based or air - launched Exocet missiles. The mean casualty rates for both Royal Navy warships and RFA vessels, averaged 8.26 sailors Killed in Action and 5.78 sailors Wounded in Action per strike. [27] These rates were similar to those experienced by the U.S. during World War II Pacific operations, despite the brief duration of the Falklands conflict and inferior enemy capability. These rates highlight both the increased risk of littoral operations and the fact that "contemporary changes to ships may not make a difference to the number of casualties sustained when an adversary is able to penetrate air defenses."[28] Understanding the requirement to risk manage the potential effects of littoral operations will ensure sea – based HSS, despite being placed on a combat ship, will not be unduly exposed to attack and possible destruction.

THREATS TO SEA BASED HSS

Protecting health services assets from attack is a fundamental aspect of HSS planning. This protection is offered under the Geneva Conventions (GC), and therefore International Law, for those who display the Red Cross on HSS elements - even if it is not openly displayed.[29] Displaying the Red Cross, using restricted communications, advertising the ship's location and restricting mobility indicates the non-combatant and neutral status of all personnel and assets covered. This protection comes with the implicit

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[27] Christopher G. Blood, Richard T. Jolly, Michael S. Odowick, "Casualty Incidence during Naval Combat Operations: A Matter of Medical Readiness" *Naval War College Review* (Autumn 1996) [journal on-line]; available from http://wwwnwc.navy.mil/press/Review/1996/autumn/cas-a96.h

understanding that HSS personnel and assets will not in any way aid or participate in combat.

Though HSS elements are entitled to protection, the protection will cease if the HSS elements are deemed to be committing a hostile act. [30] The JSS will **not** be a Hospital Ship, as defined under the Geneva Conventions and will be considered a combatant ship as a result of the multipurpose function to support combatant forces. Simply put, co-locating combat and HSS elements places the capability at increased risk of a deliberate or accidental targeting. A successful enemy strike against the JSS will not only make casualties of the ships crew and embarked medical staff, but will potentially eliminate the only Canadian Role 3 HSS in the AO. Therefore, it is very important to explore the risks and benefits of locating a Role 3 HSS capability on this type of non-traditional non-GC protected platform before deploying with this capability. While the CF has no plans to construct a hospital ship, the lessons learned from previous conflicts help to illustrate risks and benefits of sea – based Role 3 HSS in an asymmetrical threat environment.

A review of enemy action taken again GC protected HSS elements on sea and land indicates that displaying the Red Cross does not necessarily provide protection from attack, yet may significantly restrict the movement and flexibility of HSS elements. The history of the hospital ship, which has been the backbone of traditional naval Role 3 HSS for many nations, provides an important perspective on the protective value of the Red Cross in symmetric threat environments. Large slow moving hospital ships, painted

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[30] Department of National Defence, B-GG-005-027/AF-021 *The Law of Armed Conflict at the Operational and Tactical Level – Annotated,* (Ottawa: Office of the Judge Advocate General, 2001), 17-5. An HSS facility is deemed to be committing a hostile act if it is, or appears to be, aiding the war effort of one side

white and prominently marked with large Red Crosses/Crescents and afforded protected neutrality (and non combatant status) under the GC have not fared well in past conflicts despite their status. No fewer than 28 clearly marked hospital ships were sunk during WWI and WWII as a result of mine and torpedo attacks. [31] Modern day examples of the protective status of the Red Cross are no more favorable. During the conflict in Chechnya, insurgents deliberately targeted and destroyed soft-sided ambulances, medical posts and medical evacuation helicopters. [32] While no modern naval examples can be found of deliberate targeting of clearly marked protected vessels, the insurgents in Chechnya reflect one of the dangerous faces of modern asymmetrical warfare. It is reasonable to assume that hospital ships will not fare any better than their forbear in the 21st Century battle space where long-range missiles will be readily available and the use of unconventional tactics may be used to indiscriminately inflict the greatest possible damage to Allied and coalition forces. Clearly, protected status under the GC is only as good as the desire of the enemy to act in accordance with international laws: a hospital ship could prove to be an inviting target.

Geographical separation is one of the few protective options available to GC protected hospital ships in any operational scenario and would be one of the defensive postures available to the JSS in an increased threat environment. During *Operation Iraqi Freedom* in 2003/4, the U.S Navy's hospital ship *Comfort* was located outside of the littoral AO. Evacuation of casualties to the ship proved challenging as a result of the

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[31] Arthur M. Smith. "Care Delayed … , 5.

[32] Lester W. Grau and Timothy L. Thomas, " 'Soft Log' and concrete canyons: Russian urban combat logistics in Grozny" *Marine Corps* Gazzette 83, Issue 10, (October 1999) 67- 76; http://www.proquest.umi.com; Internet; accessed 6 October 2004.

large distances from shore- based staging facilities, dust storms and the general threat level. [33] Though GC protected vessels should enjoy freedom from attack and freedom of movement, history has shown that the operational restrictions of GC protected ships severely challenge the JTF Commander's ability to provide Role 3 HSS to the JTF. Lack of mobility and geographical separation, as a result of asymmetrical threats, restricted communications, and inability to return recovered troops directly back to battle suggest that the concept of the hospital ship may become and anachronism of the past symmetrical wars.

Understanding the risks and benefits of delivering sea- based HSS both with and without the protected status of the GC, will allow operational planners to better manage the risk of providing JSS - based HSS for any operational planning scenario. If, as Nordick states, sea and air superiority will be secured prior to launching a land campaign,[34] then future threats to naval forces will be significantly decreased. Threats from mines, submarines and shore based missiles, however, are still difficult to eradicate. Consequently, the threat level from sea, ground and air will continue to require careful consideration prior to committing sea - based Role 3 HSS. Additional taskings, such as underway replenishment and sustainment, might necessitate that the JSS move into a position that may place the vessel within enemy targeting range in order to sustain naval combat operations. If operational commanders determine that the elevated threat level places the HSS capability at high risk despite the force protection provided by and to the

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[33] Captain (N) Allington, CO USNS COMFORT, personal communication with the author, 18 August 2004. Lester W. Grau and Timothy L. Thomas, " 'Soft Log' and concrete canyons: Russian urban combat logistics in Grozny" *Marine Corps* Gazzette 83, Issue 10, (October 1999) 67- 76; http://www.proquest.umi.com; Internet; accessed 6 October 2004.

[34] Brigadier – General G. Nordick, " Can the CF Develop Viable National Joint Capabilities?" *Canadian Military Journal*5, no. 2 (Summer 2004) [journal on-line]; available from http://www.journal.dnd.ca/engraph/Vol5/no2/Views_asp; Internet; accessed 11 October 2004.

JSS from other warships, then serious consideration must be given to redirecting the task elsewhere. This is a costly challenge to these other JSS functions given that, generally, only one JSS will be deployed as part of a Canadian Naval Task Group at one time and " without the ability to re-supply its warships at sea, the Canadian Navy would be hard pressed to sustain a naval operation." [35]

ROLE 3 HSS OF THE FUTURE

The challenges of operating in littoral zones has caused Allied navies to rethink how to more effectively provide sea-based HSS to the sick and wounded.

The realities of modern national, continental and international operations, coupled with fiscal realities many nations are facing has resulted in innovative, risk-managed approaches to HSS delivery at all levels. Necessity has long been the catalyst in HSS evolution. In WWII, tank landing ships (LTS) were converted to forward surgical ships and were later used to help control the flow of casualties to the rear. They were flexible and mobile and proved to be relatively safe from attack despite the absence of Red Cross markings and working in the littoral zone. [36] The first Canadian example of using a non-hospital ship to provide medical care occurred during the Canadian participation in the United Nations Emergency Force during the Suez Crisis in 1956. The Canadian aircraft carrier, *HMCS Magnificent,* was equipped to " provide a small hospital to accommodate

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[35] Department of National Defence, "Canada's Navy: News and Information—Issues and Challenges. The Value of Canada's Replenishment Ships," http://www.navy.forces.gc/mpsa_news_issues_e.asp?category=2&title=16 ; Internet; accessed 19 Oct 2004.

[36] Arthur M. Smith. "Care Delayed … , 6.

the sick and injured in the force." [37] The best example of recent HSS innovation, and a model for the current medical capabilities of the JSS, comes from the experience of the Royal Navy during the build up to Operation Desert Storm in 1990. Sea and land based casualty projections indicated a requirement for increased Role 3 medical capability, the RFA *Argus*, originally built as a sea training ship, was converted into a multipurpose casualty receiving ship that contained a 100 bed, Role 3 medical facility. It proved to be an extremely efficient casualty receiving and treatment ship due to its proximity to land-based medical staging facilities. Additionally, it enjoyed protection from the naval Task Group, greatly increasing the manoeuvrability and flexibility of the platform. RFA *Argus'* successful mission was credited to the employment of a 'gray hull' (non GC protected) vessel.[38] The Royal Navy's experience with the *Argus* in Iraq in 2003 proved once again that the risk of losing GC protected status in favour of the manoeuvrability and relative protection of a 'gray hull' was advantageous in the delivery of role 3 HSS in the context of modern conflict.[39]

The German Navy recently followed suit and completed construction of a Role 3 medical facility on the multipurpose auxiliary ship, the FGS *Berlin.* [40] It is unclear how the multipurpose functions of the *Berlin* will be impacted by the presence of a Role 3 HSS function, but will be worth monitoring German progress as the FGS *Berlin* multiple sustainment, replenishment and medical capabilities most closely reflect those of the JSS.

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37 Department of National Defence, *Report No. 94 Historical Section Army Headquarters: Canadian Participation in the United Nations Emergency Force* (Ottawa: Canada, 1961), 24.

38 Arthur M. Smith. "Care Delayed … , 7.

39 Robert Fox, *Iraq Campaign 2003 Royal Navy and Royal Marines* (London: Agenda Publishing, 2003), 131.

40 Visit to the FGS *Berlin* by the author May 2004

As our Allies have demonstrated, the risk of trading GC protection for manoeuvrability and flexibility of a combatant ship has resulted in timely access to Role 3 HSS. Employed correctly, with careful consideration given to the operational situation and appropriate risk management, Canadian sea - based joint Role 3 HSS is poised to deliver significant benefit to CF expeditionary forces.

PROVISION OF SEA BASED HSS

The preceding discussion has focused on factors that require careful consideration prior to embedding joint Role 3 HSS within the JSS structure, and has addressed the critical force protection issues once the JSS deploys. The final component of the paper will focus on the general concepts of HSS planning [41] that HSS planners must consider once the commitment has been made to employ joint sea - based Role 3 HSS. Adherence will not only maximize the survivability of the sick and wounded, the key function of Force Health Protection, but will ultimately determine the degree to which the JSS will be able to carry out other roles and tasks once committed to a medical mission. Smith summarized the challenges associated with balancing competing operational requirements and effective HSS delivery as follows:

> The important question to the commander of a littoral operation is whether sea-based medical support mechanisms on hand will adequately support casualty retrieval and survival – or conversely, lead to premature death and protracted, complicated morbidity among those who survive their initial injuries. [42]

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[41] Department of National Defence, *Health Services Support* … 1-5 –6. The principles that guide HSS planning are conformity, proximity flexibility, mobility, continuity and control. The precepts of HSS planning outline the 12 legal, policy and/or operational imperatives that must be considered.

[42] Arthur M. Smith. "Care Delayed … , 1.

The manoeuvrability of the JSS, scalability of the medical capabilities, integral helicopter casualty evacuation capability and the high readiness state of the JSS make adherence to the principles and precepts potentially easy for HSS planners. Adhering to the general concepts will provide the JTF Commander with framework to determine what other roles the JSS can perform without unduly jeopardizing Role 3 HSS.

The JSS will be a highly mobile platform designed to carry out a number of sustainment and supporting tasks to both Canadian joint and naval forces. Operationally, the JSS will provide the Joint Task Force Commander with "flexibility in decisions regarding timing and location of troop committals, and provides options in countries with non existent, poor or overburdened infrastructure." [43] The mobility of the JSS will result in the ability to deliver not only sustainment, but also early in-theatre surgical support within close proximity to the combat zone. The JSS will possess the ability to support both sea and shore-based casualties. At present it is unrealistic to assume that the JSS will be used as amphibious support for high intensity, high casualty land battles,[44] but as Gouge pointed out "providing care to early casualties will be critical to mission success at the time when the medical footprint is extremely limited," [45] a task the JSS enhanced medical capability can certainly fill. As stated earlier, the challenge of constructing a multipurpose ship in the absence of joint doctrine or awareness of future JSS missions may place tasks directly in conflict with one another. While the lack of direction may

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[43] Commander Greg Aikens, " Beyond ALSC: We Need to get Amphibious and Joint to Stay Relevant" *Maritime Affairs Newsletter* (Winter 2001):12-13; http://atoz.ebsco.com; Internet; accessed 24 September 2004.

[44] Paul T. Mitchell, "Joint Support Ship …, 66.; Robert H. Edwards, "The Future of Canada's Maritime Capabilities ...,34.

[45] S. Gouge, "Combat Health Support of the Transformation force in 2015" (Carlisle Barracks: U.S. Army war College, 2001), 21.

compromise the desired capabilities once the role of the JSS is fully realized, [46] a general lack of understanding of HSS planning factors by personnel outside of the Canadian Forces Health Services may not only impact on casualty survivability and long term morbidity, but also on the ability to prioritize competing demands. Therefore, joint doctrine for the JSS must be developed and agreed upon by the Army, Navy and Air Force in order to help reduce conflicting demands on the JSS capabilities once deployed.

TIMELY ACCESS TO HEALTH SERVICE SUPPORT

The concept of "humans as perishable cargo" continues to be relevant in the battle-space of the future. Many factors such as the battle rhythm, environmental conditions and lack of casualty evacuation assets will significantly challenge the ability to provide timely HSS from the JSS platform. The main principal underpinning the roles of HSS delivery is that the highest role of care should be provided as close to the point of injury, commensurate with the tactical situation. The roles of HSS exist within a progressive system of casualty care that takes the casualty from the point of injury to the level of care dictated by their medical status. The casualty continues to progress through the HSS system until he is ready to return to duty or be transferred from the AO for further treatment. This stepped approach to HSS is utilized by our NATO and coalition allies and helps to facilitate interoperability when working in a joint and combined environment. While there are variations in terminology used to identify the roles of HSS

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[46] Robert H. Edwards, "The Future of Canada's Maritime Capabilities…, 35.

between individual NATO and coalition allies, the capabilities remain consistent. [47] Simply put, the capabilities delivered at the different roles of Canadian HSS, in addition to the continuous and progressively more complex nature of the medical care delivered, optimize the survivability of the sick and wounded while assisting commanders to clear the battle space by either evacuating the severely injured or returning the recovered back to duty. [48] According to Smith and Llewelyn, "when a field medical system is functioning efficiently, it should be able to 'fix [treat] forward' to prevent itself from becoming a giant evacuation conduit through which experienced soldiers and marines pour out of the theatre to rear echelon health care facilities". [49] The JSS will provide a platform that can treat forward and, as it is not designated as a hospital ship, can return the recovered directly back to duty with their units. Roles of care are inextricably linked with trauma management concepts and to the timelines of evacuation from point of injury to surgical intervention and non-medical taskings must take into account these concepts.

GOLDEN HOUR

The critical period of time available to deliver resuscitative HSS to battle casualties is inversely proportional to the severity of the injury. As Smith stated "Without early medical treatment (an extremely "time sensitive" reality) some unstable

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[47] United States, Department of Defense, *Joint Publication 4-02 Doctrine for Health Service Support in Joint Operations,* http://www.dtjc.mil/doctrine/jel/new_pubs/jp4_02.pdf ; Internet; accessed 4 October 2004. United Kingdom,. Department of Defence, *Joint Warfare Publication 0-10: United Kingdom Doctrine for Joint and Multinational Operations Interim Edition* (London: Ministry of Defence, n.d), 8-11 Department of National Defence, *Health Services Support* … 1-7 -8

[48] To find a detailed description of the capabilities found at the 4 roles of HSS, see Dept of National Defence *HSS Support*…1-7,1-8.

[49] Arthur M. Smith and C. Llewellyn, "Caring for our Casualties." *U.S. Naval Institute Proceedings* 117, no. 12 (December 1991) 72-8.

casualties will die, and the wounds of others will become seriously complicated disabilities." [50] He goes onto state that up to 20% of combat casualties die as a result of lack of surgical treatment for surgically correctable injuries. [51] The term "golden hour" has been use to define the time period when initial lifesaving resuscitative trauma care should be received by the casualty. Though the term is somewhat misleading in the case of penetrating trauma, such as ballistic injuries (such as gunshot wounds), it adequately indicates the requirement for rapid evacuation and care of the casualty. [52] The Canadian ratification draft of HSS doctrine mirrors Smith's comments in regard to the importance of urgent intervention. The doctrine has interlinked precepts of time and evacuation and has reinforced the concept of the "golden hour" and goes on to further indicate that the acceptable time limit to **complete** surgical intervention for non-life or limb threatening injuries is six hours.[53] The manoeuvrability of the JSS makes it an ideal platform on which to locate joint Role 3 HSS so that treatment timelines can be met. However, JSS manoeuvrability and the requirement to multi task the JSS has the potential to also extend the lines of casualty evacuation to a point where sea based HSS is, in effect, no longer accessible. [54] Depending on the mission scenario, providing sea-based joint Role 3 HSS

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50 Arthur M. Smith. "Care Delayed … ,1.

51 Arthur Smith, "All Bleeding Stops Eventually", *U.S. Naval Institute Proceedings* 1237, no.11 (November 2001) [journal on-line]; available from… ; Internet; accessed 6 October 2003, 1.

52 Gary Cecchine et al, *Army Medical Support to the Army After Next: Issues and Insights from the Medical Technology Workshop, 1999* (Santa Monica, CA: RAND, 2001), 18.

53 Department of National Defence, *Health Services Support* …, 2-6.

54 The JSS Statement of Requirement document has acknowledged that TG support may not be compatible with other taskings if it does not possess freedom of movement to complete other tasks.

will significantly restrict the movement of the JSS and will ultimately impact on either the medical task or other sustainment and replenishment functions.

EVACUATION

The most critical vulnerability of any HSS plan is the ability to evacuate casualties to and from the JSS platform. [55] From an HSS perspective, the chain of evacuation and treatment starts from the point of injury and is directly influenced by the tactical, environmental and geographical situation along with the extended lines of communication to be covered in a littoral environment. JSS based maritime helicopters, and surface boats will be made available for casualty transfer [56] if the JSS is committed to a medical mission. The availability of ships' boats, as a method of transport for casualties able to tolerate this mode of transport, will greatly enhance the flexibility of the HSS plan. However, as the type of casualty most likely evacuated to the JSS will be too unstable to tolerate transport in a surface watercraft, access to tactical air medical evacuation will be essential. Additionally, if medical estimates indicate increased casualty rates, the large distances to be covered in a littoral environment require nothing less than a dedicated on-call evacuation helicopter. [57] This will result in fewer helicopters being available for other taskings. The ability of the JSS to operate within the littoral zone in addition to ready, if not instant, access to evacuation resources will help to

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[55] Arthur M. Smith. "Care Delayed … , 3.

[56] Department of National Defence, *Statement of Operational Requirements* …, Annex A. There will be four Maritime Helicopters attached to each JSS. HSS planning indicates rearward to forward movement of medical evacuation assets meaning that receiving facilities normally move forward to pick up casualties.

[57] Arthur M. Smith. "Care Delayed … , 3.

maintain the proximity of HSS to the point of injury. Access to evacuation assets will cease to be a mitigation strategy for increased distances caused by attending to other tasks if the JSS moves beyond the effective range of the maritime helicopter and is an issue to be addressed prior to completing any other taskings.

The multi layering of tasks on a limited platform may result in the inability to commit to two or more major tasks without degrading support to another tasks. This may prove particularly problematic for delivery of HSS if the JSS moves outside of the geographical area of land-based supported elements for a period of time deemed too long by the medical estimation process. It is likely that Canada will deploy as part of a coalition or Allied operation, but HSS planners must identify for the JTF Commander situations when multiple task commitments will result in the chain of evacuation extending beyond the six-hour surgical intervention window. In this case, the Task Force Surgeon must be able to designate alternate coalition Role 3 facilities to support the Task Group. This could prove to be challenging if allied or coalition partners fail to reasonably meet the Canadian standard of health care. [58] However, if no acceptable alternate sources of coalition Role 3 HSS can be found, sea-based Role 3 HSS may prove to be an operational liability and a strategic 'red card' that limits the JSS' mobility and flexibility to perform other tasks.[59] Integrating the Task Force Surgeon into the JSS-based Joint

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[58] Department of National Defence, *Health Services Support* …, 2-6. Regardless of the geographical location, "the levels of health care shall be provided at levels of accessibility and quality comparable to those being afforded to Canadians, in general". NATO Allied Joint Medical Support Doctrine, U.S Joint Doctrine, and the U.K Joint Doctrine contain similar statements, reflecting similar emphasis being placed on robust HSS for expeditionary forces.

[59] The provision of HSS to CF expeditionary operations is inextricably linked to strategic and political priorities and realities. Health care is the number one priority for Canadians and previous Boards of Inquiry, such as the Croatia Board of Inquiry, have articulated why robust HSS is critical to success of the mission at all levels. At the tactical/operational interface to conserve fighting strength and at the

Headquarters will ensure timely medical advice is given to the Joint Task Force Commander and allow the Task Force Surgeon to exercise better operational control of all HSS assets in the JTF.[60]

Mitigating the risks to the sick and injured caused by delays in the chain of evacuation is very important in light of requirement of the JSS to provide joint, Role 3 HSS to sea and land based forces in some operational planning scenarios. Weger proposes a rethinking of the how HSS is staged and delivered to the land forces that are equally relevant to maximize the sea - based HSS capability and provide additional flexibility for the JSS to perform other non medical tasks from the platform. Though a concept not in use in Canada yet, Weger advocates moving rapid surgical intervention as far forward as the tactical situation permits. This HSS would be delivered by a mobile Forward Surgical Team (FST), ideally controlled and deployed with their equipment from the JSS platform. In the current fiscally restrictive environment, it is likely that only one Canadian land or sea – based Advanced Surgical Centre will be available within the AO at any one time. [61] Using an FST will serve to not only make the land-based medical footprint smaller and more maneuverable, but will ensure limited HSS resources are effectively used and services are not unnecessarily duplicated. The potential effectiveness of the FST is highlighted by the US and UK who currently utilize FSTs. They have reduced death and disability rates of injured soldiers and sailors as a result. [62]

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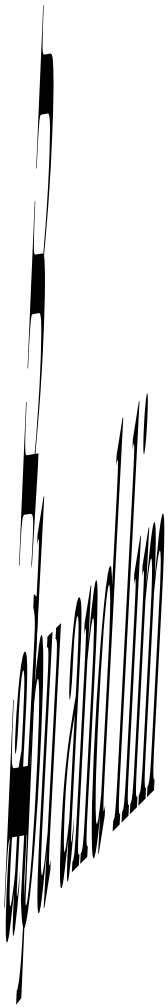
strategic/political interface to ensure that the CF maintains the support and commitment of the Canadian public.

60 Capt (N) Jung, telephone conversation with the author 5 October 2003.

61 *Ibid…,*.

62 David Weger . "Blurring of the Lines: The Call for an Integrated Surgical Capability in Canadian Field Ambulances." (Toronto: Canadian Forces College Advanced Military Studies Course , (2003), 24.

Casualties would still require continued evacuation to, and treatment from, the AASC, but initial life and limb saving intervention will have occur



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destruction will be an essential consideration for Canadian JTF Commanders prior to deployment especially as the AASC or EAASC maybe the only Canadian Role 3 facility in the AO. The asymmetric warfare tactics used by insurgents and terrorists in the post 9/11 security environment indicate that, even if carrying out a medical mission, the JSS may prove to be an inviting target to an enemy who wishes to inflict a large psychological blow to the opposing force. Force protection considerations may result in the JSS being moved seaward which may not only impact on the ability of the JSS to carry out multiple sustainment and replenishment tasks by placing restrictions on the mobility of the vessel, but the geographical separation will likely take the JSS beyond the six hour time limit acceptable for completing surgical interventions on the injured – a key concept of HSS.

A review of historical and current issues surrounding the delivery of sea-based joint, Role 3 HSS indicates that integrating and utilizing this capability will likely result in decreased death and disability rates of the sick and injured, as was the experience of the Royal Navy's RFA *Argus* in both Gulf Wars. The risk of placing Role 3 HSS on the JSS will need to be carefully weighed by operational planners to determine if the JSS is at an unacceptable risk of being deliberately or accidentally targeted by sea or land based missiles, mines or torpedoes. This evaluation will need to be made prior to leaving home port as sinking the JSS has the potential to eliminate the only source of Canadian HSS in the AO.

The most critical vulnerability of any HSS plan is the ability to evacuate shore or sea - based casualties to and from the JSS platform. The concept of timely access to care will be the key risk factor that a JTF Commander and Canadian Naval Task Group

Commander will need to consider when determining what other tasks and functions the JSS will be able to complete in light of the operational scenario. As it will be likely that only one JSS will be deployed at any given time, the ability to mitigate the risk of increased morbidity or mortality to the sick and injured caused by extended evacuation times, while maximizing the multipurpose function of the JSS platform will be essential. Integrating the Task Force Surgeon into the sea-based JTFHQ to provide medical advice to the JTF Commander and Canadian Naval Task Group Commander will provide a realistic risk assessment. Introducing Forward Surgical Teams as part of the HSS package, controlled by the Task Force Surgeon and deployed from the JSS platform, will provide early life saving, surgical treatment, and will provide the JSS with greater mobility and flexibility to complete other critical taskings. However, failure to address the evacuation issues surrounding shore- based casualties will render sea-based HSS capability irrelevant – or even hazardous to the casualty's survival.

Finally, the lack of joint doctrine compounds the challenge of realizing the full extent of the JSS supporting capabilities as the multi layering of tasks on this limited platform may result in the inability to commit to two or more major tasks without degrading support to another tasks. The challenge to effectively utilize the resource and space intensive medical capability will be directly impacted by the multipurpose function of the JSS. Until comprehensive Canadian Joint Doctrine exists, the medical capability is at risk of being under utilized as other JSS functions compete for primacy.

The concept of "humans as perishable cargo" continues to be relevant in the battle-space of the future. Many factors such as the battle rhythm, environmental conditions and the access to casualty evacuation assets for transport to and from the JSS

will significantly challenge the ability to provide timely HSS from the JSS platform. However, if maximally employed and carefully balanced with other JSS tasks, sea - based, joint, Role 3 HSS has the potential significantly improve the JTF Commander's ability to deliver force health protection to the Task Force while simultaneously providing sustainment and replenishment to forces on shore and at sea.

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