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**NAVAL
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MONTEREY, CALIFORNIA

THESIS

**MARITIME SOF IN THE LITTORALS: THEORETICAL
PRINCIPLES FOR SUCCESSFUL LITTORAL SPECIAL
OPERATIONS**

by

Torbjorn Grimeland
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June 2016

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**MARITIME SOF IN THE LITTORALS: THEORETICAL PRINCIPLES FOR
SUCCESSFUL LITTORAL SPECIAL OPERATIONS**

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ABSTRACT

This thesis uses past experiences to help develop a theoretical framework for maritime special operations forces (SOF) to succeed in the littorals. The theoretical framework defines six principles important to special operations in littoral spaces: deliberate planning, tailored force, specified mobility, joint support, cover/concealment, and innovation. Five historical case studies followed by a vignette show the importance of these theoretical principles for planning and executing successful special operations in this complex environment. These principles should be considered for incorporation into any future SOF doctrine or concepts designed for this environment.

For more than a decade of deployment in Afghanistan and Iraq, maritime SOF focused on land warfare. However, most maritime and amphibious forces are currently refocusing their efforts to their core capabilities. General statistics indicate that, because of population growth, urbanization, and half the world's population living no more than 120 miles from a coast, future conflicts and humanitarian disasters will likely take place in the littorals. Littoral operations are vastly different from land-locked or open-water operations. Maritime SOF units must prepare for future operations in the littorals.

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LIST OF ACRONYMS AND ABBREVIATIONS

CP	Counter-Piracy
CT	Counterterrorism
EUNAVFOR	European Union Naval Forces
FATA	Federal Administrated Tribal Area
FOB	Forward Operating Base
GPMG	General Purpose Machine Gun
HRO	Hostage Rescue Operations
IS	Islamic State
ISI	Inter Services Intelligence
JSO	Joint Special Operations
LAW	Light Anti-armor Weapon
LeT	Lashkar-e-Taiba
MPRA	Maritime Patrol Reconnaissance Aircraft
MV	Merchant Vessel
NATO	North Atlantic Treaty Organization
NGS	Naval Gunfire Support
NLMARSOF	Netherlands Marines Special Operations Force
OP	Observation Post
PUP	Pick-Up Point
PRCC	Personnel Recovery Coordination Cell
RHIB	Rigid Hull Inflatable Boats
SAM	Surface-to-Air Missile
SAS	Special Air Service
SBS	Special Boat Service
SDV	Seal Delivery Vehicle
SOE	Special Operation Executive
SOF	Special Operation Forces
SOMTU	Special Operation Maritime Task Unit
SR	Special Reconnaissance
TF	Task Force

TTP	Tactic, Technique, and Procedure
UN	United Nations
VOIP	Voice Over Internet Protocol
WWII	World War II
ZKRS	HMS <i>Zuiderkruis</i>

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I. INTRODUCTION

A landing on a foreign coast in the face of hostile troops has always been one of the most difficult operations of war.

—Captain Sir Basil H. Liddell Hart (1895–1970)

Both history and recent events demonstrate that many conflicts and crises occur in the littorals.¹ Despite history, little has been done to produce a doctrine specifically focused on operations in the littorals. Existing doctrine is primarily focused on five traditional domains: land, sea, air, space, and information.² In the doctrines of many nations, a gap exists in accounting for the littorals and their complex interrelationship with the other domains. It is increasingly important to strategize for the littorals, since some powerful economic and social trends indicate that decisive battles will be fought in this complex intersection of multiple domains.

An extensive literature review has helped identify six viable principles for successful littoral special operations, applicable regardless of timing and location of these operations. Therefore, this study aims to conduct a theoretical analysis of historical special operations to show the importance of viable principles that support the success of special operations in the littorals. Thereafter, states with interests in the littorals can take the principles developed and analyzed in this research and apply the concepts to future doctrine to support littoral special operations.

A. WHY ARE THE LITTORAL AREAS IMPORTANT?

This section presents reasons why the littoral areas are expected to be increasingly important in the future.

¹ Richard Mills, “Littoral Combat Clip,” *Foreign Policy*, November 1, 2012, <http://foreignpolicy.com/2012/11/01/littoral-combat-clip/>.

² Kevin Benedict, “Information Operations: The Fifth Dimension of Warfare,” *SAP Insider*, December 11, 2012, <http://sapinsider.wispubs.com/Assets/Blogs/2012/December/Information-Operations-The-Fifth-Dimension-of-Warfare>.

1. For What Future Threat Patterns Must Governments Prepare?— A Scenario

To demonstrate the principles for littoral special operations in action beyond the analysis of the historical cases, this study offers a hypothetical scenario vignette that is indicative of the present and future situations governments interested in security issues within the littoral spaces should be prepared to cope with.

Since Gadhafi's fall in 2011, Libya has been caught in a raging civil war. In 2012, a new prime minister and parliament were elected; one would expect the country would have moved in a democratic direction. However, the election in 2014 caused increasing tension as many of the old members of the parliament refused to resign. The 2014 election resulted in a dual government, and the United Nations (UN) moved in to negotiate between the rival parties.³ Currently, there are multiple large factions in Libya fighting for power. Some jihadists have pledged their allegiance to the Islamic State (IS) and have taken control over the coastal city Sirte.⁴ The IS of Libya is expanding rapidly as Russia and Western powers attack IS in Syria and Iraq.⁵

Moving from the present to a possible future, in 2024, after 13 years of civil war, the UN attempted to stabilize the country, to no avail, with rival groups dividing the country between them, leaving Libya a failed state. After the IS's defeat in Syria and Iraq, the Libyan IS is the only franchise of the group that holds actual ground and is expanding its control to include the coastal areas from Sirte to Tripoli and Zuwara. Over time, the population of Tripoli has doubled from 2.2 million people in 2016 to 4.4 million in 2024.⁶

³ Central Intelligence Agency, "The World Factbook: Libya," accessed April 19, 2016, <https://www.cia.gov/library/publications/the-world-factbook/geos/ly.html>.

⁴ Nick Robins-Early, "What We Know about ISIS in Libya," *Huffington Post*, February 19, 2016, http://www.huffingtonpost.com/entry/IS-presence-in-libya_us_56b369e2e4b08069c7a6352f.

⁵ Jim Sciutto, Barbara Starr, and Kevin Liptak, "ISIS Fighters in Libya Surge as Group Suffers Setbacks in Syria, Iraq," CNN, February 4, 2016, <http://www.cnn.com/2016/02/04/politics/isis-fighters-libya-syria-iraq/>.

⁶ A fictional scenario is presented, starting in this paragraph.

Islamic State Libya is popular and has the ability to recruit foreign fighters from Europe, Asia, and former Soviet Union countries, which enables it to import cheap drones from these areas. The drones provide intelligence, surveillance, and reconnaissance for their fighting groups. Islamic State Libya are also in the position to acquire integrated GPS-controlled mortars rounds, night vision goggles, and guided surface-to-air-missiles (SAMs) in their arsenal. Islamic State Libya has developed a very specific navy, consisting mainly of small, simple, fast patrol boats and skiffs loaded with explosive charges. Their navy units are specifically designed to apply tactics based on swarming concepts.⁷

Islamic State Libya expands its influence beyond the Libyan borders. The group has supported several terrorist attacks on soft European targets, public transport and news agencies. In 2024, its most powerful and deadly attack occurred during the finals of the Union of European Football Associations soccer championship, between France and Britain in Germany. The French and British public demanded actions from their governments to avenge the numerous national players and citizens who died in the attack.

In the fall of 2024, both French and British governments decide to act against IS Libya by ordering an operation to capture or kill its leadership. However, they face a challenging situation. The terrorists have positioned themselves in a very large and dense city along the coast, using the population as a cover and a human shield. The terrorists can defend themselves against air attacks with their SAMs and against any approaching surface navy with their simple but effective swarming patrol boats. Any conventional, large-scale intervention will result in large numbers of casualties among the innocent civilian population, and probably the loss of some French and British strategic assets as a result of the SAMs and swarming attack boats.⁸

⁷ John Arquilla and David F. Ronfeldt, *Swarming & the Future of Conflict* (Santa Monica, CA: RAND, 2000), vii.

⁸ This thesis will return to this scenario at the conclusion of the historical case studies and analysis.

2. Why Should Military Leadership Focus on Littoral Spaces?

In *The Art of War*, famous military theorist Baron A.H. de Jomini lists all the large maritime expeditionary operations from 500 BC up to the early 1800s.⁹ He points out how navies have always moved armies to the battlefields, and the littorals have always been the gateway. Is today any different? There have always been smaller specialized units, some of which precede modern special operations forces (SOF), consistently supported amphibious landings by scouting for good landing points. Underwater demolition teams cleared the beaches of obstacles on D-Day at Normandy and the Allied Jedburgh teams prepared the environment beyond the beaches.¹⁰

There are three main reasons why the littorals will become increasingly important and why focusing on the littorals is a right decision from a strategic perspective. The first reason is based on population trends. The second reason is the complexity of the littorals and the third reason is decades of limited attention on the littorals.

Four worldwide trends increase the likelihood of future conflicts in the littorals. First, the world's population is growing at an increasing rate.¹¹ In 1900, the population was just 1.5 billion, and over the next 100 years, the world population doubled to 6 billion.¹² The UN predicts that by 2050 the world population will reach 9.6 billion, and by 2100 there will be 10.9 billion people in the world.¹³

The second trend shows that the growth in human population is not equally distributed across the world. More growth is expected to take place in the U.S., India, Indonesia, Pakistan, the Philippines, and the least developed countries in Africa.¹⁴ Third,

⁹ A.H. de Jomini, *The Art of War* (London: Greenhill Books, 1996), 361–90.

¹⁰ Jedburgh teams consisted of three men. Their main mission in WWII was to link the French resistance to arriving conventional forces, just before major combat operations would take place. "Jedburgh," OSS, Office of Strategic Services, accessed April 7, 2016, <http://www.soc.mil/OSS/jedburghs.html>.

¹¹ United Nations Bureau of Economic and Social Affairs, *World Population Prospects: The 2012 Revision, Vol. 1* (New York: United Nations, 2013), xiv.

¹² David Kilcullen, *The Australian Army in the Urban, Networked Littoral*, Army Research Paper No. 2 (Sydney: Commonwealth of Australia, 2014), 8.

¹³ United Nations Bureau of Economic and Social Affairs, *World Population Prospects*, xiv.

¹⁴ *Ibid.*

the growth of human population is becoming more concentrated around cities, and the population is moving away from rural areas.

Figure 1 demonstrates this trend. The graph illustrates that, in 2010, the global population was more urban than rural for the first time in history and that this trend will increase in the future. Figure 1 illustrates that, in 2030, “nearly two-thirds of the world’s population will be living in urban areas.”¹⁵

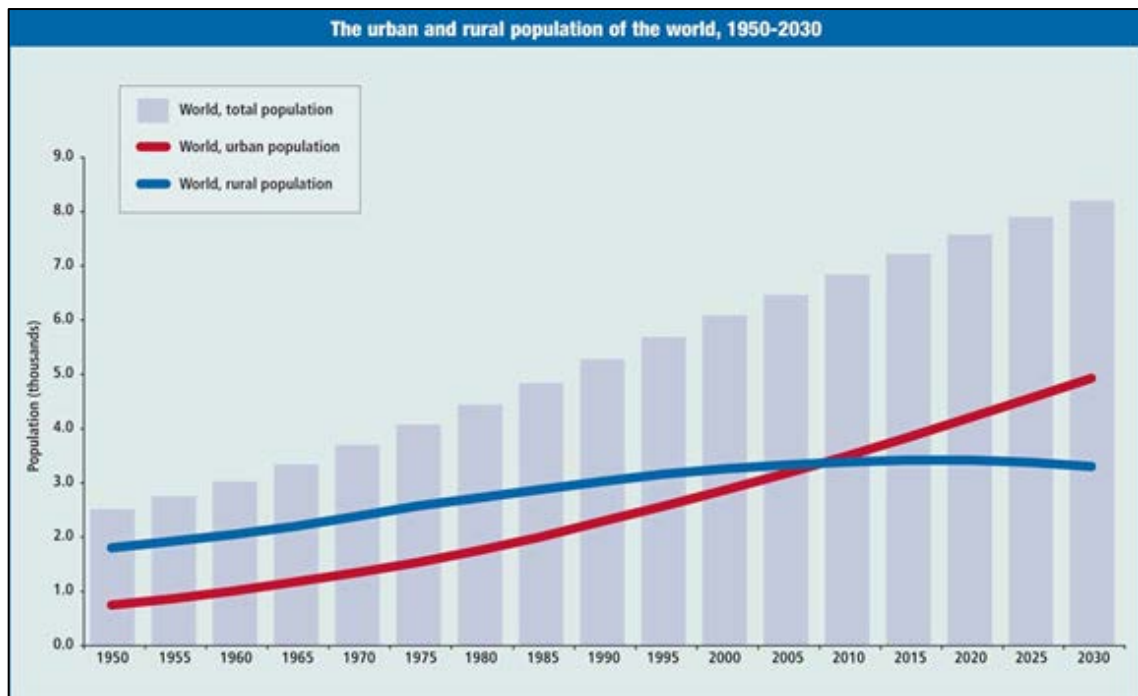


Figure 1. Urban and Rural Population of the World, 1950–2030¹⁶

The fourth trend is urbanization in the littorals. It is predicted that the future growth of the world population will take place in the cities of Asia, Africa, and the U.S.¹⁷ In the past, many large cities were positioned close to rivers, seaports, deltas, or lakes for economic reasons. These coastal cities have attracted large numbers of people, since there are more facilities (health care, schools, houses, electricity, and so on) and job

¹⁵ Ibid., 1.

¹⁶ United Nations Bureau of Economic and Social Affairs, *World Population Prospects*.

¹⁷ Ibid., 1.

opportunities. By 2012, nearly 75 percent of large and mid-sized cities were littoral.¹⁸ Urbanization and movement toward the littoral zone resulted in half of the world's population living no more than 120 miles from the coast.¹⁹ Conflicts tend to originate or concentrate where people live, hence, the increased risk of conflict in the urban littorals. In particular, large cities within a weakened state provide conditions for terrorists, insurgents, and organized crime to flourish.²⁰

The second reason, the littoral environment is unique and complex as the other five domains intersect there.²¹ Most military doctrines are based on at least one of the five different domains with concepts used to increase the chances of operational success. In some cases, the domains overlap or influence other domains. The intersection of domains adds complexity and challenges when developing sound operational concepts. Because, as the environment becomes more complex, so also does the enemy threat. David Kilcullen provides an interesting view on the complexity of the littorals with nine littoral subdomains that he describes as all interrelated or influencing each other in various ways, creating complex and sensitive relationships among themselves (see Figure 2).²² Where the domains intersect also the authority of each service or agency intersect. Responsibilities become uncertain and it increases the need for coordination. This increases the difficulty of conducting operations, developing concept or doctrine for the littorals.

¹⁸ Kilcullen, *Australian Army*, 13.

¹⁹ Maritieme Visie [Maritime vision], De Koninklijke marine in 2013 [Royal Netherlands Navy in 2013], 4.

²⁰ Magnus Nordenman, *The Naval Alliance: Preparing NATO for a Maritime Century* (Washington, DC: Atlantic Council, June 2015), http://www.atlanticcouncil.org/images/publications/NATOMaritime_finalPDF.pdf.

²¹ Five traditional domains: land, sea, air, space and information. See Benedict, "Information Operations."

²² Kilcullen, *Australian Army*, 25–26.

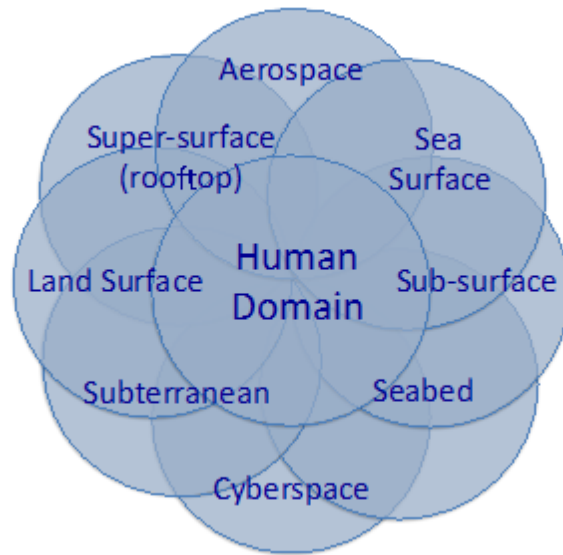


Figure 2. Nine Subdomains in the Littoral Domain²³

The third and final reason to focus on and strategize about the littorals is the decades of limited attention to the environment. For the last 15 years, the United States and its allied and coalition forces have fought primarily within the land domain during the lengthy campaigns in both Iraq and Afghanistan. Before that the focus was on peacekeeping in former Yugoslavia, Africa and Asia. Special Operations Forces and those that specialize in maritime special operations have also been deeply embroiled in these land-based fights, so much so that these forces have lost their ability to perform in the maritime domain. With the campaigns in Iraq and Afghanistan decreasing in size and scope, new maritime threats such as Somali piracy have given maritime SOF an opportunity to concentrate on their core business in the maritime and littoral domains.²⁴ Maritime SOF need to regain their specific expertise on how to operate in the littorals.

²³ Kilcullen, *Australian Army*, 26.

²⁴ Dan Lamothe, "Marine Corps Realigns Its Special Operations, Sends Elite Troops to Middle East," *Washington Post*, January 20, 2015, <https://www.washingtonpost.com/news/checkpoint/wp/2015/01/20/marine-corps-realigns-its-special-operations-sends-elite-troops-to-middle-east/>.

3. What Are Littoral Areas?

There are two main categories for defining the littorals. The first category is the civilian geographically-based definition, which varies between tide-based distances and continental shelf-based definitions.²⁵ The second category is the various military definitions, which often are weapon range- or influenced-based. The United States, British, and Norwegian militaries have similarities in their definitions. British doctrine is, however, more limiting than U.S. or Norwegian doctrine. British doctrine focuses primarily on the ability to influence these areas from the sea. British military doctrine defines the littorals thus:

The littoral, a vast, highly complex, and immensely diverse area, comprises [exclusive economic zones], territorial seas, and land territory. ... A substantial proportion of the world's economic and political activity is being conducted in a narrow strip of land and sea on average no wider than 300 miles. This narrow band, referred to as the littoral and is defined as those land areas (and their adjacent sea and associated air space) that are predominantly susceptible to engagement and influence from the sea.²⁶

U.S. and Norwegian definitions also include the ability to influence the sea from land. The U.S. definition is:

The littorals comprise two segments of battle space: 1. Seaward: the area from the open ocean to the shore, which must be controlled to support operations ashore. 2. Landward: the area inland from the shore that can be supported and defended directly from the sea.²⁷

The Norwegian definition of littorals translates almost identically to the U.S. definition.²⁸ Though the definitions may vary, each nation's military ability to influence these areas is vastly different. Large militaries with a high level of military technology

²⁵ *Encyclopedia Britannica*, s.v. "Littoral zone," accessed April 19, 2016, <http://www.britannica.com/science/littoral-zone>. Civilian definitions explain the littorals as the highest sea level to the lowest tide and the area between.

²⁶ Ministry of Defence, *British Maritime Doctrine*, Joint Doctrine Publication 0-10 (Shrivenham, England: The Development, Concepts and Doctrine Centre, August 2011).

²⁷ U.S. Department of Defense, *Command and Control for Joint Maritime Operations*, Joint Publication 3-32 (Washington, DC: Department of Defense, Joint Doctrine Division, August 7, 2013).

²⁸ Forsvarsstaben [Norwegian Defense Staff], *Forsvarets fellesoperative doctrine* [Norwegian joint doctrine] (Oslo: Forsvarets høyskole [Norwegian Defense Staff College], 2014), 223.

can expand their influence in the littoral zone by extending their operational reach both inland and into the open ocean.²⁹ For example, Chinese land-based surface missile systems are capable of stretching the littoral zone because of the system's advanced technology. Figure 3, the map of the South China Sea, the Indian Ocean, and the Pacific, shows the range of one class of Chinese missile systems. Other smaller nations with less technology, however, may think of the littoral zone as something very different.

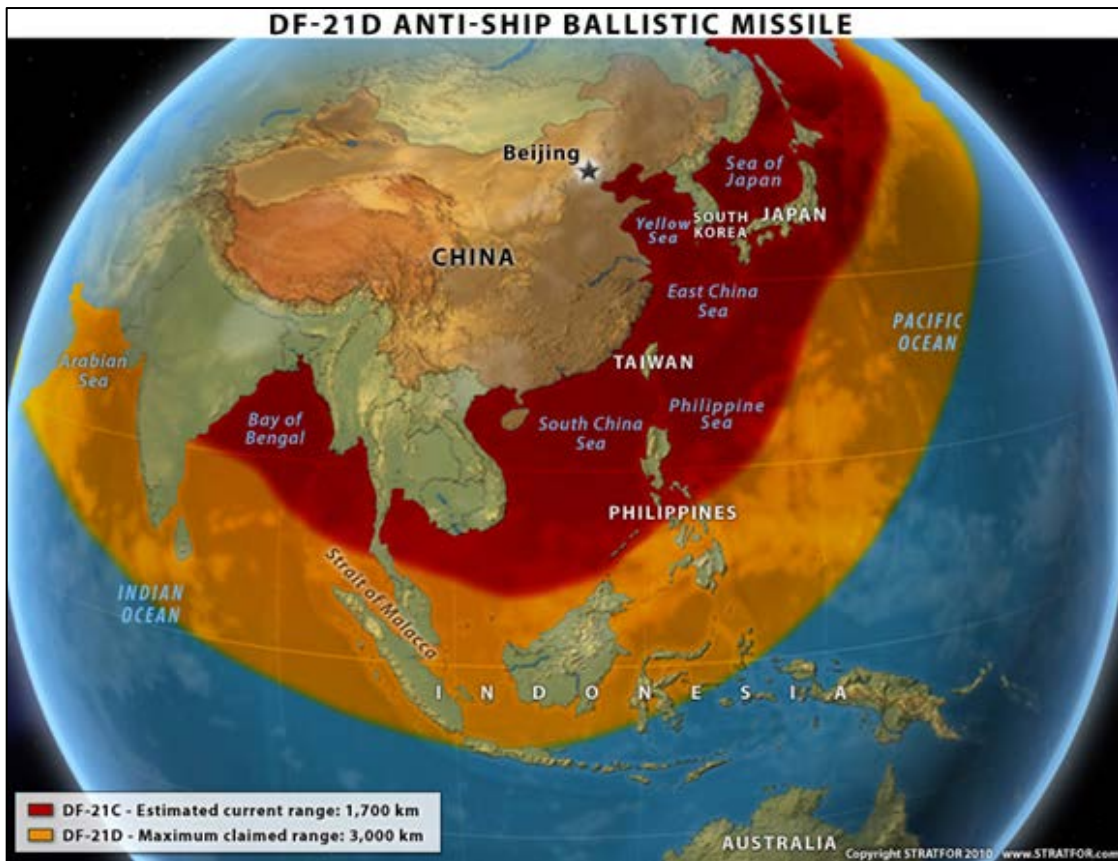


Figure 3. Maximum Weapon Range Template for the Chinese Dong Feng 21 Anti-ship Ballistic Missile³⁰

²⁹ NATO does not have its own definition for the littorals.

³⁰ David Kilcullen, "The Conduct of Future Operations in the Urban Littoral, and Its Implications for NATO," paper presented at the Final Coordination Conference for the Urbanisation Experiment, Sofia, Bulgaria, March 2015, 12.

Kilcullen defines the littorals in “The Conduct of Future Operations in the Urban Littorals, and Its Implications for NATO” as:

In a military sense, a littoral zone is the portion of land space that can be engaged using sea-based weapon systems, plus the adjacent sea space (surface and subsurface) that can be engaged using land-based weapon systems, and the surrounding airspace and cyberspace. In other words, a littoral zone is the sea space you can hit from the land, the land you can hit from the sea, and the airspace and cyberspace above both. Obviously enough, the area you can hit depends on the weapon you’re using, so as weapons get more capable and longer in range, the size of the area defined as “littoral” grows accordingly. Also, obviously, areas that are littoral for a military with long-range weapons and strike platforms may not be so for another military with shorter-range systems. However large or small littoral zones may be, the interaction among mutually influencing sea, land, air, and cyber spaces makes such zones highly complex systems that are vastly more dynamic than the sum of their parts.³¹

Kilcullen also argues that, in military scenarios, a littoral definition should always be capability-based more than territorial- or zone-based.³² His definition is a more detailed version of the U.S. and Norwegian definitions.³³

4. What Forces Are Best Suited for Operations in the Littorals?

Many types of forces can operate in the littorals. However, taking into account the complex nature of the littorals, including the subdomains, and the dense population in megacities, not every force is equally suited to operate there. A selected force needs to be able to operate fluidly against opponents of an irregular nature and to respond to a crisis or conflict on short notice.³⁴ Additionally, some governments will want to minimize collateral damage during any military operation, so the force needs to be able to operate surgically and preferably with a small footprint.

³¹ Kilcullen, “The Conduct of Future Operations,” 10.

³² *Ibid.*, 1.

³³ For this thesis, the U.S. and Norwegian definitions of littorals are used as a framework to have a common understanding of what is discussed. However, the reader should bear in mind that there are variations of the understanding of what the littoral areas are.

³⁴ Brian B. Ettrich, “The Principles of War: Are They Still Applicable?” (master’s thesis, Naval Postgraduate School, 2005).

Given these considerations, SOF is one of the most suitable forces to operate in the littoral environment. In general, SOF units are designed to execute complex missions on short notice since they are specially equipped and trained for these tasks. They are organized in relatively small units and have the capability to strike with high accuracy, especially in conjunction with airpower.³⁵

A broad variation of definitions of SOF exists; one informal definition is “that they are what conventional forces are not.”³⁶ Others may define Special Forces as elite versions of conventional forces with better training and equipment, but that would include units like the UK’s Para or the Norway’s Coastal Rangers.³⁷ While these are elite forces in comparison to conventional ones, with special equipment and training, they do not conduct special operations across the spectrum, and thus they are not defined as SOF.³⁸ The North Atlantic Treaty Organization (NATO) defines special operations as:

military activities conducted by specially designated, organized, trained and equipped forces using operational techniques and modes of employment not standard to conventional forces. These activities are conducted across the full range of military operations (peace, crisis and conflict) independently or in co-ordination with operations of conventional forces to achieve military, political, economic and psychological objectives or a combination thereof. Political-military considerations may require covert or discreet techniques and the acceptance of a degree of physical and political risk, not associated with conventional operations.³⁹

Most NATO countries follow this definition and categorize special operations into three main types of operations: Military Assistance (MA), Direct Action (DA), and

³⁵ Brent Bahl, “Special Operations, Intelligence, and Airpower: A Lethal Triumvirate,” *War on the Rocks*, September 25, 2015, <http://warontherocks.com/2015/09/special-operations-intelligence-and-airpower-a-lethal-triumvirate/>.

³⁶ Christopher Lamb, “Perspectives on Emerging SOF Roles and Missions,” *Special Warfare* 8, no. 3 (July 1995): 3.

³⁷ Tom Robertsen, “Transforming Norwegian Special Operation Forces” (master’s thesis, Naval Postgraduate School, 2006), 14. Robertsen cites Lars M. Hovtun, “Spesialister Får NATO- Trening” [Specialists get NATO training], Norwegian Defense, accessed October 11, 2005, <http://www.mil.no/haren/start/article.jhtml?articleID=108557>.

³⁸ Robertsen, “Transforming Norwegian Special Operation Forces.”

³⁹ NATO. *Allied Joint Doctrine*. AJP-01(D). Brussels: NATO, 2010. L-12.

Special Reconnaissance (SR).⁴⁰ U.S. SOF has its own definition and divides these along mission types with nine different core activities.⁴¹ Most of these activities can occur in the littorals.

Retired Admiral William McRaven defines special operations as “conducted by forces specially trained, equipped, and supported for a specific target whose destruction, elimination, or rescue is a political or military imperative.”⁴² He has received some criticism that his theory is solely focused on the conduct of direct action and does not offer an explanation for any of the other nine mission types, though he argues his theory of special operations is applicable across the SOF spectrum.⁴³

Former U.S. Defense Intelligence Agency (DIA) analyst Ross Kelly defines SOF differently: “The thrust of conventional force training ... is the achievement of consistent performance of routine tasks to the highest attainable standard. By contrast, the emphasis in special operations is on directing individual skills to the accomplishment of functions unique to a given mission, generally a high-risk one. Improvisation and independent thinking are essential.”⁴⁴ This definition captures how SOF covers a wide spectrum of training and operations, while conventional forces conduct specific training in order to achieve the highest possible standard in their specific task.⁴⁵ The wide spectrum of capabilities enables SOF to excel across the littoral sub-domains and transfer successfully between them.

⁴⁰ Forsvarsstaben [Norwegian Defense Staff], *Forsvarets fellesoperative doctrine* [Norwegian joint doctrine], 120.

⁴¹ Chairman, Joint Chiefs of Staff, Special Operations, Joint Doctrine 3-05 (Washington, DC: CJCS, July 16, 2014), II-3. U.S. SOF Core Activities: direct action, special reconnaissance, countering weapons of mass destruction, counterterrorism, unconventional warfare, foreign internal defense, security force assistance, hostage rescue and recovery, counterinsurgency, foreign humanitarian assistance, military information support operations, and civil affairs operations.

⁴² William H. McRaven, *Spec Ops: Case Studies in Special Operations Warfare; Theory and Practice* (Novato, CA: Presidio, 1995), 3.

⁴³ McRaven, *Spec Ops*, 3.

⁴⁴ Ross S. Kelly, *Special Operations and National Purpose* (Lexington, MA: Lexington Books, 1989), xvii.

⁴⁵ For this thesis, the NATO definition will be used. But the reader should keep in mind that each country might have its own definition of special operations and what SOF units are.

Some countries have several SOF units usually divided into maritime, land, and air units. It can be hard to distinguish the missions and tasks from within each unit because they often overlap, as many try to exercise an expertise in various forms of infiltration such as via air and water means. These capabilities then, in turn, naturally intersect in the littoral domain. In general, the main focus of maritime SOF units is on maritime and littoral areas while land SOF units focus on land operations. However, since the littoral domain is influenced from sea, air, and land, it is natural to expect land SOF to also operate in this domain.⁴⁶

Specifically regarding the littorals, typical maritime SOF units are capable of conducting operations in all domains. Highly equipped, specially trained, SOF units have operational experience in using insertion and extraction methods for air, land, and the maritime domain, all in order to actually conduct operations within both land and maritime domains. More importantly, maritime SOF is able to cross the borders of the three domains. Their capability is of high value in the littorals, since it enables maritime SOF to maneuver and operate with specified mobility assets in each sub-domain of the littorals. Figure 4 illustrates the domain crossing capabilities of maritime SOF. Most maritime SOF is also likely rooted in their respective navy or Marine Corps services, which help minimize the complexity of conventional support. The strong relationship between these services enables the SOF.

⁴⁶ Large-scale special operations in the former Yugoslavia, Afghanistan, and Iraq have forced countries to use maritime as well as land units in land-locked countries. Conversely, in this thesis, the focus is on maritime SOF, but large littoral operations may result in land SOF units joining the effort.

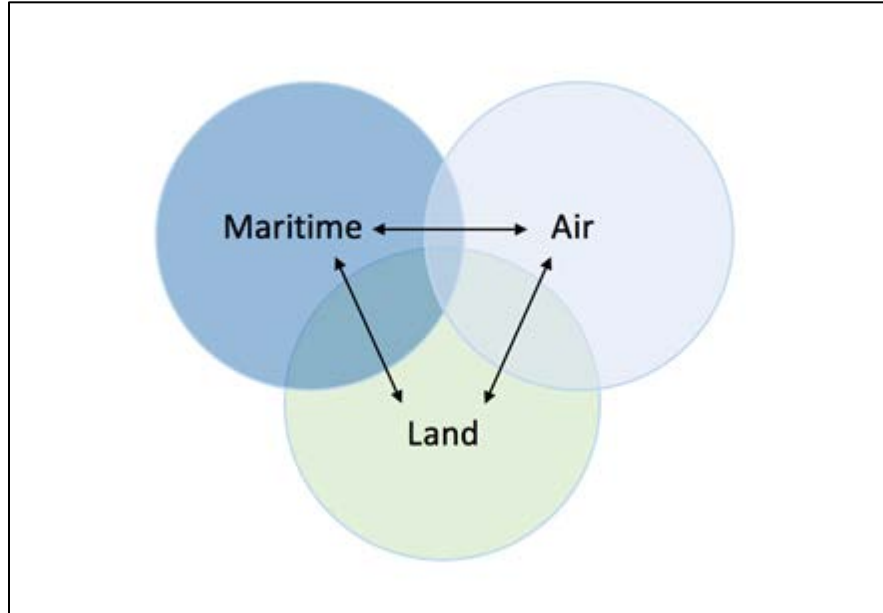


Figure 4. The Capability of Maritime SOF to Cross the Borders of the Three Domains

5. How Will Maritime SOF Operate in the Littorals?

Every country varies in its approach to operating in the littorals. Some countries have detailed doctrines for all five domains, but not specifically for the littorals. For example, the U.S. Marine Corps has developed a doctrine for amphibious operations,⁴⁷ whereas Norway⁴⁸ and neighboring Sweden have littoral concepts that focus only on conventional warfare. Even though SOF has the ability to operate across each of the domains in littoral spaces, this study has not identified any concepts or doctrine specific to special operations in the littorals.

⁴⁷ U.S. Department of Defense, *Amphibious Operations, Joint Publication 3-02* (Washington, DC: Department of Defense, July 18, 2014), <http://www.defenseinnovationmarketplace.mil/resources/JointDoctrineAmphibiousOperations.pdf>.

⁴⁸ The Norwegian Maritime Doctrine has a concept for amphibious warfare. Forsvarets overkommando [Norwegian Defense Command], *Norsk Doktrine for Maritime Operasjoner* [Norwegian doctrine for maritime operations] (Oslo: AS Gutenbergs Eftf., 2002), 87.

B. RESEARCH QUESTION

Now that maritime SOF has time to shift their focus to the littorals, specific concepts and doctrine are required to ensure that maritime SOF is well-prepared to operate in the littoral domain. The refocus of maritime SOF units to littoral operations is vital, considering the four megatrends and the likelihood of the littorals as a future operational environment.

In support of this operational shift to the littorals, this research asks the question: How can past operational experiences from the littoral areas help lead to the development of for future littoral special operations? To answer this question, this study develops a theoretical framework for littoral special operations that is based on six viable principles that are significantly important to SOF's success in this complex cross-domain environment.

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II. LITERATURE REVIEW AND METHODOLOGY

It is not big armies that win battles; it is the good ones.

—Maurice de Saxe, *Mes Reveries*, 1732

In Chapter I, the thesis discussed the definition and special needs of preparing for operations in littoral areas, with a keen eye to an increasingly complex world. Strategizing about warfare, however, is nothing new. This chapter discusses principles of war developed by important military thinkers from Sun Tzu 500 BC until Ferdinand Foch in 1918. A review of modern principles of war and those distinctive to SOF follow. From this review, key principles are then derived specific to the needs of littoral special operations to help better prepare SOF prepare for future employment.

A. PRINCIPLES OF WAR, LARGE MILITARIES, AND SOF

Thinking hard about how to best employ military forces is not a new practice. In 500 BC, Chinese general Sun Tzu was the first military thinker to develop principles of war. In *The Art of War*, Tzu outlines several guiding principles for warfare. However, these principles of war are not how they are known today.⁴⁹ Mark McNeilly reorganized and distilled Sun Tzu's works into six principles that are comparable to modern principles of war.⁵⁰

1. Win All without Fighting: Prioritize Threats and Determine Strategic Focus.
2. Avoid Strength, Attack Weakness: Develop Attacks against the Enemy's Weakness.
3. Deception and Foreknowledge: Wargame and Plan for Surprise.
4. Shaping the Enemy: Integrate Best Attacks to Defeat the Enemy.

⁴⁹ P.K. Mallick, *Principles of War: Time for Relook*, Manekshaw Paper No. 12 (New Delhi: Centre for Land Warfare Studies), http://www.claws.in/images/publication_pdf/1249965562Mankshaw%20Paper%2012.pdf.

⁵⁰ Mark R. McNeilly *Sun Tzu and the Art of Modern Warfare*, updated edition (London: Oxford University Press, 2014), 206–7; Seiha, “The Six Principles from Sun Tzu and *The Art of Modern Warfare*,” *Sun Tzu, Sun Zi Strategy* (blog), accessed May 20, 2016. <http://suntzuartstrategy.blogspot.com/2011/09/six-principles-from-sun-tzu-and-art-of.html>.

5. Speed and Preparation: Ready Attacks and Release Them.
6. Leadership: Reinforce Success, Starve Failure.⁵¹

Some of the principles that Sun Tzu and McNeilly mention support current concepts. Avoiding strength and attacking strength is a form of modern maneuver warfare. Wargaming and preparation are extremely useful in the littoral operations domain due to the complex nature of these operations and small margins for errors.

Around 300 BC, Indian philosopher and leader Kautilya (also called Chanakya) developed *Arthashastra*, a book on governance, which included military strategy. He identified important principles for planning a military campaign:

1. Power in terms of strength of fighting forces, enthusiasm, and energy.
2. Place of operation, type of terrain, and selection of ground of own choosing.
3. Time of military engagement.
4. Season for marching towards the battleground.
5. When to mobilize different types of forces.
6. Possibility of revolts and rebellions in the rear.
7. Likely losses, expenses, and gains.
8. Likely dangers.⁵²

Kautilya considered terrain a principle with powerful influence on strategy. Especially in the littorals, terrain can play a key role, in particular when forces are crossing different kinds of terrain, or in modern terms, domains. He also mentions the use of different types of forces, understanding that there is no standard solution or formula when it comes to the type of configuration or force structures. This consideration is important when operating in the multi-domain area of the littorals.

In 1512, Machiavelli published *The Art of War*, focused on discipline in the military with principles that focused on “the importance of morale, security, surprise,

⁵¹ McNeilly, *Sun Tzu and the Art of Modern Warfare*, 206–7.

⁵² Mallick, *Principles of War*, 3.

discipline, need for reserves, know yourself and know your enemy, use of terrain, logistics, intelligence and objective.”⁵³. Machiavelli, like Kautilya, focused on the terrain principle. He also focused on surprise and security, which also are very important for littoral special operations.

Then, 200 years later, in 1757, Maurice de Saxe published his theory in *Reveries* where he emphasized the “need of administration, logistics, morale, deception, initiative, leadership and discipline.”⁵⁴ Inspired by de Saxe, Frederick the Great also had a keen interest in preparations to drive operations with maxims for success in military operations: “logistics, maneuver, security, cultural awareness, morale, initiative and leadership.”⁵⁵ Here again, concepts related to maneuver and securing the movement of forces are both considered vital to success. Initiative, deception, and security are also important principles for littoral operations.

Napoleon never wrote down his own principles of war, but he did see the importance of them. He said, “The principles of war are those which have guided the great leaders whose achievements have been handed down to us by history.”⁵⁶ Both Clausewitz and Jomini based their writings on their experiences in fighting alongside or against Napoleon. Clausewitz’s first book *Principles of War*, published in 1812, was one of the first times the phrase *principles of war* was used by one of the great military thinkers. He divided his principles into “general principles for defense, general principles for offense, principles governing the use of troops and principles for the use of terrain.”⁵⁷ These four main principles had many detailed principles to explain the execution in detail. Clausewitz listed several rules under each general principle, which are relevant for littoral operations. He emphasized the importance of cover, planning, surprise, and taking

⁵³ Mallick, *Principles of War*, 3.

⁵⁴ *Ibid.*, 4.

⁵⁵ *Ibid.*

⁵⁶ Ferdinand Foch, *The Principles of War*, trans. J. de Morinni (New York: The H.K. Fly Company Publishers, 1918), 13.

⁵⁷ Carl von Clausewitz, *Principles of War*, trans. and ed. Hans W. Gatzke (Harrisburg, PA: The Military Service Publishing Company, 1942).

advantage of the terrain. These are also very important for littoral operations. Clausewitz's theory was later developed and refined in *On War*, published in 1832.

Jomini also created fundamental principles of war in his book *The Art of War*.⁵⁸ Jomini's principles were conceptual and designed to guide military commanders and staffs in planning and conducting military operations. Jomini later wrote a summary of his book with four main principles:

1. How men should be directed at decisive points against enemy lines of communication while protecting your own.
2. Maneuver with strength against enemy weakness.
3. Throw the mass of force onto the enemy's decisive point.
4. Mass force so it is not only used against the decisive point, but at the proper time with the proper amount of force.⁵⁹

His last principle is especially useful for special operations in the littorals since he understands the importance of a certain amount, or structured, force that is used correctly in time and place. SOF is best used for these kinds of missions, especially in the littorals.

Marshal Ferdinand Foch, commander of Allied Armies during World War I, also developed his own principles of war in 1918 and published them in *The Principles of War*. His principles were: "principle of economy of power, principle of freedom of action, principle of free disposal of power and principle of protection etc."⁶⁰ These principles are still important. In littoral spaces, freedom of action is a result of the ability to maneuver between the domains. In some cases, there is very limited maneuverability in the littorals. The principle of protection is also vital; it includes cover and concealment of the force and operational security.

Most of today's modern militaries have principles of war inspired by the military theorists mentioned, especially Clausewitz and Jomini's theories and principles. They are often used as list of considerations applicable to all types of operations regardless of the

⁵⁸ Jomini, *Art of War*, 66–71.

⁵⁹ Mallick, *Principles of War*, 4–5.

⁶⁰ Foch, *Principles of War*, 13.

domain and precision required to execute. Today, the British Defense Doctrine lists ten guiding principles that are meant for commanders and staffs to be used in planning and operations in war.⁶¹ The Russian military uses the principles of war as a theoretical framework for preparing and conducting operations across all domains.⁶² The U.S. Armed Forces have nine principles of war (see Figure 5).

Today's Principles of War

Great Britain	United States	Russia
<ul style="list-style-type: none"> • Selection and Maintenance of the Aim • Maintenance of Morale • Offensive Action • Security • Surprise • Concentration of Force • Economy of Effort • Flexibility • Cooperation • Sustainability 	<ul style="list-style-type: none"> • Objective • Offensive • Mass • Economy of Force • Maneuver • Unity of command • Security • Surprise • Simplicity 	<ul style="list-style-type: none"> • High combat readiness • Surprise, decisiveness and active seeking to secure the initiative • Full use of all means of combat • Coordination and interaction of all types and branches • Decisive concentration • Simultaneous attack in depth • Full use of morale-political factor • Firm and continuous command and control • Inexorability and decisiveness during the mission • Security of combat operations • Timely restoration of troop combat readiness

Figure 5. Principles of War: Great Britain, United States, and Russia⁶³

⁶¹ Ministry of Defence, *UK Defence Doctrine, Joint Doctrine Publication 0-01*, 4th ed. (Swindon, England: Development, Concepts, and Doctrine Centre, 2011), http://www.mod.uk/NR/rdonlyres/FDB67DF9-5835-47FD-897D-CA82C17EC7A5/0/20111130jdp001_bdd_Ed4.pdf

⁶² David Glantz, *Soviet Military Operational Art: In Pursuit of Deep Battle* (London: Frank Cass, 1991), 7–8, <https://books.google.com/books?id=RWmD2iOgpFAC&printsec=frontcover#v=onepage&q&f=false>.

⁶³ Ministry of Defence, *UK Defence Doctrine*; Chairman, Joint Chiefs of Staff, *Joint Operations, Joint Publication 3-0* (Washington, DC: U.S. Government Printing Office, August 11, 2011), I2, A-1–A-4; Glantz, *Soviet Military Operational Art*, 7–8.

Though the modern principles of war adopted by the modern dominant military powers are all focused on a strategic level and on large-scale conventional war, several of them are directly applicable to littoral special operations because they are each important for consideration when operating across domains. In regards to conventional amphibious operations, the United States considers flexibility of the amphibious force to be important, as well as planning and rehearsals.⁶⁴ A good doctrinal example is the *Joint Shipboard Helicopter and Tiltrotor Aircraft Operations* publication of the United States.⁶⁵ The helicopter or tiltrotor is an asset in the maritime domain that can easily transport troops across several domains. The publication emphasizes planning and integration as important factors in operating in the maritime domain and in the littorals and to successfully cross domains.⁶⁶ NATO considers the integration of land, air, and maritime forces as one of the main characteristics of an amphibious operation.⁶⁷

From the perspective of special operations theory, the same thread of importance can also be seen between principles at the tactical level. According to McRaven's *Theory of Special Operations*, the principles of surprise, security, and repetition are all features of tactical operations that are especially critical to littoral special operations, because they embody the vulnerability of moving across domains (see Figure 6). He also emphasizes the necessity to be well-rehearsed and prepared prior to mission execution. These principles go hand-in-hand with the fundamental guidance for small unit dismounted patrolling in denied areas outlined in the U.S. Army's *Ranger Handbook*, where the principles of "Planning, Reconnaissance, Security, Control and Common Sense" are foundational to all operations.⁶⁸ Since these principles are key to supporting a small

⁶⁴ Chairman, Joint Chiefs of Staff, *Amphibious Operations, Joint Publication 3-02* (Washington, DC: CJCS, July 18, 2014), xii–xvi.

⁶⁵ Chairman, Joint Chiefs of Staff, *Joint Shipboard Helicopter and Tiltrotor Aircraft Operations, Joint Publication 3-04* (Washington, DC: CJCS, December 6, 2012), http://www.dtic.mil/doctrine/new_pubs/jp3_04.pdf.

⁶⁶ *Ibid.*, viii.

⁶⁷ *ATP-(B), Volume 1, Doctrine for Amphibious Operations*, July 2004, 1-3.

⁶⁸ *United States Army, Ranger Handbook, SH 21-76* (Fort Benning, GA: United States Army Infantry School, February 2011), <http://www.benning.army.mil/infantry/rtb/4thrtb/content/PDF/Handbook.pdf>.

vulnerable unit moving in denied territory, namely in the land domain, they naturally transfer well to operations across domains that also have small and vulnerable elements.

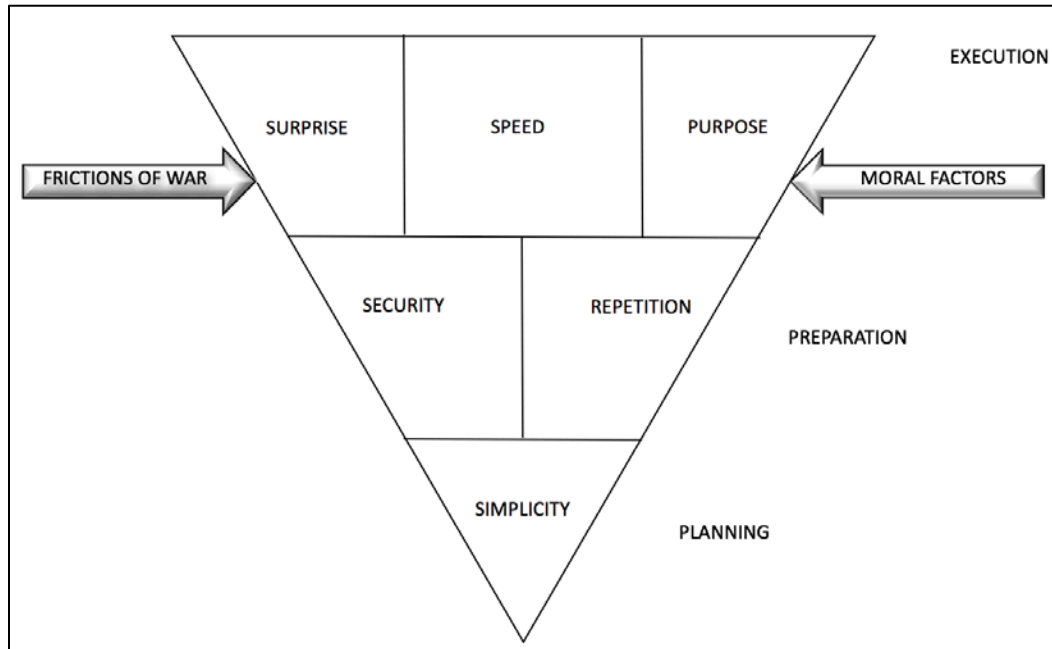


Figure 6. McRaven's Principles of Special Operations⁶⁹

B. DEFINITIONS OF DOCTRINE, PRINCIPLES, AND CONCEPTS

Doctrine, concepts, and principles of war are interconnected. Each of them plays an important role in preparing militaries to conduct war. In support of littoral special operations, this chapter defines six principles specific to the challenges of moving and operating in this unique intersection of the physical domains of military operations. Drawing on a number of theoretical traditions and experiences, these principles are developed to prepare SOF for future challenges in the littorals.

Carl von Clausewitz defined doctrine as “a guide to anyone who wants to learn about war from books: it will light their way, ease their progress, train their judgment and help them to avoid pitfalls. Doctrine is meant to educate the minds of future

⁶⁹ McRaven, *Spec Ops*, 11.

commanders ... not to accompany them to the battlefields.”⁷⁰ Ultimately, doctrine is a set of guiding principles for militaries in achieving national objectives, but they do require interpretation to make them useful. According to David M. Glantz, “The Soviets [Russia] define military doctrine as ‘a nation’s officially accepted system of scientifically founded views on the nature of modern wars and the use of the armed forces in them, and also on the requirements arising from these views regarding the country and its armed forces being ready for war.’”⁷¹ The RAND Corporation defines doctrine as “the fundamental set of principles that guides military forces as they pursue national security objectives. ... These principles ... can range from the policies and procedures put in place by a particular military branch to the tactics and techniques taught to new members during training.”⁷²

U.S. joint doctrine definitions go one step further by including the importance of coordination of actions and contain terms that also include tactics, techniques, and procedures of how to conduct operations. Military doctrine provides not only concrete principles, but also more abstract concepts such as irregular warfare (IW), air power, nuclear warfare, and maneuver warfare.

Military concepts provide descriptions of different methods or schemes to employ specific capabilities for the purpose of predetermined objectives or military aims. In the context of ways, means, and ends, concepts are regarded as the *ways*, while *means* are the capabilities, and *ends* are the objective of the specific operation.⁷³ Doctrine contains both common principles for conducting military operations and military concepts at different levels.

⁷⁰ Carl Von Clausewitz, *On War*, trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 141.

⁷¹ Glantz, *Soviet Military Operational Art*, 3.

⁷² “Military Doctrine,” RAND Corporation, accessed April 7, 2016, <http://www.rand.org/topics/military-doctrine.html>.

⁷³ John F. Schmitt, “A Practical Guide for Developing and Writing Military Concepts,” draft, accessed January 6, 2016, www.au.af.mil/au/awc/awxgate/writing/dart_paper_writing_mil_concepts.pdf.

C. PRINCIPLES OF LITTORAL SPECIAL OPERATIONS

To develop principles for littoral special operations, the researchers first reconsidered the puzzle of what makes special operations in the littorals so challenging. Since operations in littoral spaces require movement through and then transfer across at least two of the physical domains associated with military operations (air, land, sea surface, and subsurface), the researchers determined which principles of the classical military theorists, the current dominant military institutions, and those from the study of special operations are most applicable to developing these principles. Specifically, what are the most important considerations for commanders, planners, and operators in preparation for moving and conducting actions of the objective across multiple domains? In Figure 7, the principles of many military theorists are depicted in the top section of the upper triangle with the principles of the three dominant military doctrines since the end of World War II. In the bottom section of the top triangle, prominent SOF principles highlight the importance of the more general concepts to the specifics of special operations. Principles germane to littoral special operations are marked in red and italics.

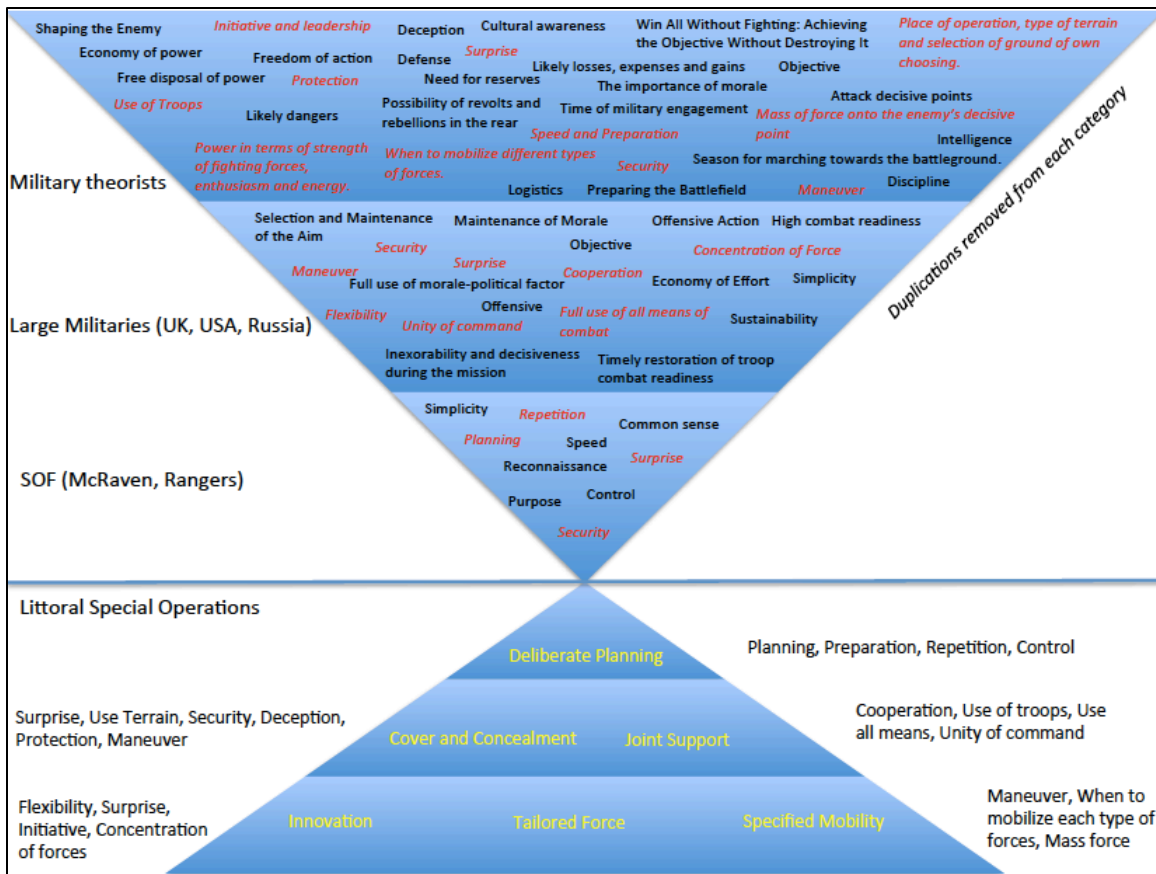


Figure 7. Comparison and Analysis of Principles

The littorals are a challenging environment in which to fight. Special forces often face unpredictable waters with quick changing and strong currents and also shallow waters, which limit maneuverability. The maritime environment can be deadly by itself, especially subsurface. Operating in the littorals means that forces often have to cross domains, which requires scarce assets, making resupply or reinforcements in support of the mission very difficult or impossible. The following principles were identified, based on the literature review, as necessary to overcome the challenges that the littorals present:

1. Deliberate planning
2. Tailored force
3. Specified mobility
4. Joint support
5. Cover and concealment
6. Innovation⁷⁴

1. Deliberate Planning

When a unit transfers between domains, the operational complexity increases and in turn, the vulnerability of the force increases. The transfer of the force involves avoiding or engaging an enemy already established and prepared in one or all the domains. Detailed planning, preparations, and rehearsals help minimize the risk for a small force to maintain its ability to retain freedom of movement and act offensively upon reaching its objective area. Clausewitz emphasized the importance of planning when he said, “Use all possible means of preparation.”⁷⁵ Many of the other theorists support that: “Machiavelli understood the need for comprehensive calculation and thorough planning prior to battle.”⁷⁶ Sun Tzu shared this view: “Machiavelli and Sun Tzu prescribed many of the same approaches to warfare. They both believed in thorough planning, prior calculations, and a swift execution.”⁷⁷ Both McRaven and the Ranger handbook also focus on planning, preparation, and rehearsals prior to missions.⁷⁸

⁷⁴ There may be other principles that are important, but these are the ones that stood out in the literature review and study. These principles may be important for conventional operations in the littorals or for special operations outside the littorals, but that is outside the scope of this thesis to prove.

⁷⁵ Clausewitz, *Principles of War*.

⁷⁶ Lucas Baur, “Machiavelli and Sun Tzu: Comparisons on Their Art of War,” *Liberty and Security* (blog), May 21, 2014, <https://libertyandsecurity.wordpress.com/2014/05/21/machiavelli-and-sun-tzu-comparisons-on-their-art-of-war/>; Niccolo Machiavelli, *The Prince and the Art of War*, ed. Oliver Francis (London: Collector’s Library, 2004). 258.

⁷⁷ Baur, “Machiavelli and Sun Tzu.”

⁷⁸ United States Army, *Ranger Handbook, 7-1*; McRaven, *Spec Ops*, 8–15.

Special operations require incredibly detailed planning. These operations usually have high stakes, and, often, a small force challenges a larger force. The smaller force has the disadvantage of less firepower and being in an offensive role against a fortified enemy.⁷⁹ Especially in the complex littorals, where minor mistakes or mishaps have large consequences, deliberate planning stands out as a key principle for success.

Deliberate planning refers to detailed preparations with all units involved, equipment testing, and rehearsals. There are many examples of these types of operations, the small submarine attack on the *Tirpitz* in Norway during World War II (WWII), stands out as an excellent example of how Royal Navy planned and rehearsed for nearly two years to be successful.⁸⁰ Operation Eagle Claw, the hostage rescue attempt in Iran by the U.S. Delta Force, is the ultimate example of the opposite, where, although the plans were detailed, the team never conducted proper rock drills and rehearsals in a similar environment. Their preparations were flawed, and the result was a disaster for the newly established counterterrorism (CT) unit.⁸¹

Deliberate planning can be described as very detailed and thorough preparations, which often include developing new methods and rehearsing these to succeed with the specific operation. These operations are often joint and could include conventional forces providing enablers, force protection, and/or fire support, which again raise the importance of a thorough planning process. The phrase “the more planning, the better” applies to most types of military operations, but certainly the higher the stakes and the more complex the type operation is, the more detail that is required. The littoral special operations are, in most cases, a combination of both several units’ involved and high stakes.

The Inchon landing is an excellent example of the importance of deliberate planning in support of littoral operations. During the initial North Korean invasion of the Republic of Korea in 1950, the UN forces had been pushed back deep into the Korean

⁷⁹ McRaven, *Spec Ops*, 3–4.

⁸⁰ *Ibid.*, 208–15.

⁸¹ Mark Bowden, *Guests of the Ayatollah: The First Battle in America’s War with Militant Islam* (New York: Atlantic Monthly Press, 2006), 467.

south. The commander of the UN forces, General Douglas MacArthur, came up with the brilliant idea to create a second front behind the North Korean lines by conducting an amphibious landing. Inchon was situated close to Seoul and would create a much-needed break for the UN forces in the South and essentially cut the North Korean army in half and disrupt their lines of communication.⁸² From MacArthur first considered the idea, just days after the loss of Seoul in June, it took nearly three months of detailed planning and preparation until the operation was executed in September.

Many military commanders and politicians opposed the idea because of the extreme tides and narrow channel leading into Inchon.⁸³ However, MacArthur was able to get the landing approved. With two narrow channels and strong currents that needed to be negotiated, planning needed to be precise to ensure the landing force's approach was timed precisely to mitigate the hydrographic challenges.⁸⁴ The natural obstacles coupled with the seawalls surrounding the small harbor meant the North Koreans would not expect an amphibious landing there.⁸⁵

To mitigate these challenges, deliberate steps were taken to improve the probability of success. The amphibious landing force directed a small SOF force to reconnoiter the area for the specific tidal conditions and to identify mines that would disrupt the landing.⁸⁶ The information from this operation was then used to update the landing plan. Additionally, the UN units further overcame these challenges with rehearsals and careful preparations. The daring landing was a huge success and turned the war for the UN forces.

⁸² "Landings by Sea Not New in Korea," *New York Times*, September 15, 1950, 3.

⁸³ "Inch'on Landing," History.com, accessed May 9, 2016, <http://www.history.com/topics/inchon>.

⁸⁴ Roy E. Appleman, *United States Army in the Korean War: South to the Naktong, North to the Yalu* (Washington, DC: G.P.O., 1998), 494.

⁸⁵ "Inch'on Landing."

⁸⁶ Eugene F. Clark, *The Secrets of Inchon: The Untold Story of the Most Daring Covert Mission of the Korean War* (New York: Putnam, 2002).

2. Tailored Force

Several military theorists emphasize the importance of attacking with mass and at a decisive point. Theorists including Kautilya, Machiavelli, and Jomini also emphasize the correct use of troops for the terrain and the task at hand. Within the littorals, it is important to be able to cross domains and fight within those domains. A tailored force will allow this. U.S. Army doctrine further describes force tailoring and its importance as “the process of determining the right mix and sequence of units”⁸⁷ and that “units identified for rapid deployment are tailored to mission requirements.”⁸⁸ The U.S. Navy also emphasizes the tailoring concept. “Our Maritime Forces will be tailored to meet the unique and evolving requirements particular to each geographical region, often in conjunction with special operation forces and other interagency partners.”⁸⁹

A tailored force is very important in littoral special operations because each mission requires a custom-designed task organization to increase the probability of success. Even reaching the mission objective area often requires the force to transit between the air, sea surface, potentially sea subsurface, and land domains, each with its own specified means of mobility, which could in many cases significantly restrict the force size. In such situations, the inclusion of every operator must be considered carefully to ensure the best possible force in the objective area.

While one might be tempted to solve these unique types of operations by sending a standard Task Force or Task Group, the solution need to be more complex than that. Since insertion and extraction in the littoral environment are more difficult, one must carefully consider how the force for the mission is organized. Every operator and staff member’s skill set must be carefully considered to reach the maximum potential of the force to succeed in the mission. For example, creative insertion crafts as Seal Delivery

⁸⁷ U.S. Army Field Manual 100-5, accessed April 20, 2016, <http://www.globalsecurity.org/military/library/policy/army/fm/5-100-15/CH3.htm>

⁸⁸ U.S. Army Field Manual 3-0, 3-27, *Force Tailoring*, accessed April 20, 2016, <http://www.globalsecurity.org/military/library/policy/army/fm/3-0/ch3.htm>

⁸⁹ U.S. Navy, Coast Guard and Marine Corps, *Cooperative Strategy for 21st Century Seapower* (Washington, DC: Chief of Naval Operations, 2007), <https://books.google.com/books?id=OUbq0w9T7vMC&printsec=frontcover#v=onepage&q&f=false>.

Vehicles (SDVs), canoes, kayaks, or water jets give excellent cover from the enemy, but limit the number of operators on the mission. Submarines and ships have limited space for SOF operators, staff, assets, and equipment, which forces the commander to carefully consider each individual needed for the operation. The Italian manned-torpedo attack on British ships during WWII is an excellent example of how a force can be tailored to the needs of the operation.⁹⁰

In 1975, after the Vietnam War, the U.S. government faced a hostage situation when Cambodian authorities arrested a U.S. merchant ship, the *Mayaguez*. The Hostage Release Operation (HRO) launched to save the *Mayaguez's* crew is an example of poor tailoring of force, where U.S. Pacific Command (PACOM) sent a regular U.S. Marine Corps unit to conduct a surgical HRO.⁹¹ They planned to conduct an amphibious landing and retrieve the hostages, but the resistance on the beach was too fierce, and the U.S. Marines had to retreat with severe casualties without achieving the mission. The hostages had already been released by the Cambodians.

If SOF units are to succeed with these types of operations, they must tailor the force beyond the regular conventional way of dividing the companies into troops or troops into teams. The operational force for a special operation in the littorals must be considered carefully and be handpicked to fit the unique insertion capabilities and problems at hand. Successful special operations in this environment are conducted by uniquely configured force structures varying from the individual to squadron size operations. Thus, SOF leadership needs to think creatively when structuring forces to operate in the littorals.

In 1942, in Operation Musketoon, a combined British and Norwegian force conducted a sabotage raid in Glomfjord, Norway. The operation is an excellent example of how a small force, tailored to meet an objective, and the available insertion means can succeed in littoral operations. The operation was designed to stop the nearby German

⁹⁰ Jack Greene and Alessandro Massignani, *The Black Prince and the Sea Devils* (Boston: Da Capo Press, 2004), 93–95.

⁹¹ Lucien S. Vandenbroucke, *Perilous Options: Special Operations as an Instrument of U.S. Foreign Policy* (New York: Oxford University Press, 1993), 72–113.

aluminum production plant by destroying the factory's power source in Glomfjord. The Allied force consisted of two officers and eight commandos from the British No. 2 Commando, two Norwegian corporals from the Norwegian Special Operations Executive (SOE) to serve as local area guides, and a French submarine *Junon*. The combined force selected the submarine for its similarity to the German U-boats. Infiltrating from Scotland, the *Junon* inserted the small force of the 12 operators in the Bjaerangsfjord south of Glomfjord (see Figure 8).⁹²



Figure 8. French Submarine Inserts Raid Force in Glomfjord⁹³

After the rubber boat transit to shore, the small force crossed the mountain to Glomfjord. Once at the objective, the team divided into two groups, with one placing the charges on the water pipes leading into the power station while the other group entered

⁹² “Float Off” is a tactical term for SOF leaving a submarine with rubber boats.

⁹³ “Operation Musketoon: Glomfjord—15/21 Sept 1942,” Combined Ops, accessed May 6, 2016, <http://www.combinedops.com/glomfjord.htm>.

the power station and placed explosive charges on the generators. The force blew up the power station and rendered it inoperable for the remainder of the war. The team then divided into groups of two or three men and started their exfiltration to Sweden. Though the mission result was a great success, the Germans killed one Norwegian and captured seven British Commandos during the exfiltration. In total, only four members made it to Sweden and later arrived in Britain.⁹⁴ The precise force configuration, tailored to the challenging objective, greatly contributed to the success of the operation. Although, the poor exfiltration plan led to one casualty and seven captured commandoes.

3. Specified Mobility

Because maritime SOF need to transfer between the sea, land, and air domains in the littorals, strategizing the best specified mobility to reach an objective area, preferably without engaging the enemy before one's own choosing becomes a daunting task. The mobility used for these missions needs to be specific to the requirement of the domain it will function in and must allow the force to transfer seamlessly between and into the next domain. It is essential for a SOF force to maneuver with as few restrictions as possible to strike the usually larger enemy force when and where they intend.

Mobility is essential to move the force as quickly and discreetly as possible. Military theorists often discuss the necessity to move forces and maneuver in the terrain under cover to strike the enemies' decisive point with mass.⁹⁵ Mobility facilitates the force's ability to maneuver in a manner that creates an advantage. The term mobility was invented later when technological advances made military movement and maneuver much faster. Almost all the military theorists mention the importance of maneuver.

Today, mobility is defined as "a quality or capability of military forces which permits them to move from place to place while retaining the ability to fulfill their primary mission."⁹⁶ U.S. doctrine stresses the importance of mobility: "[It] ... is the basis

⁹⁴ "Operation Musketoon: Glomfjord—15/21 Sept 1942," Combined Ops, accessed May 6, 2016, <http://www.combinedops.com/glomfjord.htm>.

⁹⁵ Jomini, *Art of War*, 66–71.

⁹⁶ "U.S. DoD Terminology: Mobility," Military Factory, accessed April 20, 2016, http://www.militaryfactory.com/dictionary/military-terms-defined.asp?term_id=3491.

of all operational success. Unless tactical movement of troops can be executed quickly and supply operations maintained in the necessary manner, the striking power of an army is severely restricted and its security from the enemy is greatly impaired.”⁹⁷ The U.S. Army field manual further defines tactical mobility as “the ability to move rapidly from one part of the battlefield to another, relative to the enemy. Tactical mobility is a function of cross-country mobility, firepower, and protection.”⁹⁸

Littoral special operations often involve the need for a force to cross several domains during infiltration, conduct the operation, and then successfully egress. Success in crossing domains often requires mobility means that are organic both to the unit’s capability and to the use of external support.⁹⁹ Since missions typically require a tailored force to achieve mission accomplishment, the supporting mobility must also be specified to achieve a successful and concealed infiltration, especially as the force transits between domains. In some cases, the required mobility must be organic, but, in other cases, conventional forces best provide it.

The small submarine attack on *Tirpitz* again is a great example of tailoring mobility specific for the mission. Attacking a ship with combat-divers, a submarine, or a SDV may be the best solution, while for a HRO mission, a submarine may be too slow to provide the desired insertion speed. Every mission has a specific plan and timeline; therefore, the mobility must be specified to meet those requirements. Special operations in general often require specific insertion methods and in some cases specified mobility; in littoral special operations, it is the rule rather than the exception. For some missions, new mobility assets were designed and built specifically for that operation, the earlier mentioned mini submarines used against *Tirpitz* are a prime example.¹⁰⁰

In 1805, U.S. forces raided Derna, Libya, with the support of local mercenaries and Naval Gunfire Support (NGS). The Derna raid is an excellent example of the

⁹⁷ War Department, *Military Police, FM 19-5* (Washington, DC: G.P.O., 1944), 23.

⁹⁸ Headquarters, Department of the Army, *Tactics, FM 3-90* (Washington, DC: Government Printing Office, 2001), 2-1.

⁹⁹ Organic mobility is owned by the SOF unit itself. External mobility is support from other military units.

¹⁰⁰ McRaven, *Spec Ops*, 201–45.

importance of specified mobility for littoral operations. William Eaton commanded the force of ten U.S. Marines and a combined mercenary force of 200 Greeks and 200–300 Arabs. Eaton landed with the Marines in Alexandria, Egypt, and built the force with the help of Hamet, the former Pasha of Tripoli.¹⁰¹

Eaton's force then marched across the desert on camels and received logistical support from the U.S. Navy. After the 600-mile overland movement, Eaton divided his army in two units and attacked the fortress in Derna from two sides while the USS *Argus*, USS *Hornet*, and USS *Nautilus* provided NGS. The innovative insertion method with camels meant the enemy was surprised at the audacious line of the march and surrounded by land and sea. By doing so, Eaton defeated a far superior fortified enemy. It was the first time the U.S. flag was raised on foreign soil and marked the end to the First Berber War.¹⁰²

4. Joint Support

Joint support is key in littoral special operations because in many cases capabilities essential to mission success rest under the command of another component of a joint force. Joint support is perhaps only limited by the imagination of the planners and the risk a commander is willing to assume to achieve a desired end state. For example, a SOF unit may request that fixed-wing aircraft insert ground or maritime mobility equipment in support of an infiltration. Additionally, joint support could come in the form of intelligence, fire support, diversions, or on today's ever-expanding battle space, support through disabling cyber-based systems that could influence the infiltration.

Though many military theorists are primarily focused on decisive land battle, many do mention the importance of cooperation and unity of command. Jomini in fact dedicates a chapter to amphibious warfare and the use of navies to move armies to new battlefields.¹⁰³ Operations in the littorals are the interface where all the domains meet.

¹⁰¹ "First Barbary War: Battle of Derna," *About Education*, accessed May 9, 2016, <http://militaryhistory.about.com/od/battleswars1800s/p/derne.htm>.

¹⁰² "First Barbary War: Battle of Derna."

¹⁰³ Jomini, *Art of War*, 361–90.

Successful operations in this environment involve taking advantage of the niche capacity from the other services and domain owners. It also involves a high degree of coordination to avoid “blue on blue”¹⁰⁴ incidents and potential disruptions of other friendly force operations in the same vicinity. Many types of special operations often utilize joint support; however, littoral special operations are practically impossible without joint support and close coordination.

One such example is the raid on Pointe du Hoc to support the June 6, 1944 Allied D-Day landings at Normandy and the American landing on Omaha Beach.¹⁰⁵ A prominent landmark at Omaha Beach was the 100ft cliff at Pointe du Hoc. From this location, the German Army had a strong tactical advantage over the Allied amphibious landing force since it could easily employ heavy weapons from there. Three companies of the U.S. Army’s 2nd Ranger Battalion conducted a vertical cliff assault at Pointe du Hoc with the aim to destroy any German resistance that would endanger the invasion.¹⁰⁶

The Ranger assault on Pointe du Hoc was a true joint operation. Several days before the landing, Allied air strikes heavily bombarded German positions near Pointe du Hoc. During D-Day itself, the Rangers used several amphibious crafts, supported by the navy, to cross from the maritime domain onto the land domain. During the amphibious landing and the actual cliff assault, the USS *Satterlee* and HMS *Talybont* supported them with NGS to prevent the Germans from firing on the Rangers.¹⁰⁷

The Rangers succeeded in taking Pointe du Hoc and eliminating any German threats to the remainder of the Allied forces on D-Day. Without full cooperation between the services, victory would not have been possible.

¹⁰⁴ “Blue on blue” means a unintentional firefight between two friendly forces caused by each side thinking the other side is the enemy.

¹⁰⁵ T.T.A. Lovering, *Amphibious Assault: Manoeuvre from the Sea* (Woodbridge, England: Seafarer, 2007), 302–3.

¹⁰⁶ “Pointe du Hoe [sic]: 2d Ranger Battalion, 6 June 1944,” U.S. Army Center of Military History, accessed May 10, 2016, <http://www.history.army.mil/books/wwii/smallunit/smallunit-pdh.htm>.

¹⁰⁷ Antony Beevor, *D-Day: The Battle for Normandy* (New York: Viking, 2009), 102–3.

5. Cover and Concealment

Cover and concealment are very important in littoral special operations because these missions typically involve a smaller numerical force that must move between several domains to avoid or challenge a numerically superior force. The best way to achieve this goal is to avoid the enemy by using the cover of terrain, weather, or deception. Not unique to the littorals or special operations, the use of terrain as cover for the movement of troops or defensive purposes is as old as warfare itself. “In making tactical dispositions, the highest pitch you can attain is to conceal them; conceal your dispositions, and you will be safe from the prying of the subtlest spies, from the machinations of the wisest brains.”¹⁰⁸ Clausewitz also stresses the advantages both defensively and offensively for the use of terrain to gain an advantage:

The terrain (the ground or country) offers two advantages in warfare. The first is that it presents obstacles to the enemy’s approach. These either make his advance impossible at a given point, or force him to march more slowly and to maintain his formation in columns, etc. The second advantage is that obstacles in the terrain enable us to place our troops under cover. Although both advantages are very important, I think the second more important than the first. In any event, it is certain that we profit from it more frequently, since in most cases even the simplest terrain permits us to place ourselves more or less under cover. Formerly only the first of these advantages was known and the second was rarely used. But today the greater mobility of all armies has led us to use the former less frequently, and therefore the latter more frequently. The first of these two advantages is useful for defense alone, the second for both offense and defense.¹⁰⁹

It is also important to cover one’s intentions and force dispositions. Machiavelli, Fredrick the Great, and Foch all mention the importance of secrecy for success in war.¹¹⁰ The UK, the United States, and Russia have all incorporated security into their principles of war, and McRaven recommends it for SOF. For this research, security is incorporated into the principle called “cover and concealment.”

¹⁰⁸ Sun Tzu, *On the Art of War*, Translated from the Chinese by Lionel Giles, M.A. (1910) (Leicester, England: Allandale Online Publishing, 2000).

¹⁰⁹ Clausewitz, *Principles of War*.

¹¹⁰ Mallick, *Principles of War*, 3–4; Foch, *Principles of War*, 13.

Cover and concealment can be vital for SOF in the littorals. Compromise by the enemy during an insertion is likely to result in mission failure before the operation even starts. Almost all types of maritime insertion methods are based on cover and concealment. These types of insertions are often slower than land- or air-based mobility and include long-range insertion crafts, RHIBs, SDVs, kayaks, zodiacs, and divers, all of which are extremely vulnerable to enemy action if compromised during either the mission ingress or egress. Add in the requirement to transit forces between types of craft, and the risk further increases.

The most vulnerable moment for any SOF force in the littorals is the transfer from one domain to another. During Operation Musketoon in Norway 1942, the SOE operators inserted by rubber dinghies. When approaching land in Bjaerangsfjord, the operators must have landed with their dinghies and hid them somewhere in the beach zone. In the moment when they were carrying their dinghies on land, they were the most vulnerable, with 70–90 kg on their backs in the strand zone and the closest friendly forces submerged off the coast.¹¹¹

Similarly, when a helicopter is landing to drop off personnel, it is also at high risk. Operation Gothic Serpent, best known from the movie *Black Hawk Down*, is probably the best example of failure due to the danger during transfer. If a SOF force is discovered when transferring from one environment to the other, the enemy can surprise them and outgun them. Cover or concealment is hence a vital principle for success in the littoral domain. This principle is important in other domains as well but not to the same degree.

During the summer of 1942, the elite Marine Raider 2nd Battalion, commanded by Lieutenant Colonel Evans F. Carlson, received orders from Admiral Chester Nimitz to conduct an amphibious raid on the Makin Atoll in the Pacific Ocean. The mission had multiple objectives: to destroy Japanese installations on the island, to divert Japanese

¹¹¹ “Operation Musketoon: Glomfjord—15/21 Sept 1942,” Combined Ops, accessed May 6, 2016, <http://www.combinedops.com/glomfjord.htm>.

attention and reinforcements from Guadalcanal and Tulagi, to take prisoners, and to gain intelligence.¹¹²

In order to avoid detection by the Japanese during the transit to Makin, on August 8, 1942, the Marine Raiders embarked on two submarines, the *Nautilus* and *Argonaut*, which were both large enough to facilitate a company of Marine Raiders. After eight days underway, which was mainly subsurfaced, the Marine Raiders reached Makin Atoll in the Gilbert Islands, still undetected by the Japanese. Under the cover of darkness on August 17, the Marine Raiders completed the last leg of the infiltration as they moved by rubber boats to shore.¹¹³ Although severe weather conditions and miscommunication hampered the landing, the Raiders successfully infiltrated. Although, an accumulation of mishaps and leadership decisions, the mission eventually resulted in failure.

On August 18, the Raiders tried to make their way back to the submarine. Technical problems with the outboard engines on the rubber boats combined with heavy surf made this a difficult task. In the chaos, nine Raiders were left behind on Makin and later beheaded by the Japanese.¹¹⁴ Though the Raiders failed to meet their objectives and took unnecessary casualties during exfiltration, the use of the submarines to support mother ship delivery allowed the raiding force to move into and from the target area undetected and eventually return to Pearl Harbor.

6. Innovation

Innovation is important for all types of special operations, but it is vital for special operations in the littorals where the margins for failure are much smaller. Littoral operations are complex and risky, especially when the force transitions from one domain to another (e.g., air to water, subsurface to surface, or water to land). Most militaries or forces prepare for the next war or engagement using experiences of the last conflict. However, when things are constantly changing the exposure to the force when

¹¹² Jon T. Hoffman, *From Makin to Bougainville: Marine Raiders in the Pacific War* (Washington, DC: Marine Corps Historical Center, 1995), 6.

¹¹³ David W. Haughey, "Carlson's Raid on Makin Island," Marine Corps Association and Foundation, assessed May 20, 2016. <https://www.mca-marines.org/gazette/carlsons-raid-makin-island>

¹¹⁴ Hoffman, *From Makin to Bougainville*, 9.

transferring from domains makes innovation vital to succeed. To help achieve success under these arduous conditions in the littorals, innovation allows the force to outmatch the enemy with new tactics and equipment. Developing new technologies, doctrine, tactics, and organizational models can create an advantage for an operational unit by employing certain means the enemy has never seen before, thus creating more than simply a tactical surprise. The 9/11 attacks are an excellent example of how a small force can attack a superior force by surprise by using innovative and unexpected methods. At the time of the attack, no one anticipated terrorists would ever employ civilian airliners as cruise missiles to target buildings. Thus, the challenge to innovate continually in order to seek an advantage over one's opponents becomes a matter of survival.¹¹⁵ Though innovation is not a principle of war that military theorists have emphasized previously, large militaries and their SOF elements have focused on similar principles such as flexibility, initiative, and surprise to gain immediate tactical advantages. Innovation, however, takes place primarily prior to tactical execution, and thus, the true work surrounding innovation rests with developing the new technologies, doctrine, and tactics that will keep the enemy off balance. Stephen Rosen, in *Innovation and the Military—Winning the Next War*, emphasizes the difficulty of innovation:

All social innovation is difficult. Machiavelli noted over four hundred years ago that "there is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things. For the reformer has enemies in all those who profit by the old order, and only lukewarm defenders in all those who would profit by the new order ... the incredulity of mankind who do not truly believe in anything new until they have had actual experience of it."¹¹⁶

Isaacson, Layne, and Arquilla, in their RAND Corporation presentation on *Predicting Military Innovation*, define innovation as "for a specific military, innovation is manifested by the development of new war fighting concepts and/or new means of

¹¹⁵ David Kilcullen, *Out of the Mountains: The Coming Age of the Urban Guerrilla* (New York: Oxford University Press, 2013), 17. According to Kilcullen, those that can innovate to meet these challenges will thrive and those who do not will fall.

¹¹⁶ Stephen Peter Rosen, *Innovation and the Military—Winning the Next War* (New York: Cornell University Press, 1994) 1; Niccolò Machiavelli, *The Prince* (New York: New American Library, 1952), book 6, *Of New Dominions Which Have Been Acquired by One's Own Arms and Ability*, 49–50.

integrating technology.”¹¹⁷ Isaacson et al. divide innovation in the military into three distinct types of innovation: organizational innovation, doctrinal innovation, and technological innovation. If the technology is improved, then the organization and its doctrine (concepts and tactics) will also need to change to adapt to the new technology, and in turn, changes in organization or doctrine should lead to changes in technology:¹¹⁸

Future warfare will likely be won by those who maintain the offensive. Forces that are proactive and in constant pursuit of the enemy will enjoy a greater advantage than those who content themselves with reacting and responding to an elusive foe. The former will constantly seek out new and innovative methods for maintaining the upper hand while simultaneously striking the adversary in a pre-emptive manner to keep him continually off balance.¹¹⁹

Innovation is an important principle for littoral special operations due to the complexity of operating in nine subdomains simultaneously and the disadvantage of the attacker. In transferring from maritime to the land domain, a littoral special operation may falter from exposure to the enemy. Developing new methods in organizing the operators and their tactics and adapting new technology is vital to succeed with every mission. The defender will prepare for attacks replicating prior tactics, force structure, and technology. Maritime SOF preparing for littoral operations must innovate to succeed.

Norwegian saboteurs in Oslo during WWII learned the importance of innovation the hard way. After several underwater attacks on German ships during WWII, the Germans started to employ diving nets, rigid guard routines, and random shooting and dropping of grenades into the water to protect their ships. During Operation Bundle, the Norwegian SOE operatives in Oslo wanted to sink the German troop transport *Donau*, and they tried several different techniques including frogmen, small torpedoes, and canoes.¹²⁰ In the end, they figured that they needed a totally new approach to trick the German defenses. Inevitably, they disguised themselves as harbor workers and entered

¹¹⁷ Jefferey A. Isaacson, Christopher Layne, and John Arquilla, *Predicting Military Innovation* (Santa Monica, CA: RAND Corporation, 1999), vii.

¹¹⁸ Interview with Dr. John Arquilla, Naval Postgraduate School, Monterey, California, January 2015.

¹¹⁹ Ettrich, “Principles of War,” 44.

¹²⁰ Frogmen are naval or marine SOF divers.

under the pier of the *Donau* through the sewage system at the harbor to place limpets. Their sabotage resulted in the sinking of the *Donau* and delivered a large blow to moving German troops from Norway to the eastern and western fronts on continental Europe.¹²¹

During WWII, Italy faced a superior British Navy in the Mediterranean Sea. To counter the imbalance, the Italian Navy used an innovative naval unit called the Decima Mas (10th Assault Vehicle Flotilla or X-MAS). The Decima Mas consisted of highly motivated and trained combat-divers. Working in close corporation with Italian industry, X-MAS developed the latest diving equipment. One such innovation credited to X-MAS is the first use of manned torpedoes to conduct sabotage missions in enemy harbors.¹²²

As an operational concept, a submarine would transport the torpedoes with combat-divers close to the enemy harbors. A few miles from the targets, the submarine would then launch the divers and torpedoes, and then the divers would maneuver the torpedo towards the enemy ship. With entrances to the harbor often heavily guarded and protected by anti-submarine nets made of steel, the divers would navigate around or under these obstacles, or even cut through them.¹²³ Figure 9 illustrates the kind of obstacles that frogmen on their torpedo encountered.

¹²¹ Max Manus, *Mitt Liv [My life]* (Oslo: N.W. Damm, 1995), 250–55.

¹²² Greene and Massignani, *Black Prince and the Sea Devils*, 15.

¹²³ Sven Erik Jørgensen, “The First Frogmen,” *X-Ray Magazine* 7 (2005): 70, http://www.xray-mag.com/pdfs/articles/Feature_FirstFrogmen_07.pdf.



Figure 9. Frogmen of X-MAS on a Torpedo Cutting an Anti-submarine Net¹²⁴

Once the divers reached their target, they would completely submerge the torpedo and place it under the keel of the ship, activate the timer, and start their escape to shore or try to egress to an awaiting boat. In order to conduct such challenging missions, the combat-divers of X-MAS had to be innovative with their equipment. They modified the existing compressed-air diving equipment into rebreathers suitable for tactical use.¹²⁵ To navigate underwater, they had to have waterproof depth meters and watches that were readable in dark waters.¹²⁶

By innovating their equipment and procedures and combining these new capabilities with the use of submarines, the X-MAS sank more tonnage than the entire conventional Italian Navy did during WWII.¹²⁷ The X-MAS conducted successful sabotage missions at Alexandria, Malta, and Gibraltar. The Italians were so successful

¹²⁴ Original image by Rudolf Claudus, courtesy of the Marina Militare, reprinted in *Naval War College Review* 68, no. 3 (summer 2015): 1.

¹²⁵ Rebreathers are diving equipment with an internal CO₂ filter that ensures no bubbles and makes it almost impossible to spot a diver from the surface.

¹²⁶ These were developed by the famous watchmaker Panerai, who ensured visibility in dark conditions by using radium bromide and zinc sulphide on his instruments.

¹²⁷ Greene and Massignani, *Black Prince and the Sea Devils*, 138.

that the British Navy quickly adapted and started their own program with manned torpedoes, the so-called Chariot.¹²⁸ The success of X-MAS illustrates how innovation in the littorals can overcome a conventional disadvantage.

D. CASE STUDY LOGIC, SELECTION, AND ANALYSIS

Five historical (1667–2011) special operations are used to test the importance of the six principles.

To demonstrate the importance these six principles play in littoral special operations, five historical operations are used to demonstrate the importance of these six principles with cases from the seventeenth, twentieth, and twenty-first centuries. These examples are selected because they represent a variety of operations with different sponsors, doctrines, and geographies to show each principle's importance in the preparation and conduct of littoral special operations:

- A. Raid on Chatham: Royal Netherlands Marine Corps (1667)
- B. Ship attack Oslo Harbor: Norwegian Special Operations Executive (1943)
- C. Pebble Island Raid, Falklands: British Special Air Service (1982)
- D. Mumbai attacks: Lashkar-e-Taiba (2008)
- E. Somali Pirate Ship Attack: Netherlands Marine Special Operations Forces (2011)

The five cases of littoral special operations cover four continents, three centuries, and five different forces (including one international terrorist group). The variety of the cases helps demonstrate how these principles are applicable regardless of the executing force, the doctrine, equipment and technology available, or the timeframe. The cases also offer cross-domain variation where some of these operations were conducted from the sea to the land, some from land to sea and others from the air to sea or land. In total, the cases give a good idea of the importance of the principles.

¹²⁸ Greene and Massignani, *Black Prince and the Sea Devils*, 138.

1. Analysis of Cases

Each case study is analyzed using a narrative of each operation that covers the background for the operation, its objectives, and the result of the operation. Thereafter, each case is evaluated using the six principles presented earlier to assess whether the principles were important or not to the overall mission outcome. Though the analysis is chiefly qualitative in nature, accompanying the assessment of the role of each principle is an ordinal scoring (1–5) with a “1” being irrelevant to mission accomplishment and a “5” being highly important to mission success.

2. Rating Scale for Principles

A Likert rating scale is used to measure the importance of each principle for each case with a scale ranging from “Irrelevant to Mission Success” (1), “Less Important to Mission Success” (2), “Moderate Importance to Mission Success” (3), “Important to Mission Success” (4), to “Very Important to Mission Success” (5). The score for each principle is determined by evaluating the degree of importance each principle had to the outcome of the operation in question.¹²⁹ The scale ranges from 1–5, and the scores are presented in Table 1.

1. **IRRELEVANT** means that the principle did not influence the operational outcome at all.
2. **Less important** means that the principle did influence the operation, but it **ENHANCED** the likelihood of mission success with only a minor impact.
3. **Moderate importance** means that the principle made a considerable impact on **ENHANCING** the likelihood of overall mission success.
4. **Important** means that the principle was essential for overall mission success. **ESSENTIAL** is further defined as the consideration of or employment of the principle in question is necessary to accomplish the mission.
5. **Very important** means that the principle was critical for mission success. **CRITICAL** is further defined as the mission would likely **FAIL** without the proper consideration of or employment of the principle in question.

Table 1 is an example of how each principle is rated, using the scale for one case study.

¹²⁹ Scale inspired by <http://www.hr-survey.com/PfRatingScales.htm>, accessed March 28, 2016.

Table 1. Rating an Example Operation

Example operation					
Principle	Irrelevant (1)	Less important (2)	Moderate (3)	Important (4)	Very Important (5)
D. Planning				X	
S. Mobility			X		
Tailored F.				X	
Joint Supp.	X				
Cover/Con		X			
Innovation					X

To better visualize the principles for each case, the study employs a radar figure to compare the importance of each of the six principles (see Figure 10). The radar figure consists of five concentric hexagons with each concentric hexagon ring representing one of the values on the five-point Likert scale (1–5). With six principles to compare, each point that connects two sides of the hexagon represents one of the six principles (see Figure 10). With the qualitative definitions above, each principle is assessed with an ordinal value and plotted at the appropriate intersection for each principle on the radar figure. The outcome is a six-sided geometric shape displayed onto the radar figure. If each of the six principles has the same point value for a specific case, then the hexagon will be equilateral and regular in shape. However, most likely, variation exists between point values for the different principles, and thus a six-sided geometric shape will be irregular in appearance (see Figure 10.)

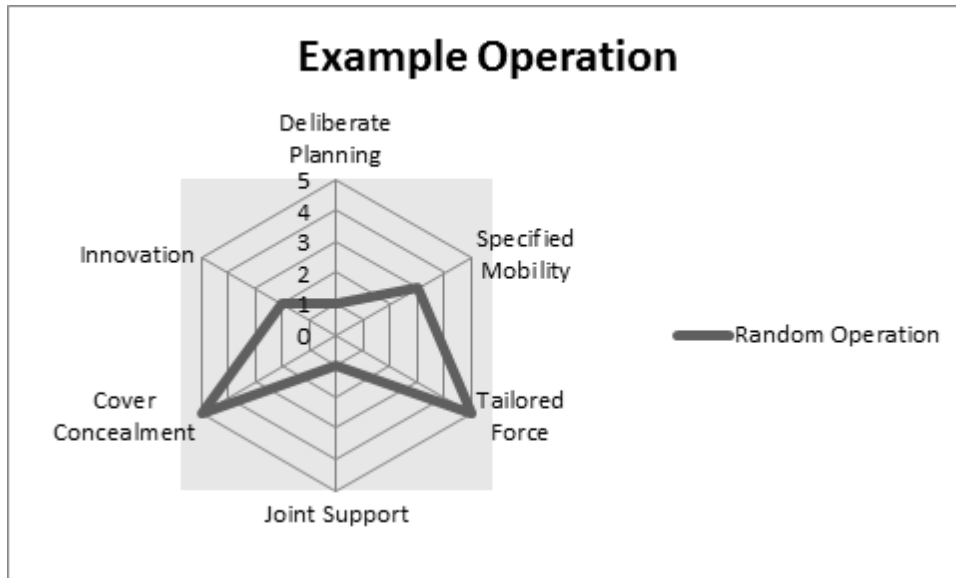


Figure 10. Example Operation with Visualization of Principles

The radar figure is also suitable to compare the importance of each principle, case-by-case, as each case's hexagon is overlaid upon the radar figure backdrop. Layering the hexagons associated with each case accommodates an across case comparison to show which principles are the most important. Additionally, an average score for each principle across cases is also calculated as a second metric to further show which principles have been evaluated as more important relative to the others examined in this study.

This study concludes with a summary of the cross-case findings and an example of the principles in action during a feasible future scenario. Additionally, the study concludes with policy implications and recommendations for the next steps in a littoral special operations research.

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III. HISTORICAL CASE STUDIES

To test the validity of the six principles of littoral special operations, five historical special operations are analyzed. These cases were selected due to their variation in method, force, conflict, geography, and timeframe. The purpose of this analysis is to show the applicability of the principles for littoral special operation. The six cases follow the same outline with a narrative that covers the background for the operation, its aim, its execution, and the outcome. Thereafter, each case is analyzed using the six littoral special operations principles.

A. RAID ON CHATHAM: ROYAL NETHERLANDS MARINE CORPS (1667)

This case has been selected for several reasons. First, the mission took place nearly 350 years ago. This is important to demonstrate the viability of the principles across time. Second, the mission was conducted in an environment that allowed limited maneuverability, an aspect that is characteristic of the littorals.

1. Background

During the sixteenth century, Great Britain built a stronger navy to balance its strength against the dominant Spanish Navy. The Dutch Navy was the third strongest Navy in Europe. Over centuries, this triangle of power, in which each country pursued its own interests, resulted in several conflicts and changing alliances between the countries. To protect the Dutch interests (East Indies, Suriname, Curaçao, and New Amsterdam), the Dutch Navy grew, as did its rivals. Around 1650, internal power conflicts in the Dutch Republic took their toll on the strength of both the Army and Navy. Meanwhile, the British continued to strengthen their navy. The power struggle between Great Britain and the Dutch Republic resulted in four Anglo-Dutch Wars: first war (1652–1654), second war (1665–1667), third war (1672–1674), and fourth war (1780–1784). The last war ended when the Dutch were forced to sign the Treaty of Paris in 1784. The raid on Chatham took place in the second Anglo-Dutch War (Figure 11).



Figure 11. The Raid on Chatham¹³⁰

In 1652, the Dutch developed the first plans to sail up the river Thames to conduct offensive operations against the British. However, it was considered too risky since there was insufficient intelligence available to the Dutch on the depth of the Thames.¹³¹ The Second Anglo-Dutch War did not initially favor the Dutch, and they suffered several defeats; the British attacked trade posts in Africa and inflicted heavy losses during the battle of Lowestoft.¹³² However, the British did suffer in another way from two major disasters at home: the plague (1665) and the Great London Fire (1666). Both disasters had a great negative effect on both British morale and economy. As a result of the poor economy, the British King Charles II decided to bring in a large portion of his navy and lay off sailors and soldiers to reduce costs. He considered that his ships would be safe at Chatham (Figure 12). Chatham was also Great Britain's largest shipyard.

¹³⁰ Admin, "The Raid on Chatham (Raid on Medway), 17–23 June 1667," *History of the Sailing Warship in the Marine Art* (blog), April 5, 2010, <http://www.sailingwarship.com/the-raid-on-chatham-raid-on-medway-17-23-june-1667.html>.

¹³¹ Bert Wezeman, "De Tocht naar Chatham, 1667" [The raid on Chatham, 1667], *Historie*, January 22, 2015, <http://www.historien.nl/de-tweede-engelse-oorlog-de-tocht-naar-chatham/>.

¹³² J.R. Jones, *The Anglo-Dutch Wars of the Seventeenth Century* (New York: Longman Group Limited, 1996), 158.

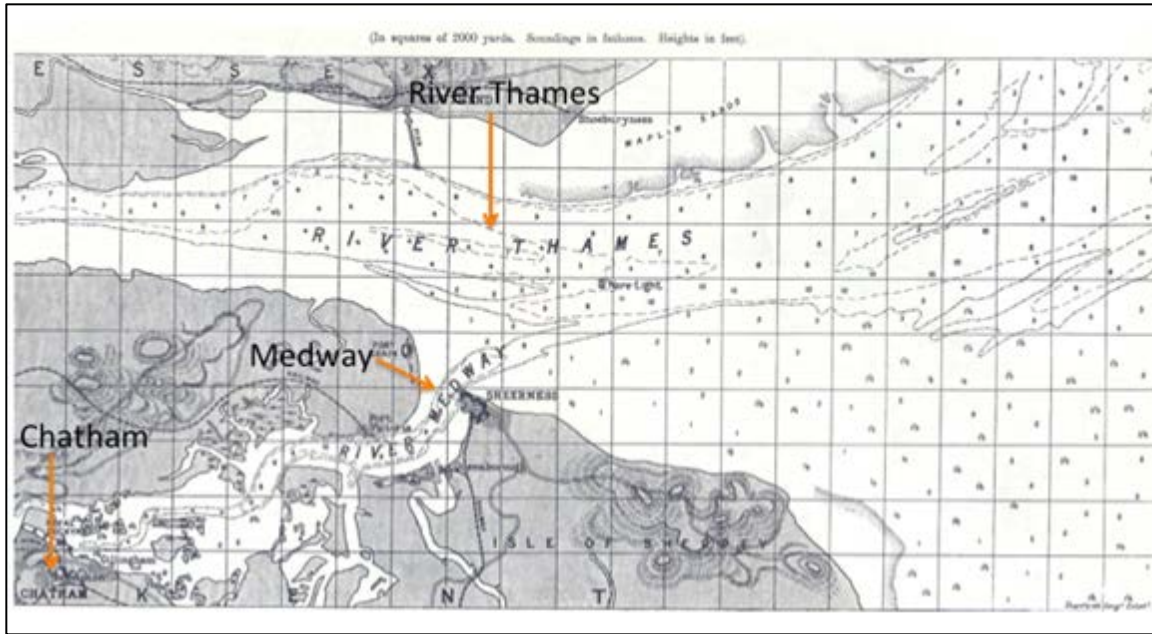


Figure 12. Map of River Thames and Chatham¹³³

Meanwhile, peace talks between the Dutch Republic and Great Britain had started in Breda (the Netherlands), where the British were confident that they would reach an agreement in their favor since they had been dominant so far in their naval campaign.¹³⁴ The Dutch Republic wanted to shift the power balance back in their favor during the talks in Breda by attacking the vulnerable British Navy.

Johan de Witt directed the Dutch Navy to be modernized; he was convinced that a strong navy was in the interest of the Dutch Republic.¹³⁵ Due to this modernization, the Dutch Navy had specific ships with more firepower and maneuverability, instead of converting old merchant ships into navy ships with limited capabilities.

¹³³ “The Royal Navy’s Role in Warship Research, Building, Repair & Maintenance Worldwide,” Naval History, August 2, 2011, <http://www.naval-history.net/WW1NavyBritish-Shipbuild03.htm>.

¹³⁴ Wezeman, “De Tocht naar Chatham, 1667” [The raid on Chatham].

¹³⁵ Jonathan Israel, *The Dutch Republic: Its Rise, Greatness, and Fall 1477–1806* (New York: Oxford University Press, 1995), 767.

2. Aim of the Mission

The overall aim of the raid on Great Britain was to counterbalance the dominant position of Great Britain in the Breda negotiations by an attack on the British Navy, some critical facilities of the Navy, Chatham Dockyard, and supply depots.¹³⁶ According to de Witt, it would be “the best plenipotentiary for peace.”¹³⁷

3. Mission Execution

The Dutch had recruited British pilots from their prisoners who had good knowledge of both rivers, Thames and Medway.¹³⁸ Some prisoners were eager to work for the Dutch, since they finally received pay for their service, in contrast to the wages postponed by the British king. Another source of information came from a Dutch merchant who was spying on behalf of the Dutch in Great Britain; he provided the positions of large British Navy ships.¹³⁹ The British took some protective measures for their Navy, by removing all navigation buoys on the Thames and Medway and setting up a few fortified positions along the riverbanks.

The fleet, commanded by Admiral De Ruyter, with marines¹⁴⁰ onboard, and commanded by Willem van Ghent, entered the Thames in June 1667.¹⁴¹ They sailed towards Sheerness Castle, which was tasked with protecting the mouth of the Medway. After a naval bombardment by the modernized Dutch ships, a landing force consisting of the newly formed Marine Corps captured the fort. The Dutch fleet continued their way upstream on the river Medway. Despite British-made obstacles on both rivers, the pilots found a way through, and the Dutch set sail to Chatham. An obstacle that caused more concern to the Dutch was a large chain stretched diagonally across the river close to

¹³⁶ “The Raid on Chatham (Raid on Medway).”

¹³⁷ David Roger Hainsworth and Christine Churches, *The Anglo-Dutch Naval Wars 1652–1674* (Thrupp: Sutton Publishing, 1998), 157.

¹³⁸ Hainsworth and Churches, *The Anglo-Dutch Naval Wars 1652–1674*, 157.

¹³⁹ *Ibid.*

¹⁴⁰ Having Marines on board a warship was new concept for the Dutch, copied from the Portuguese and British Navy.

¹⁴¹ “The Raid on Chatham (Raid on Medway).”

Gillingham, which was safeguarded by artillery.¹⁴² The Dutch broke the chain on June 22 and destroyed several British ships by using fire ships. On June 23, the Dutch captured the British flagship, the *Royal Charles*. Although the defensive positions of the British were no longer effective, the Dutch could not proceed with their advance due to a falling tide and decided to return to the North Sea. To keep the pressure on the British during the peace talks, the Dutch Navy kept patrolling along the British coast. The Treaty of Breda was signed on August 24, 1667; both parties had to make concessions under this treaty—for the British, this was harder to accept.

4. Result of the Mission

As a direct result of the raid, the British realized that they could not continue their war against the Dutch. Great Britain was forced to accept less than favorable conditions under the Treaty of Breda; the British navigation laws were relaxed, New Amsterdam would remain in British hands and was renamed New York, and Suriname remained a Dutch possession.¹⁴³ More importantly, the young Dutch Republic demonstrated that it could hold its ground against Great Britain; the success of the raid on Medway was decisive in accomplishing this.¹⁴⁴

5. Analysis of Principles

The operation is analyzed, applying the six principles for successful littoral special operations. The purpose of the analysis is to determine whether the principles were essential for the mission.

a. Deliberate Planning

The initial plan to conduct a raid on Great Britain was rejected, since there was not enough information present. Fifteen years after the initial plan, more intelligence on

¹⁴² “The Raid on Chatham (Raid on Medway).”

¹⁴³ Memory of the Netherlands, “England and the Netherlands: The Ties between Two Nations,” accessed March 8, 2016, http://www.geheugenvannederland.nl/?/en/collecties/nederland_engeland/zeeoorlogen.

¹⁴⁴ Wezeman, “De Tocht naar Chatham, 1667” [The raid on Chatham].

the tides and waterways was gathered from British pilots and reconnaissance.¹⁴⁵ Together with this critical information, as well as information from other sources on the position of British great ships and their defenses along the riverbanks, a detailed plan was constructed to conduct a raid on Chatham in the heart of British naval pride. No documentation was found on rehearsals with the complete fleet and marines. Deliberate planning was essential for this case (4/5, four out of five on the scale) for the overall success of the mission.

b. Tailored Force

A well-balanced Dutch force of ships, sailors, and marines conducted the raid; they had 17 smaller ships, four fire-ships, several galliots,¹⁴⁶ and 1,000 marines.¹⁴⁷ Each ship had a specific function varying from naval gunfire, fire-ship, to reconnaissance. The keel depth of a ship was crucial; the ships could not be too heavy, because of the shallow waters of the rivers Thames and Medway, and had to be fairly maneuverable due to limited maneuver space along the river. A balance needed to be found between regular Dutch sailors and marines who would fight against British soldiers and sailors. The Marine units were specially tasked to conduct amphibious raids on fortified positions. This was a new concept in the Dutch Navy and across European navies. This tailored force was critical (5/5) for the overall success of the mission.

c. Specified Mobility

As previously stated, the ships used for the raid were selected based on their keel depth, maneuverability, and firepower. Due to the state of technology at that time, mobility was limited to sailboats. Smaller ships that could support an amphibious raid conducted by the Dutch Marine Corps provided cross-domain mobility. Specified mobility was essential (4/5) for the overall success of the mission.

¹⁴⁵ Hainsworth and Churches, *Anglo-Dutch Naval Wars 1652–1674*, 157.

¹⁴⁶ Flat bottom ships that are able to maneuver freely in shallow waters.

¹⁴⁷ Hainsworth and Churches, *Anglo-Dutch Naval Wars 1652–1674*, 160.

d. Joint Support

In the seventeenth century, the term *joint support* had not yet been employed. However, the integration of land (army) soldiers on board navy ships was the first sign of mutual support or an understanding that specialized forces from other branches could be extremely useful. The marines on board the ships allowed the Dutch to cross from the maritime domain onto the land domain, and back again. It was, of course, not the first time that the land domain was reached from the maritime domain. However, this time it was done with large numbers of marines who were specifically trained and equipped for this task, making them more effective. The deployment of marines in such a manner had never before been displayed in Europe. Joint support was critical (5/5) for the overall success of the mission.

e. Cover/Concealment

No cover or concealment was used for the raid on Medway. Naval movement was dictated by the tides of the river; therefore, movement in darkness was considered to be too risky, given the navigational challenges of shallow waters and bendy rivers. De Ruyter was not concerned with this principle, since his intelligence indicated that the British were too weak to react in force in a timely manner. Therefore, operational security was successful, as the British were not expecting the Dutch. Cover and concealment was less important (2/5) for mission success, partly because the raiding force was delivered by a superior force.

f. Innovation

The innovation used in this raid was both technological and organizational. Under the leadership of De Witt, the navy ships were reformed before the second Anglo-Dutch War; new types of ships, specifically for the navy, were built instead by converting existing merchant ships into navy ships with limited firepower and maneuverability.¹⁴⁸ The organizational innovation was the creation and use of a new amphibious unit, the

¹⁴⁸ Samuel McLean, “‘Victory Was Everywhere.’ Johan de Witt, Decision-Making and the Raid on the Medway (1667),” *British Naval History*, October 7, 2015, <http://www.britishnavalhistory.com/victory-was-everywhere-johan-de-witt-decision-making-and-the-raid-on-the-medway-1667/#sdfootnote23sym>.

Dutch Marine Corps. The marines from the newly-formed Marine Corps were mainly recruited from the army, and were commanded by a former army commander who was brought into the navy, Lieutenant-Admiral Van Ghent.¹⁴⁹ This was the first time the marines were used in combination with the navy; therefore, innovation was critical (5/5) for mission success.

6. Conclusion

The principles for successful special operations in the littorals were analyzed against the operation and saw the principles hold, in various degrees. Five out of six principles were considered important or very important for mission success. The only principle not considered important was cover and concealment. The points given for each principle are shown in Table 2.

Table 2. Chatham Raid: Rating of Principles

Chatham Raid 1667					
Principle	Irrelevant (1)	Less important (2)	Moderate (3)	Important (4)	Very Important (5)
D. Planning				X	
Tailored F.				X	
S. Mobility				X	
Joint Supp.					X
Cover/Con		X			
Innovation					X

Due to extremely difficult terrain (unpredictable, shallow, and bendy waterways), the Dutch decided to put less emphasis on the principle of cover/concealment. In this operation, the superior force numbers meant the lack of cover and concealment did not influence the outcome. Figure 13 shows the analysis of the principles in a radar figure.

¹⁴⁹ Wezeman, “De Tocht naar Chatham, 1667” [The raid on Chatham, 1667].

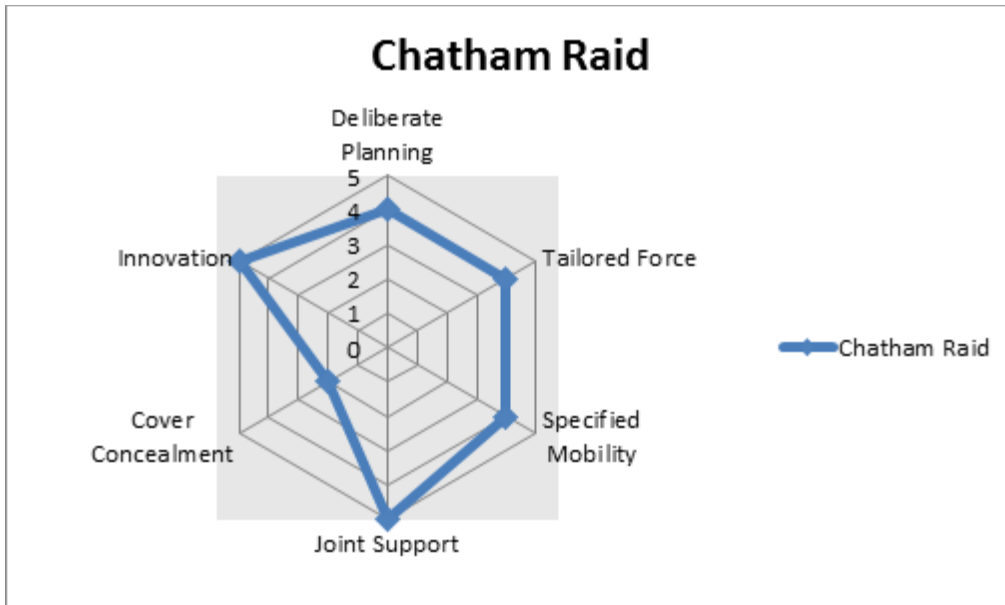


Figure 13. Chatham Raid Analysis

In the hexagram, the further each point is from the center, the more important the principle is for overall success. The figure gives a clear indication that five out of six principles are important for mission success. Overall, the case helped to show the significance of five of the six principles.

B. OSLO HARBOR SHIP ATTACK: OPERATION MARDONIUS NORWEGIAN SOE (1943)

As a case where the force came from land and conducted an operation in littoral waters, the Oslo harbor ship attack is the only case from the WWII period, when most countries first established formal Special Forces. The case signifies one of two operations in this study conducted on occupied territory. It also represents one of the most daring missions conducted by Norwegian Special Forces.¹⁵⁰

1. Background

On April 9, 1940, German forces invaded Norway as part of Operation Weserübung. During World War I (WWI), the British Royal Navy effectively denied the

¹⁵⁰ It would also be the predecessor for what today is Norwegian Naval SOF.

German High Seas Fleet (Hochseeflotte) access to the Atlantic by creating a blockade between Scotland and Norway, and England and France. The aim of the Germans was to prevent a similar blockade between Scotland and Norway. The second aim for invading Norway was to ensure access to the Swedish iron ores, which were transported by train to Narvik in northern Norway and then shipped to Germany. The iron was used for building U-boats and warships for Germany.¹⁵¹

Once the Germans initiated Operation Weserübung, the Norwegian government surrendered or fled to Britain in a few days.¹⁵² Many young Norwegians escaped to Britain to join the allied fight against the Germans, enlisting in the Norwegian Armed Forces, which fought under British command. A small unit called the Norwegian Independence Company No. 1, later renamed Company Linge after their first commander, was formed as part of the British Special Operations Executive (SOE).¹⁵³ The Company recruited the finest Norwegian soldiers who received special training to conduct propaganda, sabotage, special operations, intelligence work, and lead the resistance in Norway.¹⁵⁴ Two of these men were Max Manus and Gregers Gram.

While going through SOE training, Manus and Gram discussed attacking German shipping in Norway. The Germans relied on ship transport to move Norwegian Jews to Germany, to transport troops to the Eastern Front and supplies to Norway (see Figure 14). A strike on their shipping would disrupt their logistics significantly. For this purpose, Manus built new limpets consisting of magnets and a time fuse that dissolved in saltwater that could be left on the ship hull.¹⁵⁵ They made several attempts to get the operational

¹⁵¹ Richard D. Hooker and Christopher Coglianesse, *Operation Weserübung and the Origins of Joint Warfare* (Washington, DC: National Defense University, Institute for National Strategic Studies, 1993), 101–2. <http://www.dtic.mil/dtic/tr/fulltext/u2/a528871.pdf>.

¹⁵² Hooker and Coglianesse, *Operation Weserübung and the Origins of Joint Warfare*, 101–2. King Haakon fled to London with his family.

¹⁵³ Manus, *Mitt Liv [My life]*, 136.

¹⁵⁴ Det Store Norske Leksikon [The Large Norwegian Lexicon], “Kompani Linge” [Company Linge], accessed March 8, 2016, https://snl.no/Kompani_Linge.

¹⁵⁵ Manus, *Mitt Liv [My life]*, 143. A limpet mine is an underwater explosive charge, especially designed to damage the hull, propulsion or steering of a ship.

plans approved by their commanders. After making the plan very detailed, it was finally approved.¹⁵⁶



Figure 14. Norwegian Jews Awaiting Transportation via SS *Donau* to Nazi Concentration Camps¹⁵⁷

2. Aim of the Mission

The overall aim of the mission was to disrupt German logistics by damaging or sinking as many ships as possible in Oslo Harbor. A successful mission would hamper the Germans' ability to deport Jews from Norway to the concentration camps in Germany and Poland. It would also stop German troop transports from Norway to the Eastern Front.¹⁵⁸ A successful attack in the middle of the Norwegian capital would also

¹⁵⁶ Manus, *Mitt Liv* [My life], 136. [don't u

¹⁵⁷ Later sunk by Manus and his colleagues in the Norwegian Company Linge. Ryde.org, accessed March 8, 2016, <http://www.ryde.org/wp-content/uploads/2014/11/norway-ss-donau.jpg>.

¹⁵⁸ Michael Tillotson, *SOE and the Resistance: As Told in the Times Obituaries* (London: Continuum International Publishing Group, 2011), 62–63.

demonstrate Allied capabilities to strike German forces in their safe havens. In Norway, any successful resistance against the Germans would help to boost the morale of the occupied people and their resistance fighters.

3. Mission Planning

Manus and Gram's plan was to cross the North Sea by plane and be dropped by parachute into the woodlands east of Oslo.¹⁵⁹ Then they would build a camp in the forest, link up with the local resistance, and recruit locals to join the ship attack. They would conduct reconnaissance on the harbor and potential targets, and acquire canoes to conduct the operation. The initial plan was to conduct a large-scale attack on German ships, using up to ten canoes, manned by Manus, Gram, and 18 local Norwegians armed with limpets, in a swarmed-based attack. Once the ship attack was executed, Manus and Gram planned to escape from Norway on foot to Sweden and from there make their way to Great Britain.¹⁶⁰

4. Mission Execution

The insertion from Britain did not go as planned. On 12 March 1943, the team was dropped at the wrong location, and the equipment got spread across the forest. Once they recovered their equipment, they set up their camp.¹⁶¹ Manus became severely ill, which resulted in a delay of five days. Once contact was made with the local resistance, they established a Forward Operating Base (FOB) in Ljan. From Ljan, they started their reconnaissance of Oslo harbor. They observed that the Germans patrolled the harbor with three patrol boats, and the pier and ships had anti-sabotage guards patrolling. They also gained intelligence from Norwegian workmen at the harbor, who also helped them to smuggle 30 limpets inside the harbor.¹⁶²

¹⁵⁹ Jan Christensen, *Oslogjengen: Europas Beste Sabotørgruppe [The Oslo Gang: Europe's best sabotage group]* (Oslo: Nova, 2011).

¹⁶⁰ Manus, *Mitt Liv [My life]*, 144–46.

¹⁶¹ *Ibid.*, 149–53.

¹⁶² Christensen, *Oslogjengen [The Oslo Gang]*.

Initially, there were enough local Norwegians interested to join the sabotage operation. However, once the plan was shared, the volunteers backed off because they thought it was too risky. In the end, they were left with only two volunteers, Halvor Haddeland and Einar Riis Johansen, to join the sabotage mission with the canoes. Instead of the large-scale swarm attack, they went for stealth and guile. One local shipyard worker, Sigurd Jacobsen, would place limpets on several ships that same night at Aker Mech (see Figure 15.)¹⁶³



Figure 15. Akers Mek Verksted: Shipyard in Oslo¹⁶⁴

The saboteurs prepositioned equipment and explosives on Bleikøya, one of the islands close to the target harbor.¹⁶⁵ They planned to row to the island in daytime, wait for darkness, then row the last distance to the harbor, and place the limpets on the ships.

¹⁶³ Christensen, *Oslogjengen [The Oslo Gang]*.

¹⁶⁴ Akers Historie [Aker's history], "Om Aker" [About Aker], accessed March 9, 2016. <https://www.akerasa.com/Om-Aker/Historie>.

¹⁶⁵ Christensen, *Oslogjengen [The Oslo Gang]*.

The operation would be executed under the cover of darkness and clouds. The team found the perfect night and initiated the operation. Unfortunately, the cloud cover dissolved, the quay was busy with Germans shipping goods, and the sky was lit up like daytime.

On 27 April 1943, the saboteurs left in two canoes from Ljanskollen in daytime and, as a distraction, they started to paddle towards Nesodden.¹⁶⁶ Then, they turned and started to paddle towards Hovedøya and Blekøya. When passing Hovedøya, the German watchtower guards followed the two canoes closely with binoculars. However, the guards did not notice the British battle uniforms and the weapons in the canoes. They also passed several German soldiers relaxing on a beach. Strangely, none of the Germans did anything to stop the canoes.¹⁶⁷

The teams approached Blekøya and pulled the canoes onshore. They were positioned close to the targets and in sight of the German guards in the watchtower at Hovedøya. To avoid attention, the saboteurs behaved like sightseers. The men prepared their canoes for the sabotage. Manus left some British cigarettes, a letter to Admiral Dönitz signed by Corporal Atkins in the Royal Navy, and one limpet with a timed fuse left to create a distraction when the other limpets went off.¹⁶⁸

The men paddled around Sjursøya and began to spot the German ships in the harbor. There were three targets on Aker Mech.¹⁶⁹ At Grønli, there were two ships, *Tuguela* and *von Knipprode*. In the main harbor, there were several other ships. The canoes split up and started their final approach. As the team got closer, they saw a lot of activity, noticed that the harbor was lit up, and that the Germans were supplying the ships.¹⁷⁰

¹⁶⁶ Nesodden is a populated island away from the main harbor in Oslo.

¹⁶⁷ Manus, *Mitt Liv [My life]*, 162–63.

¹⁶⁸ The letter was left to ensure that the Germans would believe it was a British attack, and in that way avoid any retaliation against the local workers in the harbor and shipyard.

¹⁶⁹ Aker Mech was the main shipyard in Oslo Harbor at the time. Christiansen, *Oslo Gjengen*, no page numbers.

¹⁷⁰ Christiansen, *Oslogjengen [The Oslo Gang]*.

The team was able to maneuver around the guards and the patrol boats to place limpets on *Tuguela*.¹⁷¹ *Von Knipprode* was also well lighted, so Manus decided to drop the target.¹⁷² Once the limpets were placed, they paddled for their lives back to Ljankloppen and met the others.¹⁷³ Gram and Halvor had escaped the patrol boat by hiding on land, close to the main harbor, and then successfully placed limpets on three ships from their canoes.

The teams left one by one: Halvor and Einar went home, while Manus and Gram met up at Martinsen's farm.¹⁷⁴ Including Sigurd's work, they had planted limpets on seven ships in total. *Ortelsburg* and *Tuluega* were destroyed together with a smaller bunker boat.¹⁷⁵ The limpets on *Aker Mech* had a malfunction and were spotted by one of the workers later in the day. The last ship Gram had placed limpets on also had a malfunction, and the Germans pulled it ashore and removed the limpets. The detonators had gone off on all the limpets; however, the detonators' charges were too small to detonate the plastic explosive underwater for most of the limpets. Manus and Gram made their way to Sweden on foot and then from Sweden to Britain by a merchant ship.¹⁷⁶

5. Result of the Mission

Although the limpets only worked on three of the seven ships, the operation was a big success. The operation hampered the Germans' ability to move personnel and supplies to vital locations. The most important result was to demonstrate Allied capability to attack the German occupiers in Norway, which created a morale boost for the

¹⁷¹ Christensen, *Oslogjengen [The Oslo Gang]*.

¹⁷² Manus, *Mitt Liv [My life]*, 166–68.

¹⁷³ Christensen, *Oslogjengen [The Oslo Gang]*.

¹⁷⁴ Martinsen was a local farmer living close to their initial landing site in the woodlands. He helped them store equipment and supported the local resistance.

¹⁷⁵ Bernard O'Connor, *Sabotage in Norway during World War Two*, June 2, 2014, 202, https://books.google.com/books?id=FmcNBgAAQBAJ&lpg=PP1&ots=cHHniO3w_T&dq=O%E2%80%99Connor%2C%20Bernard.%20Sabotage%20in%20Norway%20during%20World%20War%20Two.&pg=PP1#v=onepage&q=O%E2%80%99Connor.%20Bernard.%20Sabotage%20in%20Norway%20during%20World%20War%20Two.&f=false.

¹⁷⁶ Christensen, *Oslogjengen [The Oslo Gang]*.

Norwegian population and resistance. The people of Oslo celebrated the sinking of the ships like it was Norwegian Independence Day.

During the attack, 24 Germans died on *Ortelsburg* and one German was injured on *Tuluega*. Figure 16 illustrates the result of the attack and a picture of Manus. The Germans believed it was a British submarine with combat-divers that had conducted the attack. No Norwegian workers were suspected.¹⁷⁷ Manus and Gram were both invited to meet the Norwegian King Haakon in London to receive his gratitude for the success of the operation, and both were awarded the War Cross with a Sword medal.¹⁷⁸

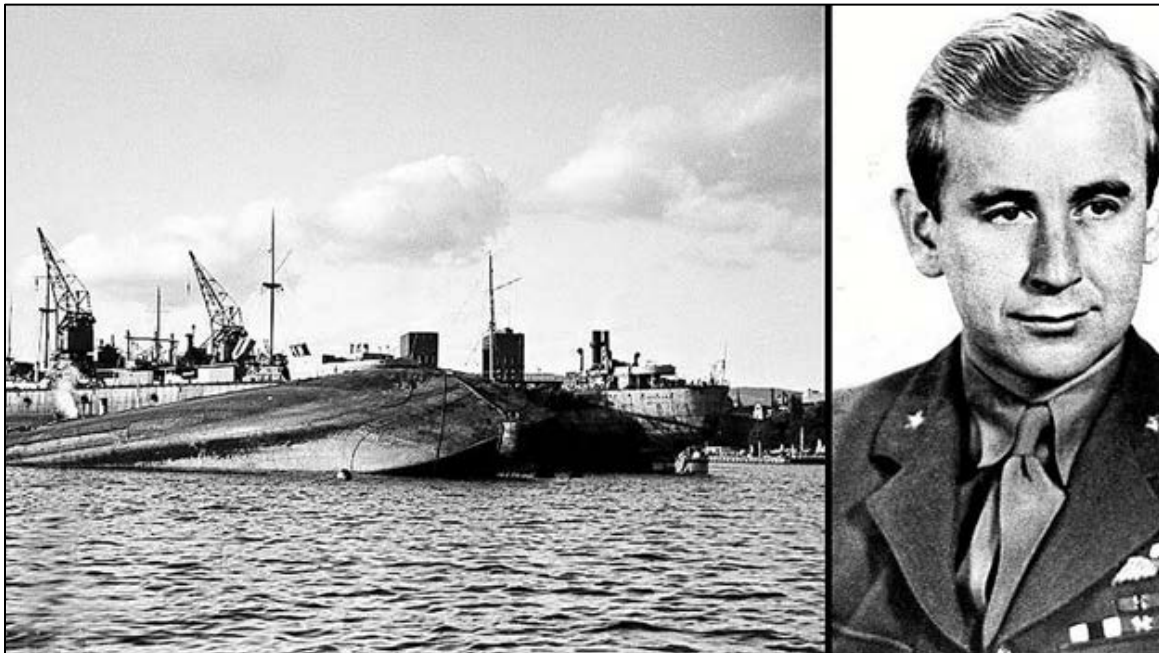


Figure 16. Ship Sunk by Manus and His Colleagues at Aker Mech Shipyard/Picture of Manus in Uniform¹⁷⁹

¹⁷⁷ Manus, *Mitt Liv [My life]*, 170–72.

¹⁷⁸ *Ibid.*, 174–76. It is equivalent to the Medal of Honor.

¹⁷⁹ Osloby [Oslo city homepage], “Krigsminnekrasj på Aker Brygge,” accessed March 10, 2016, <http://www.osloby.no/nyheter/Krigsminnekrasj-pa-Aker-Brygge-5353455.html>.

6. Analysis of Principles

a. Deliberate Planning

The operation was planned in great detail. Manus and Gram made several attempts to get the operation approved by the Norwegian and British commanders in London. Manus and Gram conducted specific training and rehearsals to be prepared for the operation in Scotland. However, this was the case only for Manus and Gram. For the local resistance, the preparations were done in the vicinity of Oslo. The operation scores very high on the planning phase and helps strengthen the argument for this principle in littoral special operations. Deliberate planning was very important (5/5) to the overall mission success.

b. Tailored Force

The force was specifically tailored for the mission. The leaders of the mission were Manus and Gram, both native Norwegians. It was important to act as normal civilians in Norway and blend in, which reduced the chance of them being compromised. Manus and Gram wanted to try and get more canoes involved, but in the end, the force was sufficient to carry out the operation. A small force had less chance to be detected by German patrol boats, guards on the pier or the ships. The small footprint made it also possible to move into Oslo without being spotted by the Germans. The operation scores high on the tailoring of force and reinforces the importance of this principle. Tailored force was critical (5/5) to the overall mission success.

c. Specified Mobility

The saboteurs used specified mobility for this operation. They were transported from Britain in a Douglas airplane and parachuted into the woodlands in Norway. Then they used foot and bicycle transport around Oslo, before conducting the actual ship attack with canoes. After the attack, they used foot and bicycle to get across the Swedish border. The use of canoes for the actual ship attack was a good choice and completely unexpected by the Germans. The operation scores high on this principle. Specified mobility was critical (5/5) to the overall mission success.

d. Joint Support

Without the support of the Royal Air Force, the saboteurs would not have inserted successfully. They also received essential support from the local resistance who hid equipment and provided safe houses, their resources, and three locals who joined the operation. The operation could not have been conducted without this support, and therefore it scores high on jointness. Joint support was essential (4/5) to the overall mission success.

e. Cover/Concealment

The operation took place on occupied territory, so the saboteurs had very little chance of any external support during the operation in Norway. Cover and concealment became an important instrument of success. The air insertion, for example, was dependent on concealment. Subsequently, the saboteurs used the forest and the local farmer to cover their presence. They used disguise to move around Oslo without being spotted, as the Germans were seeking both Gram and Manus for previous propaganda operations.¹⁸⁰ The most vital part of the operation was the infiltration by canoes in daytime when they appeared to be normal people on an outdoor activity. Norwegians are very fond of outdoor activity, and dressing up as a hiker was a very effective way to blend in. They used the cover of darkness and the silent approach by a canoe to place the limpets. On their way to Sweden, they also disguised themselves as hikers to move safely across the countryside. The Germans did not know of the mission, and the locals did not inform the Gestapo of the presence of Manus and Gram in Oslo; hence, the mission scores high on security. This principle was also vital for the team to succeed with their mission. Cover and concealment was critical (5/5) to the overall mission success.

¹⁸⁰ Manus and Gram conducted several propaganda operations in Norway prior to escaping to Britain and joining the SOE. The German Gestapo already wanted them for these operations.

f. Innovation

Manus and Joakim Rønneberg¹⁸¹ created a new type of limpet mine, which allowed them to execute the operation. The use of canoes to infiltrate to the harbor was also a new concept. They were able to combine many types of insertions and the use of local resistance to support the operation in a very creative way. They also achieved this without generating any accusations against the local workers at Akers Mech and the other harbors.

The team used military insertion from Britain and then shifted to a civilian cover when safely established in the Norwegian woodlands. Then they used British battle uniforms during the night operation and shifted back to civilian cover when infiltrating to Sweden and Britain. It was a very effective and creative way of ensuring cover and concealment at every stage of the operation. The operation all in all scores very high on innovation both in methods, team configuration and technology. Innovation was critical (5/5) to the overall mission success.

7. Conclusion

The operation was very successful and used all the principles to successfully conduct special operations in the littorals. From Table 3, one can see that the operation scored “important” or “very important” on all the principles. Joint support was the only principle that scored “important.” This case is a prime example of how important these principles are for littoral special operations. The Norwegian SOE operatives later used similar methods on several other ship attacks in Oslo and other locations in Norway in WWII.¹⁸²

¹⁸¹ Rønneberg is another highly decorated war hero who led the Heavy Water Raid at Rjukan, Norway.

¹⁸² *Max Manus: Man of War*, directed by Joachim Rønning, Espen Sandberg, Oslo, Norway, 2008.

Table 3. Oslo Ship Attack: Rating of Principles

Oslo Ship Attack 1943					
Principle	Irrelevant (1)	Less important (2)	Moderate (3)	Important (4)	Very Important (5)
D. Planning					X
Tailored F.					X
S. Mobility					X
Joint Supp.				X	
Cover/Con					X
Innovation					X

This operation is an excellent example of how a small team of SOF operators can create a strategic effect on a far superior enemy by preparing and executing operations in a creative, daring, and thorough way. The hexagram in the radar figure shown in Figure 17 shows an almost perfect score.

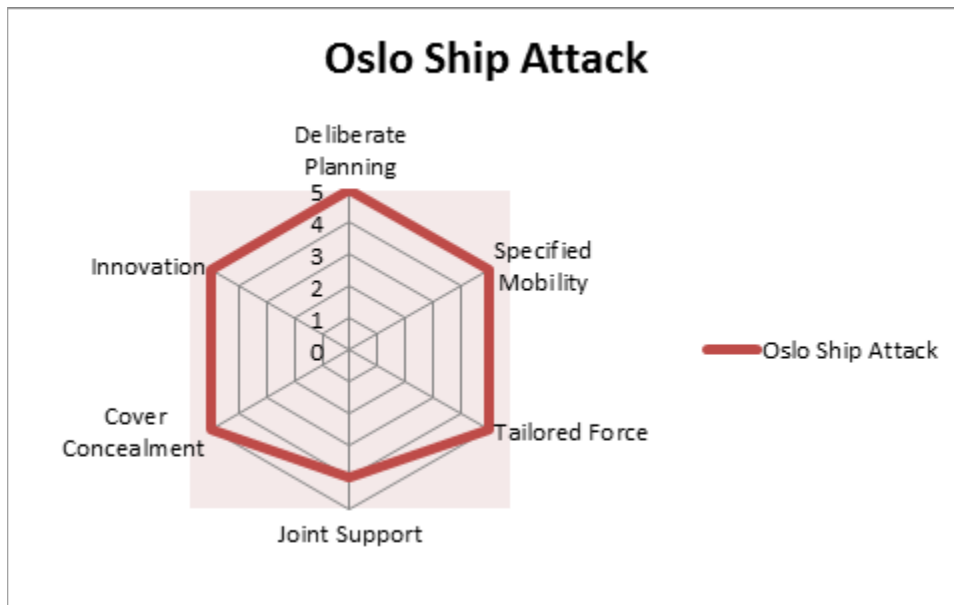


Figure 17. Oslo Ship Attack Analysis

Joint support is the only principle that only scores four out of five.

C. PEBBLE ISLAND RAID: OPERATION PRELIM, FALKLANDS (1982)

This case was selected because it includes a large nation in a full war scenario in occupied territory. The operation was conducted in support of the decisive landing in San Carlos during the Falklands War in 1982. The operation was at the height of the Cold War. It is the only operation conducted both in the southern hemisphere and in South America, involving a large-scale airport raid. These characteristics help provide a broader testing ground for the principles for successful littoral special operations.

1. Background

In April 1982, the Argentinian Junta initiated Operation Rosario. The purpose of the operation was to remove the British authorities from the Falklands and to reintegrate the Islands into Argentina. The Argentinian landing was conducted with elite units from the Armada (Army) and the Infanteria de Marina (marines). It was a success with few casualties.¹⁸³

British Prime Minister Margaret Thatcher and the Parliament responded quickly to the Argentinian invasion by sending a large naval Task Force (TF) toward the Falklands. Rear Admiral Sandy Woodward commanded the Force.¹⁸⁴ He planned Operation Corporate with the aim to reestablish British sovereignty over the Falklands. Included in the TF were special operation teams from the navy, army, and air force.¹⁸⁵ The maritime SOF unit, the Special Boat Squadron (SBS), was quickly deployed on multiple SR missions across East Falkland Island to help prepare an amphibious landing to free Stanley, the capital of the Falklands.¹⁸⁶ Figure 18 illustrates the target area and the landing site on the East and West Falkland Islands.

¹⁸³ Francis Mackay and Jon Cooksey, *Pebble Island—Operation Prelim* (South Yorkshire: Pen and Sword Military, 2007), 9.

¹⁸⁴ John Arquilla and Maria Moyano Rasmussen, “The Origins of the South Atlantic War,” *Journal of Latin American Studies* 33, no. 4 (November 2001): 753.

¹⁸⁵ “Falklands/Malvinas War,” *Global Security*, accessed April 25, 2016, <http://www.globalsecurity.org/military/world/war/malvinas.htm>.

¹⁸⁶ Mackay and Cooksey, *Pebble Island—Operation Prelim*, 12.



Figure 18. Map of Pebble Island and Falklands: Raid Site and Main Landing Site Marked¹⁸⁷

Admiral Woodward and his staff planned to conduct Operation Sutton, the amphibious landing, on the East Falkland Island in the area of San Carlos. When British Harriers discovered an Argentinian airfield in the vicinity of Pebble Island, it posed a serious threat to the landing.¹⁸⁸ The observation was made May 10, just five days prior to the planned landing. All SBS teams were already deployed across the main islands in Observation Post (OP) or beach reconnaissance operations. The land SOF unit, the Special Air Service (SAS), was given the task to remove the air threat from Pebble Island. The operation was named Prelim, and it was established as a support operation to Operation Sutton.¹⁸⁹

¹⁸⁷ Gina B., “The Pebble Island Raid,” SAS Regimental Sergeant-Major (blog), November 1, 2013, <http://peterratcliffeappreciationsociety.blogspot.com/2013/11/pebble-island-raid.html>.

¹⁸⁸ Mackay and Cooksey, *Pebble Island—Operation Prelim*, 49–50.

¹⁸⁹ *Ibid.*, 54–55.

2. Aim of the Mission

The aim of Operation Prelim was to eliminate the air threat on Pebble Island to allow the amphibious landing in San Carlos to continue as planned. The SAS had two squadrons deployed with the maritime TF, and both took part in what would be the largest raid conducted by British SOF since 1956.

3. Mission Execution

On May 11, the SAS inserted two patrols of four men by helicopters into Garden Hill on West Falkland; they were equipped with two-man Klepper canoes. The SR patrols were planning to insert from West Falkland to Pebble Island by paddling through Whale Bay and landing at Phillips Cove, but due to strong winds and the high sea state, ended up crossing from Garden Hill to Whale Bay across land (see Figure 19).¹⁹⁰ The heavy canoes were carried across the hills, and the patrols established an OP in Deep Ferney Valley, during daytime. Late on May 13, they paddled from Deep Ferney Valley to Phillips Cove and cached their canoes.¹⁹¹ The flat area they had identified on the map as a possible landing site, for the raiding force in Phillips Cove, turned out to be a small lake. The reconnaissance patrols had to find a new site while searching for enemy activity.¹⁹²

¹⁹⁰ Mackay and Cooksey, *Pebble Island—Operation Prelim*, The Klepper canoes can be disassembled and carried backpacks. These loads are very heavy.

¹⁹¹ Cache: to hide equipment so as to later retrieve it. The cache is camouflaged to ensure the enemy or civilians don't discover the equipment.

¹⁹² Mackay and Cooksey, *Pebble Island—Operation Prelim*, 61.



Figure 19. Pebble Island Map¹⁹³

A small team moved four miles across Pebble Island until the airport was in sight and established an OP east of First Mountain. The OP identified 11 Argentinian aircraft and reported the Argentinian force strength to the British TF. They informed the TF that the raid could proceed that night. The OP continued to report enemy guard routines and defensive positions of the Argentinian FOB.¹⁹⁴

The SOF operators at HMS *Hermes* prepared to insert by helicopter to Phillips Cove to link up with the reconnaissance patrols. The raiding force was 42 men strong. The force included one conventional naval officer, with local knowledge, and one NGS

¹⁹³ “Everythingselectric,” accessed April 8, 2016, <http://www.everythingselectric.com/images/geology/>.

¹⁹⁴ Mackay and Cooksey, *Pebble Island—Operation Prelim*, 62–63.

controller.¹⁹⁵ The raiding force was divided into one fire support group, one assault group, one command group, one covering group, and one reserve group.¹⁹⁶

HMS *Hermes*, HMS *Broadsword* and HMS *Glamorgan* would support the operation. The Sea King helicopters would insert the raid force from HMS *Hermes*, while HMS *Broadsword* would provide anti-air and anti-submarine protection. HMS *Glamorgan* would move north of Pebble Island and provide NGS for the raid force. Due to heavy winds, HMS *Hermes* had to sail far into Argentinian air coverage, but luckily, the Argentinians neither identified her presence nor attacked her.

The raiding force was successfully inserted into Phillips Cove and met by the reconnaissance team. The team led the raiding unit up to the fire support position on the ridge, southeast of the airfield. Then the assault and command group moved towards the airfield, while the covering troop took up position between the settlement and the airfield. All units agreed to meet at the fire support location for withdrawal after the raid.¹⁹⁷

The raid force had explosive charges, M16s with 203 40mm rocket launchers, Light Anti-armor Weapons (LAWs) and General Purpose Machine Guns (GPMG) to destroy the airplanes, arms, and fuel dumps. The Pucarás,¹⁹⁸ arms, and fuel dumps would be prioritized with explosive charges, while the Mentors and Skyvans would be attacked by small arms and rockets.¹⁹⁹ Figure 20 illustrates the airstrip on Pebble Island after the attack:

¹⁹⁵ The naval officer had previously lived at Pebble Island and knew the area well.

¹⁹⁶ Mackay and Cooksey, *Pebble Island—Operation Prelim*, 64–65.

¹⁹⁷ *Ibid.*, 74–75.

¹⁹⁸ Argentinian fighter jet.

¹⁹⁹ Mackay and Cooksey, *Pebble Island—Operation Prelim*, 80.



Figure 20. Picture of Airstrip on Pebble Island²⁰⁰

The raid was initiated when HMS *Glamorgan* fired an illumination round at the ridge north of the airfield.²⁰¹ The Argentinian defenses on the ridge fired shots in reply. The command group then requested high explosive rounds on the ridge from *Glamorgan* and illumination rounds from the mortars in the fire support group. The assault force moved from north to south and attached explosives on the Pucarás while the other planes were attacked with M16/203, LAW, and GPMG. One of the 203 40mm grenades went off close to the assault group, and a splinter injured Corporal Davey. He was taken care of by the troop medic and escorted to the fire support group.²⁰²

²⁰⁰ Wikipedia, s.v. “Raid on Pebble Island,” last modified January 16, 2016, https://en.wikipedia.org/wiki/Raid_on_Pebble_Island.

²⁰¹ Lawrence Freedman, *The Official History of the Falklands Campaign, Volume 2: War and Diplomacy* (London: Routledge, 2005), 369.

²⁰² Mackay and Cooksey, *Pebble Island—Operation Prelim*, 81.

Argentinian defenses gave little resistance to the raiding group. The six Argentinian Marines on guard duty informed their commander, Lieutenant Marega, who prepared the pre-positioned explosive charges. The bombardment ignited some air fuel and lit up the area. The raid group spotted a group of Argentinian Marines preparing the charges on the airfield. This led to a small firefight between the forces, but the raiders suppressed the Marines. One more raider received an injury when the Argentinians detonated the pre-positioned charges. The charges were dug in to make the airfield unusable. Corporal Armstrong was blown off his feet, but he only suffered reduced hearing for a few days.²⁰³

As first light was approaching, the raiding group blew the charges and fired the last rounds on the Argentinian aircraft, before they infiltrated to the fire support group.²⁰⁴ The command group radioed to HMS *Hermes*, “Mission accomplished and ready for pick up.”²⁰⁵ They reorganized at the fire support position and moved east to the pickup point (PUP) while HMS *Glamorgan* continued to cover their retreat by NGS. As the Sea Kings approached the PUP, *Glamorgan* shifted its fire, from the ridge north of the airfield to the ridge between the airfield and the PUP. The raiding force was successfully picked up and returned to HMS *Hermes*.²⁰⁶

4. Result of the Mission

The raid was a huge success. All the Argentinian aircraft were destroyed beyond local repair. The British raiding force had destroyed most of the aircraft, even though the Argentinian forces had successfully destroyed the airfield with their charges. The operation essentially eliminated the air threat from the West Falklands against the British landing in San Carlos. The raid was completed without any casualties, only two minor injuries for the SOF operators. It demonstrated the capability of the British SOF units,

²⁰³ Mackay and Cooksey, *Pebble Island—Operation Prelim*, 82.

²⁰⁴ *Ibid.*, 83.

²⁰⁵ *Ibid.*, 84.

²⁰⁶ *Ibid.*, 84.

and the ability to strike Argentinian FOBs across the Falklands.²⁰⁷ Figure 21 illustrates the result of the raid.



Figure 21. A Pucara, one of 11 Destroyed by the SAS²⁰⁸

5. Analysis of Principles

a. *Deliberate Planning*

The operation timeline left the reconnaissance and raid group with little time for planning and rehearsal. The two reconnaissance patrols were deployed 48 hours after the British recognized the air threat at Pebble Island. Then 48 hours later, the raiding force met the reconnaissance teams in Phillips Cove. However, the planning was sufficient to succeed with the mission. The key players in the operation were given a four-day period to complete. The helicopter pilots were familiar with these types of insertions after

²⁰⁷ Freedman, *Official History of the Falklands Campaign*, 369.

²⁰⁸ Gina B., "The Pebble Island Raid."

several successful insertions of SBS teams, earlier in the conflict. The naval support was already present, and the use of an experienced NGS controller gave the raiding force a huge advantage. However, the operation gave no chance to conduct full-scale rehearsals due to positioning in the South Atlantic Sea with Argentinian naval and air threat. Additionally, the timeline of the main landing in San Carlos forced the raiding group to speed up their planning process. The planning did, however, qualify as deliberate for the specific operation. The operation scores moderately important (3/5) on the principle, which means it made a considerable impact on mission success.

b. Tailored Force

The operation was conducted with a force combined by troops from two SAS squadrons, supported by one NGS controller and one local expert. It also included aviation, naval, and NGS support during the mission. The force was tailored for the specific mission. Limitations in carrying capacity, distance, and weather conditions on the Sea Kings meant the SOF commander had to carefully consider each member of his raiding group. The raiding force was the largest British SOF force conducting a raid since the 1950s and included personnel from two assault squadrons. The operation scores very important (5/5) on the principle, which means it made a critical impact on mission success.

c. Specified Mobility

The reconnaissance teams used a combination of naval insertion, helicopters, foot insertion, canoes, and foot infiltration, crossing three domains by those means, to reach the target area. The assault force did not use canoes but were otherwise identical in the use of insertion methods. Then the entire force used foot exfiltration, helicopter extraction, and naval extraction. The mobility was specified for the mission, but it did not include creating new types of insertion crafts specifically for the mission. On the scale, the principle scores essential (4/5), which means that it was essential for achieving mission success.

d. Joint Support

The mission would not have been possible without joint support to the raiding force, and it included all the services in the British Armed Forces. First, the target was observed by Harrier fighter jets to confirm the airfield and Argentinian land forces at Pebble Island. Both the reconnaissance team and the assault force were based and launched from HMS *Hermes* during operation. The helicopter carrier inserted them all the way from Britain. The navy also provided NGS support during the mission. The operation scores very important (5/5) on the principle, which means it was critical for mission success.

e. Cover/Concealment

The British naval force considered HMS *Hermes* as mission critical to succeed with an amphibious landing on the Falkland Islands. However, during the raid on Pebble Island, Admiral Woodward did place substantial risk upon HMS *Hermes*, HMS *Sutton*, and HMS *Glamorgan* by exposing them to Argentinian air threat when inserting the reconnaissance team. Harsh wind conditions made it impossible for the Sea Kings to fly from outside the Argentinian air coverage. The British force encountered the same problem when the main raiding force was inserted. Any discovery by Argentinean air assets during this part of the operation could have been a disaster for the British.

In addition, the helicopter insertions were dependent upon concealment, because detection during landing could result in a catastrophe. The reconnaissance force was very vulnerable when crossing in canoes from West Falkland Island to Pebble Island. If an Argentinian patrol on land or a patrol boat had discovered them, they would have been an easy target. The lack of radio contact while paddling and an impossible retreat to the British naval TF in canoes meant they would have been on their own. Similarly, the reconnaissance team and raid team foot infiltrations heavily depended on cover and concealment to succeed. The Argentinian forces did not know of the raid prior to the attack, hence the operation scores high on operational security. The operation was extremely dependent on this principle; hence it scores very important (5/5) on our scale. It was critical for overall mission success.

f. Innovation

Although they used innovation to a certain degree, the level of innovation was not radical. There were few new tactics and procedures used during the Pebble Island raid. However, the combinations of SR patrols inserted with helicopters and Klepper canoes were unique. Similarly, the use of NGS during a SOF raid on an airfield was a creative combination, although none of these tactics were new in themselves.

The on-scene commander had to make some difficult choices during the operation, which altered the plan. Firstly, the primary assault force was changed for the reserve when they walked off course during the insertion. Secondly, one of the objectives was dropped when one of the SOF operators got shrapnel in his foot. The ability to rapidly change and create new solutions is one of the most important characteristics of a SOF unit, especially in the littorals where circumstances are very dynamic. In summary, there were few technological innovations during this mission, but several organizational and doctrinal innovations. There were new approaches to accomplishing tasks and changes during the mission to allow for mission success.²⁰⁹ The principle was moderately important (3/5) on our scale, which indicates it made a considerable contribution to the mission success.

6. Conclusion

The Pebble Island raid was a very important contribution to the successful British landing in San Carlos. It helped Britain to regain control over the Falkland Islands. The special operation was conducted in a very complex littoral environment. However, the raiding force successfully achieved the desired end state for the mission, the elimination of the air threat in West Falkland.

The principles for SOF success in the littorals was tested against the operation, and the analysis in large part saw the principles hold. The operation was deliberately planned, and the force was tailored to the mission. The mobility was specified and saw

²⁰⁹ Robert G. Spulak, *Innovate or Die: Innovation and Technology for Special Operations* (Tampa, FL: JSOU Press, 2010), 53.

combinations not seen earlier, which gives the mission elements of innovation. The on-scene commander was also forced to change priorities during the mission.

It was a joint mission and depended heavily on other services to succeed. The mission also demonstrated the importance of cover and concealment to avoid mission failure. Table 4 gives an overview of the rating of the principles.

Table 4. Pebble Island Raid: Rating of Principles

Falklands Pebble Island Raid 1982					
Principle	Irrelevant (1)	Less important (2)	Moderate (3)	Important (4)	Very Important (5)
D. Planning			X		
Tailored F.					X
S. Mobility				X	
Joint Supp.					X
Cover/Con					X
Innovation			X		

The operation scored high on four out of six principles, and the two principles deliberate planning and innovation scored moderately important. Moderate importance means that they enhanced the likelihood of overall mission success and made a considerable contribution to that success. Figure 22 helps to visualize the principles in a radar hexagram.



Figure 22. Pebble Island Raid Analysis

The Pebble Island Raid helped to show the significance of the principles and especially tailored force, specified mobility, joint support, and cover and concealment. The limits on time made deliberate planning difficult. It is also hard to innovate when the planning and preparation period is constrained, and the force is onboard a helicopter carrier in the South Atlantic.

D. MUMBAI TERROR ATTACK: LASHKAR-E-TAIBA (2008)

This case is unique in nature because the mission was executed by terrorists against civilian targets. It demonstrates that terrorists are able to exploit the complexity of the littorals. The attack on Mumbai was conducted by a small tailored force, which was highly selected and well trained²¹⁰ and caused a tremendous amount of terror in the largest city in India.

²¹⁰ Similar to a SOF unit.

1. Background

Since 1947, when the partitioning of British India took place, India and Pakistan have been involved in four wars and several border skirmishes. The main reasons for these conflicts are the disagreement over the ownership of the Kashmir area. China is also part of this conflict. There were also several disputes along the maritime borders of India and Pakistan.

The Lashkar-e-Taiba (LeT, Army of the Pure) is a Pakistani terror organization whose main goal is to fight the Indian republic and to destroy Hinduism and Judaism.²¹¹ LeT was founded in 1990; it regards Hindus and Jews to be enemies of Islam, and they use that to justify a jihad against the two groups. LeT also recruit from the large Muslim population in India.²¹² Initially, LeT focused on suicide bombings to support the struggle for Kashmir. However, in 1999, the focus shifted to other parts of India as well: “LeT was not working for the liberation of Kashmir alone, but intended to aid the 200 million Muslims in India.”²¹³ As a result, LeT conducted several attacks in India, including the attack against the Indian Parliament in 2001 and a railway bombing in 2006.²¹⁴

It is believed that the Inter-Services Intelligence (ISI), the main intelligence agency in Pakistan, supports LeT:²¹⁵ “LeT has reportedly been supported by Pakistan’s Inter-Services Intelligence (ISI) since the early 1990s as one of many paramilitary groups used by Pakistan as proxy forces to create instability in India.”²¹⁶

²¹¹ Angel Rabasa et al., *The Lessons of Mumbai* (Santa Monica, CA: RAND Corporation, 2009), 1.

²¹² Rohan Gunaratna, *Mumbai Investigation: The Operatives, Masterminds and Enduring Threat*, UNISCI Discussion Papers no. 19 (Madrid: UNISCI, January 2009), 145.

²¹³ Andrea Dew, “Exploiting Seams and Closing Gaps: Lessons from Mumbai and Beyond,” *Journal of Strategic Security* 5, no. 4 (Winter 2012): 22.

²¹⁴ “Lashkar-e-Taiba,” *Mapping Militants*, January 30, 2016, <https://web.stanford.edu/group/mappingmilitants/cgi-bin/groups/view/79>.

²¹⁵ Maloy Krishna Dhar, *Fulcrum of Evil: ISI, CIA, Al Qaeda Nexus* (New Delhi: Manas Publications, 2006), 26.

²¹⁶ “Lashkar-e-Taiba,” *Mapping Militant Organizations*, January 30, 2016, <https://web.stanford.edu/group/mappingmilitants/cgi-bin/groups/view/79>; Jayshree Bajoria, “Lashkar-e-Taiba (Army of the Pure) (aka Lashkar e-Tayyiba, Lashkar e-Toiba; Lashkar-i-Taiba),” Council on Foreign Relations, January 14, 2010, <http://www.cfr.org/pakistan/lashkar-e-taiba-army-pure-aka-lashkar-e-tayyiba-lashkar-e-toiba-lashkar--taiba/p17882#p1>.

2. The Attack on Mumbai

As part of the LeT strategy, they planned a complex and well-coordinated attack against civilians in the city of Mumbai. They started the planning of the attacks nearly a year before the operation took place.²¹⁷ Although Mumbai has experienced terror attacks and bombings in the past, the Indian government and police forces were not prepared for an attack of this magnitude. The complex and spectacular attack was dispersed over multiple locations.²¹⁸ The local police forces were not trained and equipped to fight the terrorists. They had only prepared for regular bomb attacks, usually in one location.

3. Aim of the Mission

The strategic aim of the LeT attacks was to increase the tension between Pakistan and India. They wanted to shift Pakistan's focus to the Kashmir region and possible conflict with India. This would result in less of Pakistan's resources being diverted to support the U.S. effort on the Afghan border region. LeT wanted to reduce the pressure on the Afghan Taliban and Al-Qaida in the Federally Administrated Tribal Area (FATA) in northwestern Pakistan.²¹⁹ Another goal was to increase the numbers of new recruits for the cause. The tactical goal was to create terror in Mumbai, by killing as many citizens, law enforcement officers, and internationals, in the face of the international media.²²⁰

4. Mission Execution

The attacks on Mumbai were well planned; the recruitment and training of most of the attackers took over a year. During this period, they received lessons on the Quran and advanced training with focus on assault rifles, hand grenades, explosives, rocket launchers, and understanding India's security agencies.²²¹ One remarkable aspect of the training was a month-long, maritime-focused training. They were taught how to survive and operate in a maritime environment: swimming, navigation, and small boating skills.

²¹⁷ Kilcullen, *Out of the Mountains*, 52.

²¹⁸ Rabasa et al., *Lessons of Mumbai*, 6.

²¹⁹ Dew, "Exploiting Seams and Closing Gaps," 29.

²²⁰ "Lashkar-e-Taiba."

²²¹ Gunaratna, *Mumbai Investigation*, 146–48.

Besides the Liberation Tigers of Tamil Eelam (LTTE), few terrorist groups conduct specific training in maritime operations.²²² Once the training was complete, ten members were selected to perform the attack on Mumbai. All the operatives were of Pakistani descent.

LeT used open source intelligence like Google Earth to support the planning process. LeT members living in Mumbai scouted the landing site, routes to the target, and targets in Mumbai.²²³ The attack teams got their target packs together with all relevant information from the LeT leadership.²²⁴ The terrorists concluded that the safest way to travel from Pakistan to Mumbai with large amount of weapons and explosives was by sea.

On November 21, 2008, the attack teams left India from Karachi on board a fishing trawler, merchant vessel (MV) *al-Husseini*.²²⁵ They blended in with the rest of the fishing trawlers and other ships on the busy shipping lanes, as they prepared themselves for a journey of 500 nautical miles that would take over 36 hours. In order to improve cover in India waters and close to Mumbai, the attack teams hijacked an Indian fishing trawler, the trawler, MV *Kuber*, out in the open sea.²²⁶ The terrorists killed the crew and forced the captain to navigate to Mumbai.

Once the MV *Kuber* was a few miles out of the landing point, the captain was killed. The attack teams got off the trawler and into motorized rubber boats. This transfer, at night, at considerable sea-state with weapons and equipment, demonstrated that the maritime training had paid off. The attack teams, however, may have forgotten to sink the MV *Kuber*.²²⁷ The attack teams sailed with the motorized rubber boats, under the cover of darkness, towards the landing point.

²²² Gunaratna, *Mumbai Investigation*, 148.

²²³ *Ibid.*, 144.

²²⁴ *Ibid.*, 53.

²²⁵ Kilcullen, *Out of the Mountains*, 52.

²²⁶ *Ibid.*, 54.

²²⁷ Gunaratna, *Mumbai Investigation*, 149–50. The plan was for the attack force to sink the ship before they left in the rubber boats.

The scouts selected a landing point that could be described as coastal slums, consisting of numerous shacks, fishing huts, and moored boats.²²⁸ Locals noticed the attack teams, but they never contacted the police, believing the terrorists were smugglers or students.

The complete attack on Mumbai consisted of several diversion attacks, to confuse the local law enforcement and authorities. This drew the attention away from the main target. From the landing point, the teams split up, heading towards their targets. They used cabs or went by foot. The diversionary attacks took place at a popular café for tourists and the central railway station.²²⁹ In addition, to increase confusion, the cabs that were used contained bags of explosives with timed fuses.

Once these diversionary attacks were conducted, the teams went towards the main objectives. These were Taj Mahal Hotel (two teams), Oberoi Trident Hotel (two teams), and a Jewish center at Nariman House (one team). The main attacks were synchronized and controlled by a LeT command center in Pakistan. They gave the attack teams specific instructions, mainly based on information they saw on the media (e.g., television and Twitter) that covered the attacks. Satellite phones, cell phones, and Voice Over Internet Protocol (VOIP) were used as communication between the attack teams and the command center.²³⁰

The LeT commanders in Pakistan kept tight control of the overall attack. Media gave details on the whereabouts of a large group of citizens and of several ministers that were trapped in the Taj Mahal Hotel. News cameras also revealed the time it would take for the National Security Guard and Special Weapons and Tactics (SWAT) police unit to arrive.²³¹ The LeT command center in Pakistan used this information to give the attack teams specific instructions to increase chaos and destruction. They encouraged the terrorists in their attacks and reminded them to avoid capture by the police.

²²⁸ Kilcullen, *Out of the Mountains*, 55.

²²⁹ *Ibid.*, 56.

²³⁰ Gunaratna, *Mumbai Investigation*, 151.

²³¹ *Ibid.*

It took the Indians quite some time to react. After reaching an initial understanding of the extent of the attacks, the Indian authorities initiated the response. The National Security Guard, and later the Marine Commando (MARCO), a military counterterrorism unit, started to assault the three different locations. Regular Indian police units were not trained, armed, or equipped to face the heavily armed and well-trained terrorists. However, in the morning of November 29, 2008, the Indian security forces had secured the city. They had killed nine of the ten terrorists and captured one. The terrorists had killed 172 people and injured 304 during their 60-hour attack.²³²

5. Result of the Mission

While tactically the mission was a success, the strategic goal of the terrorist mission was not met. The attack did increase the political tension between India and Pakistan, nor did it lead to a conventional conflict between India and Pakistan, which could have drawn the attention away from Pakistan's CT efforts in the FATA. Additionally, it is hard to draw conclusions on the effects of the attacks on LeT recruitment. The attacks did result in a large increase in media attention for them, with more recruits the likely result. Tactically, the mission was a success; ten men caused havoc for three days in the financial capital of India. They caused multiple casualties and got extensive international media attention.

6. Analysis of Principles

a. Deliberate Planning

The attacks were planned in great detail in advance. The maritime insertion was simple, but required detailed planning and specific maritime skills. These skills had to be taught and practiced. Crossing from the maritime domain to the land domain required small boat skills in a difficult environment in darkness and unforgiving sea-state. The fact that the leadership used a maritime insertion indicates that they thought this mission through.

²³² Kilcullen, *Out of the Mountains*, 58.

The targets and the routes from the landing point were scouted by LeT members living in Mumbai. They had to know what to look for and transfer this information to LeT in Pakistan. This information must have been analyzed and subsequently turned into a plan of attack by the LeT leadership and the attackers. The attackers memorized the plan, routes, and instructions in detail: “Eyewitness accounts from the Taj Hotel indicate that the terrorists knew their way through hidden doors and back hallways of the hotel. According to another report, the terrorists had a detailed diagram of the hotel’s layout.”²³³ The operation scores very important (5/5) on the principle, which means it was critical for mission success.

b. Tailored Force

The detailed planned operation required a tailored force. The LeT organization made the decision to select only Pakistani members of LeT and not Indian members, who could have blended in better in their own country. The reason was that LeT leadership was afraid that India members would “chicken out” close to the attacks. The attacks were so indiscriminate that many fellow Muslims could be hurt or killed.²³⁴ Out of ten suitable candidates, only seven were selected, and another three battle-hardened members were added.²³⁵ The final ten members were hand-picked, based on their ethnic background, psychological profile, skill set, and previous experience. Out of the ten members, five equal assault teams were formed with one mission commander, Abu Dera Ismail Khan.²³⁶

The total group size of ten was probably chosen due to limited space on board of the fishing trawler and rubber boats. They also wanted to avoid too much attention if stopped by security forces during the maritime insertion and the landing in Mumbai. Although the terrorists were on a suicide mission, they were the object of more selection, and received more training and equipment than normal terrorists or suicide bombers. The

²³³ Rabasa, *Lessons of Mumbai*, 3.

²³⁴ Gunaratna, *Mumbai Investigation*, 145.

²³⁵ Kilcullen, *Out of the Mountains*, 53.

²³⁶ *Ibid.*, 53.

operation scores very important (5/5) on the principle, which means it was critical for mission success.

c. Specified Mobility

One of the major success factors for the mission was a successful maritime insertion. For this, the attack teams chose to use several different platforms: two different fishing trawlers (one hijacked) and three rubber motorized boats. Once landed, the teams had no mobility assets of their own; some teams took a cab, and others walked to their targets. The use of the maritime insertion and different types of boats made the mission possible. Insertion by plane, road, or rail involved high risks of early detection by Indian authorities. The operation scores very important (5/5) on the principle, which means it was critical for mission success.

d. Joint Support

Terrorist organizations usually do not have a joint organization or structure. Two aspects in regards to joint support are specific to the Mumbai attacks. First, the attack teams did get support and guidance from their commanders in Pakistan. The commanders used media to provide detailed information on the ongoing attack. This simple, but effective, use of open source intelligence could be considered joint support, and also command and control.

Secondly, the LeT planners of the attack exploited a weakness in the joint training and coordination of the Indian maritime security forces:

The Indian Navy had discontinued joint coastal patrolling off the Mumbai coast after September 2005, and by 2008 neither the Navy nor the Coast Guard had practiced working together in joint operations. As a result, there was little understanding of the limits of their joint capabilities and coverage and the blind spots that standard operating procedures created.²³⁷

By knowing and understanding the lack of coordination and capabilities of India's maritime security services, the LeT leadership exploited India's weakness when conducting maritime insertion: "Interoperability issues and confusion over maritime areas

²³⁷ Dew, "Exploiting Seams and Closing Gaps," 26.

of responsibility among the Indian Navy, Coast Guard, and coastal police forces made it possible for the teams to slip into the city unchallenged.”²³⁸ LeT exploited their lack of joint cooperation and demonstrated the importance of this principle in CT operations. The attack scores very important (5/5) on the principle, which means it was critical for mission success.

e. Cover/Concealment

Cover and concealment was especially important during the insertion phase, but also during the attack. The use of fishing vessels in an area where fishing is very common demonstrates the use of concealment. This was especially the case when the teams hijacked an Indian trawler, so they sailed unnoticed in Indian waters and close to the coast. From the debarkation off the fishing vessel, they used motorized rubber boats, which had a small footprint, especially while it was still dark. At the landing point, there were smaller boats beached, so here they blended in with their surroundings. Local citizen spotted the LeT teams after the landing, but they were not able to identify them. The attackers gave the impression they were smugglers or students, which were not uncommon in these areas.²³⁹

The terrorists were dressed in a Western-style clothing not uncommon in Mumbai. Therefore, it was very difficult for the Indian security forces to stop the terrorists. The terrorist changed their clothes to ensured cover when moving between the targets.²⁴⁰ The Indian authorities did not know of the attack prior to the operation, hence it scores high on operational security. The operation scores very important (5/5) on the principle, which means it was critical for mission success.

²³⁸ Dew, “Exploiting Seams and Closing Gaps,” 24.

²³⁹ Kilcullen, *Out of the Mountains*, 53.

²⁴⁰ *Ibid.*, 54.

f. Innovation

The LeT innovated in several ways when planning and executing the attacks. They used the littorals to their advantage to insert the terrorists. LeT used information from open sources and Google Earth for their planning. The use of media coverage as a source of real-time open source intelligence was unique. This information meant the commanders in Pakistan could give the attack teams detailed instructions on common communications means: cell phones, satellite phones, and VOIP. The technology used in this attack was not new, but common and widely available. It was the way the terrorists used and combined it to their advantage that demonstrated doctrinal innovation. They also made five two-man teams, a creative way to ensure that multiple targets could be attacked at the same time, which is an excellent example of organizational innovation.²⁴¹ On the scale, the principle scores (4/5), which means that it was essential for achieving for mission success.

7. Conclusion

The Mumbai attack, from a terrorist point of view, would qualify as a special operation. Although the strategic goal was not met, on a tactical level, the mission was a success. All principles are considered to be very important, except the principle innovation; this one scores important on the scale. The reason for the high score on the five criteria is that, with a lesser score or effort by the terrorists, the mission would have had a very high chance of failure. Innovation was important, but not critical for the tactical success. With a lower score on innovation, the mission would probably still have been successful, but less effective without the intelligence from the LeT leadership. However, the use of the littorals remains crucial within the principle of innovation. This operation only had one principle that scored less than full score. Table 5 illustrates the scores for each principle.

²⁴¹ John Arquilla “The Coming Swarm,” *New York Times*, February 14, 2009, http://www.nytimes.com/2009/02/15/opinion/15arquilla.html?_r=0

Table 5. Mumbai Terror Attack: Rating of Principles

Mumbai Terror Attack 2008					
Principle	Irrelevant (1)	Less important (2)	Moderate (3)	Important (4)	Very Important (5)
D. Planning					X
Tailored F.					X
S. Mobility					X
Joint Supp.					X
Cover/Con					X
Innovation				X	

Figure 23 visualizes the principles in the radar figure.

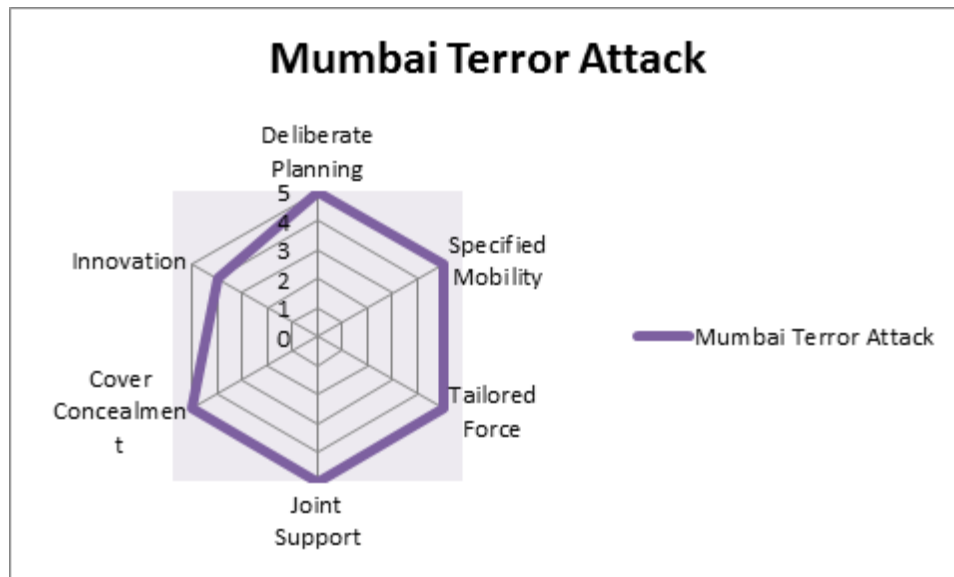


Figure 23. Mumbai Terror Attack Analysis

The hexagram is almost perfect, which makes it an excellent example of the significance of the principles for successful littoral special operations. It is also the only case where a non-state actor is analyzed using the principles. The high scores help build confidence in the importance of the principles across different types of Special Forces.

E. SOMALI PIRATE SHIP ATTACK: NLMARSO (2011)

This case was selected because underwater mobility played a crucial role in the mission. There are few similar missions conducted since WWII when Italian frogmen sabotaged allied ships.²⁴² It is also one of the most current littoral special operations conducted.

1. Background

In 1991, ongoing civil war in Somalia brought down the government, which eventually turned it into a failed state. In South Somalia, the terror organization Al-Shabaab gained more influence over the years. In North Somalia, a weak government was installed (Transitional Federal Government). Smaller states arose with some type of government control; Somaliland and Puntland are the most successful examples of this.

Somalia has a coastline of over 1,500 nm—the longest in continental Africa—and had no government and certainly no effective coast guard. As a result, Somalia's waters were frequently visited by foreign fishing vessels, which emptied the coastal waters of fish at a rapid rate. This often occurred without a permit, leaving the local fishermen with empty waters and no compensation. As a result of growing discontent by these fishermen, they started to seize foreign fishing vessels and demanded financial compensation for their loss of income. The companies who owned the vessels often paid this compensation quickly, which was practically a ransom. Somali fishermen and opportunists took notice of this. More "hijacks" of foreign fishing vessels occurred, but shifted eventually to large Merchant Vessels (MV) where sometimes valuable or sensitive cargo was hijacked.²⁴³ Also, there were instances of sports and leisure yachts being hijacked and held hostage.²⁴⁴ Initially, the pirates operated around 200 nm off the Somali coast, with their twin-engine attack skiffs or slightly bigger whalers. Since 2008, the pirates extended their

²⁴² Greene and Massignani, *Black Prince and the Sea Devils*, 91.

²⁴³ In 2008, a Ukrainian vessel, carrying 33 Russian battle tanks and ammunition was seized by pirates off the Horn of Africa. "Somalia's Pirates Seize 33 Tanks," *BBC*, September 26, 2008, <http://news.bbc.co.uk/2/hi/africa/7637257.stm>.

²⁴⁴ In February 2011, seven Danish citizens, including three children, were hijacked on a sailing yacht in the Gulf of Aden. "Somalia Pirates Free Danish Family Seized in February," *BBC*, September 7, 2011, <http://www.bbc.com/news/world-europe-14823454>.

range by making use of mother ships that had the attack skiffs onboard or towed behind.²⁴⁵ Figure 24 shows how the range of the pirates increased as they improved and innovated their methods:

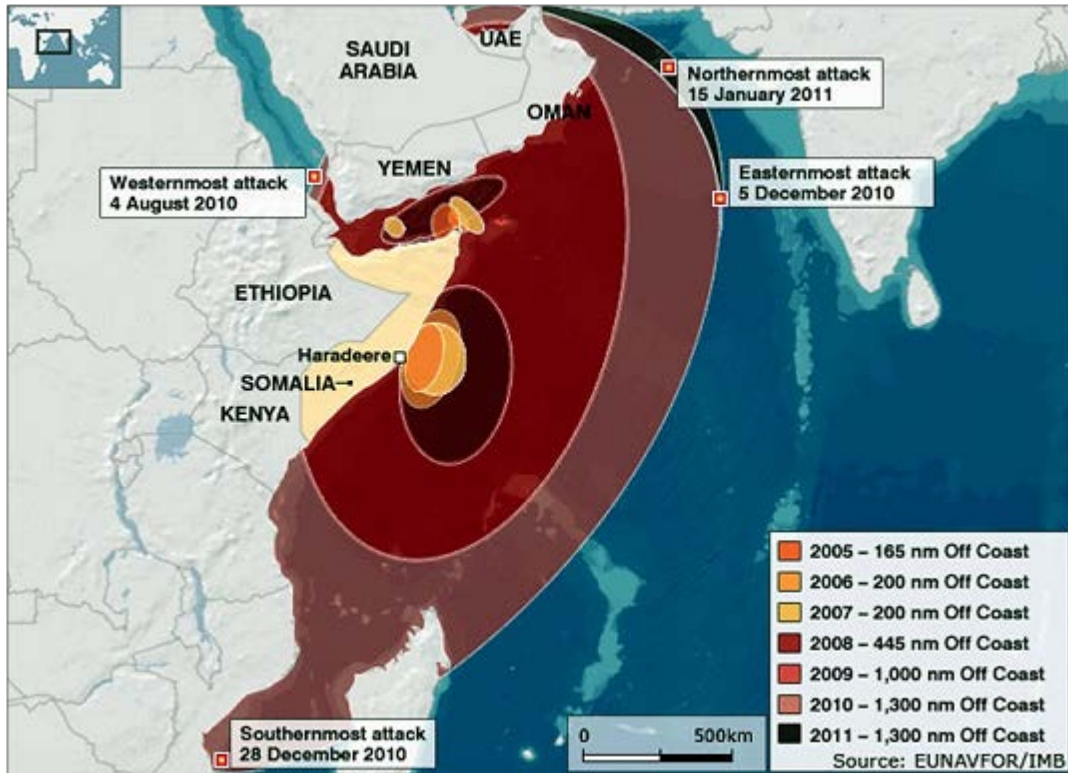


Figure 24. Somali Coast and Range Circles²⁴⁶

After successfully boarding the MV, the pirates would take control of the ship and force the crew to sail towards the Somali coast for anchorage, usually close to the pirates’ logistical home base. From this point on, the negotiations would start with the shipping companies for ransom for the crew, ship, and cargo. Often, the shipping companies would agree, after weeks and months of negotiations, to pay several millions of dollars

²⁴⁵ By using fishing dhows, often hijacked from Iranian fishermen, they also blended in better in the normal fishing pattern and were less easy to be detected by the Maritime Patrol Reconnaissance Aircrafts (MPRA) of military organizations like EUNAVFOR and NATO.

²⁴⁶ Royal Netherlands Navy, “N2 briefing,” January 2011.

for the release of the ship and crew. This piracy business model was very attractive to many poor Somalia fishermen, which resulted in an increase of hijacked ships.

The international community responded with counter-piracy (CP) operations supported by NATO, European Union Naval Force (EUNAVFOR), Combined Maritime Forces and Combined Task Force-151. Some countries sent ships under national command to safeguard their own specific national interests (i.e., China). The naval ships had the task to either escort and protect vulnerable ships, or disrupt the pirate activity at sea. One effective method of disrupting the pirates was to target their mother ships. While protection of the merchant shipping required a lot of assets, disrupting the pirates was difficult due to the large area of operation of the mother ships and the difficulty of identifying them. Figure 25 illustrates the size of the Area of Operations for the pirates compared to the size of Western Europe.

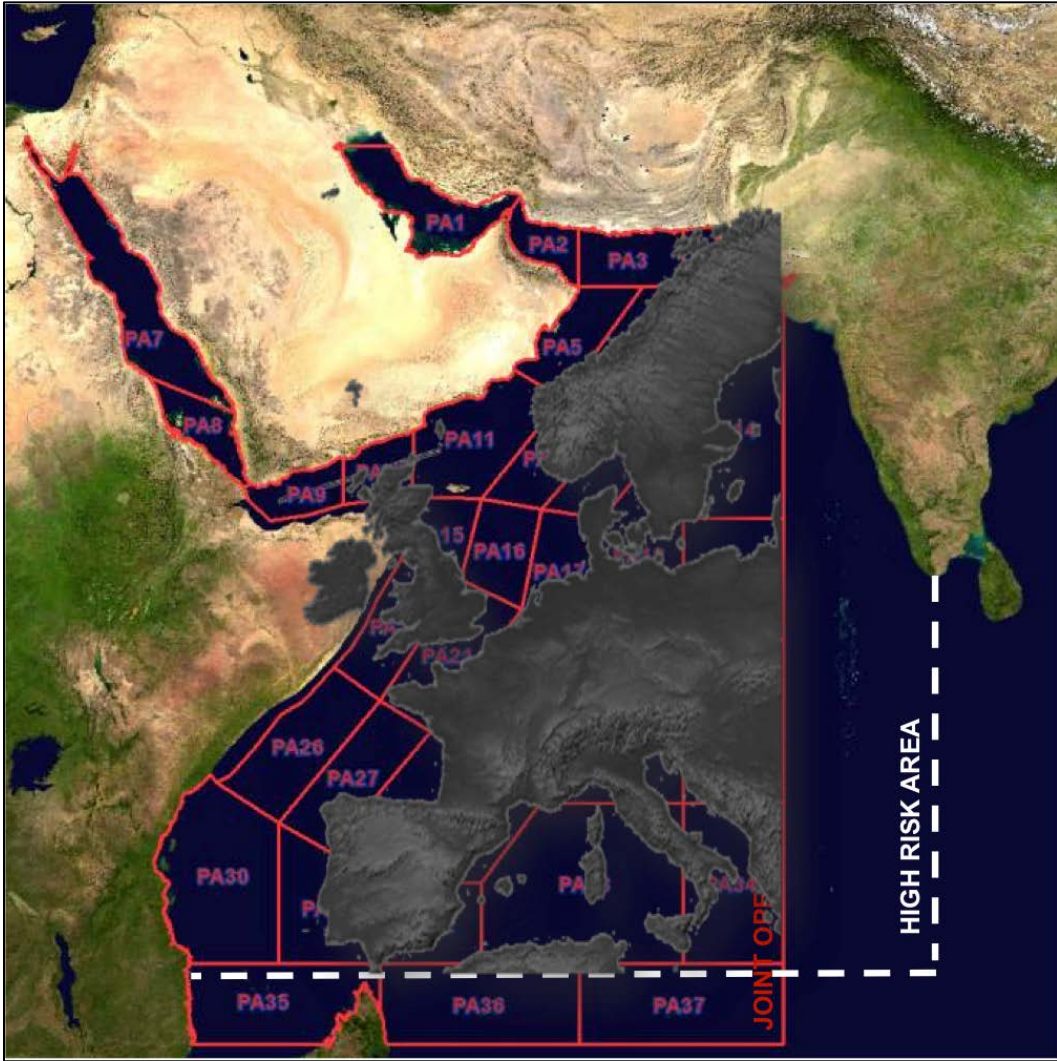


Figure 25. The Somalia Pirates' Area of Operations Compared to Western Europe²⁴⁷

²⁴⁷ Royal Netherlands Navy, "N2 briefing," January 2011.

Despite these challenges, naval TFs reduced the number of successful attacks by pirates. However, the root cause of piracy was caused by the absence of an effective Somali government that could solve the problem on land. Unfortunately, neither the EU nor NATO approved CP operations on land in Somalia.

Since 2009, the Royal Netherlands Navy had been deploying surface ships under EU and NATO command. The Netherlands has a large merchant fleet and substantial maritime interest. The Dutch minister of defense wanted to prioritize contributions to the protection of the shipping lanes in East Africa. Subsequently, the Royal Netherlands Navy deployed submarines to the coast of Somalia to gather intelligence on the activities of mother ships. Although the use of submarines was contributing to the fight against piracy, at the time, it was not considered enough by the minister of defense, and he requested further research on options to fight the pirates.

At the same time, EUNAVFOR wanted to attack the pirates as closely as possible to the coastline—the center of the littorals. EUNAVFOR assessed that mother ships were the pirates’ most valued assets because the mother ships extended their range and made them blend in with regular fishermen. NL Maritime Special Operations Force (NLMARSOF) was requested by the Dutch Joint Special Operations (JSO) Branch to answer what they could contribute to target the mother ships. After an assessment on the threat (watch guards, use of radar, use of night vision goggles, and so on) and environment (water temperature, current, sea state, and shark threat), NLMARSOF stated that they could disable mother ships using frogmen to place explosive charges on the mother ships. JSO approved the mission. It was the first deployment of its kind for NLMARSOF, a trial for the use of maritime SOF in the fight against piracy, in a subsurface role.

2. Aim of the Mission

The aim of the mission for NLMARSOF was to disable pirate mother ships along the coast. By doing so, the pirates’ range of operation would be severely limited. The result would be safer shipping lanes for commercial use. There was one critical restriction during the mission; no pirates or hostages were to be injured or killed. Due to this, the

frogmen could not simply blow up the mother ship; they had to use surgical precision when employing limpets to terminate a mother ship's sea worthiness. The deployment was scheduled to last six weeks.

3. Mission Execution

Since 2006, NLMARSOF had been focused on deployments outside the maritime environment, in the Afghan desert and mountains. When the antipiracy mission came up, the force had to refocus. Within a short time frame of months, they had to improve old skills and knowledge regarding diving, underwater demolition, and maritime maneuver. The platoon of frogmen developed new techniques, tactics, and procedures (TTP) for the specific mission along the coast of Somalia. These new TTPs had to be tested in an environment similar to Somalia. The Royal Dutch Navy has a naval base and marine barracks at the island of Curaçao, in the Caribbean. Although the conditions at Curaçao were not completely the same as in Somali waters, they were similar enough. After three weeks of intensive training and testing, the Special Operations Maritime Task Unit (SOMTU) had improved their diving skills, TTPs, and equipment well enough to proceed.

The next phase before the deployment was training and integration with the ship used as a floating FOB. HMS *Zuiderkruis* (ZKRS) would be used for the counter-piracy operations. It was an old but sturdy supply ship, with a minimum of weapons, but had a Lynx helicopter on board to be used as a sniper platform. The focus of the integration was to practice the Command and Control structure and synchronize TTPs. Meetings achieved some of the integration, but the main effort took place during the transit from the Netherlands to Djibouti with the SOMTU on board. During this three-week transit, the SOMTU and the ZKRS finalized their critical integration training.

In Djibouti, an exercise was held with the U.S. Personal Recovery Coordination Cell of Combined Joint Task Force—Horn of Africa (CJTF-HOA). Shortly after Djibouti, a full dress rehearsal was held with all elements involved, SOMTU, ZKRS, Personnel Recovery Coordination Cell (PRCC), and Maritime Patrol Reconnaissance Aircrafts (MPRA), from Djibouti and Seychelles.

The first two weeks in theater were difficult. The SOMTU faced two major problems. The Rigid Hull Inflatable Boats (RHIB) were not reliable in the harsh conditions of a weakening monsoon. The satellite communication was not stable to guarantee communication between the RHIBs and the ZKRS. Both problems were critical to improve before conducting the mission. Due to these problems, the first two missions were canceled. After two weeks of hard work by the mechanics of the ZKRS and signalers of the SOMTU, the problems were finally resolved. This left the SOMTU with only three and a half weeks to perform their mission.

Shortly after solving the technical problems, the SOMTU received orders to disable a small mother ship in South Somalia, in an Al-Shabaab-controlled area. The conditions were challenging: very shallow waters, confined maneuverability, limited entrance, limited exit routes, and changing currents. Two days were used to study maps and photographs, plan, and prepare the explosive charges. However, the actual execution of the mission took only a few hours. The frogmen were able to place an explosive charge and disable the mother ship without any collateral damage or hurting any pirates and hostages. After this success, three more missions were executed in a short space of time. All four missions had their own characteristics, but each took place in the heart of the littorals: changing currents, strong surf, full moonlight, a dozen hostages on board, or located in the center of a pirate anchorage with multiple hijacked ships. The missions conducted during full moon required additional underwater mobility: a two-person underwater delivery vehicle.

Figure 26 illustrates the effect of a surgical sabotage mission. The explosives placed by the frogmen, destroyed the rudder and propeller of the dhow which resulted in the beaching of the dhow.



Figure 26. Stranded Iranian Dhow with 20 Hostages, after a Sabotage Mission without Collateral Damage or Persons Hurt²⁴⁸

At the end of the six-week deployment at sea, there were no more mother ships present at the coastline of Somalia. As planned, the ZKRS set sail to Kenya where the SOMTU disembarked.

4. Result of the Mission

The deployment resulted in the loss of four pirate mother ships previously used for supporting hijackings of MVs. The pirates were not able to repair or replace these valuable assets. The use of maritime SOF, especially frogmen, in combination with the presence of naval TFs resulted in a tremendous drop in successful hijacks by pirates. The numbers went from 176 attacks by suspected pirates in 2011, to 35 total attacks in 2012.²⁴⁹

²⁴⁸ Picture taken from helicopter of ZKRS, 2011.

²⁴⁹ This reduction is not completely caused by NLMARSOF; other naval TFs have contributed. "Countering Piracy Off the Coast of Somalia," EUNAVFOR Somalia, accessed May 12 2016, <http://eunavfor.eu/home/key-facts-and-figures/>.

5. Analysis of Principles

a. Deliberate Planning

Although most frogmen were trained in conducting ship attacks in a harbor, this mission was conducted in a completely different environment. The changing and unknown environmental conditions required research and additional extensive training. During the pre-deployment training, all procedures were tested and rehearsed with all units involved. In theater, a last full dress rehearsal was conducted. However, some problems were detected only in the exact environment and place of the actual mission; a strong monsoon created heavy sea state, which caused problems with communication and mobility. Once these technical problems were resolved, the missions went without any problems. Before each separate mission, it was not possible to rehearse since there were no practice targets available, and time was extremely limited. However, before the mission planning started, intelligence from MPRAs and other sensors was available so that a detailed planning was possible. On the scale, the principle scores (4/5), which means that it was essential for achieving for mission success.

b. Tailored Force

The SOMTU was specifically organized to perform the required tasks for the mission. It was an effort to keep the teams organic, and to maintain unit cohesion, but some changes were required. An additional sniper team was created to support the mission from the helicopter. The staff element of the SOMTU needed to perform several core staff functions like intelligence, operations, and communications. The ZKRS limited the size of the staff element because of limited space on board, especially in the command center. In addition, the staff had to be as lean as possible, which resulted in limitations to the frequency and the duration of the missions that could be performed. The operation scores very important (5/5) on the principle, which means it was critical for mission success.

c. Specified Mobility

To conduct subsurface sabotage missions, frogmen were required. In this mission, surface attacks were possible, but they would have increased the risks to the SOMTU and the hostages. Mostly, the frogmen were relying on their own propulsion (fins). However, due to changing environmental conditions, additional assets were required to conduct a specific mission. For that mission, the frogmen used an underwater propulsion device to increase their reach.

The RHIBs were normally used by the navy for logistical runs between ship to ship or ship to shore. However, they were not suitable as a SOF platform under harsh environmental conditions. Ideally, more robust RHIBs with additional sensors and weapons would have increased success of the deployment from the beginning. In the following year (2012), more specified mobility deployment was used, like jet skis and the use of submarines by frogmen. Also, RHIBs specifically for maritime SOF missions were implemented. The operation scores very important (5/5) on the principle, which means it was critical for mission success.

d. Joint Support

The deployment was run by the Royal Netherlands Marine Corps and Navy, but was also supported by assets from the air force, MPRAs and Para Jumpers of the PRCC. The MPRAs were used to gather critical information for the targeting process and surveillance during the mission itself. Without this joint support, the targeting process would have been very difficult, if not impossible. During the execution of the mission, the MPRAs provided information that reduced the overall risk to the mission. Although the mission was mainly self-supported by the Royal Netherlands Marine Corps and Navy, a small but crucial support was provided by assets of the Air Force. The operation scores very important (5/5) on the principle, which means it was critical for mission success.

e. Cover/Concealment

The ZKRS was a difficult ship to hide in the littorals due to her size. Therefore, she kept her distance from the target, and stayed outside radar range. Helicopters accomplished the reconnaissance. Because many naval TFs were also conducting flights by helicopter, the reconnaissance flights did not draw extra attention. Initially, the SOMTU used only the hours of total darkness in the evenings for operations. In a later stage, specified underwater mobility was used to stay completely undetected even during full moonlight conditions. The frogmen made use of cover and concealment in a high degree; they stayed mostly underwater and only surfaced to check navigation. The Somali pirates did not expect ship attacks on their mother ships, and the operation scores high on security. The operation scores very important (5/5) on the principle, which means it was critical for mission success.

f. Innovation

It was the Minister of Defense who pushed for innovation in the fight against piracy in Somalia—first surface ships, then submarines, and later maritime SOF. It is fair to state that the innovation of this deployment was more organizational and doctrinal than technical. The deployment was conducted by using relatively basic technology; some had existed since WWII. However, some technology was state of the art and was used to improve the navigational capabilities of the frogmen, as well as their communication means for recovery purposes. On the scale, the principle scores (4/5), which means that it was essential for achieving for mission success.

6. Conclusion

The first deployment was a trial, with limited expectations. After overcoming technical problems (satellite communication and RHIB problems), it became possible to execute the missions in a challenging littoral environment. The deliberate planning, joint support, and cover/concealment, made the mission possible. From Table 6, one can see that the operation scores high on all the principles:

Table 6. Somalia Ship Attack: Rating of Principles

Somalia Ship Attack 2011					
Principle	Irrelevant (1)	Less important (2)	Moderate (3)	Important (4)	Very Important (5)
D. Planning				X	
S. Mobility					X
Tailored F.					X
Joint Supp.					X
Cover/Con					X
Innovation				X	

The operation analysis gave four principles on very important and two on important, which helps validate the principles as important for littoral special operations. The deployment resulted in a devastating loss of the pirates’ most valued asset: the mother ships. By doing so, the frogmen contributed to the disruption of their lucrative business model. Figure 27 visualizes the score of the principles in the radar figure.

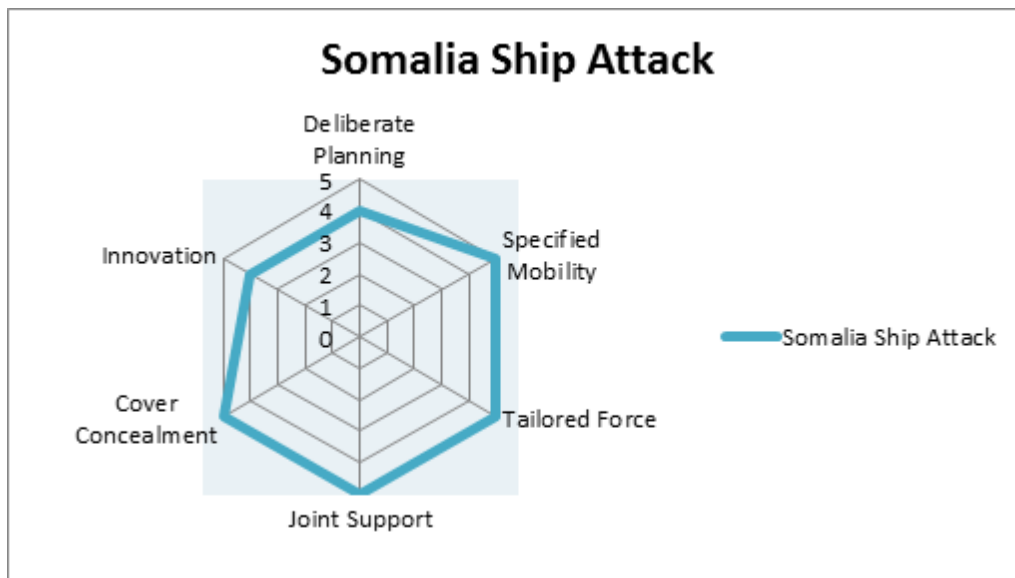


Figure 27. Somalia Ship Attack Analysis

The hexagram is almost perfect, except for deliberate planning and innovation, both of which score four out of five. After 2011, the number of pirated ships decreased significantly. Nearly 70 years later, after the success of Italian and British frogmen in

WWII, a dozen frogmen again demonstrated, in the waters off Somalia, that they could still make a difference. This operation is an excellent example of the significance of the six principles of littoral special operations.

IV. CONCLUSIONS AND RECOMMENDATIONS

In this chapter, the cases are compared to demonstrate which principles are the most important for conducting littoral special operations. Thereafter, the futuristic scenario introduced in Chapter I is further developed and then analyzed using the littoral special operations principles. The chapter concludes with a summary and recommendations for future research.

A. COMPARISON OF ALL HISTORICAL CASES AGAINST PRINCIPLES

Table 7 shows the relative importance of each principle with a cross-case comparison.

Table 7. All Cases Rated against Principles (1–5)

Principle	Chatham Raid	Oslo Ship Attack	Pebble Island Raid	Mumbai Terror Attack	Somalia Ship Attack	Average score	Percentage of 5 point scale
Deliberate Planning	4	5	3	5	4	4.2	84%
Tailored Force	4	5	5	5	5	4.8	96%
Specified Mobility	4	5	4	5	5	4.6	92%
Joint Support	5	4	5	5	5	4.8	96%
Cover Conceal	2	5	5	5	5	4.4	88%
Innovation	5	5	3	4	4	4.2	84%

Based on the cases presented, each score is considered important to successfully plan and execute a littoral special operation as each has an average score of 4.3 or higher. Using a percentage rating as well, the principles can be further compared against each other in Figure 28.

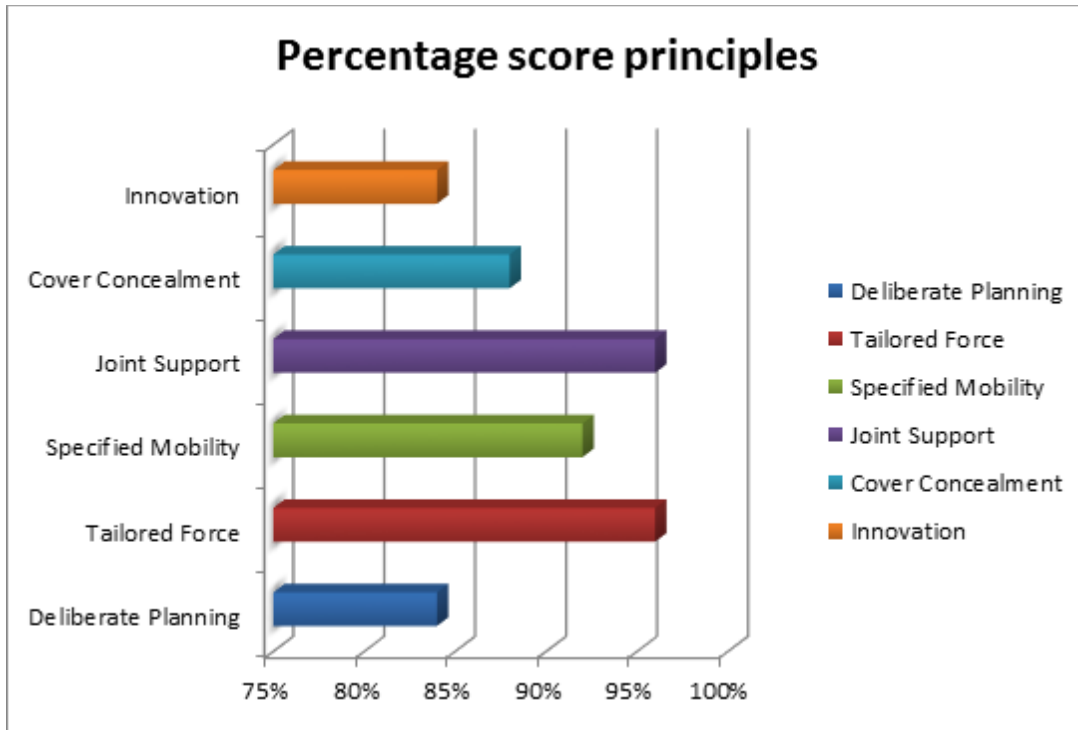


Figure 28. Percentage Score for Principles

The most important principles for littoral special operations, with the highest score of 96 percent, are joint support and tailored force. In second place is specified mobility. Then cover and concealment is in third place. Deliberate planning and innovation share a fourth place, both scoring 84 percent. It may be that these last three principles are important for all types of operations, but not specifically as important as the other principles for littoral special operations. Figure 29 shows a comparison of all the principles in a radar figure.

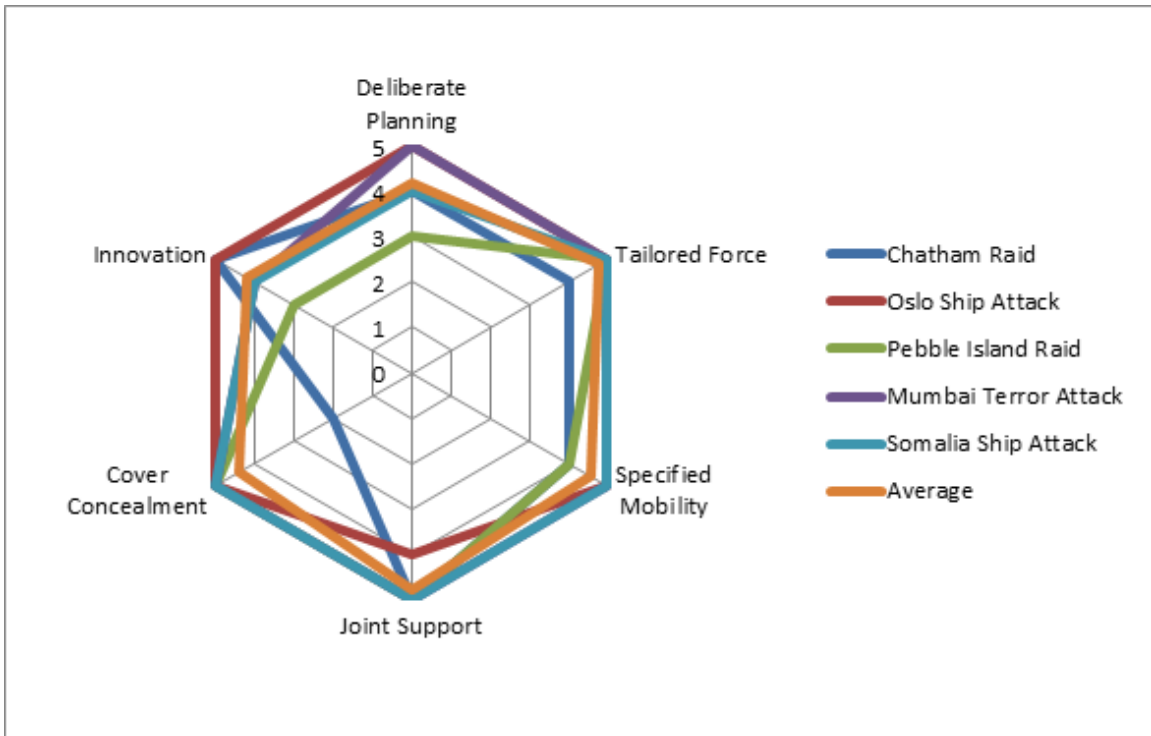


Figure 29. All Cases Rated with Principles

Across all the cases, each principle generally scored high on the 1-5 rating scale meaning that as defined each principle was at a minimum essential to consider for mission success. The raid on Chatham scored relatively low on cover and concealment, but scored high on most of the other principles. Cover and concealment is considered to be an outlier, since it pulls the average score significantly down for this principle. Cover and concealment like it is applied today, was apparently less relevant at the time of the raid on Chatham. Probably, de Ruyter was less concerned with this principle since communication of the British, after being compromised, went by foot, horseback, or perhaps by smoke signals. This meant that the British had little time to make preparations for the raid. The raid on Chatham was also the operation with the least SOF-like force structure since it was inserted using a superior Dutch fleet to target the objectives. If the score of cover and concealment was left out for the raid on Chatham, it would have become the most important principle of all. Since this was the only operation where the offensive force was not at a sizable disadvantage, the principle was less relevant to the success of the operation.

On the Pebble Island raid, there are two principles with a moderate score: deliberate planning and innovation. The operation was planned and executed in a few days to ensure the main landing in San Carlos could happen as planned. Initially the SAS planners asked for a three-week planning and preparation period for the big raid. However, Admiral Woodward, the commander of the entire British Task Force, pushed to keep the original landing date. The SAS planners had their SR team deploy within 48 hours of the initial warning order. The raid happened just 48 hours after that, which means that the time for deliberate planning and innovations was limited. Although there were a few injuries and some mistakes, the overall mission was a success, and the main landing could happen as planned.

The average score for all the principles is included in Figure 29 as the orange color, and is almost a perfect hexagram. That indicates that the principles are important for all the cases in which they were tested. The analysis of the case studies clearly shows that the principles are important for littoral special operations. It makes sense that any special operation would benefit from support from the other services, especially in the littoral domain where all services can influence the fight. Littoral special operations are with high risks and place the unit at an extreme disadvantage; as such, a small, fragile force must rely on others and guile to make the mission succeed.

B. TRIPOLI HOSTAGE RESCUE: OPERATION ORCA 2024

This operation was developed to create a realistic scenario occurring in the future to stress the importance of the principles. The scenario incorporates new types of weaponry and tactics, to show the use of the principles in a futuristic urban littoral scenario.²⁵⁰ The security situation in Libya has been degrading for several years and it may become a failed state. IS in Libya is currently gaining ground, and the close proximity to European borders makes it plausible for future attacks to originate from this area. French forces were chosen for the scenario because they have capable maritime SOF and a government willing to act on direct provocations. This scenario concludes

²⁵⁰ The concept of this futuristic scenario is similar to “The war of 19-,” a chapter in *Command of the Air* by Giulio Douhet, where he describes his concept of future air power. The air forces he imagined did not exist when he wrote his book in 1931.

with an analysis, demonstrating how each principle impacted the operation positively. Although the scenario occurs in the future, it is written as if it already had happened.

1. Background

The background for this scenario was initially presented in Chapter I. Libya became a failed state in which IS Libya was able to grow in strength. IS Libya was responsible for a terrorist attack at the European soccer championship between France and Britain. IS Libya had SAMs and swarming patrol boats to protect themselves from any outside threat.

Figure 30 shows the main factions and their respective land areas. Elements of the jihadist factions had pledged alliance with IS and took control of the coastal city Sirte.²⁵¹ IS Libya expanded rapidly as Russia and Western powers attacked IS in Syria and Iraq.²⁵²

²⁵¹ Nick Robins-Early, “What We Know About ISIS in Libya,” *Huffington Post*, February 19, 2016, http://www.huffingtonpost.com/entry/IS-presence-in-libya_us_56b369e2e4b08069c7a6352f.

²⁵² Sciutto, Starr, and Liptak, “ISIS Fighters in Libya Surge.”

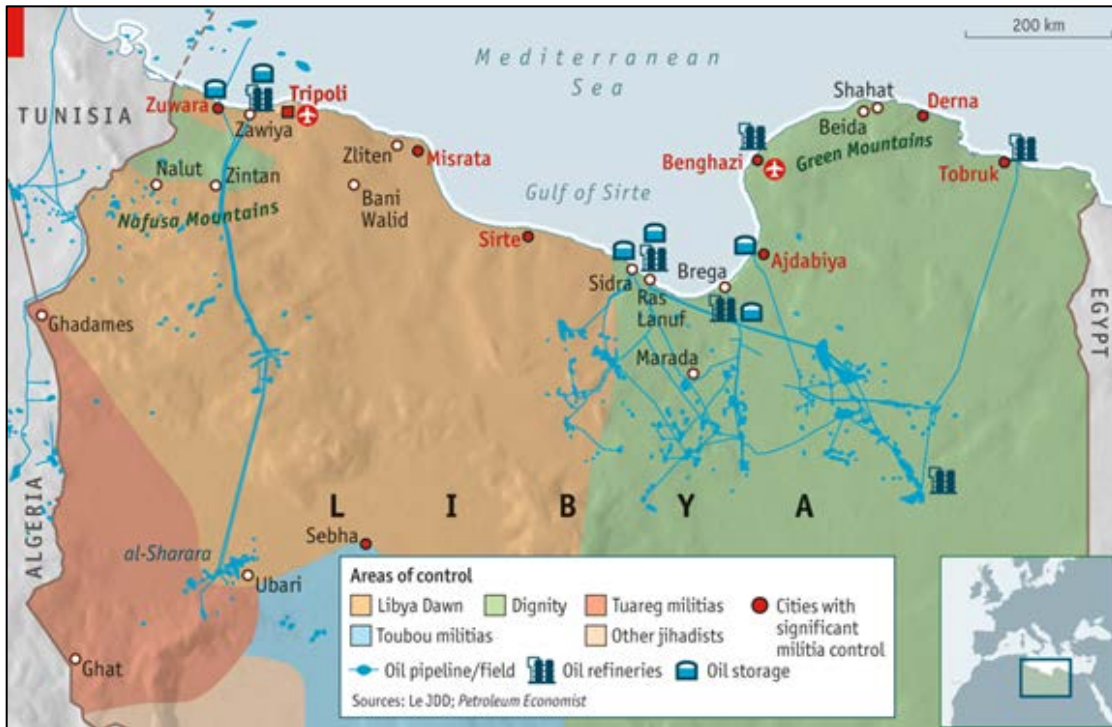


Figure 30. Map of Groups in the Libyan Civil War in 2014²⁵³

2. Aim of the Mission

The French Commandos Marine, Counter Terrorist section, was tasked to conduct a leadership targeting operation in Tripoli to avenge the attacks. The British Special Boat Service (SBS) conducted a similar operation simultaneously. The French commandos attempted to capture Mohammad Al-Yemini, the Yemeni national, believed to lead the IS council in Tripoli. The SBS targeted the second in command, Abu Nabil Hussein.²⁵⁴ Both targets were believed to hold residence in Tripoli. The operation was intended to hamper IS's ability to lead its groups, potentially resulting in a leadership quarrel within IS Libya. The operation would also be a huge public victory for the French and British governments after the horrific attack on their national teams during the European

²⁵³ Staff, "Libya Civil War: That It Should Come to This," *Economist*, January 10, 2015, <http://www.economist.com/news/briefing/21638123-four-year-descent-arab-spring-factional-chaos-it-should-come>.

²⁵⁴ Both persons are fictional.

championships in Germany. This futuristic scenario focuses on the French part of the operation.

3. Mission Execution

Due to limited presence in Libya over the last five years, French intelligence was sparse about IS leadership and its capabilities. Through bilateral support from the United States, the French were informed about the location of the main compound of Al-Yemini. However, limited intelligence was available on the protection of the compound or the disposition of IS troops in the area. Initially, French higher command had discussed an air strike on the compound, but the French government did not want to risk any excessive collateral damage in the city. They primarily wanted the IS leader captured, and killed only if capture was not possible.

The planning team decided early to insert an SR team to provide firsthand intelligence on the current situation. The small four-man SR team would report back to provide the necessary details for the assault group to plan and execute the high risk capture. The French decided for a small group, so they could move around in Tripoli with a small footprint. The surface-to-air threat made any air insertion or extraction on land difficult. Figure 31 illustrates the challenging terrain of the mission.



Figure 31. Tripoli Harbor²⁵⁵

The SR and assault teams built a mock-up version of the IS compound and conducted several rehearsals. They conducted large-scale insertion rehearsals with submarines and airplanes that would support the operation. They also met with their British counterparts, the SBS, to exchange ideas and tactics. The SBS also functioned as a so-called red cell. The SBS would conduct a similar raid the same night.

Due to the threat from the IS navy, which was organized based on swarming tactics, the insertion of the SR team was below the water (subsurface). The SR team was inserted by a French submarine off the coast of Libya. The operators left the submarine while submerged and infiltrated with diving equipment together with the innovative personal underwater propulsion fins. The new stealthy propulsion fins could help them move eight knots for three hours, covering up to 24 nm. A local agent linked up with them at a preplanned position. The combat divers were picked up by his fishing boat and transported to one of the small harbors in the suburbs of Tripoli.

The agent introduced the SR team to his compatriots in a local resistance group. The resistance fighters transported the SR team in local vehicles to an apartment close to

²⁵⁵ “Tripoli Harbor,” *Cecili Images*, accessed April 7, 2016, <http://cecilimages.photoshelter.com/image/I00005yvPtINgAQE>.

the IS compound. The apartment provided over-watch on the compound and would provide sniper cover during the operation. The main assault group was inserted by a French transport airplane from the mainland and dropped the assaulters by parachutes with submergible RHIBs off the coast of Tripoli, two days after the SR team was inserted.

The assault force made use of the cover of darkness and the submergible stealth RHIBs to reach the friendly harbor building unnoticed. They linked up with the local resistance and spent the day in hiding. At dusk the following night, they linked up with the advance party and infiltrated with local cars, close to the target building. They dismounted the cars a few blocks away and went by foot into the target compound and conducted the assault.

The primary goal was to capture Al-Yemini or eliminate him if the resistance was too fierce. The assaulters would try to extract as much information as possible from the compound. The local resistance groups would attack several other IS compounds in the city at the same time to divert the IS forces.

The assault was initiated when the sniper over-watch eliminated the threat of the main guards, using non-lethal weapons. The command group would secure the building from outside the compound. The assaulters climbed the compound wall and divided into three groups. One group entered the building at the main door, one entered the back door, and the third group entered the guard building.

At the compound, everyone was asleep. The other guards and the family members were taken by surprise and handcuffed and blindfolded. The assaulters collected all found documents and digital storage devices. The target was cleared and searched in less than 15 minutes. The prisoner was brought out the main gate while the assaulters dragged the unconscious main guards inside the compound to avoid any attention. The assaulters all infiltrated the harbor in civilian cars and thanked the locals for their help. The boat drivers brought their submergible RHIBs to the water's surface and started the extraction to the preplanned submarine link-up location. After the link up with the submarine and

the French Commando Marines, all left the coast of Libya with their main objective being captured. The mission was a great success.

4. Result of the Mission

Both the French and British operations were successful. The French arrested the IS leader, and the British SBS managed to eliminate the second-in-command. By removing the leaders, internal fights for power within IS Libya broke out. This internal struggle enabled the rise of a new wave of resistance against IS Libya. It was also a success for the French and British governments, as it demonstrated that the classic superpowers were still able to influence world affairs, and if necessary, would respond to direct provocations with force.

5. Analysis of How the Principles Influenced the Mission

a. Deliberate Planning

The operation was well planned and rehearsed before the execution. This helped to ensure that the operation was executed without any significant mishaps. The planners were able to look at the strengths and weaknesses of the enemy and utilize those to successfully conduct the operation. The surface-to-air capability of IS, combined with their swarm-capable navy, made the IS leadership feel safe from targeting operations in the city of Tripoli. The IS leadership knew that an airstrike in a highly populated city was very unlikely. The use of local resistance and an SR team in advance helped the assault force get the information and support they needed on the ground. Submarines, submerged RHIBs, and propulsive fins helped the force avoid the threat from the IS navy. Deliberate planning contributed on a large scale to the mission success.

b. Tailored Force

Since the force was entering enemy territory and was using local assets for transportation, the SR team leader and the assault team leader had to cut the force size to the absolute minimum. The submergible RHIBs can only take eight operators each. A submarine would pick them up after the attack, which again limited the size of the group.

The small footprint also made it easier to move around with local forces in Tripoli. In that sense, the force was tailored to the exact need of the operation.

c. Specified Mobility

The force used a submarine for both insertion and extraction. They used airdrop and diving equipment. They also had self-propelled fins and submergible RHIBs: both products were built with the latest technology and were unique on the market. The force combined the best equipment that a technology-advanced military can offer, with local assets such as fishing boats and vehicles to blend in. The mobility was highly specified in order to reach the compound and to extract everyone safely back to France after the mission.

d. Joint Support

The operation received support from the French Navy and Air Force, allies, and locals in Tripoli. The mission could simply not have been completed without joint and combined support.

e. Cover/Concealment

Throughout the mission, cover and concealment were key to successfully capturing the IS leader. If the SR team or the assault force had been spotted, during insertion or observing the target, the mission would have been a failure. When including local forces in an operation like this, there is always a risk that the operation might be leaked to the enemy. In this scenario, the local resistance was trustworthy. They certainly had the same interest as the French forces. The use of the new submergible RHIBs made it possible for the assault force to enter the harbor unseen by the IS navy, avoiding any swarm attacks. The operation was carried out without the enemy's prior knowledge, which implies the security was good.

f. Innovation

The planners had to be very creative to achieve the necessary surprise for this mission. The surface-to-air threat combined with the smart naval defense of IS made

cover and concealment a very important principle for success. The French force combined military tactics with local support to achieve the insertion and extraction without exposing the force to IS. This would not have been possible without the innovative use of different types of insertion methods and creative use of tactics once on the ground. The mission was very much dependent on the innovative use of different techniques.

6. Conclusion

The principles were important to succeed with this complex operation. Cover and concealment stands out prominently as a key principle and was very dependent on the other principles to be successful. Any exposure to the enemy prior to the actual assault would probably have led to the cancellation of the whole operation. The clever use of the maritime SOF unit allowed the French government to arrest and prosecute the IS leader without any collateral damage to innocent Libyan civilians. This futuristic scenario helps to illustrate how important these principles may be when maritime SOF conducts operations in the urban littoral environment in the future.

C. SUMMARY

World trends highlight the importance of the littorals as a future environment for conflicts. The littorals are more complex than other domains, since they are in the intersection of all of them. Special forces are arguably the force of choice for complex missions in the littorals; maritime special forces are preferred since they possess the capability to exceed in and cross all the domains effectively. Littoral special operations are more complex than other types of special operations because of the subdomains and the interrelationship with the other domains.

Since 2001, SOF has become more land-focused due to 15 years of fighting in landlocked environments. As future conflicts are more likely to happen in the littorals, a shift in focus for maritime SOF is a logical decision enabling SOF to prepare for the future fight instead of the last type of conflict fought. The analysis of five historical cases supports the significance of the six key principles identified for success in littoral special operations. The cases were chosen to provide variety in time period, geography, mission

type, and force. The futuristic scenario illuminates the principles in a likely future conflict. Terrorists are aware of the complexity of the littorals as well; they have exploited and will exploit gaps left by governments and state organizations, as is shown by the LeT attacks on Mumbai.

The principles showed significance across the operations analyzed. Therefore, the principles are relevant and should become part of any future concepts or doctrine to set SOF up for success in the littorals.

D. RECOMMENDATIONS

1. Doctrinal

SOF should consider the six principles when training, planning, and executing missions in the littorals. In order to formalize the importance of the principles, it is also recommended that these principles be incorporated into any future concept or doctrine for special operations in the littorals. If the UN trends and Kilcullen's insight become reality, the principles will be important for maritime SOF to consider in meeting the challenges of the future.

2. Future Research

Future studies regarding littoral special operations should consider testing these principles on more historical examples. This study selected operations with variety in time, geography, force, and execution, but the more examples in which the principles can be evaluated, the better it is for validating or disproving them. It would also be interesting to see how cover and concealment would fare in other cases, as the raid on Chatham had a strong influence on the final score. More case studies would help resolve this question.

Additionally, an even more detailed analysis of each case study could also help to validate the principles. This research was limited to only secondary sources. Primary source research to include interviews and possible site surveys of actual location are methods that would help to improve the overall richness of the analysis and further validate the principles.

Third, the existing six principles were developed by incorporating the most important principles derived from the literature review. There may, however, be other principles out there that are equally or more important than the ones found here. Now moving on to the.

In regards to the methodological framework, the five-point Likert scale was used to represent how relevant a principle was. The findings showed that many of the scores of for each principles are very close together therefore the use of a scale with more variability could result in a more precise measure of each principle. This could lead to more insight. This is also useful to disaggregate the three most important and relevant principles, joint support, specified mobility, and tailored force. Since they all had high scores, it is plausible that these three principles are not only foundational ones but also are dependent on each other to achieve operational success. A scale that offers more precision could then help explain which principles are the most critical to littoral special operations.

Second, this limited research demonstrates the importance of the six principles. Another effective method to validate or disprove research is falsification, used in science and the intelligence community. It would help validate the principles if it was not possible to find littoral special operations that were successful without the use of the principles, or those that followed the principles and still failed. Another approach is to analyze unsuccessful littoral special operations, and see whether they scored high on these principles.

Last, future studies may develop an overarching theory for littoral special operations where these principles, and perhaps others, help the littoral SOF to achieve an advantage over the enemy. The principles may be equally important for conventional littoral operations or for other types of special operations. One might extend on the theory to incorporate other types of operations by testing the principles on historical examples of those types.

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