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THESIS

THE BALTIC: A SEA IN TRANSITION

by

John L. Green

September 1991

Thesis Advisor: D. Abenheim

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The objective of this thesis is to analyze naval developments in the countries abutting the Baltic Sea. Major international security events have radically altered the political landscape surrounding the region. Fundamental changes to the regional security environment are affecting naval building and modernization plans. This region should be of primary concern to the United States political and naval leadership because it comprises one of the world's largest concentrations of naval combatants. The navies deployed in the Baltic Sea are highly capable, and the geographic importance of the region has predicated a unique pattern of naval development. As regional threats to international security emerge, littoral naval warfare will become increasingly difficult to manage. Examination of the Baltic naval balance should provide a useful tool for monitoring national intentions in that region as well as forecasting future littoral naval threats elsewhere.

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The Baltic: A Sea In Transition

by

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ABSTRACT

The objective of this thesis is to analyze naval developments in the countries abutting the Baltic Sea. Major international security events have radically altered the political landscape surrounding the region. Fundamental changes to the regional security environment are affecting naval building and modernization plans. This region should be of primary concern to the United States political and naval leadership because it comprises one of the world's largest concentrations of naval combatants. The navies deployed in the Baltic Sea are highly capable, and the geographic importance of the region has predicated a unique pattern of naval development. As regional threats to international security emerge, littoral naval warfare will become increasingly difficult to manage. Examination of the Baltic naval balance should provide a useful tool for monitoring national intentions in that region as well as forecasting future littoral naval threats elsewhere.

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EXECUTIVE SUMMARY

The Baltic Sea is an important maritime region and merits continued attention by U.S. naval strategists and planners. The regional focus of this thesis highlights common trends in naval development among the countries abutting the Baltic Sea. The littoral aspect of the region has predicated a unique pattern of naval development and modernization. The six navies deployed in the Baltic Sea emphasize conventional submarines, mine warfare units, and fast attack craft in their force structures. The advanced technology developed in Sweden, Germany, Denmark, and the Soviet Union in these three areas is significant for the U.S. Navy. These are the technologies that regional and third world naval powers are acquiring. These areas are especially important when considering naval aspects of amphibious operations and low intensity conflicts.

The expertise and experience of the Baltic navies should be incorporated into U.S. Navy training, exercises, and wargaming. The Baltic navies not only deploy forces in these categories, they also deploy forces to counter those warfare areas. Training exercises with advanced conventional submarines, mine warfare units, and fast attack/patrol craft would benefit the U.S. Navy as it

prepares for the next littoral naval engagement. The forces deployed in the Baltic Sea are the most advanced in the world in these three categories.

Air independent propulsion systems for conventional submarines are being tested by Sweden and Germany. This technology could significantly affect coastal naval warfare. Some of the mine countermeasures systems deployed by the Baltic navies may be worth considering for incorporation into current force structures. Both Sweden and Germany deploy remote controlled mine sweepers. Fast attack craft are also emphasized in regional naval modernization plans. Modern craft are utilizing stealth technology and may be more survivable than their predecessors.

The political instability of the region is evident. In light of recent events in the Soviet Union, the U.S. Navy may be able to expand navy-to-navy ties with Poland, Finland, and Sweden. The U.S. Navy could be in the forefront of developing relations with Estonia, Latvia, Lithuania, and Russia. Port visits to these countries would demonstrate U.S. national concern in the region. The presence of the U.S. Navy may add some stability to an incipiently unstable region.

The regional naval balance in the Baltic is undergoing fundamental shifts. The Swedish, German, Polish, and Danish Navies are all facing serious budgetary constraints and

manpower and force structure reductions. The Finnish Navy
seems to be the most integrated with other national security
forces. Finland's defense plans do not call for personnel
or force structure reductions. The Soviet Baltic Fleet is
the largest navy in the region and the only navy that is
modernizing all classes of ships. Declining defense budgets
in most of the Baltic countries may make naval arms control
measures more appealing in the near future. The
independence of Estonia, Latvia, and Lithuania may add
support to regional naval arms control proposals. Finland
and Sweden have supported naval confidence building measures
in the past. The U.S. Navy should ensure it has a voice in
any regional arms control negotiations. The Soviets have
championed naval arms control for the Baltic region for
years and may renew efforts in that direction.

The Baltic Sea is an important maritime region that
presents the U.S. Navy with many opportunities. The
political systems in the region are changing rapidly. One
variable that has remained constant is the regional
geography and its importance in the evolution of naval
systems. All the countries bordering the Baltic Sea rely on
the sea lanes of communications for vital import/export
shipping. The Baltic Sea and its approaches will continue
to be a very important maritime theater as the new Europe
evolves. The U.S. Navy can play an important role in that
process.

I. INTRODUCTION

Dramatic events have substantially altered the international security environment during the past two years. The most obvious of these are the disintegration of the Warsaw Pact and the apparent end of the Cold War, but the chronicle includes many others. One maritime region, the Baltic Sea and the countries that surround it, has been fundamentally affected by these recent developments. The objective of this thesis is to chronicle and analyze the history and development of the naval balance in the Baltic region, postulate on possible future naval issues which may presage naval operations and warfare in the future, and thus provide alternative courses of actions for U.S. naval strategists and other types of planners. The littoral aspects of naval developments in the Baltic region have increasing significance when surveying regional naval threats elsewhere.

The downfall of most of the communist regimes in Eastern Europe, economic and political conditions in the Soviet Union and the East European countries, the unification of Germany, and the success of an international coalition in prosecuting the Persian Gulf War are some other important events that are changing the traditionally accepted

international security environment. The Soviet Union is in turmoil and has apparently adopted a profoundly diminished expansionist politico-military agenda. That fact has also influenced the overall security picture. These events have substantially altered the bipolar aspects of international security. The result can be viewed as either multipolar with several regional centers of power, or unipolar with the United States as the only true superpower. (Krauthammer, 1991, p. 23) The delicate politico-military balance in the Baltic region has been shifted significantly by these developments. The evolving political environment in the Baltic region will dictate new national, alliance, and regional security requirements. National naval modernization plans will be affected by the changing security environment.

The six countries surrounding the Baltic Sea are Sweden, Finland, the Soviet Union, Poland, Germany, and Denmark. This region had been relatively stable from the conclusion of World War II until 1989. It was certainly not stable prior to World War II. Regional security considerations for the past forty years have been dominated by East-West tension, NATO-Warsaw Pact military preparations, United States-Soviet Union superpower haggling, and the looming possibility of nuclear war. The foundations for Baltic regional security are shifting rapidly as the Soviet empire

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devolves. At a meeting of NATO alliance foreign ministers, Secretary-General Manfred Wörner said, "The growing cooperation and unity of Europe in security and defense matters must lead to a strengthening of our European pillar, to an internal rebalancing of the alliance, and also where necessary to structural changes." (Lewis, 15 January 1991, p. 15) The precise nature of the rebalancing and structural changes have not yet been formally adopted, but they will have impact on the Baltic region.

A. THE NEW WORLD ORDER

Few regions have witnessed the phenomenal rate of fundamental security shifts as have occurred in the Baltic region. Some of the more important factors in the new regional security environment include the unification of Germany, the political independence of Poland, and the recent independence of the three Soviet Baltic Republics: Estonia, Latvia, and Lithuania. The economic and political crisis in the Soviet Union directly affects the area, as does the uncertain economic future of Poland. The military doctrinal shift of the Soviet Union to defensive defense and reasonable sufficiency has also had an impact on regional security concerns. When analyzed individually, these events have significance, but viewed collectively, they represent a virtual revolution in regional security considerations.

Flag Officer Denmark, Rear Admiral Hans Garde said, "The
geostrategic importance of the Danish Straits cannot be
changed, and it is wise to remember that intentions can
change overnight, but it takes years to create
capabilities." (Garde, 1989, p. 36) The logic behind this
statement can be applied to the entire Baltic region, and it
is especially important in light of recently expressed
changes of intentions by the Soviet leadership. It is
important to keep at least one eye on the capability side of
the intentions-capability problem. The August 1991 coup in
the Soviet Union, although unsuccessful, clearly brought
that fact home. The political instability of the region
should warrant a closer examination of the capability side
of security considerations.

For the United States, this new world order has meant a
reduction in military spending and operational force
structures. The United States Navy will draw down from the
proposed 600 ship force structure to 450 ships. There is
speculation that the final number of ships may be
significantly lower than 450. In this new security
environment, it is becoming more difficult to justify
massive government spending on security forces.
Congressional calls for major defense budget reductions have
increased as the perceived threat diminishes. The Navy, as
an organization, is actively searching for a new "threat" to
justify its future force structure and modernization plans.

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The reason for discussing the current security debate in the United States is that these same pressures are being felt by all countries, including those in the Baltic region. Admiral Vladimir Chernavin, the Commander in Chief of the Soviet Navy, said that the Soviet Navy would be cut by at least 20% in the next decade. (Remmnick, 26 July 1991, p. A26) Denmark has reportedly reduced the 1991 and 1992 defense budgets recently. For the Danish Navy this will mean delayed ship acquisitions. (Gething, 1991, p. 41) The Polish Navy is changing considerably because of the announced shift toward a new national defense doctrine and cuts in the size of the country's armed forces. (Vego, 1991, p. 113) Swedish Armed Forces are facing continued budgetary cuts and reductions as proposed by the Social Democrat Government for the 1991-96 five year period. Swedish Prime Minister Ingvar Carlsson is suggesting a budget freeze which would actually reduce the defense budget from 2.5% to 2.2% of Gross National Product (GNP). (Wetterqvist, 1991, p. 12) The German Navy will reduce manpower by 10,000 sailors and officers as part of German military restructuring. The desired result is a smaller, more modern and flexible navy ready for the next century. (Braun, 1991, p. 57)

The evolving international security environment is the catalyst behind these recent defense decisions. The impact on the navies deployed in the Baltic Sea is just as

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substantial as it has been on the United States Navy. The
nature and scope of these changes deserve attention and
merit close monitoring by the United States. Naval forces,
perhaps more than either air forces or ground forces,
require time to design, construct, and train.
Reconstitution of naval assets is a demanding task. It also
takes time to transform designed capabilities into trained
warfighting capabilities.

B. NEGOTIATIONS AND COALITIONS

The Persian Gulf War highlighted the necessity and
usefulness of a quickly articulated international political
response to a regional crisis. The United Nations undertook
timely actions to resolve a regional crisis. The
multinational aspect of the military coalition was largely
responsible for the quick military victory. In general, the
international community acted responsibly and implemented
measured responses to a very delicate regional crisis. This
phenomena is encouraging and, in the European context, has
added credibility to regional security efforts such as the
Conference on Security and Cooperation in Europe (CSCE),
Western European Union (WEU), and the European Community
(EC). The 1991 Yugoslavia crises added momentum to plans
for an EC role in Europe's security options. The ability of
the EC member states to respond quickly and in unison to
address the crisis in Yugoslavia dispelled criticism that

the EC was unable to provide any form of coordinated diplomatic or military response to international crises. (Reed, 27 July 1991, p. 147) The success of the allied naval forces in the Gulf War has also led to speculation about the utility of a WEU rapid reaction force much like the one planned for NATO, except it would include French forces. (Pontillon, 3 August 1991, p. 193)

Arms control negotiations have also been encouraging in the past few years. The successful Conventional Armed Forces in Europe (CFE) negotiations stand in stark contrast to its predecessor, the Mutual and Balanced Force Reductions (MBFR) negotiations. MBFR was stalled from its opening round at Vienna in October, 1973. The negotiations considered conventional reductions in central Europe and lasted sixteen years without any agreement. The rapid conclusion of the CFE agreement was possible because of a dissimilar international security environment. The CFE agreement will limit the conventional forces stationed in Poland, Germany, Denmark, and the Soviet Union. Indirectly, the CFE agreement will also affect the armed forces of Sweden and Finland. Both countries were particularly concerned that naval forces were not included in the CFE negotiations. (Wetterqvist, 1991, p. 6) The second round of CFE negotiations may include proposals to include restrictions on naval forces. The area covered by CFE is from the Atlantic to the Urals, including the Baltic Sea.

The signing of the START agreement by President Bush and General Secretary Gorbachev on 31 July, 1991 is another important arms control success. The nine year negotiations will bring about a 30% reduction in the long range nuclear missile arsenals of the two nuclear superpowers. Successful nuclear reduction negotiations are important to Europeans, who feel that any nuclear confrontation would probably occur in their backyard.

These successes and anticipation for continued arms control negotiations have created an optimistic atmosphere for a more stable future. This optimism is contagious and has special importance in the Baltic. The Soviets have proposed making the Baltic Sea a "sea of peace" for several years and may continue or reinvigorate efforts along this line. There is also a growing demand for specific naval arms control measures in many European countries. In particular, the Swedes and Finns are in favor of naval arms control confidence building measures as a first step to some sort of naval disarmament agreement. Naval arms control is also a high priority issue for the Soviet Union. (Kennedy-Minott, 1990, p. 46) The German government hopes that a future treaty will eliminate the Soviet amphibious capability in the Baltic altogether, thus reducing the need for most of the German Baltic Fleet. (Friedman, 1991, p. 104)

Multinational security efforts and negotiated arms control have taken on added significance in the past two years. The security role of the United Nations, NATO, EC, WEU, and others has been expanded. It appears that this trend will continue, and may have significant impact on the Baltic region. Political independence of the Soviet Republics may accelerate regional naval arms control negotiations. Poland, Latvia, Lithuania, and Estonia may desire naval arms control measures to enhance their security.

C. BALTIC IMPORTANCE

The Baltic Sea is an important maritime theater for several reasons. Historically, the nations surrounding the Baltic Sea have greatly influenced world events. The naval importance of the region is evidenced by the rich tradition of seafaring men dating back to the Vikings. The countries surrounding the Baltic rely on sea lines of communication for trade. The sea is one of the economic lifelines of all the countries being discussed. According to the Jane's Fighting Ships 1990-91, there are over 4,300 merchant marine vessels registered to the Baltic countries excluding those of the Soviet Union. These vessels comprise a total tonnage of over sixteen million tons.

Today, many military strategists consider the Baltic to be a small part of the larger northern flank region which

includes Norway, the North Atlantic, and the Kola Peninsula.
The impressive buildup of the Soviet Northern Fleet and
naval facilities on the Kola Peninsula between 1964 and the
late 1980's has added credence to this perception. The
Baltic, in the West, is often considered backwater, with
little maritime significance to the overall success of any
military campaign. This is an imperfect perception because
amphibious warfare operations involving the Russians,
Estonians, and Finns played a considerable and important
role in both World Wars.

Recent events have helped legitimize the Baltic Sea as
an independent maritime theater, with obvious links to the
greater Northern European area, but a distinct region in its
own right. The U.S. Navy's Maritime Strategy, with its
forward emphasis, was partly responsible for the increased
geostrategic significance of the Kola Peninsula and northern
Norway in the 1980's. The geographic location of Poland and
the three Baltic Republics between Leningrad and the
Kaliningrad Oblast make the Baltic region important in its
own right, with no direct relationship to the Kola
Peninsula.

The possibility of a regional crisis independent of any
direct U.S. involvement is highlighted by recent events in
Lithuania. Fifteen Lithuanians were killed in January,
1991. Seven more were killed at a border crossing station

on 29 July, 1991. Although this was not a war, it surely
could have developed into a more serious regional crisis.
Immediate intervention by either the United States or NATO
would not be automatic, since no alliance member is directly
involved. Events of this nature could, however, result in
some form of international military response.

The Nordic nations all sent General Secretary Gorbachev
a letter of protest in January 1991, protesting the
Lithuanian incident and Baltic crackdown. Denmark, Germany,
Finland, and Sweden recently called on the Soviet Union to
permit full independence of the three Baltic Republics.
(Binder, 1991, p. A1) The failed August 1991 coup attempt
in the Soviet Union accelerated the independence of the
Baltic Republics. Unfortunately, economic conditions in the
Soviet Union may lead to further crises and more ethnic
instability. The situation should not be considered stable.

D. NAVAL IMPLICATIONS

The Baltic Sea has historically comprised a maritime
region with one of the largest concentrations of naval
forces in the world relative to its limited geographic area.
This is still true today. The navies in the region are all
highly capable, and most have a long naval tradition. The
area should be of primary concern to the United States naval
leadership simply because of the large concentration of
highly capable naval forces developed and deployed there.

The Baltic Sea also serves as one of the world's primary test grounds for naval system development. The Soviet Union depends on Baltic shipyards for over 50% of its naval construction and has its primary training facilities located on the Baltic shores. According to German sources, around 85% of all Soviet Northern Fleet surface combatants are built in the Baltic and depend on facilities there for maintenance and repair. New classes of Soviet vessels routinely undergo six to twelve months of sea trials in the Baltic Sea. (Schulte, 25 May 1991, p. 868) Germany, Sweden, Finland, and Denmark also train naval personnel in the Baltic and deploy highly capable, technologically advanced naval systems.

The significance of the specific naval technology developed in this region was highlighted during the recent Persian Gulf War. Conventional submarines, mine warfare, shallow water anti-submarine warfare, and patrol/fast attack craft warfare have become increasingly significant as the United States incorporates littoral naval warfare into its blue water warfighting capability. These are the warfare areas on which the Baltic navies have concentrated, structuring their naval forces accordingly. Unfortunately, they do not develop these capabilities and systems for exclusive use in the Baltic. Advances in littoral naval technology will make these threats more difficult to counter in the future.

Sweden, Germany, and the Soviet Union all export naval systems to other countries around the world. All three are in the top ten arms exporters in the world. (Kennedy-Minott, 1990, p. 35) As technology in littoral naval warfare matures, the threat posed by smaller coastal navies will become more difficult to manage. Economic problems that shipyards in the Baltic region are experiencing due to decreasing domestic orders may force countries to put more emphasis on the naval arms export business, thus enhancing the proliferation problem.

E. THESIS OBJECTIVE AND SCOPE

The primary focus of this thesis will be a country-by-country analysis of the naval forces deployed and planned for future deployment in the Baltic Sea. The preceding pages have highlighted the importance of this area to the United States. Recent shifts in regional security considerations have been discussed. It should be stressed that there will be alterations to naval force structures as a result of those changes. This thesis will discuss the impact that these changing security considerations are having on the naval plans of the region and the individual countries.

Additionally, a regional focus may provide a better understanding of national intentions than the traditional single country order of battle analysis. The Soviet Navy,

when viewed as a collective entity, does not present a valid
picture of true operational capabilities. Each of the four
Soviet Fleets should be viewed as an independent regional
naval force. One of the purposes of this paper will be to
address the Soviet Baltic Fleet in a regional context.
Factors such as Baltic Republic independence and Russian
Republic independence will also be discussed. The breakup
of the Soviet Union will certainly have an impact on all the
Baltic navies. It can be dangerous and misleading to
analyze navies without presenting the regional security
context in which they are designed to operate.

The littoral influence on naval development will also be
analyzed. Although six different navies operate in the
Baltic Sea routinely, each of them emphasize common
characteristics in their naval modernization plans. The
significance of conventional submarines, fast attack craft,
and mine warfare to regional stability worldwide will be
discussed. The next ten years promise a robust increase in
the stealth and lethality of conventional submarines,
possibly at a reduced price. (Zimmerman, 1991, p. 76) There
may also be an increased market for fast attack craft in the
near future since most of those currently deployed were
built in the 1960's and 1970's. (Lenton, 1989, p. 105) The
mine threat is obvious, they are still effective. The
Baltic navies are producing and exporting forces in these
three categories.

The final objective of this thesis will be to provide a
tool for naval planners to use when considering incipiently
unstable regional naval developments. The final chapter
will propose options for United States naval planners to
consider for implementation in the region.

Chapter II will provide a brief discussion of the
importance of geography in regional naval developments. One
constant variable in the Baltic region has been geography
and its strategic importance.
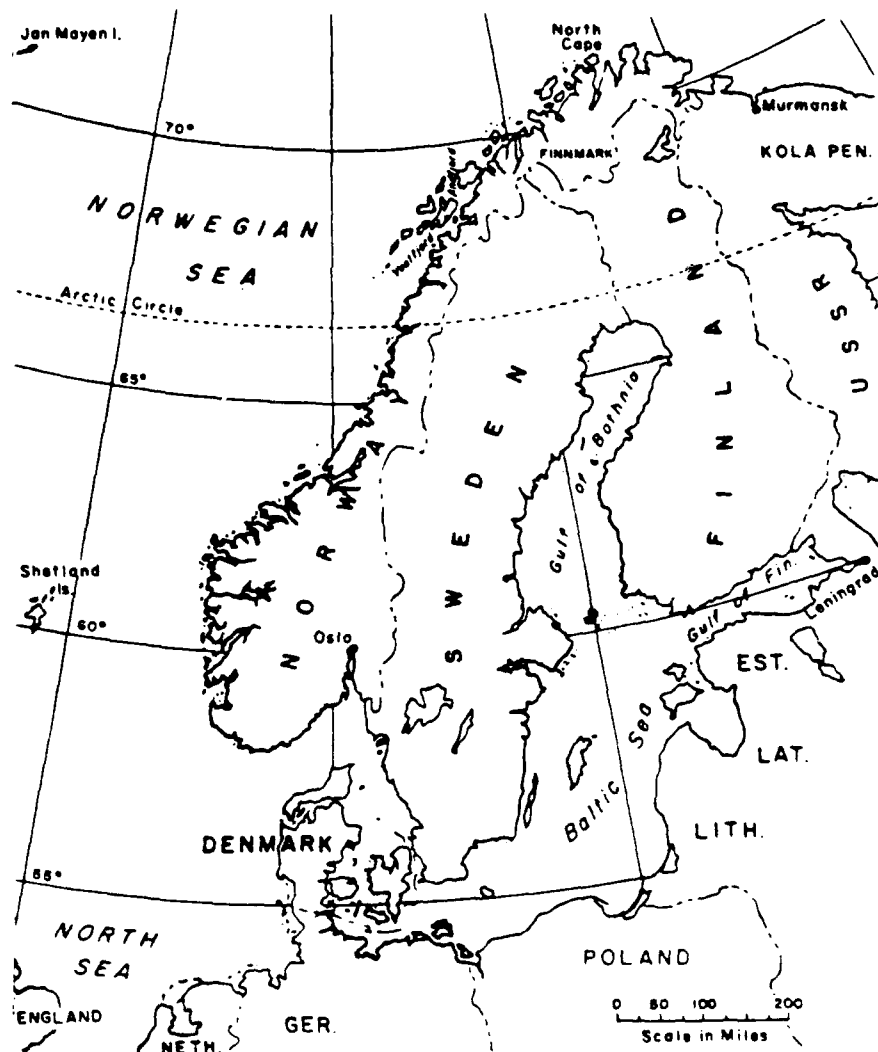
(Holst, 1990, p. 85)

II. GEOGRAPHY AND ENVIRONMENT

The history of naval development in the Baltic Sea has been heavily influenced by the geography and environment in the region. The Baltic Sea is over 700 miles long and between 100 and 200 miles wide. The water is cold and shallow, with depths rarely exceeding 150 meters. The Baltic Sea has one main outlet, the southern Baltic Approaches. They provide the main maritime transit route to and from the North Sea. The chart below provides a graphical representation of the Baltic region.

(Jansson, 1988, p. 48)

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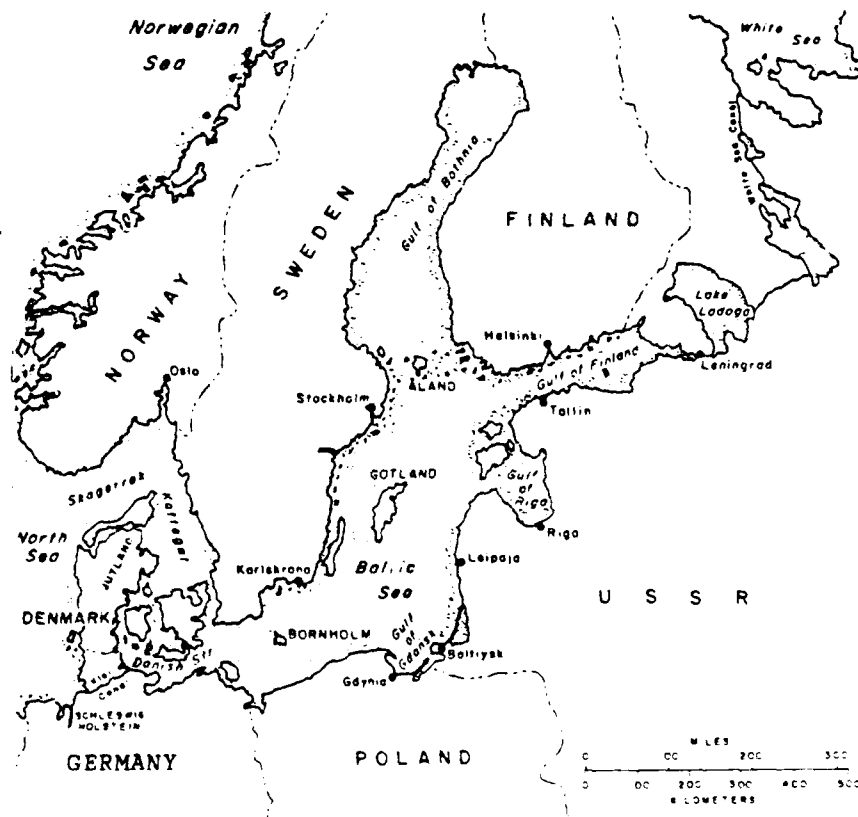
The approaches can be geographically broken into three areas: the Jutland Peninsula on the west, the Funen group of islands in the center, and the Zealand group of islands in the east. Denmark's Bornholm Island, occupied by Soviet forces in 1945, can be viewed as a forward observation post between the main part of the Baltic Sea and the approaches to the North Sea. The southern parts of the approaches are shallow: 20 fathoms or less. Only in the northern Skagerrak do depths exceed 100 fathoms. The primary bottlenecks in and out of the Baltic are the Danish Straits: the narrow, winding Little Belt between Jutland and Funen, the Great Belt between Funen and Zealand, and the narrow Sound between Zealand and Sweden. None of these arteries exceed ten miles in width. In average winters, some ice can be expected, which limits the movement of small combatants. (Kampe, 1988, p. 115) The chart below identifies these main transit routes in the Baltic Approaches.

(Kampe, 1985, p. 20)
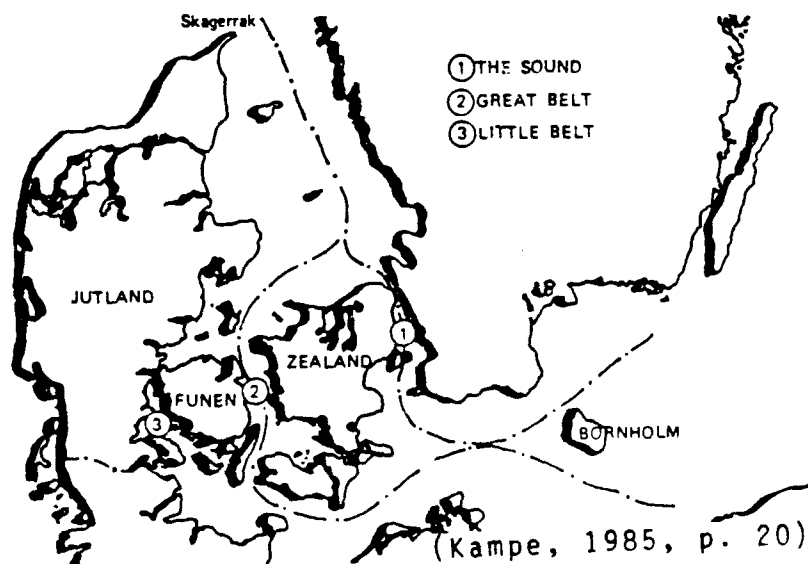
These approaches have traditionally been of great economic and political importance. They form the link between Scandinavia and Central Europe. They also serve as the barrier controlling the entry into and exit from the Baltic Sea. It is a strategically important maritime location in the European balance of power. Control of the Baltic Approaches was a strategic goal of both alliances during the Cold War. (Kampe, 1985, p. 20)

The only other exits are two man-made canals. They were built, at least in part, to provide secure transit routes to the North Sea for Germany and the White Sea/Barents Sea for the Soviet Union. The Kiel Canal runs through Germany and provides an important secondary access to the North Sea. The completion of the canal in 1898 allowed Germany to steam her warships from the Baltic to the North Sea without political or maritime interference from other countries. The Kiel canal provides Germany a secondary key to the Baltic. (Warner, 1965, p. 133) The White Sea Canal runs from Leningrad to Lake Lagoda to the White Sea.

All of these outlets are vulnerable in time of war and would quickly become disputed in a crisis. When discussing naval developments in the region, one critical point to remember is the geographic conditions and restrictions that are present. The importance of geography in the region cannot be overstated. The next section will discuss some of the geographic traits or the region.

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A. UNIQUE GEOGRAPHIC FEATURES

When viewing the Baltic from the Arctic Circle, the region can be seen as a partially closed lobster claw, with Norway and Sweden forming the upper half. Germany and Denmark combine to form the lower half. Poland, the Soviet Union, and Finland form the interior of the claw. (Warner, 1965, p. 8) The tips of both parts of the claw have been strategically important throughout history, while the interior portions have been the scene for the world's most severe military confrontations.

One of the most important geographic attributes of the Baltic Sea is the presence of numerous islands. Several are strategically located and many are capable of providing dispersal sites as well as cover from enemy forces. Three of the islands, Zealand, Funen, and Bornholm, are easily recognized as strategically important because of their location in the center of the southern approaches and Danish Straits. Control of these islands would be critical for any sea control plans in the Baltic region.

Two other large islands are also strategically important. Sweden's Gotland, in the center of the Baltic, creates a division of maritime traffic to either the Swedish or Soviet side. Finnish Åland, located at the mouth of the Gulf of Bothnia, restricts movement into its northern waters. The Åland Islands have historically served as naval

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bases and staging areas during conflict in the Baltic Sea.
In 1921 Åland was demilitarized. Additional clauses in the
1947 Paris Peace Treaty recognized the demilitarization of
the islands. The Finnish Coast Guard patrols the
territorial waters around Åland during peacetime and would
exercise responsibility for their defense in a war.
(Solsten, 1990, pp. 307-8)

The narrow mouth on the Gulf of Finland has historically
been another important geographic area. It was used
effectively by the Germans during World War II to bottle up
the Soviet Baltic Fleet in Leningrad. The Germans laid
anti-submarine minefields and nets across the gulf's
entrance to stop Soviet submarines from operating in the
Baltic Sea. These measures, plus winter ice, limited the
effectiveness of the Soviet Baltic Fleet during World War
II. (Polmar, 1986, p. 21) The attack of the German Army
towards Leningrad forced the Soviet Baltic Fleet to evacuate
new naval bases in Libau, Riga, and Tallinn and retreat into
the inner parts of the Gulf of Finland. After finally
breaking out of the Leningrad pocket in 1944, Soviet light
naval forces supported the sea flanks of the advancing Red
Army with fire support, tactical landings, and attacks
against German supply routes. (Gillette, 1990, p. 107)

The Gulf of Finland has special significance today as
Estonia strives for political independence. When granted

complete independence, the entire entrance to the Gulf of
Finland will be bordered by Finland to the north and Estonia
to the south. The Russian Republic would include only about
100 miles of coastline at the head of the Gulf of Finland.
The only other Russian territory with access to the Baltic
Sea is the Kaliningrad Oblast, surrounded by Lithuania and
Poland. The chart below identifies the Soviet coastline and
Republic borders along the Baltic Sea.

(DDB-1200-124-90, p. 20)
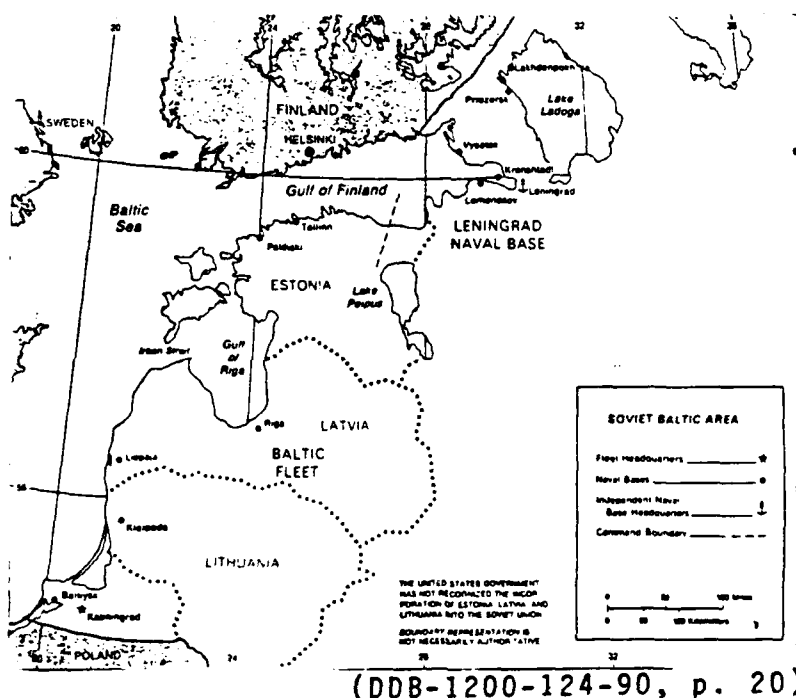
B. GEOGRAPHIC INFLUENCE ON NAVAL OPERATIONS

The restricted access routes to and from the Baltic
dictate that the forces assigned to operational duties in
the Baltic be stationed there. The geography likewise
dictates that those forces in the Baltic will likely remain

there during any regional maritime crisis. The Soviet
Baltic Fleet is intended primarily for Baltic operations,
although its conventional submarines do occasionally conduct
training exercises in the North Sea. (Polmar, 1986, p. 22)
The only other navy with a viable out-of-area capability is
the German Navy. German naval forces stationed on the North
Sea coast include 16 destroyers and frigates capable of
sustained open ocean operations. German blue water
capabilities appear to be expanding according to recent
German naval modernization plans. Specific details of
German Navy plans will be discussed in Chapter IV of the
thesis.

Advances in mine and submarine warfare have magnified
the vulnerability of the southern approaches. NATO, as well
as the Warsaw Pact, made plans to fight the naval
engagements in the Baltic initially with forces already
deployed there. Any plans to reinforce the Baltic Sea by
introducing naval units through the Danish Straits in time
of crisis would be risky at best. Integrated naval air
power and dedicated amphibious forces, as well as special
operations forces are all important features of naval
development in the Baltic.

The small size of the Baltic makes air power, both
reconnaissance and strike, an important part of naval
strategy. The strategically located islands emphasize the

need for amphibious capability and special forces for any sea control ambitions. Strong defenses against possible amphibious/special force aggression are also necessary.

The northern tip of the Baltic is on the same latitude as Nome, Alaska. Its southern approaches are on the same latitude as Ketchican, Alaska. This northern location predicates a unique, almost arctic maritime environment. Ice and ice breakers are an essential part of Baltic naval operations. Small attack boats, surfaced submarines, and small mine warfare units have difficulty maneuvering in ice conditions. Larger principal combatants have less problems with the ice. The northern half of the Baltic Sea including the Gulf of Bothnia, the Gulf of Finland, and the Gulf of Riga is covered with ice from two to five months. (Jansson, 1988, p. 49)

Anti-submarine operations are very difficult in the cold, shallow waters of the Baltic. The specific conditions that make submarine hunting so difficult are large changes in water temperature and salinity, rugged bottom features, archipelago features, magnetic disturbances, poor visibility, and significant currents in various patterns. (Tornburg, 1991, p. 49) Fresh water from the ice melt and rivers flowing into the Baltic make conditions that much more difficult. All of these conditions appearing in the same region have magnified the effectiveness of conventional submarines in the Baltic Sea.

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The shallow waters in the Baltic Approaches create ideal conditions for mine warfare. The water depth coincides with the maximum effective depth for bottom mines in most areas. These shallow waters also make sustained submarine operations difficult. On the other hand, difficult ASW conditions make submarine detection troublesome if they do operate there. (Garde, 1989, p. 35) In general, the Baltic Sea is an extremely difficult maritime environment for waging naval warfare. It is littoral in nature, with few of the characteristics of open ocean naval warfare. The littoral aspects are prevalent in all coastal regions where small navies operate. The chart below identifies water depths in the Southern Baltic.
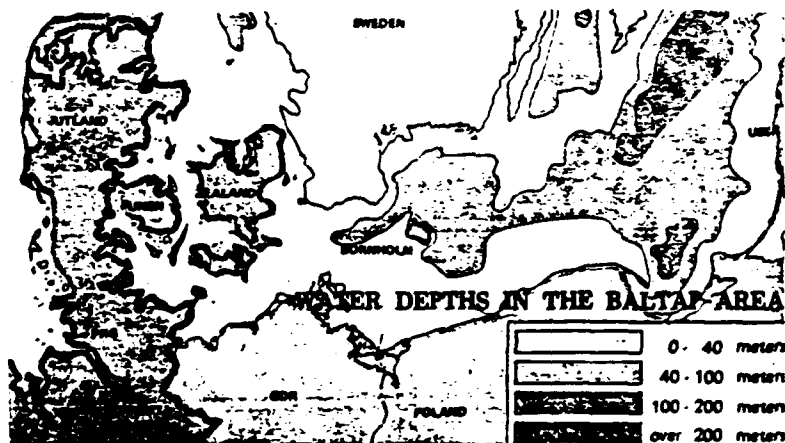
(Garde, 1989, p. 35)

C. GEOGRAPHY, THE COMMON DENOMINATOR

In the following chapters, it will be evident that the navies designed to operate in the Baltic all have certain characteristics in common. This regional naval evolution is

an important consideration when attempting to forecast future developments. Small patrol and fast attack craft have largely replaced principal surface combatants for Baltic operations. Collectively, there are over 300 of these small, flexible ships deployed by the navies in the Baltic.

The Soviet Union, Sweden, Germany, Poland and Denmark all employ conventional submarines, with the first three being among the few countries that export diesel submarines. Over 70 conventional submarines are deployed by the Baltic navies. All the navies in the Baltic also stress forces designed to counter the diesel submarine challenge. Shallow water anti-submarine warfare is a common area for research and development as well as operational deployment. The effectiveness of newly developed shallow water anti-submarine measures are often offset by advances in submarine technology.

Mine warfare is another important aspect of all regional naval plans and designs. Most submarines, surface craft, and aircraft are capable of laying mines. Another common theme is the preponderance of mine countermeasure forces required to counter the mine threat. Some of the most advanced mine and countermine equipment in production today is produced by the Baltic countries. Research and development in mine warfare is continuing in all the Baltic navies.

Geography is the dominant factor in these common development patterns. The littoral aspects of the region have dominated naval designs and tactics. Littoral naval warfare makes air bases on land a viable replacement for aircraft carriers. Shallow seas, dotted with islands, make small, quiet diesel submarines more attractive than large nuclear submarines. Shore based anti-air facilities and coastal defense batteries can be seen as replacements for manpower intensive, multipurpose cruisers and battleships. The concept of hit-and-run using small missile-equipped ships has more utility than massing a battle group for large scale naval warfare. The islands and rugged shorelines of the northern Baltic Sea provide countless force dispersion sites for small groups of craft or individual units. They also provide excellent observation sites.

The forces designed for use in the Baltic generally constitute defensively oriented forces with a strong counter-offensive capability. The obvious exception to that generalization was the strong emphasis the Warsaw Pact navies placed on amphibious capability. This offensive amphibious threat has been greatly diminished by recent events. Polish amphibious capability, viewed independently from the Warsaw Pact, does not present a viable threat to the region. The East German amphibious capability can be seen in the same light, and for the most part is being

either sold or scrapped. Soviet amphibious capability in the Baltic is impressive, but it is certainly not the same threat independently that it was when integrated with Polish and East German amphibious forces. Strong offensive amphibious capabilities would be required to effectively establish sea control in the Baltic Sea. Amphibious capabilities deserve continued monitoring. They are one indicator of national intentions in the region.

The next chapter will discuss the Baltic Sea from an historical perspective. Although geography has probably been the most important factor in the evolution of regional naval forces, political considerations have also been important. History, when viewed objectively, can provide valuable insight into what future events are significant. It can also aid in putting current developments into perspective. Many of the political developments in the region today have historical similiarities with developments of the past. The Baltic Republics are a case in point. All three of them had their own navies from 1922 until 1939. (Gardiner, 1980, pp. 351-54)

III. HISTORICAL PERSPECTIVE

National political systems in the Baltic countries have
been diverse historically. Governments have ranged from
autocratic dictatorships to liberal democracies. Communism
has been an important part of recent Baltic history. It was
the glue that held several of the countries together under
one security arrangement, the Warsaw Pact. With the end of
the Warsaw Pact and the downfall of the communist regimes in
Eastern Europe, there are several new democracies developing
in the Baltic region. It is not clear if they will develop
independent national security systems or rely on some type
of security federation with neighboring countries.

Lithuania, Latvia, and Estonia are located between the
the two Russian territories that have Baltic coastline. The
three Baltic Republics were incorporated into the Soviet
Union at the outset of World War II. They were under
Russian dominance from the time of Peter the Great until
World War I and independent from 1919 to 1939. (Polmar,
1986, p. 455) Russian influence in the region is
significant. The only Soviet Republic bordering the Baltic
Sea with a strong naval tradition is Russia. Estonia,
Latvia, and Lithuania all had small navies during the
interwar periods, but none of them had national navies prior

to or after that period. Russia's Baltic coast is about 100 miles long at the head of the Gulf of Finland and a similar distance in the Kaliningrad Obalst between Poland and Lithuania. Baltiysk and Kaliningrad, two ports in the Kaliningrad Oblast, are of major importance to Soviet naval operations in the Baltic. The Kaliningrad Oblast is located in what was formerly East Prussia. It was overrun by Soviet troops during World War II and incorporated into the Soviet Union after the war. (Polmar, 1986, p. 458) The political future of the Kaliningrad Oblast is an important issue for regional naval considerations.

Tallinn, the capital of Estonia, is the sight of naval and commercial ports that are ice free most of the year. Riga, the capital of Latvia, is also a major sea port. Another Latvian port, Ventspils, is ice free more often than Riga and has greater cargo handling capacity. Lepaia, Latvia provides protected naval and commercial ports. Klaipeda, the capital of Lithuania, has long been a shipbuilding center and provides commercial and naval harbors. (Polmar, 1986, pp. 455-7) The relationship between the three Baltic Republics and the Russian Republic should dictate whether or not Soviet Baltic Fleet assets will continue to be based in Baltic Republic port cities. Russia will likely want some sort of security arrangement with the three Baltic Republics. The Baltic Republics will also need

some sort of mutual security agreement with Russia.
Maritime security arrangements between the Soviet Rebublics
merit continued attention.

The number of countries surrounding the Baltic Sea has
varied considerably with time. In 1989 there were seven
countries; the German Democratic Republic has since become
unified with the Federal Republic of Germany. During the
interwar period between World War I and II, the Baltic
shores included three other independent countries: Latvia,
Lithuania, and Estonia. The last thousand years have
produced a long history of confrontation between the
countries listed above, and today some of the same problems
still exist. The map below outlines current borders with
regional population figures.

(Ries, 1991, p. 762)

30
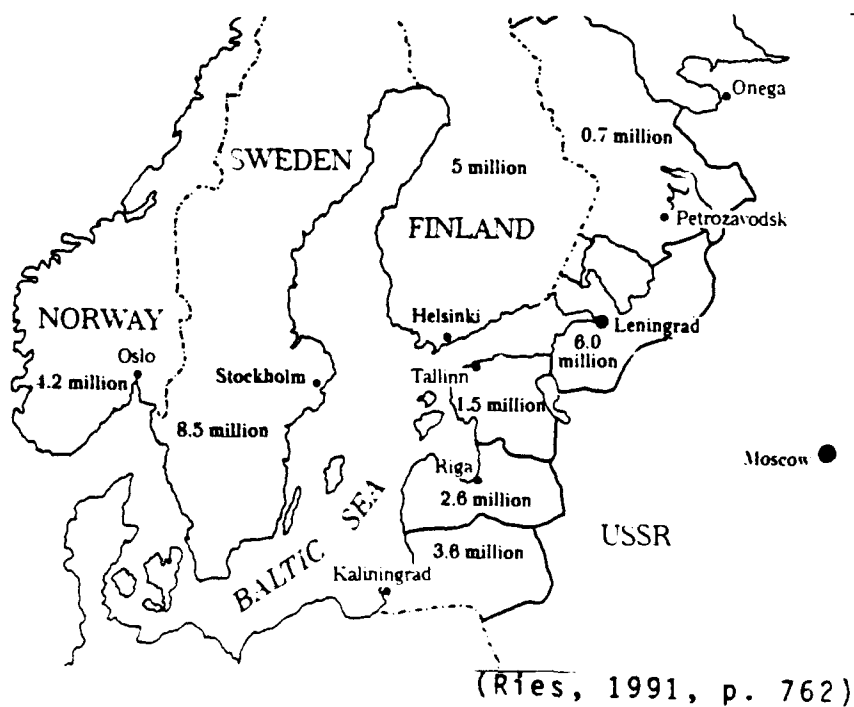
The tradition of great power influence is certainly not
new to the lands surrounding the Baltic Sea. Sweden,
Denmark, Prussia, Germany, and Russia have all preceded the
Soviet Union as the dominant great power in the region.
Soviet military domination in the region is not the first
instance of one nation having more power than all the other
nations in the region combined. In 1397, the Union of
Kalmar was established. This arrangement brought Denmark,
Sweden, and Norway together under the Danish crown. It was
a precarious bond but lasted for a century and a quarter.
(Warner, 1965, p. 5) Later attempts to control the entire
region met with limited success for both Sweden and Germany.
The charts provided below and on the next page present
regional political and territorial shifts during the last
four centuries.

Map 8: The Political Divisions of Europe
in the Sixteenth Century
Border of Holy Roman Empire

(Kennedy. 1989, p. 18)

Map 5: Europe in 1721

☐ Habsburg Lands

▬▬ Border of Holy Roman Empire

ATLANTIC OCEAN

NORWAY

S W E D E N

RUSSIA

NORTH SEA

DENMARK

BALTIC SEA

GREAT BRITAIN

EAST PRUSSIA

UNITED PROVINCES

HANOVER

BRANDENBURG

POLAND

SAXONY

SOUTHERN NETHERLANDS

(Kennedy, 1989, p. 109)
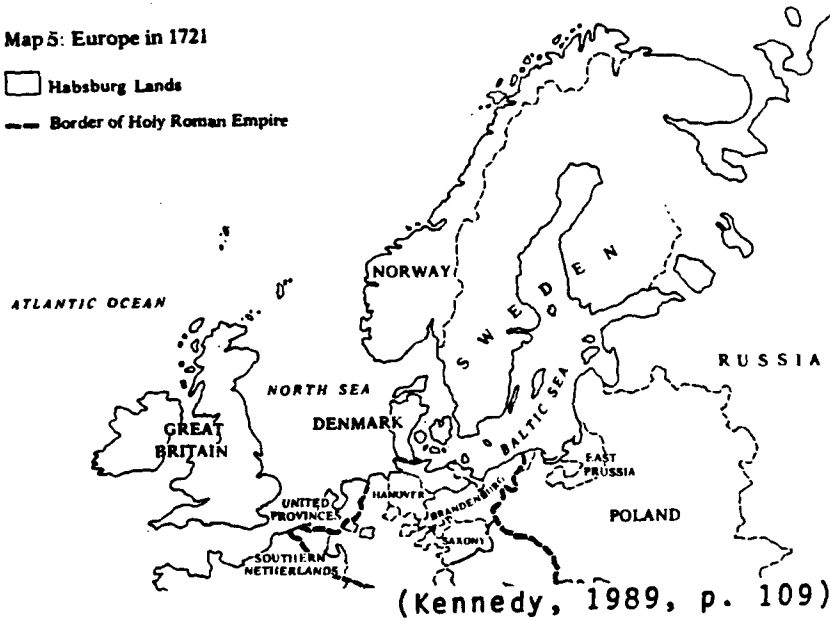
☒ French Empire

☐ "Greater Empire" subject to Napoleonic controls

☐ Nominal allies of Napoleon

▨ Hostile to Napoleon, protected by British

Height of Napoleon's Power, 1810

ATLANTIC OCEAN

GRAND DUCHY OF FINLAND

S W E D E N

NORWAY AND DENMARK

RUSSIAN EMPIRE

GREAT BRITAIN AND IRELAND

NORTH SEA

BALTIC SEA

PRUSSIA

GRAND DUCHY OF WARSAW

CONFEDERATION OF THE RHINE

FRENCH EMPIRE

SWITZ.

AUSTRIAN EMPIRE

(Kennedy, 1989, p. 128)

32
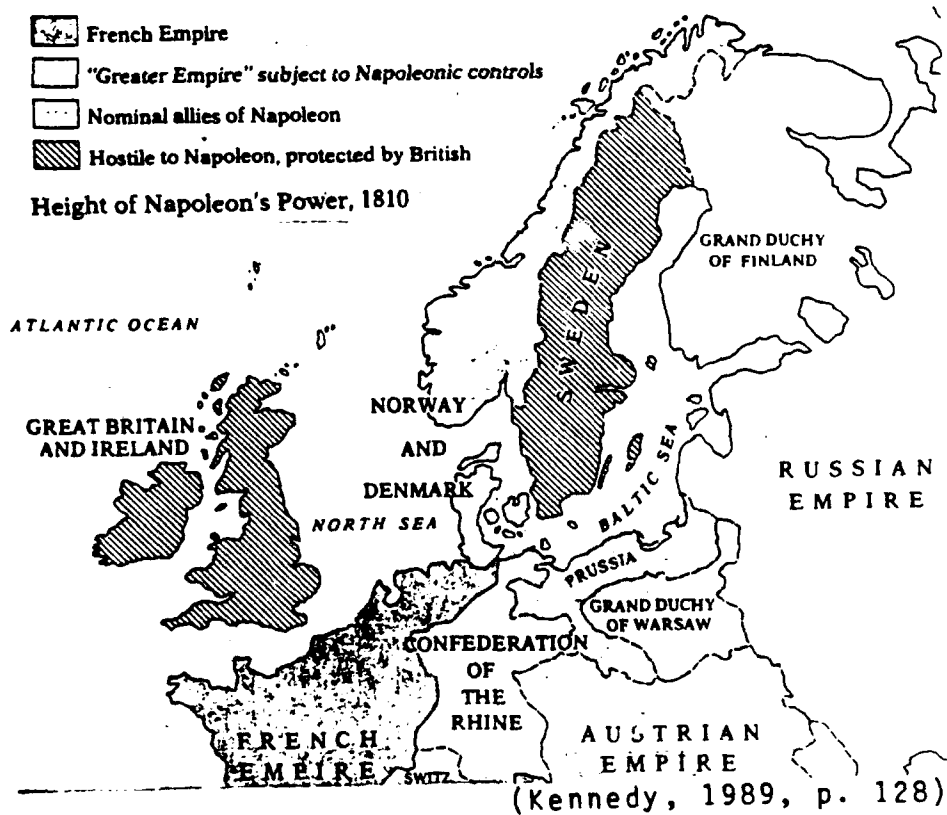
Historically, the Baltic region was important because it contained the resources necessary for naval construction. Timber of all sorts, tar, hemp, iron, copper, and other important naval stores were readily available in the region. Countries such as the Netherlands, Great Britain, France, Italy and Spain all valued these items and developed trade relations to import them. (Warner, 1965, p. 4) As discussed earlier, trade and merchant shipping are still important aspects of the regional economies.

A. POLITICAL HISTORY

The political systems in the Baltic region have always been diverse. The past two years have seen dramatic changes in the political goals and aims of the region. Two previously communist countries, Poland and the German Democratic Republic, have become democratic. The overt expansionist tendencies of the Soviet Union have apparently diminished. The Soviet Union is more focused on domestic issues than it was previously. Some form of political independence has been granted to the Soviet Republics. Naval developments in the region are certainly being affected by these political shifts.

National and regional security interests in these countries during the past forty years have been dominated by the bipolar security environment. The naval balance has been cast in terms of NATO, Warsaw Pact, and neutral. When

analyzing naval strategies for the region, alliance and
neutral ratios have been used to generalize naval power in
the Baltic region. Both Poland and the German Democratic
Republic were considered to be an integral part of any
Soviet naval plans for the area. NATO's naval plans for the
region highlighted the importance of both East German and
Polish naval contributions to the Warsaw Pact maritime
effort. The modern Danish and German Navies were specially
designed to meet NATO naval objectives. In a crisis, they
were intended to engage the Warsaw Pact naval threat, not
just the Soviet Baltic Fleet. The NATO missions for Baltic
naval forces will be adjusted to reflect this new security
environment.

Sweden and Finland, although neutral, based their
security postures on the alliance balance and possibility of
some sort of superpower confrontation. In the past two
years, this situation has changed dramatically. A unified
Germany in NATO and an independent, economically weak
Poland wreak havoc on past naval correlation-of-force
calculations. The emergence of four separate countries
(Russia, Estonia, Latvia, and Lithuania) in place of the
Soviet Union will not make naval correlation-of-force
calculations any easier. In many respects, the political
disintegration of the Soviet Union could be viewed as a
destabilizing regional factor. The charts below identify

some territorial and political adjustments that took place
earlier this century during an era of similar political
instability.

Map 10: Europe After the First World War

(Kennedy, 1989, p. 276)

Map 11: Europe at the Height of
Hitler's Power, 1942

Axis Powers
Axis Satellites
Conquered Lands
Neutrals
Allied Powers

500 Miles
500 Kilometers

(Kennedy, 1989, p. 351)
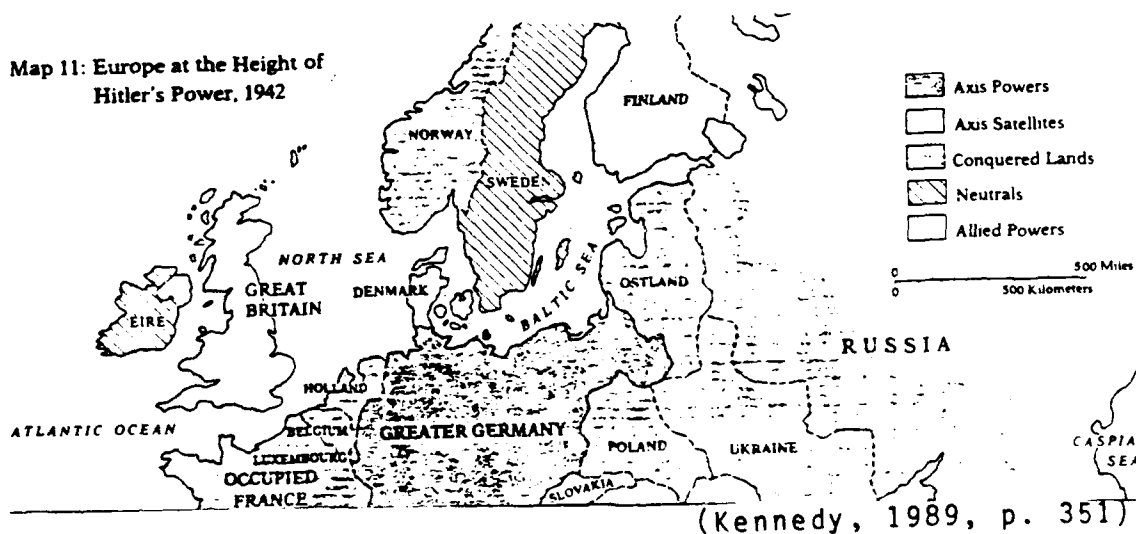
B. RECENT HISTORY

The new world order is no more apparent than in the
Baltic region. The traditional military balance and war
plans of the past forty years no longer have significance.
This new security environment will have an impact on
military and naval strategies developed for the future.
From an historical viewpoint, chances for a limited regional
crisis in the area have perhaps increased as a result of
recent political developments. A brief study of history in
the Baltic provides ample evidence of regional problems
becoming global problems. Poland's history is a case in
point; its borders have changed dramatically throughout
history as a result of regional and global power struggles.
Poland cannot escape the strategic importance of its
geographic position, even in the new world order.

The United States Navy is currently developing a new
Maritime Policy less offensively oriented than the old
Maritime Strategy. While the Soviet Navy is still the only
true global naval threat, chances for any major superpower
confrontation have greatly subsided. The countries in the
Baltic face the same dilemma: who is the enemy? They also
face unique problems such as emphasis on Scandinavian and
Nordic security balances. The emerging "European security"
discussions also have significance for each of the
countries. Without an enemy, it is difficult to justify

government spending on security forces, especially
expensive, technologically advanced naval forces. In an era
of shrinking defense budgets, certain trends in naval system
acquisitions may exist. The Baltic countries, with the
possible exception of the Soviet Union, have been working
with limited defense budgets for years.

This new security environment does not seem to dictate a
need for strong, dedicated operational navies. Any major
confrontation in the Baltic region between the Soviet Union
and NATO will supposedly be preceded by a much longer
warning time. Two weeks to a month was the accepted warning
time in 1989; it is now agreed to be closer to two to three
years. In light of the August 1991 coup in the Soviet
Union, even that evaluation will have to be revised. In
this environment, the navies of the Baltic countries are
having the same difficulty the U.S. Navy was having in
defining security roles in the new post-Cold War world.

As the memory of World War II fades, the perception that
the recent thaw in international tension will be permanent
is contagious. The Baltic still comprises a major sea line
of communication with over 300 vessels a day, or 100,000 a
year, passing through the Danish Straits. (Garde, 1989, p.
35) A brief look at any world history book would suggest
that peace in the region might not be as permanent as some
perceive. There are positive indications that the late

1990's and early twenty-first century may very well be an
era of peace for the region, but nationality disputes,
economic problems in the Soviet Union, and ethnic unrest
could raise their ugly heads higher and provide the catalyst
for a regional crisis at any time. In the emerging
political environment, the Soviet Union will no longer be
able to "control" these events. That role may be delegated
to Russia, or some other multinational political
organization. By focusing on the navies in the region, it
may be possible to determine how secure each nation feels in
the emerging security environment. A regional analysis may
also suggest that actual security interests are not being
adequately addressed.

The next chapter will provide a country-by-country
analysis of the naval history, force structures, and
modernization plans for the six countries surrounding the
Baltic Sea. The preceding chapters have provided the
background necessary for a better understanding of the
regional aspects of national naval developments.

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IV. THE NAVIES

This chapter will focus on the development of the
individual navies in the Baltic region. The previous three
chapters have highlighted the importance that geography and
political history have had on the region. The significance
of recent international and regional security developments
has also been discussed in detail. An examination of the
history and development of each navy individually should
highlight common regional themes in naval system acquisition
and force composition. Common regional naval modernization
trends will then be examined to validate whether they can be
used to predict future Baltic naval developments.

Additionally, this chapter will address current naval
capabilities and the specific national security requirements
they are designed to meet. A brief history of the navies
will be presented, as well as a five year force structure
breakdown for the past twenty years. The data compiled in
the five year charts is taken from the Jane's Fighting Ships
series and the forecasts for the 1995 data is a compilation
from all available sources. Finally, future plans will be
discussed and analyzed for the individual navies. The
impact that evolving national security requirements are
having on naval modernization plans will be addressed.

Although the region is linked by geography, each country has
different approaches to national defense issues. The naval
contributions to national defense are also unique in each
country.

A. SWEDEN

Sweden's defense posture is based on armed non-alignment
in peacetime, aimed toward neutrality in case of war. Entry
into the European Economic Community will invalidate the
non-alignment aspect of the policy; but for purposes of this
study the traditional policy must be examined, because as of
1991, it had not been repudiated or officially modified.
This neutral posture became policy after Russia defeated
Sweden in 1812. Sweden decided that the best policy for a
country in its geographic position was to adopt a security
course somewhere between contending major powers. (Sundberg,
1991, p. 12) Since World War II, this policy has meant
armed neutrality backed up with powerful conventional
forces.

This neutral posture was not always the case in the
past, however. Prior to the decline of the Swedish empire,
Sweden was a great power willing to defend its empire with a
formidable military establishment. From 1521 to 1814 Sweden
was engaged in a total of 48 wars and was at war more often
than peace. (Kruzel, 1988, p. 529) Every Swedish
generation, from the eleventh through the nineteenth

century, fought approximately two wars. (Wetterqvist, 1990, p. 6) From 1610 until his death in 1632, the preeminent Swedish national hero, King Gustavus Adolphus, waged war simultaneously against Denmark, Poland, and Russia. Nicknamed the Lion from the North, Gustavus was largely responsible for the expansion of the last great Swedish Empire. (Warner, 1965, pp. 10-26) The map below identifies the boundaries of the Swedish Empire in the 1600's.

SWEDISH TERRITORY IN 1661

Average limit of winter pack-ice in exceptional seasons, such as 1657/8, further areas are frozen

(Warner, 1965, p. 44)

During this period Sweden's greatest weakness was its economic base. The small population and excessive barren arctic territory compounded the problem. Foreign developers drew Sweden into the mercantile world system and Sweden became the greatest producer of iron and copper in Europe. These exports financed the armed forces. Sweden became self-sufficient in armaments thanks to foreign investment and expertise. (Kennedy, 1989, pp. 64-6)

From the sixteenth through the eighteenth centuries, when waterways were the primary means of transportation, the Baltic held Sweden together. During this time Sweden included Finland, portions of the Baltic States, and parts of northern Germany. (Rudberg, 1985, p. 22) In 1699, Denmark, Poland, and Russia all conspired to take parts of Sweden's Baltic Empire. By 1715, all the trans-Baltic possessions were gone, and parts of Finland were incorporated in Russia. Sweden admitted the loss of its Baltic provinces in the 1721 Peace of Nystad. Sweden became a second order power, while Russia had risen to the first order. (Kennedy, 1989. pp. 106-7)

Since 1814, Sweden has not taken military actions in a major war. Its security policy has been based on a system of military conscription to mobilize up to ten percent of the population in case of war. Sweden's luck in avoiding armed conflict during both World Wars validated the

neutrality policy as an historical success as far as Swedish policy makers and the public were concerned. (Kruzel, 1988, p. 529) In the 1950's and 1960's, Sweden spent 5% of GNP on defense. During the 1970's and 1980's, the figure dropped to around 3% of GNP. In the late 1980's, Sweden faced a choice of providing greater resources to perform assigned missions or reducing missions to match available resources. (Kruzel, 1988, p. 539) From all available evidence, it would appear that Sweden chose the latter.

Reserve forces include over 700,000 personnel, with slightly over 100,000 assigned to the navy. (Heisbourg, 1990, p. 92) For a country with only 8.5 million people, this means one of every twelve citizens would be activated in time of war. Sweden can mobilize its reserves within three days. (Kruzel, 1988, p. 529)

The basis for Sweden's defense policy has changed significantly in the past two years. The challenge for Swedish policy makers is to assess the new developments and decide how Sweden should contribute to a new European security architecture. (Sundberg, 1991, p. 12) The perceived likelihood of a superpower confrontation or global war has diminished with the demise of the Warsaw Pact and the fall of many of the communist regimes in Eastern Europe. World economic conditions, coupled with high tax rates to support social programs, have placed the Swedish defense

budget under increasing domestic pressure. The cost of the
the Swedish welfare state has risen from 44% to 70% of the
gross domestic product since 1970. Demographic pressures
from an aging population are also increasing demands on
government spending. (Kruzel, 1988, pp. 540-42) There is
little evidence that the Swedish government plans to
substantially increase defense spending any time soon.

Sweden's defense policy is a central part of the Nordic
security balance. Although East-West tensions have eased
recently, there remains a special relationship between the
Nordic countries: Sweden, Finland, Norway, Denmark and
Iceland. This relationship is based on mutual respect and
apprecia ion for the security policies adopted by the other
Nord¹⁻ countries. (Sundberg, 1991, p. 13) After World War
II, the Nordic countries toyed with the concept of a Nordic
Union. Norway and Denmark, with vivid memories of the
German occupation fresh in their mind, favored more
practical measures and became founding members in the NATO
alliance. (Curtis, 1988, p. 30) Sweden's armed neutrality
policy is perceived by its people as a focal point for the
Nordic balance and peaceful conditions that the region has
enjoyed since World War II.

Sweden's military forces are designed for territorial
defense against external attack, with little emphasis on
offensive strike or amphibious capabilities. Security

forces are expected to be capable of providing a substantial counteroffensive to make any plans for aggression against Sweden too costly to undertake. Defense forces can be categorized into three different missions. Power projection forces maintain the ability to attack potential intruding forces before they penetrate Swedish territory. Perimeter defense forces are designed to engage enemy forces at the border and impose a high entrance cost on the intruder. These forces include coastal defense forces that guard Sweden's territorial seas. The final forces are designed for territorial defense. This includes resistance measures after an invader has crossed the borders into Sweden. (Kruzel, 1988, p. 535) The Swedish Navy has historically performed in all three of these missions.

The Swedish Navy was the strongest in the Baltic after World War I. In 1922, the Swedish government dismissed the idea that there would be another war and made plans to reduce defense forces by 50%. The government placed great confidence in the utility and anticipated success of the League of Nations. As Germany rearmed in the 1930's, Sweden increased defense spending. Although neutral during World War II, Sweden had reached her highest degree of naval readiness in centuries by 1943. In 1946, the Swedish Navy consisted of seven battleships, four cruisers, 29 destroyers, 26 submarines, 21 torpedo boats, 21 patrol

boats, two minelayers, and 42 minesweepers. This force
constituted the most capable navy in the Baltic region.
(Gardiner, 1980, p. 368) The only interruption to
continuous Swedish Baltic naval dominance from 1918 to 1950
was the German Navy during both World Wars.

The next decade and a half witnessed continued naval
building programs. Sweden remained the primary Baltic Sea
naval power while the other Baltic countries recovered from
the devastation of World War II. (Gardiner, 1983, p. 377).
During the 1950's and 1960's, the Swedish Navy included 20
destroyers and frigates. These forces were part of the
power projection forces for the country's defense.

Decisions taken in 1958 by the Swedish Parliament ended
construction of large surface combatants for the navy.
These decisions were based on the assumed vulnerability of
large surface units and the assumption that any future war
would immediately escalate into a nuclear conflict. At that
time 30% of the Royal Swedish Navy's budget was transferred
to the strike air force. In other countries, the theory of
flexible response had been adopted and combat fleets were
being built and modernized including large ships. (Morling,
1988, p. 119) Sweden's Air Force has maintained a force
structure of between four and five hundred domestically
produced combat aircraft. The air force is currently the

only branch of the armed forces that realistically has the ability to strike forces before they enter Swedish territorial boundaries.

The 1958 decision was the beginning of the end for a large Swedish Navy including destroyers and frigates. The concept of a "light navy" without battleships or cruisers evolved into a theory of "light task forces" without destroyers and frigates. (Gardiner, 1983, p. 377) As the larger combatants were stricken from the naval inventory, so was the Swedish Navy's ability to project any power beyond the immediate coastline. The following table provides data on certain aspects of the Swedish Navy drawdown since 1970.

Category	1970	1975	1980	1985	1990	1995
DDs/FFs	16	12	8	1	0	0
Submarines	24	22	14	12	12	12
Mine Sweeps	41	38	30	31	24	22
Patrol/FAC	31	44	39	38	30	34
Personnel	16,000	14,500	14,900	9,700	9,150	9,000

From the above data, it is obvious that the Swedish Navy is declining in units and manpower. By the 1980's, serious implications from the 1958 defense doctrine were clear. In 1980, the Swedish naval magazine Marin-Nytt published fears that the country's maritime forces were becoming a navy without ships. (Morling, 1988, p. 121) The Swedish Navy not only lost part of its strength, but also most of its ASW

capability when the decision was made not to have destroyers and frigates. This fact was later made painfully obvious. (Rudberg, 1985, p. 29)

Currently Sweden spends 2.2% of GNP on defense, compared to 2.9% in 1981. (Wetterqvist, 1990, p. 7) This reduction is even more critical when compared to the annual defense budget during the 1950's and early 1960's, when it averaged about 5% of GNP. (Kruzel, 1988, p. 539) The defense budget for the next five years is expected to be further reduced. If these spending reductions continue, the implications for the Swedish Navy will be severe. The result will be continued force structure and manpower reductions.

Swedish Commander in Chief of the Armed Forces, General Bengt Gustafsson, stated in a report to the Parliament in August 1990 that he considers instability in the Baltic region significant for a long period of time. He goes on further to report that if current military spending is not significantly increased, the Swedish Navy will decline from 58 principal combatants to 36 by 1996. (Wetterqvist, 1990, pp. 7-8)

Royal Swedish Navy manpower includes approximately one third regular service sailors with the remaining two thirds serving between ten and eighteen months of national service. (Moore, 1989, p.32) Current budget deliberations have included discussions on reducing the service time for

conscripts to three months. Although this policy has not been adopted, the government is experimenting with a five month conscription period. (Wetterqvist, 1991, p. 13)

The Royal Swedish Navy has a long standing reputation as a capable, professional navy, but shortened national service will make it difficult to maintain high standards. Reduced conscription time will also aggravate the fact that currently Swedish sailors are trade unionists who receive overtime pay and who operate according to trade union practices. In 1987, reports of suspected submarine sightings could not be verified because the local anti-submarine force was on summer vacation. (Kruzel, 1988, p. 540) These personnel factors are especially pertinent when considering the highly advanced technology employed by Swedish naval units.

Submarine intrusions into Swedish territorial waters have dominated naval plans for the past decade. The only incident where the nationality of the intruder was certain was the 1981 "Whiskey on the rocks" incursion in Karlskrona. A Whiskey class Soviet submarine ran aground near the Karlskrona naval base, one of Sweden's most important naval facilities. (Kruzel, 1988, p. 533) Another incident took place in 1982 in the main naval base of Horsfjarden. The navy made two attacks but did not produce a kill or positively identify the intruder. (Bildt, 1985, p. 135) A

Swedish surveillance ship was tracking a Soviet submarine in the Gotland area in October 1985 and was rammed by a Soviet minehunter. (Moore, 1989, p. 31) These are just a sample of many incidents that have highlighted embarrassing deficiencies in Swedish capability to successfully offer any type of coastal defense against submarine incursions.

In 1982, Prime Minister Olof Palme set up a parliamentary commission to investigate the submarine incidents and the problem of Swedish anti-submarine defenses. The group was designated The Submarine Defense Commission. In its final report, the commission stated, "A large number of observations of different kinds have been reported to the commission which, taken together, clearly show that these were submarines belonging to the Warsaw Pact, i.e. essentially the Soviet Union." The report went on to say that there appeared to be six submarines in the Horsfjarden incident, three of which were mini-submarines of an unknown type. (Kennedy-Minott, 1990, pp. 25-6)

By the mid-1980's, the Swedish Navy had been instructed to take whatever action necessary to force any intruding submarine to surface. (Kruzel, 1988, p. 534) The Swedish Navy has been granted liberal rules of engagement yet has not been able to validate any of the numerous submarine sightings and reports. This issue remains one of significant embarrassment for Sweden, and particularly for the Swedish Navy.

An "ASW emphasis" is strongly influencing the force structure and capabilities of the modern Swedish Navy. The incursions are generally viewed as a Soviet attempt to gain reconnaissance on vital command and control nodes as well as beach geography for possible amphibious operations. They have continued through the 1980's and did not halt when General Secretary Gorbachev began directing Soviet foreign policy. The frequency of incidents has declined in the last few years, but as of 1991 they were still occurring.

As a result of continued submarine incursions, Sweden is reorganizing the Coastal Artillery into six mobile coast battalions of 800 men each. The first began training in 1989. The units are intended to outflank small amphibious operations and will be transported by 25 fast landing craft and 25 support craft. (Friedmann, 1991, p. 111) The Combatboat-90 raiding craft will transport these troops. This 17-ton craft is capable of over 30 knots and is equipped with 30mm guns, RBS-15 Hellfire missiles, and mines. Sweden plans to order 180 of these vessels. (Sharpe, 1990, p. 523) The deployment of these units clearly reflects the Ministry of Defense's perception that the Swedish Navy's capability to preempt any type of amphibious operation is questionable.

As discussed earlier, ASW operations are extremely difficult in the Baltic Sea. In Sweden's case, this

includes over 1,100 miles of coastline between the land borders with Finland and Norway. The area includes some 25,000 islands, which essentially doubles the operational coastline the Swedish Navy is required to patrol. (Moore, 1989, p. 30) The task is beyond the means, and with continued reductions, it is a farce to even consider the force structure minimally adequate for the job.

To strengthen their naval forces, and in effect the armed neutrality defense policy, Sweden has undertaken several measures to improve ASW capability. New ASW capabilities are being built into submarine upgrades as well as fast attack craft. Swedish Landsort class minehunters are equipped with a powerful bottom scanning sonar and will be integrated into the planned ASW force. Japanese built helicopters are equipped with French Alcated dipping sonars and Swedish Philips fire control systems. They are armed with the Swedish Type-42 torpedoes. (Bildt, 1985, p. 140) All twelve of the submarines in the Swedish Navy are capable of delivering both anti-surface and anti-submarine torpedoes. The missile corvettes are equipped with racks for depth charges, torpedoes, and hull mounted, as well as variable depth, sonars. Modernization plans have equipped all 28 fast attack missile craft, the Hugin and Norrkoping classes, with hull mounted sonars, depth charges, and torpedoes. (Sharpe, 1990, pp. 514-518)

Unfortunately, because of the difficult conditions and long coastline, these ASW initiatives have not been effective. In the words of the director of the Swedish Armed Forces Staff and War College in Stockholm, Rear Admiral Tornberg, "The submarine crises, more than any other issue, have most hurt the image of Swedish security policy in the postwar period." (Tornberg, 1991, p. 48) Submarine incursions along Sweden's Baltic coast have heightened the public's awareness of security issues. Even though the Swedish government has increased spending to improve ASW capability, most security experts do not think the measures are adequate. (Kennedy-Minott, 1990, p. 41) The real problem with the submarine violations is that some country is violating Swedish territory for some reason. The Swedish public cannot feel completely secure knowing the intrusions are continuing.

The future for the Swedish Navy is not bright. A 1991 Minister of Defense report on future defense planning advocated a move away from costly anti-invasion defense to more emphasis on the air force and a smaller, better equipped army. It promised no increases in the military budget. (Kemp, 30 March 1991, p. 491) In twenty years, Sweden has transformed from a strong, capable naval power in the Baltic to a status of questionable naval effectiveness.

Sweden's declared intention to apply for membership in the European Community (EC) later in the decade certainly appears to be a major shift in its neutrality policy. Since the dissolution of the Warsaw Pact, Sweden has been moving closer to Western Europe. (Gething, 1991, p. 44) More than half the industrial output of the country is exported. Since the 1960's, Sweden has relied less on oil imports as a result of the construction of 12 nuclear reactors, but the issue of nuclear energy and the future remains a controversial one in Sweden. Sweden mines ten percent of the world's iron ore and holds 15% of the world's known uranium deposits. (Moore, 1990, p. 14) These facts underline the importance of maritime trade for continued economic success in Sweden.

Membership in the EC could be a powerful influence on Sweden's security policies in the next five to ten years. The role of EC security forces will affect all of Europe. Sweden, as well as the rest of the world, is deeply affected by the developments in European security issues. There appears to be consensus among Swedish leaders that an independent Swedish defense policy will be considered just as important to Nordic and European security as it was before recent developments. (Sundberg, 1991, p. 13) The role of the EC, WEU, NATO, or other European security forces will continue to be a complex affair. Presently, it is a

situation worth monitoring. Swedish participation in any
security arrangement will be a significant shift away from
its longstanding neutrality policy.

Current naval construction plans call for between three
and five A-19 class Vastergotland submarines to be fitted
with the Stirling air-independent propulsion system. This
program has been delayed and will be addressed in the next
five year defense plan slated for release in the fall of
1991. These units are scheduled to replace the oldest
submarines that were built in the 1960's. Construction is
continuing on the Goteborg class missile corvettes. Four of
these 300-ton vessels should be in service by 1992. The
only other large combatant construction is the Landsort mine
countermeasure vessel, a surface effect ship. (Sharpe, 1990,
pp. 514-521) The photographs below are taken from an
advertisement by Karlskronavarvet, the builder of Goteborg
(left) and Landsort (right) classes.
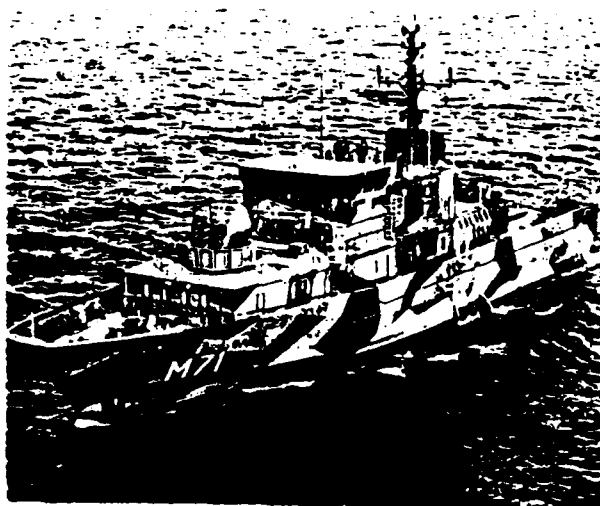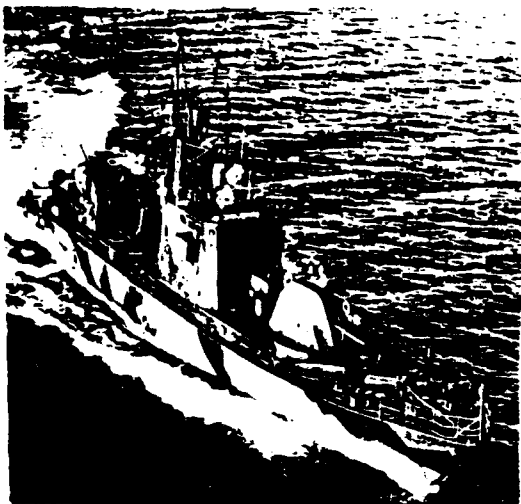
The lack of new construction for the Swedish Navy will have a negative impact on Swedish shipyards. In the future, they may be forced to rely more on the export market for major construction programs. Sweden is the industrial giant of the Nordic region. The highly successful Swedish defense industry already meets many of the requirements of Denmark, Norway, and Finland with guns, torpedoes, missiles, combat systems, and electronic warfare equipment. (Williamson, 1991, p. 54)

One other interesting naval development program in Sweden is the Smyge program, which is Swedish for stealth. This surface effect ship is a catamaran, has a complement of 14 personnel, and displaces 140 tons. The shallow drafted vessel is reported to be capable of 40 to 50 knots. Possible weapon systems include a 40mm gun, two Saab RBS-15 surface-to-surface missiles, ASW equipment, mine countermeasures systems and mines. Tubes for 40cm wire-guided torpedoes can be concealed under a hatch in the stern. (Rapp, March 1991, p. 464) The hull and superstructure are angled to prevent radar pulses from being reflected, thus providing a reduced radar cross section. (Douglas, 1991, p. 47) This vessel, although not in full production, may be among the type of units that will replace many of the aging Swedish patrol and mine warfare units. The photograph on the following page shows the Smyge prototype being launched.
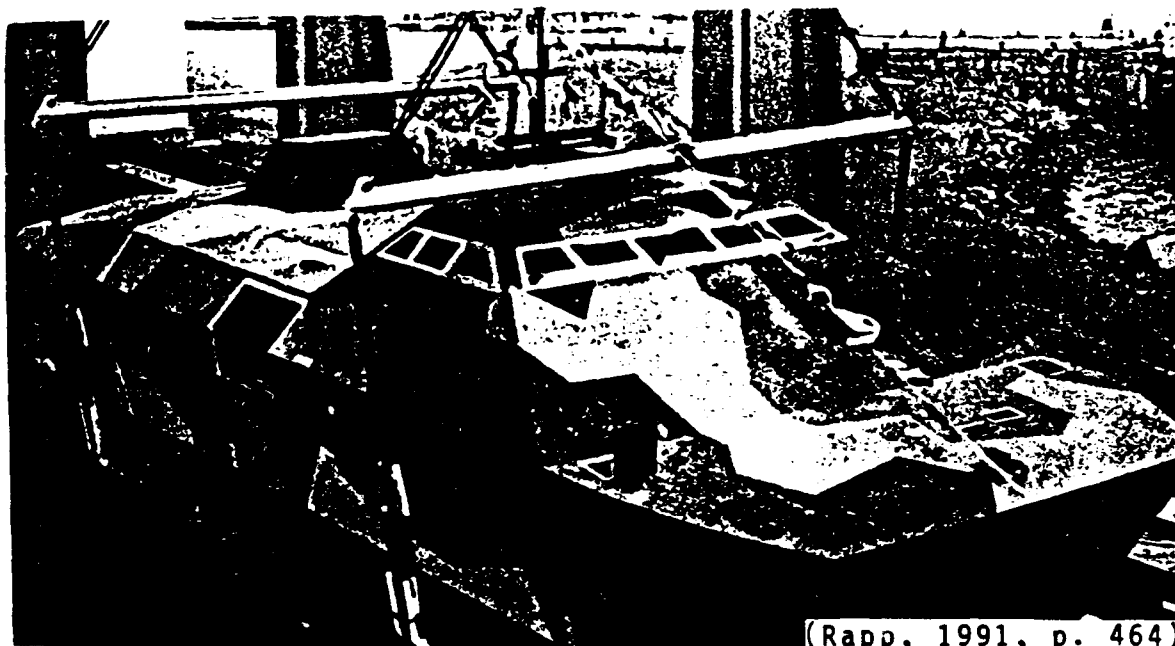
The Swedish Navy is presently at a critical point. Future plans call for a small force of highly capable submarines, a small force of multi-purpose missile corvettes, and a larger force of flexible, multi-role fast attack/patrol craft. Sweden has a highly developed shipbuilding industry, with a long tradition of producing quality products. To maintain that industry, either Sweden will have to buy more ships for domestic use or more fully participate in the arms export economy. There are no indications that the decline in the size of the Swedish Navy will slow down. The attempted coup in the Soviet Union in August 1991 could possibly slow the current trend toward reduced defense capabilities. Powerful naval capabilities take years to produce. Even more important, it takes years

to train the crews to become proficient at naval warfare. It has been a long time since Sweden has been involved in a shooting war, and its navy has been ineffective when called on during peace. The next section will discuss Sweden's neighbor to the east, Finland. Unlike Sweden, Finland has fought in several wars this century.

B. FINLAND

Finland's geographic position between Sweden and Russia
has dominated its political history and security posture.
Today, Finland and Sweden form a neutral buffer between NATO
member Norway and the Soviet Union. Finland's borders and
political status have a long history of responding to the
changing relationships between these countries. The map
below shows some of the historical changes in Finland's
borders.

Legend:
— Boundary of 1323
-- - Boundary of 1595
······ Boundary of 1617
0   50 Kilometers
0   50 Miles

LAPPS

RUSSIA

SWEDEN

Gulf of Bothnia

FINLAND

Viipuri

Lake Ladoga

Åland Islands   Turku

Gulf of Finland

Baltic Sea

INGRIA

ESTONIA

(Solsten, 1990, p. 8)
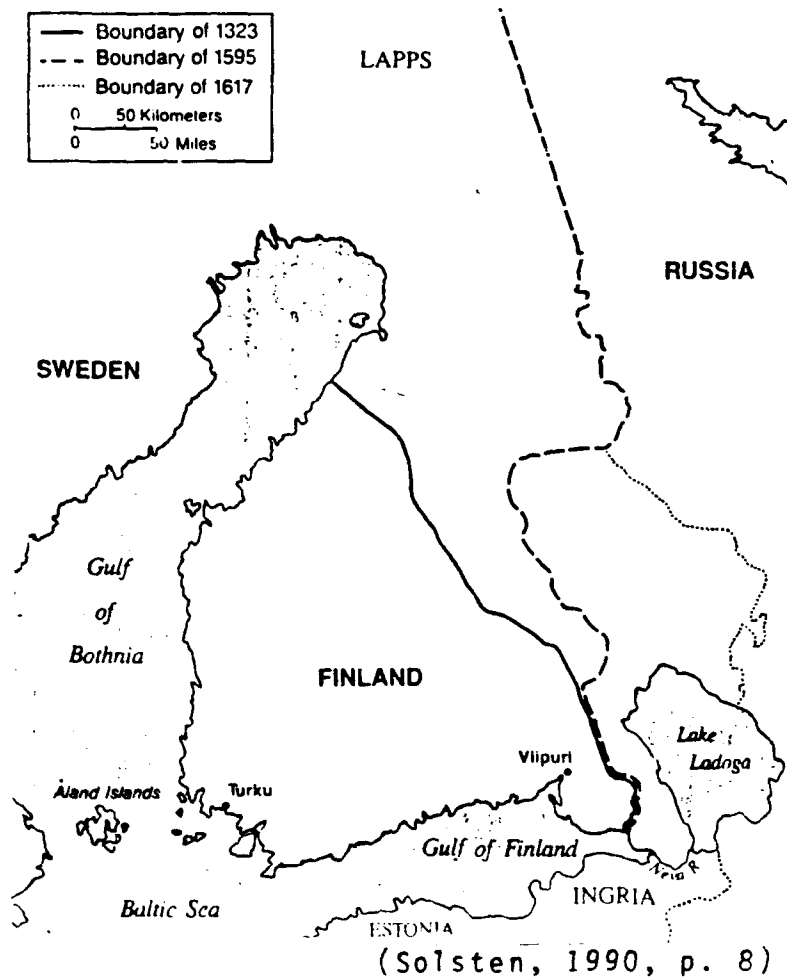
Prior to the 1809 Treaty of Fredrikshamm, Sweden was the dominant influence in Finnish history. Sweden's King Eric began a seven hundred year association between Sweden and Finland around 1150. Russia and Sweden fought several wars disputing Finland's eastern borders during this period. As the Swedish empire began to collapse, defending Finland became too difficult. In 1809, after the armies of Alexander I had conquered the area, Finland became a Grand Duchy of Russia while retaining a high degree of autonomy. (Warner, 1965, p. 111) During the 1917 Bolshevik Revolution, Finland seized the opportunity to assert political independence. After a brief but bitter civil war and a campaign against Russian Communist forces in 1918, Finland became an independent kingdom, later to become a republic. (Solsten, 1990, pp. 26-30)

Northern Finland includes over 300 miles of border with Sweden and 400 miles with Norway. The only access to the sea is in the south, along the Baltic Sea. Finland's geostrategic importance has been magnified during the past two decades due to the massive buildup of the Soviet Northern Fleet on the Kola Peninsula. The presence of large stockpiles of strategic nuclear forces so close to Finland's borders has made northern Finland an important area to both the Soviets and NATO. Finnish Lapland, the sparsely populated northern region bordering the Kola Peninsula, is a

region deemed to be of vital military significance. Finnish defense planners stress the importance of preventing their airspace from being used by either aircraft or missiles. (Howard, 25 August 1990, p. 271) Any discussion of the northern flank region includes speculation about northern Finland, but the southern coastline along the northern Gulf of Finland is also an important strategic area.

Finland's southern region has been of geostrategic importance throughout history. Southern Finland forms the northern edge of the Gulf of Finland. The narrow mouth of the Gulf of Finland restricts maritime traffic into and out of Leningrad, which is located at the gulf's head. Five shipyards in Leningrad make it a major focal point for Soviet shipbuilding. The shipyards are instrumental in construction of vessels from cruisers and nuclear submarines to floating docks and tugs. Other shipyards southeast of Leningrad construct mine warfare and hydrofoil vessels. The naval base on Kotlin Island, Kronshtadt, includes considerable refitting facilities and dry docks. (Moore, 1990, p. 16)

Russia, and later the Soviet Union, has always been extremely interested in this region. Protection of the population and vital industry located in the Leningrad area has been an important mission of both the old Russian and modern Soviet Baltic Fleets.

In 1918, the Germans conducted amphibious and land operations in the region that involved penetration of Estonia as they moved on Petrograd (later Leningrad). The importance of southern Finland to Soviet Union national security was one of the reasons for the Soviet invasion in 1939, which became the Winter War. The Soviets were concerned about the security of the Gulf of Finland and the approaches along the Finnish Karelian Peninsula. If the Soviets could control the territory on both sides of the Gulf of Finland (southern Finland and northern Estonia), the security of Leningrad would be much safer. (Kennedy-Minott, 1990, pp. 3-5) The area's importance was evident in t terms of the peace settlement agreed to at Moscow on 13 March, 1940, marking the end of the Winter War. Finland ceded substantial territory including several islands in the Gulf of Finland. The naval base at Hanko, southwest of Helsinki at the entrance to the Gulf of Finland, was leased to the Soviets for thirty years. (Solsten, 1990, pp. 43-47)

After the Winter War, Soviet relations with Finland indicated a continued Soviet desire to subjugate the entire country. These actions were occuring at the same time the Soviets annexed the three Baltic states in 1940. The Finns allied with the Germans secretly, in the hope of regaining their lost territories and reducing the threat of another Soviet invasion. In the Fenno-Soviet Continuation War

(1941-44), the Soviets were always fearful of Finnish
operations that threatened beleaguered Leningrad. At the
conclusion of the War, Finland was required to lease the
Porkkala Peninsula to the Soviets for fifty years. It is
located between Hanko naval base and Helsinki. The Soviets
were also given transit rights to the base. (Solsten, 1990,
pp. 47-50) The Soviets returned the Porkkala Peninsula to
Finland in 1955. This was the last time Soviet troops were
stationed on Finnish territory. Their departure added
credibility to Finnish claims of neutrality. (Solsten, 1990,
p. 57) The map below shows the location of Porkkala and
Hanko.

SWEDEN

SOVIET UNION

SALLA

White
Sea

Murmansk

SOVIET
KARELIA

Railroad

Gulf

of

Bothnia

Areas ceded or leased
in 1940
Areas ceded or leased
in 1944

0 25 50 75 Kilometers
0 25 50 75 Miles

FINNISH

KARELIA

Lake
Onega

Lake
Ladoga

River

Viipuri

Åland Islands

Turku

HELSINKI

Gulf
of
Finland

Leningrad

PORKKALA
PENINSULA

Hanko

SOVIET UNION

Boundary representation not necessarily authoritative

(Solsten, 1990, p. 46)

63

The political evolution of Finland after World War II is often misunderstood in Western countries. Finlandization was a term used to describe perceived Finnish subservience toward the Soviets. Actually, the Finns had earned Soviet respect during the war, never being occupied by the forces of the Soviet Union. Few neighbors bordering the Soviet Union ever enjoyed the auto omy and flexibility of Finland after World War II. (Kennedy-Minott, 1990, p. 9)

As a result of lessons learned during the Winter War and the Continuation War, Finland based its national security on a concept of territorial defense. (Howard, 25 August 1990, p. 271) Finland's small population and sparsely populated northern territory have dictated that more financial support is given to the army than either the air force or navy. The Finnish Army has historically been the primary security force, with the other services performing support functions. The Army has received more than half of the procurement allocation during the past decade and will continue doing so until the mid-1990's when the purchase of new fighters will shift priority to the air force. The navy is considered to be less important than either the army or air force. (Howard, 25 August 1990, pp. 271-2)

Finland's defense capability today is based on universal male conscription. This policy has allowed a force of 700,000 reservists to be mobilized if needed. Currently,

50,000 reservists are activated annually for refresher training. Plans call for increasing this to 80,000 by the mid-1990's. (Howard, 25 August 90, p. 271) With a population of just over five million, total mobilization would involve almost one in every seven citizens.

In light of this political background, naval developments are somewhat easier to explain. The initial Finnish Navy was developed using numerous ex-Russian warships that had been abandoned in Finnish ports after the Bolshevik Revolution. Few of these vessels were operational. Initially after World War I, old Russian expansionist tendencies seemed nonexistant, but they began to reappear in the 1920's. Finland made plans for a modest navy in the 1920's, but the program had no chance for success given the poor state of the economy. The only warships built in the 1930's were two minelayers and some small craft. The Finnish Navy was successful in mining the entrance to the Gulf of Finland during World War II. Two old coastal defense ships acted as a miniature "fleet in being" to ward off amphibious attacks. (Gardiner, 1980, p. 363)

Since World War II, treaties have played an important part in the size and composition of the Finnish Navy. The 1947 Paris Peace Treaty (PPT) officially ending World War II stipulated that the army could have only 34,400 permanent

personnel, the air force 3,000 men and 60 combat aircraft, and the navy 4,500 personnel and a total tonnage not to exceed 10,000 tons. These stipulations were imposed because of Finland's alliance with Germany during World War II. The alliance with Germany was more a product of the Soviet invasion of Finland in 1939 than any ideological similarities with Nazi Germany. The Finns had lost territory during the Winter War and were fighting to regain that territory. The PPT also prohibited Finland from acquiring nuclear weapons or offensive weapons such as bombers, submarines, torpedo boats, or missiles. This treaty was later modified in 1963 to allow the acquisition of anti-aircraft, anti-ship, and anti-tank missiles for defensive purposes. (Howard, 25 August 1990, p. 274)

Another treaty, the Treaty of Friendship, Cooperation and Mutual Assistance (FCMA), was concluded with the Soviet Union in 1948 and defines Finland's security relationship with the Soviet Union. For Finnish security concerns, the key elements are Soviet recognition of the independence and neutrality of Finland. (Howard, 25 August 1990, p. 274) This treaty was extended for twenty years in 1955, 1970, and 1983. The regularity of the treaty renewel suggests the Soviet Union considers it important. The PPT and FCMA have formed the basis for Finland's neutrality policy since the end of World War II. (Moore, 1990, p. 16)

Finland currently spends about 1.5% of its GNP on its defense forces. This figure does not include the costs of the Frontier Guard or civil defense expenditures. If these are included, the defense budget is closer to 2% of GNP. The Finnish Navy is small, with under 2,000 personnel permanently assigned. The navy is the smallest of the security forces and receives a relatively constant allocation of about 15% of the defense budget. (Howard, 25 August 1990, p. 271)

In September, 1990 Finland unilaterally declared the PPT void and renounced certain aspects of the FCMA Treaty. Finland's Foreign Minister, Perti Paavlo, said no changes would take place in foreign or defense policies as a result of the unilateral declarations on the FCMA and PPT treaties. (Wetterqvist, 1990, p. 11) There is some speculation about the actual reasons for this decision. Finland's Prime Minister, Harri Holkeri, said the only limitation Finland would abide by is the prohibition to acquire nuclear weapons. (Wetterqvist, 1990, pp. 10-11) One possible reason for the declaration could be a desire for Finland to either build or acquire from Sweden or Germany a submarine capability. As stated earlier, Finland is the only country bordering the Baltic Sea that does not have a submarine force. The Finnish Navy did operate several classes of German-designed submarines built in Finland prior to and

during World War II. These submarines were used by German engineers to build design expertise in the 1930's, while adhering to the no submarine provision of the Versailles Treaty. (Gardiner, 1980, p. 365)

The composition of the Finnish Navy has remained fairly constant for the past twenty-five years. The primary naval units are patrol boats, fast attack craft, mine warfare units, and small patrol craft. Mine warfare is a secondary mission for all Finnish Navy units. The ships are organized into four flotillas, three of which are located at the navy's headquarters at Pansio, near Turku. The Gunboat Flotilla consists of one corvette and ten missile equipped fast attack craft. The Missile Flotilla consists of one corvette and the four Helsinki class fast attack craft. The Mine Warfare Flotilla includes minesweepers and minelayers. The final group is the Patrol Craft Flotilla which is based at Helsinki. (Solsten, 1990, p. 312) The table below provides naval force levels for the past twenty years.

| Category	1970	1975	1980	1985	1990	1995
FF	3	2	2	0	0	0
Corvettes	2	2	2	2	2	2
FAC(missile)	0	1	5	7	8	12
Patrol	15	19	19	12	12	12
Mine Units	7	8	8	16	15	18
Personnel	2,000	2,500	2,500	2,500	1,800	1,800

From the preceding table, it is obvious that the Finnish Navy is a small force that has maintained force structure and manpower consistency since the 1970's. Of the 1800 personnel, 200 are officers, 500 are petty officers, and 1,100 are conscripts serving eleven months national service. In a time of crisis, the navy would be augmented by 10,000 naval reservists. (Howard, 1990, 25 August 1990, p. 276)

The primary mission of the Finnish Navy is to conduct maritime surveillance of territorial waters, protect fishing rights, and monitor any maritime naval threat. In a crisis the navy would operate in conjunction with the army and air force to defend ports and the Finnish coastline. Current manpower restrictions only allow about 50% of the fleet to be operationally manned. To maintain readiness, the remaining ships are tested and systematically rotated into active service. (Solsten, 1990, p. 312-13)

Finland's maritime defense structure also includes forces in the Finnish Coastal Artillery. The importance of coastal defense, especially the southern shorelines, cannot be exaggerated. Whenever Finland has surrendered, it was when overpowered on the southern shores. (Valoplini, 1990, p. 98) The Finnish Coastal Artillery is administered by the Finnish Army. It includes several guarded forts organized into five military areas. The coastal artillery monitors maritime traffic continuously using radars, optronic

sensors, and underwater surveillance systems. They are also responsible for protecting and laying sea minefields with 46 minor vessels assigned for this purpose. (Valoplini, p. 99-101)

The major new Finnish Navy construction project is the Rauma class fast attack missile boat program. This class had previously been called the Helsinki-II class but differs from the Helsinki class because it includes Finnish designed propulsion and steering. The Rauma class is faster, lighter, and more maneuverable in shallow water. (Friedman, 1991, p. 111) Four are planned to enter service by 1992, with another order for four anticipated during the latter part of the 1990's. Armament on these craft includes six Swedish RBS-15 surface-to-surface missiles, a Bofors 57mm gun, Matra Mistral launcher, and the Saab Elma ASW system. (Wetterqvist, 1990, p. 11) The 200-ton Rauma are 48 meters long and will form the backbone of the future Finnish Navy. The photograph below is a Rauma craft.
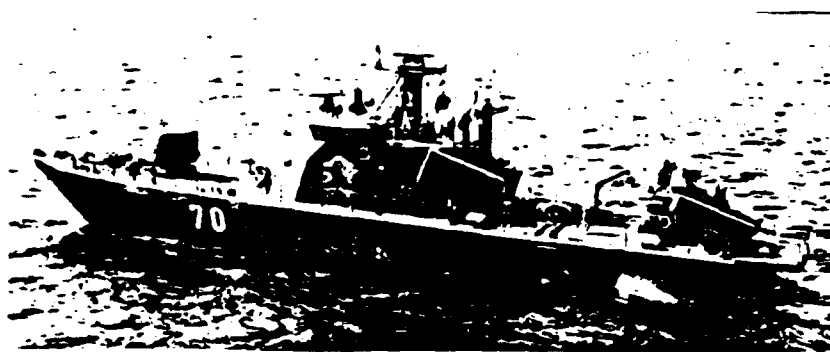
(Friedman, 1991, p. 111)

The only other major naval project is the addition of
another two 1,300 ton minelayers expected for delivery by
1992. These new minelayers will be the largest ships in the
navy, carrying between 100 and 150 mines each. The ships
will be armed with a Matra Sadral sextuple Mistral
surface-to-air missile launcher for the Swedish RBS-15SF
missiles, two Bofors 40mm guns, four Soviet 23mm guns and
two Wallop Super-barricade multi-chaff launchers. (Lok, 2
February 1991, p. 143) The drawing below is an artists
impression of the new minelayer.
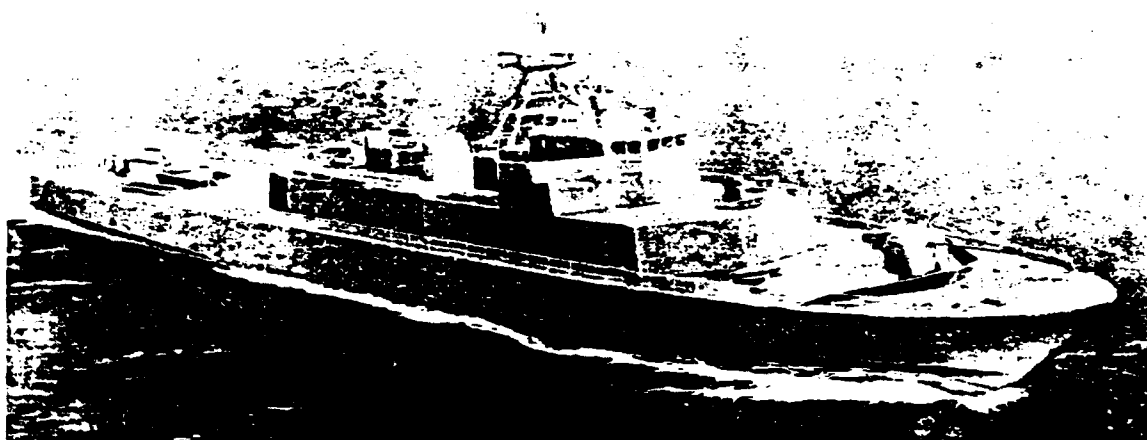
MINELAYER 90 (artist's impression)   1989, Finnish Navy

(Sharpe, 1991, p. 177)

A majority of the Finnish Navy ships are constructed at
Wartsila shipyard in Helsinki or Holming OY shipyard at
Raimo. Many of the weapons systems are purchased from

either Sweden or the Soviet Union. Wartsila, which has had
financial problems, was recently bought by the Norwegian
Kvaerner group and renamed Masa Yard. The shipyard is
capable of producing naval vessels from the 250-ton fast
attack craft to 1,200-ton frigates. (Gething, 1991, p. 55)

Finland is a large country with a small but resilient
population. The Finns were historically known as fierce
fighters in the armies of Sweden and Russia. During the
1940's they proved themselves as the only nation attacked by
the Soviet Union that was not eventually occupied. During
the end of World War II, they also fought the Germans and
forced them out of Finland. One of the heroes of modern day
Finland, Field Marshal Carl Mannerheim, had commanded the
Russian Tsar's Cavalry Guard. (Warner, 1965, p. 156) He
later led Finland in its fight for independence against
Bolsheviks in 1918 and again against the Soviets during
World War II. He became President in 1944 and is generally
credited with ensuring Finnish independence.

A new command structure for the armed forces has been
instituted in Finland during the 1990's. It will reduce
general staff members by 40% and regional headquarters from
30 to 15. The reorganization is intended to increase
effectiveness and reduce bureaucracy. It does not reflect
any structural changes becase of decreased funding or
disarmament. (Wetterqvist, 1990, p. 11) Another significant

change for the armed forces may be a reduction in the amount of Soviet equipment purchased. The FCMA Treaty required Finland to consider Soviet equipment for arming the military. The split was about 40% domestically produced, 30% from the Soviets, and 30% from the West. The Soviet share is decreasing and Western industry is picking up the shortfall. (Gething, 1991, p. 46)

The official Finnish position on submarine incursions is that there are few if any in Finnish territorial waters. While economic pressures and treaty restrictions have limited Finnish military power, a significant effort has gone into building coastal defenses and submarine surveillance systems. (Curtis, 1988, p. 31) A Finnish developed acoustic-based underwater surveillance system is reliable, but the navy still lacks mobile detection systems. (Howard, 25 August 1990, p. 284)

Finland's long borders along the Russian Republic and geostrategic location dictate requirements for a strong, credible defense posture. Finland fought two wars with the Soviet Union this century, and although they made territorial concessions, they maintained their independence. The army has been the senior service in Finland historically, and there is no indication this will change.

The Finnish Navy is continuing to modernize its naval forces while maintaining manpower consistency. The only

major change on the horizon might be the addition of small conventional submarines to its naval force structure. The Commander in Chief of the Finnish armed forces, Admiral Jan Klenberg, believes Finland's military forces are in good shape. He also believes that many of the new states now emerging in Europe will become neutral. (Howard, 25 August 1990, pp. 283-4) The Finnish Navy seems to be on an even keel, meeting the security demands placed on it by the government and its neighbors. The geographic importance of southern Finland could become pivotal again depending on the direction that the Estonian independence movement takes. The next section will discuss Poland, the most recent Baltic country to declare itself a neutral nation.

C. POLAND

Historically, Poland is the only country in the Baltic region that has not had strong naval forces to complement national military forces. (Warner, 1965, p. 81) Poland's history has been severely conditioned by its geographic position between two great powers, Germany and Russia. The Polish Baltic coastlines have also varied with history. Currently, Poland has over 300 miles of coastline on the Baltic Sea. The two charts below and on the next page detail some of the territorial changes that Poland has undergone this century.

Poland. 1815-1918

(Okey, 1989, p. 189)

Poland since 1945
(Okey, 1989, p. 189)
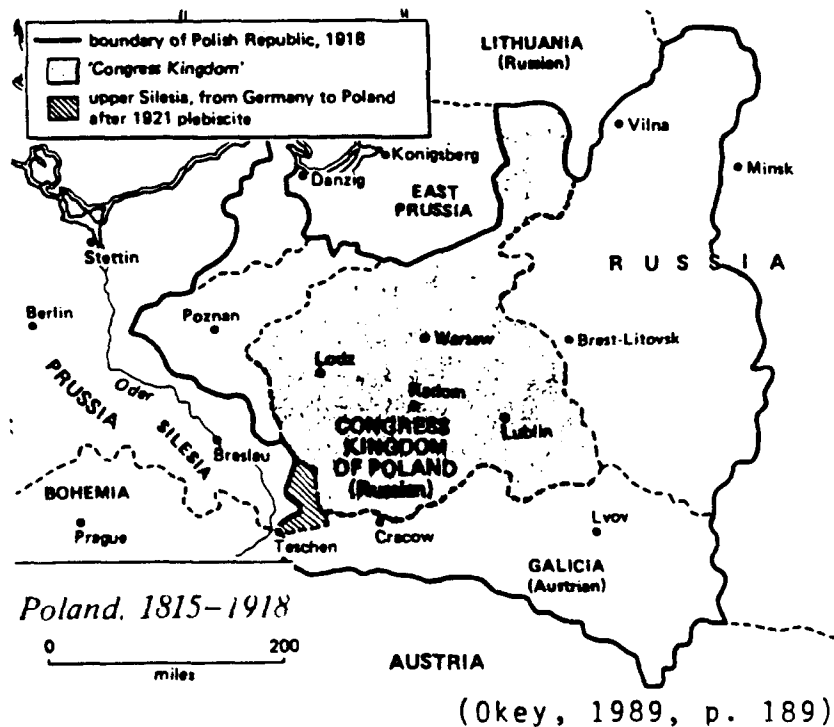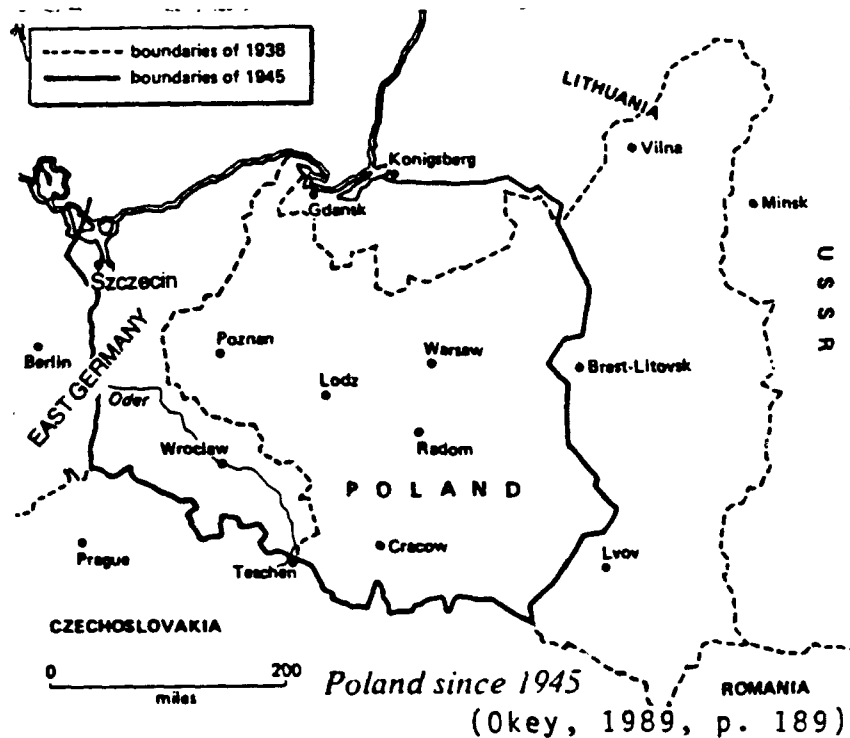
The Council for Mutual Economic Assistance (COMECON), founded in 1949, and the 1955 Treaty of Friendship, Cooperation and Mutual Assistance, which founded the Warsaw Pact, dominated Polish military plans from the end of World War II until 1991. The end of those organizations signaled the end of the Soviet led communist alliance. Poland maintains a relatively large navy and a number of naval bases along the Baltic Sea, including Gdynia, Hel, Swinoujscie, Kolobrzeg, Ustka and Gdansk. (Moore, 1990, p. 17)

The dissolution of the Warsaw Pact on 1 July, 1991 officially ended the era of Soviet domination of Warsaw Pact military plans and missions. The Polish Navy today, as a

security force for a neutral nation void of military alliances, has different missions than it did for several decades as an integral part of the Warsaw Pact. New Polish national security considerations are replacing Warsaw Pact security requirements. New military doctrinal decisions will affect the size, composition, and character of the Polish Navy substantially. The future of the Polish Navy is difficult to predict, but some general trends may be evident. A brief discussion of the history of Poland and the Polish Navy may shed light on how the new navy will evolve.

After World War I, Poland reappeared in 1919 as an independent nation. This followed more than 100 years of foreign rule by Austria, Prussia, and Russia. As reconstituted by the Treaty of Versailles and successive agreements, Poland was larger in area than any of the other nations in the region except Germany and Russia. (Warner, 1965, p. 168) At that time, Poland's coastline on the Baltic Sea was only 90 miles. This was in contrast to almost 2,000 miles of land borders. (Gardiner, 1980, p. 347)

In 1920, naval plans for the next decade called for a force of six torpedo boats, two gunboats, four minesweepers, and six river monitors. In 1924, the Polish Directorate of the Navy expanded building plans to include two cruisers, six destroyers, twelve torpedo boats, and twelve submarines

to be acquired over a period of twelve years. A primary
naval base had to be constructed at the Baltic seaport of
Gdynia. Adverse economic conditions and the fact that there
were no naval yards on Polish soil in the 1920's made these
plans difficult to fulfill. (Gardiner, 1980, p. 347)
Neither of the plans were completely realized.

The Molotov-Ribbentrop pact between Nazi Germany and the
Soviet Union sealed the fate of Poland during World War II.
Hitler addressed the Polish question with special verve; he
wanted nothing less than the liquidation of the Polish
nation. Stalin agreed that the European order could happily
dispense with a sovereign Poland. Within days of its start,
World War II developed into the ultimate Polish nightmare.
No country in Europe sustained as much barbarism during the
war. The Polish population was decimated; six million Poles
were slaughtered during occupation. (Glenny, 1990, p. 50)

Prior to the invasion on 1 September, 1939, the Polish
Navy consisted of four destroyers, five submarines, one
minelayer, six minesweepers, and two gunboats. Because of
German superiority in the air and on the sea, the Polish
Navy was quickly overcome during the German invasion.
Several of the naval units did escape to Britain, and by
October 1939 there were three destroyers and two submarines
operating as the Polish Flotilla with the Royal Navy.
During World War II, Britain loaned the Polish Flotilla two

cruisers, six destroyers, three submarines, and nine torpedo boats. The Polish Navy, under Royal Navy operational control, participated in Allied operations in the Atlantic, the Mediterranean, and the Arctic. They took part in 1,949 operations and were responsible for sinking seven ships and two submarines. During the war, one cruiser, three destroyers, and two submarines were lost by the Polish Flotilla. (Gardiner, 1980, p. 348)

In 1944, the Navy of the People's Republic was formed in Poland as the First Independent Battalion of the communist dominated Polish Army. It fought with the advancing Soviet forces along the Baltic coast. By 1945, its strength had increased to about 2,560 men. The modern Polish Navy was officially formed on 7 July, 1945. (Vego, 1991, p. 114)

From 1945 to 1948, efforts to gain the return of Polish Navy assets were somewhat successful. War reparations from Germany and the Soviet Union added to the size of the Polish Fleet. In 1948, the Polish Navy included three submarines, sixteen minesweepers, twelve submarine chasers, and two torpedo boats. (Gardiner, 1983, p. 457)

During the early 1950's, the modernization and leadership of the Polish Navy was dominated by Soviet officers. During this period, six submarines and four patrol craft were purchased from the Soviet Union. Polish shipyards were under licence to construct several classes of

minesweepers. The gradual withdrawal of Soviet officers in the early 1950's finally resulted in the Polish Navy reverting to full Polish command by 1956. (Gardiner, 1983, p. 457)

In the 1960's the Polish Navy began a period of gradual modernization. New equipment included twelve Osa-I class missile craft acquired from the Soviet Union. Polish shipyards built several of the Polnochny class medium landing ships and eight Obluze class large patrol craft. (Vego, 1991, p. 114) From 1958 to 1964, the size of the Polish Navy doubled in number to almost 20,000 personnel. (Gardiner, 1983, p. 457) During the 1970's the Polish Navy embarked on a plan to increase its amphibious capabilities. The chart below provides a twenty year history for certain categories of the Polish Navy.

Category	1970	1975	1980	1985	1990	1995
DD/FF	3	1	1	1	2	2
SS	6	4	4	3	3	3
FAC	12	34	29	20	11	0
Corvettes	0	0	0	2	4	5
Patrol	64	46	25	8	8	8
Mine Warfare	51	44	44	49	32	26
Amphibs	16	23	23	23	26	5
Personnel	20,000	25,000	25,000	19,100	19,300	10,000

From the preceding chart, it is apparent that the Polish Navy is a large, multi-mission navy. It was the largest of the non-Soviet Warsaw Pact navies in terms of ship size, ship tonnage, and naval personnel. It was also reported to be the best trained of the four Soviet satellite navies. (Polmar, 1986, p. 498)

Recent modernization programs have included the purchase of four Tarantul-I class missile patrol boats and one Kilo submarine from the Soviets. The Polish Navy also leases two ex-Soviet Foxtrot submarines, considered by the Poles to be the largest size submarine practical for Baltic operations. Plans call for the addition of one more submarine. (Sharpe, 1990, p. 455) The amphibious force modernization began in 1989 with the addition of the first of five planned Lublin class multipurpose landing ships. They were built to replace the aging Polnochny landing ships. (Vego, 1991, p. 115) These ships have a ferry-like design and are reportedly capable of carrying up to eight medium tanks and 135 soldiers. (Vego, 1990, p. 38)

The composition of the Polish Navy will be affected by the deletion of the remaining Soviet built Osa-I class fast attack craft, which all date back to the early 1960's and are reaching the end of their operational lives. The Poles planned to acquire four additional Tarantul-I class corvettes, but economic conditions may limit the final number purchased. (Sharpe, 1990, p. 456)

The future of the amphibious forces is another major
force structure anomaly. Poland's new defensive doctrine
stipulates that Poland must maintain defense capabilities
that make potential aggressors pay too high a price for
launching any kind of aggression. (Vego, 1991, p. 114) This
policy is similar to that of Sweden and Finland. The Polish
coastline along the Baltic is much shorter than either of
those countries, but its geographic location has been of
equal, if not greater, military significance during past
European conflicts. Future Soviet requests for access to
Polish ports may be an indicator of Soviet intentions in the
region. The Soviets (or Russians) must have access to
Polish ports to exert a sustained presence in the southern
parts of the Baltic Sea. (Vego, 1990, p. 38)

Poland is building a new national security system. This
process will create new institutions and change the military
organization. Poland is looking to the West to enhance its
security. Newly elected President Lech Walesa laid down the
foundations for a new national security system closely
linked with his office. The military establishment is being
drastically reduced. It was reduced by more than 100,000
men in 1990, and further reductions are planned. The Polish
Foreign Minister, Krzyszt Skubiszewski, recently emphasized
that since the collapse of the communist government, Poland
is focused on fostering links with the West and developing

cooperation with Poland's immediate neighbors. (Weydenthal, 1991, pp. 12-6) The new security system will apparently have much smaller force structures and fewer personnel. The economic and political stability of Poland will greatly influence its defense plans.

The exact missions of the Polish Navy are currently being redefined, but the primary missions will be defensive. The main operational area will be in the coastal regions along Poland's Baltic coastline. The utility of a large amphibious shipping capability is questionable in light of the new security environment. The 23 _Polnochny_ landing ships were all built in the 1960's and may be capable of other missions including minelaying. The domestically produced _Lublin_ class landing ships are being built as replacements for the _Polnochny_ ships, but have been reported for sale in the international market. (Sharpe, 1990, pp. 457-8) One indication about the future of the Polish amphibious capability is the decision to reduce the size of the 12,000 man Seventh Sea Landing Division (SLD) to a 5,000 man brigade. The SLD is based in Gdansk and was specially trained for amphibious assault landings. Currently, Polish amphibious ships are capable of transporting about 4,400 troops and 154 tanks. (Vego, 1990, p. 38) The reduction of the SLD by over 50% should be an indication that the number of amphibious ships will also be reduced.

If Poland uses the Swedish and Finnish Navies as examples for restructuring its navy, there is no apparent need for the large amphibious capability. The importance that fast attack/patrol craft have in all the other navies in the region would seem to dictate that the Polish Navy would use them as the cornerstone for future plans. All of the Polish Navy fast attack craft (Osa) and patrol craft (Obluze) were built in the 1960's. The Polish Navy minesweeping units are also getting old. The twelve Krouglec class ships were all built in the 1960's and the eight Soviet built T-43 class were built in the 1950's. Only eleven Noltec and two Leniwka class coastal minesweepers are relatively modern. The Noltec class are being acquired at about one per year. (Sharpe, 1990, p. 457)

The Polish Coast Guard is a para-naval force of about 1,800 men who would be integrated into the navy in a crisis. The force includes about 40 small patrol craft, and its strength continues to decline. Three port battallions were disbanded in 1989. The Coastal Defense Forces include 4,200 personnel formed into several battallions. Shore facilities have gun batteries covering aproaches to naval bases and major commercial ports and are armed with Soviet SS-N-2C missiles. (Sharpe, 1990, pp. 454-61)

The only modern forces in the Polish Navy are three Soviet built submarines, one domestically produced frigate,

four Soviet built _Tarantul-I_ corvettes, thirteen coastal minesweepers (250-300 tons), and three Polish built _Lublin_ class landing ships. The photographs below is one of the _Tarantul_ corvettes.
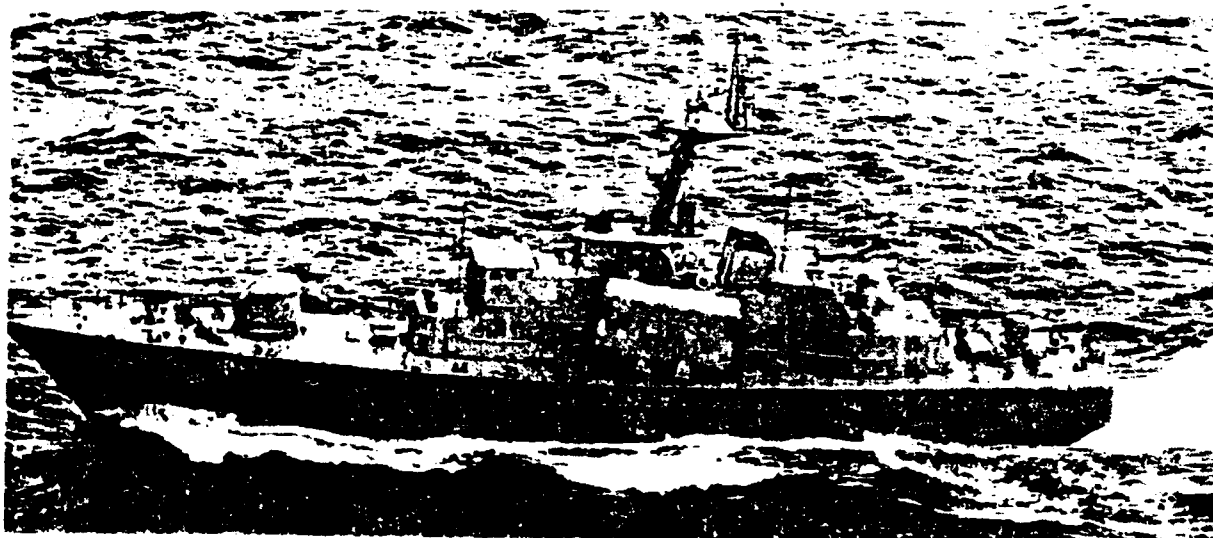
(Vego, 1990, p. 38)

Recently, the Soviets publicly revealed the existence of a Soviet base at Swinoujscie, in western Poland. The base includes about five miles of coastline. A ship brigade stationed there included four missile craft, four small ASW ships, other auxiliary ships, and about 5,000 Soviet sailors. The Soviets are making preparations to leave and should be out by 1992. (Vego, 1991, p. 114)

Withdrawal of the Soviet military forces from Poland will have an impact on both Polish and Soviet security interests. The Soviets have had uninterrupted access to

Polish ports for the past fifty years. They may not be welcome in the future, and in that case, it does not appear that the current Polish Navy has the capability to mount any type of credible defense to deter aggression. In order to restructure their forces for national defense, the Polish Navy will have to quickly modernize their ASW and reconnaissance forces. They also need to acquire more modern fast attack/patrol forces similar to the Tarantul-I corvettes. Economically this restructuring may be difficult, but to provide a credible maritime defense posture, it will be necessary.

The navies of the three neutral Baltic countries have been discussed. They all face many of the same problems but are approaching them differently. The next sections will discuss the navies of the two NATO countries, Denmark and Germany.

D. DENMARK

Denmark occupies a very special geographic position, acting not only as the harbor master for the Baltic Sea, but also serving as the link between the Scandinavian Peninsula (Norway and Sweden) and the European continent. This geographic location has been both a blessing and a curse for centuries. (Garde, 1989, p. 34) Denmark can be viewed as a wedge of land separating the Baltic Sea from the North Sea. Because of her geographic position, Denmark holds the key to the Baltic, whose history is a succession of wars of which the world at large has heard little. (Warner, 1965, p. 8) The strategic importance of Denmark was highlighted during World War II. German occupation of Denmark allowed indisputable sea control in the Baltic as well as basing for those submarines that fought the Battle of the Atlantic. (Watson, 1939, p. 205) Historically, Denmark was once among the great powers in the Baltic region.

In the 1400's, the Union of Kalmar resulted in the union of Denmark, Sweden, and Finland all under the Danish crown. If the treaty had held firm, it would have effectively made the Baltic a Scandinavian lake. (Warner, 1965, p. 5) Denmark was a rival power with Sweden in the 1600's. During this period, Denmark controlled southern parts of Sweden. thus having significant control over both shores of the Baltic Approaches. (Warner, 1965, p. 11) Several wars were

fought during this period, and the naval aspects were important. (Warner, 1965, p. 28)

The European continental powers have attempted throughout history to assert some control over the Baltic Approaches for various reasons. Denmark has occupied the unfortunate position as a pawn in the power game between rival states several times, the last being World War II. Nations have used political pressure and military force to assert control of maritime traffic through the Baltic Approaches. These nations wanted to hold the key to the Baltic in their own hands. Fortunately, maritime nations have assisted Denmark in keeping the Danish Straits open for commerce. (Garde, 1989, p. 34)

Like the other Scandinavian countries, Denmark was neutral prior to and during World War I. The neutrality was precarious because both Germany and Britain applied pressure to open and close the Danish Straits. Following World War I, parts of historic Danish territory that had been annexed by Prussia in 1864 were returned. After the war, Danish political leaders placed considerable faith in the League of Nations. National interest in defense was minimal, proposals in 1924 were put forward to reduce the armed forces to a simple defense/coast guard organization. Even during the rise of the Nazi regime in Germany, little was done to increase national defense forces. In 1939, the

Danish Navy consisted of two coastal battleships, 18 torpedo boats, nine submarines, and five minelayers. One submarine and one minelayer were under construction. (Gardiner, 1980, p. 381)

Hitler believed Denmark could be taken at any time with a telephone call, and he was basically correct. Danish military forces were ordered to offer no resistance when the Germans invaded on 9 April, 1940. The German invasion of Denmark was the tidiest invasion in Baltic history. (Warner, 1965, pp. 205-6) The Danish government, under German "protection," was forced to lend six modern torpedo boats to the German Navy. By 1943, relations between the Germans and the Danes had deteriorated to the point that on 29 August, 1943, the Germans launched a coup and German occupation became complete. When German forces entered the naval dockyard at Copenhagen, the Danish Navy scuttled 27 warships. A few vessels escaped to neutral Sweden, but by the end of the war the Danish Navy ceased to exist. (Gardiner, 1983, p. 12)

After World War II, Denmark abandoned a century of neutrality and joined the NATO alliance. This decision was an important one for the Scandinavian countries. After the war, Sweden was alarmed about the developing Cold War and wanted to establish a policy of nonalignment for the entire Scandinavian region. The Norwegians and the Danes, with

unhealed wounds from the Nazi occupation, listened to
Swedish concerns but opted for NATO membership.
(Kennedy-Minott, 1990, pp. 8-9) Norway and Denmark had both
tested the neutrality posture prior to World War II, and it
had failed them during a crisis. Both were founding members
in the NATO alliance. Although both Norway and Denmark have
a vocal neutralist faction, their participation in NATO has
been continuous. Both countries do have certain
restrictions that go along with their NATO membership.
These restrictions include a ban on nuclear weapons
stationed in the country and some restrictions on nuclear
armed warship visits. (Curtis, 1988, p. 30)

The Royal Danish Navy has been specifically designed to
enforce specific NATO security requirements. The main
mission is to control the Baltic Approaches. The Allied
Command Baltic Approaches includes naval, army, and air
force units with a majority of the forces belonging to
Denmark and Germany. The defense of the Baltic Approaches
means more than NATO operational plans to the Danes; it
means the fight to survive as a nation. According to the
Flag Officer Denmark, Rear Admiral Hans Garde, "The defense
of the Baltic Approaches has been the reason to be for the
Royal Danish Navy since the creation of NATO." (Garde, 1989,
p. 34)

The NATO tasks for the Danish Navy are countering amphibious assaults against Denmark and Schleswig-Holstein, countering penetration of the Danish Straits, and securing the sea lines of communication for the protection of reinforcement shipping. The navy is designed and structured to perform those tasks. The same is true for the German Navy. The Danish and the German Navies share the same naval philosophy, operational concepts, and tactical doctrines. These two navies cooperate smoothly together while performing their NATO missions. The primary mission for the Danish Navy during peacetime is surveillance of territorial waters. (Garde, 1989, pp. 34-6)

The Danish Navy consists primarily of frigates, submarines, fast attack/patrol craft and mine warfare ships. The following chart provides a five year development profile of the modern Danish Navy since 1970.

| Category	1970	1975	1980	1985	1990	1995
FF	10	10	11	10	10	9
Submarine	4	6	6	4	7	5
FAC	16	16	16	16	16	10
Patrol	29	40	30	30	23	17
Minelayers	8	5	7	7	6	6
Minesweeps	12	8	8	6	3	0
STANFLEX	0	0	0	0	3	16
Personnel	7,000	5,800	6,100	6,200	5,600	5,000

During the 1980's, the navy faced a major problem of
block obsolescence. Three classes of the patrol craft and
minesweepers were reaching the end of their useful lives.
The Danish Navy addressed this problem with a novel concept.
Instead of designing and acquiring three different ship
classes, it chose to design a multi-role ship that would
have the capability of performing fast attack, mine
countermeasures, minelaying, surveillance, and ASW missions.
(Wettern, 1991, p. 24) The four primary configurations are
shown below.
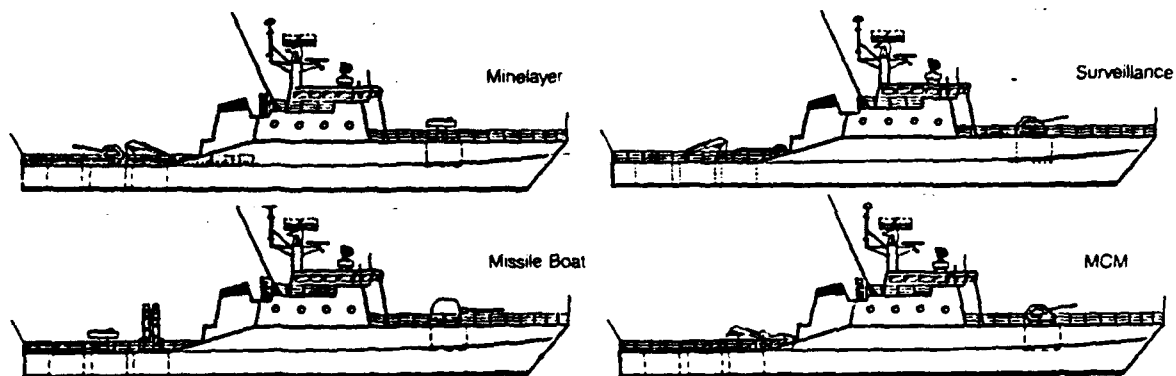
(Peston, 1990, p. 46)

This ship is the called the Stanflex-300, as well as the
Flyvefisken class. Initial orders call for 16 ships to be
delivered by the mid-1990's. The modular concept of naval
construction is one way of reducing costs. These ships will
also allow Denmark to respond to different levels of tension
with the same platform. The same ship could be a dedicated
minelayer one week and a dedicated mine countermeasures
vessel the next. Future plans call for another order of 16

92

ships after the first is fulfilled. (Preston, Oct 1990, p. 639) The photograph below shows one of the latest Stanflex-300 ships.
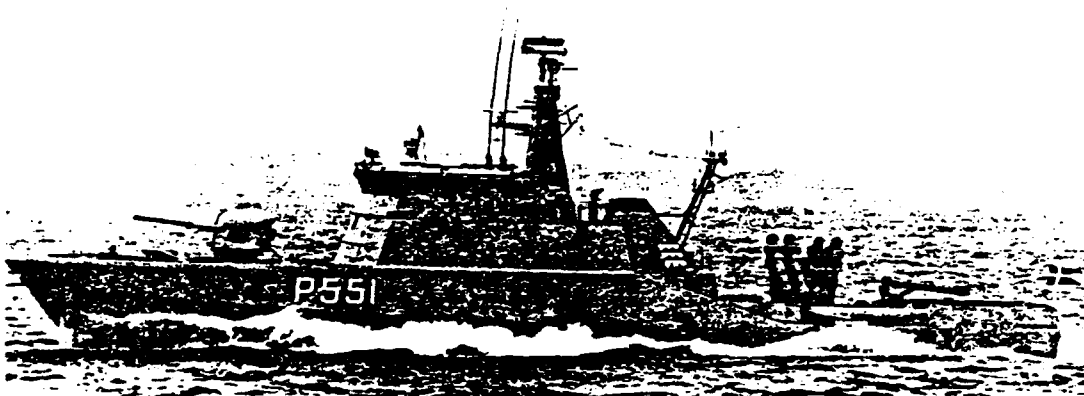
(Sharpe, 1991, p. 149)

Other modernization plans include the replacement of the four Hvidbjornen class frigates. These ships are lightly armed, were built in the early 1960's, and are used for fishery protection and surveying duties in the North Sea, Faeroe Islands, and Greenland waters. Four Thetis class frigates are being built as replacements. They displace 2,600 tons and are designed to use containerized equipment much like the Stanflex-300 ship. (Sharpe, 1990, p. 139) The ships have a double-skin ice strengthened hull with de-icing equipment. The radars, electronic systems, and combat system are common with the Stanflex-300. This class of ships is also called the Stanflex-2000. Armament includes one 76mm OTO Melara Super Rapid and one or two 20mm guns.

The ship provides hangar facilities for a Lynx Mk 80 helicopter. (Preston, 1990, pp. 45-6) The picture below is of Thetis during sea trials.
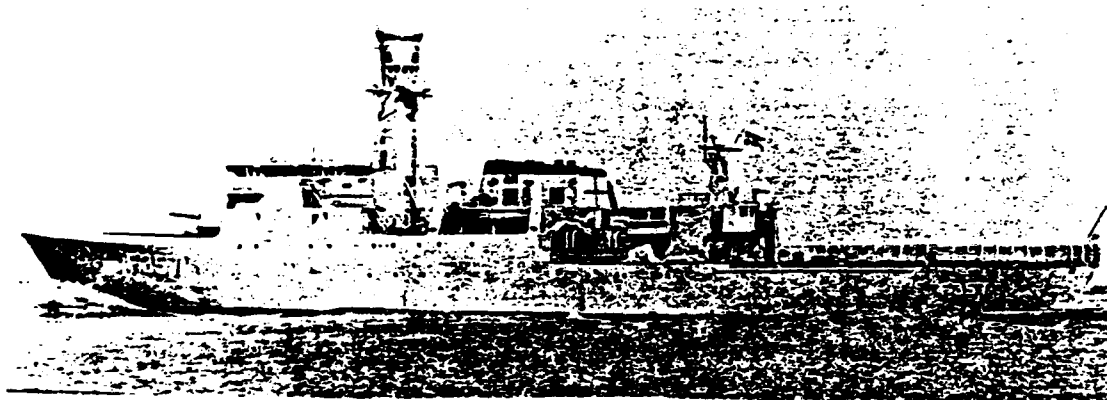
(Sharpe, 1991, p. 148)

Submarine modernization plans include the acquisition of three Type-207 ex-Norwegian submarines that were modernized for Danish service. They are scheduled to replace two Delfinen submarines that were built in the late 1950's. All three were delivered from Norway, but one sank on 3 December, 1990. (Friedman, 1991, p. 107) Recent reports from Denmark suggest that the submarine was recovered and will be repaired. (Williamson, 1991, p. 50) The Danish Navy should maintain a force of five submarines in the future.

Recently, the Danish Government has proposed three to four year defense plans. The most recent was published in 1988 and was based on "best case" and "worst case" scenerios. The successful CFE agreement (a best case) resulted in a new evaluation of the defense plan with results

published on 3 April, 1991. The current 1991 budget will be reduced by $14 million (US) and the 1992 budget will be reduced by $40 million. These reductions are from a total annual budget of about $2.1 billion (US). The effect on the Danish Navy will be a delay in the acquisition of the Stanflex 300 ships. (Gething, 1991, p. 41) Another aspect of 1989-91 Defense Agreement was the decision to close Copenhagen's naval dockyard and reduce the naval base there. (Wetterqvist, 1990, p. 36)

The 4,500 personnel of the Naval Home Guard (NHG) are an important element in Denmark's maritime posture. They patrol inshore waters and would perform shore functions for the Danish Navy in time of emergency or war. The NHG operates 37 patrol craft, which are being modernized. Most of the ships are small patrol craft. (Williamson, 1991, p. 51)

With a total annual defense budget of slightly over two billion dollars, Denmark cannot afford to build or buy several different classes of expensive ships. The Danish Navy realizes the importance of not falling behind in technology, and has opted for a highly sophisticated, multi-role system that has built-in flexibility to respond to a changing threat. Both the Stanflex-300 and the Stanflex-2000 are examples of how a small country can adapt to the rising costs of naval equipment. These ships ensure

that the Danish Navy will retain some flexibility in the
future. The flexibility of these units is designed into the
hull. This concept may become more widely accepted as
navies operate under reduced budgets while facing the same
threat and performing the same security missions.

The Danish Navy is specifically designed and structured
to meet NATO security requirements. Fortunately for
Denmark, these alliance responsibilities dovetail nicely
with national security requirements. The Danish and German
Navies operate together in performing their NATO missions.
The next section will focus on the Geman Navy.

E. GERMANY

Of all the navies in the Baltic, the German Navy has perhaps undergone the most fundamental shifts since 1990. The unification of Germany, the announced reduction of the German military to 370,000 personnel, and the end of the Warsaw Pact have affected the missions and projected force structure of the German Navy. Economic pressures resulting from unification are also an important factor in current naval reorganization plans.

Despite changes in the political landscape, there are several constants to consider when discussing future naval plans. Germany remains a trading nation dependent on the sea for imports and exports. Germany is almost entirely dependent on imported raw materials. Every day 650,000 tons of imports destined for Germany are unloaded in European ports. One third of all exports leave by sea. (Mann, 1989, p. 47) Ten percent of world shipping has German cargo on board. Germany imports 95% of the oil, 98% of the iron, and 100% of the maganese, vanadium, and chrome needed for industry. Naval forces guarantee Germany access to the sea lines of communicaton that link it with the world. Against the background of changing security concerns, the German Navy is reassessing its future role and evaluating the naval resources required to perform that role. (Braun, 1991, pp. 53-4)

Germany has a long established military tradition. The first German Navy was commissioned to counter a Danish blockade in 1848 during the German-Danish war. That navy was disbanded in 1852. (Tindall, 1983, p. 3) Since then, Germany has had a history of producing and disbanding its navies. Before discussing current modernization plans, a brief discussion of German naval history may provide some useful background. The maps below show the changes in German borders this century.

After centuries of factional warfare the rise of Prussian military might led to the establishment of the German Empire in 1871, under the leadership of the Iron Chancellor, Otto von Bismarck. Growing instability in Europe foreshadowed the outbreak of the First World War in 1914 and the empire's collapse.

Germany's attempts to rebuild after World War I were frustrated by territorial losses, war reparations, high inflation, and the post-1929 world depression. Public disenchantment paved the way for the rise of the National Socialist (Nazi) Party under Adolf Hitler, whose territorial ambitions sparked the Second World War.

Upon surrendering in 1945, Germany was stripped of its annexed territory. The Allied powers—the U. S., the United Kingdom, France, and the U.S.S.R.—set up occupation zones in Germany and divided Berlin into quadrants. In 1949 the Soviet zone became East Germany; the other three became West Germany.

(Ellis, 1991, p. 12)

Germany was defeated in both World Wars. One of the major contributing causes of those defeats was that German policies brought her into conflict with the great seapowers of the world. I both wars, Germany had no clear understanding of the strength and possibilities of seapower.

Germany was not only defeated in both wars but, under the terms of treaties, was severely disarmed. (Ruge, 1957, p. 1035) As a result of the two World Wars, the German Navy has been transformed from one of the world's most powerful navies to one of its smallest twice this century.

Germany has produced and operated three large navies this century. Each of these navies had different missions and were structured differently. The first two were severely reduced by treaties following World War I and II. Kaiser Wilhelm and Admiral Tirpitz were responsible for the rise of the High Seas Fleet and U-boat Flotilla prior to World War I. (Moore, 1989, p. 26) Admiral Tirpitz urged Kaiser Wilhelm to build a large navy so that Germany could become one of the four World Powers (Russia, England, America, and Germany). (Kennedy, 1989, p. 196) Germany, as a nation, grew rapidly from 1890 to 1913; its population rose from 49 to 66 million. Foreign exports tripled in the same period. It was during this period that Kaiser Wilhelm began looking outside continental Europe to project power. (Kennedy, 1989, pp. 210-1) The German Navy, under Admiral Tirpitz, was transformed from the sixth largest fleet in the world to being second only to the Royal Navy. The High Seas Fleet included 13 dreadnought battleships, 16 older battleships, and five battlecruisers prior to World War I. (Kennedy, 1989, p. 212)

After being defeated in World War I, the Treaty of Versailles restricted the German Navy to a few ships with limited tonnage. The Germans were also required to clear the North and Baltic Seas of mines after World War I. German minesweeper flotillas remained intact until the mines were cleared and were then scrapped or sold. (Gardiner, 1980, p. 223) German expertise in minesweeping has been consistent throughout its naval history.

Hitler was responsible for the massive buildup of the German Navy prior to World War II. (Moore, 1989, p. 36) The evolution of the German Navy after World War I reflected conditions that accompanied the rebirth of a nation. The German Navy, after World War I, consisted of eight light cruisers, 16 destroyers, and 16 torpedo boats. Most of these ships were old and barely operational. New construction was limited, submarines were forbidden, and manpower was limited to 15,000 personnel by the Versailles Treaty. In the 1920's, the possibility of a German-Polish conflict reflected the likelihood that France, Poland's ally, could be a future naval enemy. The buildup of the German Navy in the early 1930's was a result of that possibility. When Hitler became Chancellor in 1933, his plans centered around rejection of the Versailles Treaty and rearmament of Germany. Hitler wanted to reestablish Germany as a world power. (Gardiner, 1980, pp. 218-220) A large navy was an important part of those plans.

In 1935, Germany and Britain agreed to the Anglo-German
Naval Agreement which limited the German Navy to 35% of
British warship tonnage and 45% of British submarine
tonnage. The agreement included clauses to eventually allow
the German Navy parity in both categories with the British.
In 1939, Hitler repudiated the agreement. Hitler needed a
powerful battleship force for leverage in international
politics. He ordered the construction of several classes of
battleships and battlecruisers in the late 1930's. The
largest built were the 50,000-ton Bismarck and Tirpitz. By
1939, the German Navy had expanded substantially and plans
called for four aircraft carriers, eight battleships, eight
heavy cruisers, 13 light cruisers, 68 destroyers, 90 torpedo
boats, and 249 submarines. (Gardiner, 1980, p. 220) World
War II prevented full completion of the plan, but the
numbers of submarines produced far exceeded the 1939 plan.

Initially during World War II, the German Navy
emphasized commerce raiding using surface combatants.
Although successful. several of the German ships were sunk
during engagements. The loss of the Bismarck in 1941
effectively ended commerce raiding with capital ships.
Hitler feared the loss of more ships and used those
remaining to form a "fleet in being." During the rest of
World War II, submarines were the primary naval priority.
At the war's conclusion, only two major surface ships were

operational. Submarine warfare reached its peak in 1943, after which the Allies gained the upper hand and successfully implemented anti-submarine tactics. Over 1,100 submarines were commissioned in the German Navy during World War II. (Gardiner, 1980, p. 240) One common theme in all three German Navies of the twentieth century is the importance of submarine forces. Although Gemany only operates 24 submarines currently, German shipyards have produced over 100 conventional submarines since 1962 and exported them to 16 counties. (Wallner, 1989, p. 25) Severe limitations on submarine production after both World Wars were gradually withdrawn. The German submarine building industry has consistently responded with quality products.

At the conclusion of World War II, Germany was responsible for clearing mines in the North and Baltic Seas. A force of over 750 vessels and 16,000 sailors swept 581,000 mines from 1945 to 1947. This operation was conducted under British command, and when completed, the German Navy ceased to exist. (Gardiner, 1983, p. 257)

Several events in the early 1950's caused the Atlantic Powers to reconsider the policy of a disarmed Germany. The Korean War and Soviet rearmament of East Germany were two primary factors. (Ruge, 1957, p. 1035) Germany became a member of NATO in May 1955, ten years after after the unconditional surrender. This marked the birth of the modern German Navy. (Rhades, 1985, p. 50)

The modern German Navy was established on 1 January,
1956. It was planned and built as a navy within a maritime
alliance with clearly defined and limited alliance missions.
(Mann, 1989, p. 47) The two main problems that had to be
immediately solved were lack of trained personnel and modern
ships. By 1957, the navy had expanded to 7,600 personnel
and several old ships. The first ship built in a German
shipyard after World War II was delivered in 1957. (Rhades,
1985, pp. 52-71) Since then, the German Navy has continued
to grow and modernize.

The evolution of the German Navy since its rebirth has
been remarkably smooth and according to plan. The original
planned force structure of 1956 is strikingly close to what
it is today. In 1956 planned force levels included 18
destroyers, 54 mine countermeasures ships, 12 submarines,
and 40 patrol boats. (Ruge, 1956, p. 1038) The following
chart shows force levels in selected categories for the last
twenty years.

Category	1970	1975	1980	1985	1990	1995
DD/FF	20	17	17	16	14	16
Corvette	6	6	6	5	5	5
Submarine	12	24	24	24	24	12
FAC	0	20	30	40	40	24
Amphib Craft	24	50	22	35	30	20
MCM	75	58	60	67	61	40
Personnel	39,000	35,900	38,500	38,500	38,300	25,000

German Navy force structure has been stable for the past 20 years but will be reduced significantly during the next five years. Part of the announced reorganization will include reducing the command structure from fifteen commands to ten. Some naval bases will be affected, but final plans have not been released. (Schulte, 1 June 1991, p. 914)

Under the German-Soviet agreement for German unification, the German armed forces will be reduced from 600,000 to 370,000 by 1994. These force sizes include the 170,000 that were formerly in the East German military. For the German Navy, this means that by 1994, its personnel strength will be reduced by almost a third. (Gates, 1991, p. 55) Combined, the East and West German Navies included about 54,000 personnel and 350 naval combatants in 1990. Now that they are unified with exactly the same Baltic coastline, the naval force will be closer to 25,000 personnel and 100 naval combatants. Very few, if any, of the former East German naval units will be retained. Economic factors are playing a large role in these planned reductions. There is also a belief in Germany that the naval threat in the Baltic has been significantly reduced during the past two years.

The economic costs of German unification are staggering. It is anticipated that the cost will be $65 billion in addition to another $8 billion to finance the Soviet Army

withdrawal from Germany. (Wallner, 1991, p. 67) This
economic drain and the negotiated manpower ceilings will
affect the German Navy significantly. The disintegration of
the Warsaw Pact means that the Soviets can no longer march
across Poland and East Germany onto German soil without
facing strong resistance. Because of increased warning time
prior to a Soviet military offensive, the German Navy sees
the naval threat in the Baltic declining. (Friedman, 1991,
p. 104)

During the past two years, the German Navy has increased
its contacts with the Soviet Navy. The Germans and Soviets
concluded an Incidents at Sea Agreement and had reciprocol
port visits in Kiel and Leningrad. Admiral Chernavin and
Admiral Mann have also agreed to exchange visits. (Mann,
1991, p. 25) The Soviet Navy withdrew its last warships
from East German territory in July 1991. (Daily, 27 July
1991, p. 131)

According to Admiral Braun, the Commander in Chief of
the German Navy, the missions of the future German Navy can
be broken into three categories. The peacetime mission
includes visible presence at sea, reconnaissance and
intelligence gathering, participation in alliance
activities, fostering international moves to preserve peace,
and meeting international commitments. The crisis mission
includes support of international, alliance, and national

actions aimed at coping with developing crises. Bilateral
and multilateral agreements will form the basis for the
crisis tasks. Naval control of shipping and fishery control
are areas of special significance. The war mission includes
actions to deter seaborne aggression against the alliance
and restoring territorial and political freedom of action if
required. (Braun, 1991, pp. 53-7)

The German Navy is structuring its navy to meet these
missions. The emphasis on these plans will be on
destroyers, frigates, and submarines. The only shipbuilding
programs currently ongoing are the construction of four new
Type-123 frigates to replace the existing Hamburg class
destroyers and a new class of minehunters. (Friedman, 1991,
p. 104)

The submarine force in the German Navy is getting old.
All 24 of the German submarines were commissioned prior to
1975. The six older Type-205's will be replaced by new
construction Type-212's in the late 1990's. The first
Type-212 is expected to enter service in 1996. They are
equipped for North and Baltic Sea operations and will
include a hybrid fuel cell/battery propulsion system.
Twelve of the Type-206 submarines were extensively
modernized and will serve for ten to fifteen more years.
(Sharpe, 1991, pp. 215-17) The future submarine force in
the German Navy will likely decline to around 18 units.

Six 3,450-ton depot stores ships are scheduled to be completed by 1994. These ships are designed to support the fast attack squadrons and mine countermeasures forces during out-of-area and extended deployments. Future plans also call for delivery of four larger combat stores ships to support destroyers and frigates. These ships are planned to enter service in the early 2000's. (Sharpe, 1991, p. 214) These logistic support ships will provide the German Navy with a significant out-of-area capability for its fast attack, mine warfare, and destroyer/frigate forces. All available evidence suggests that the Geman Navy will maintain the destroyer/frigate force at around 16, while all other force levels will drop.

The German Navy mine countermeasures modernization has included two new classes of ships, the 635-ton Type-343 mine warfare craft and the 650-ton Type-332 minehunter. These ships are built on the same non-magnetic hull. Each class will consist of ten ships. The Type-343's have all been commissioned and the Type-332's will be commissioned between 1993 and 1995. (Preston, 1991, pp. 77-9) The size of the German mine warfare naval component will shrink as some of the older classes are retired, but it will remain one of the most capable navies in the world for countering the mine threat. The two new classes of mine warfare units are shown on the next page. The Type-343 is the upper photograph and the Type-332 is the artist's impression.
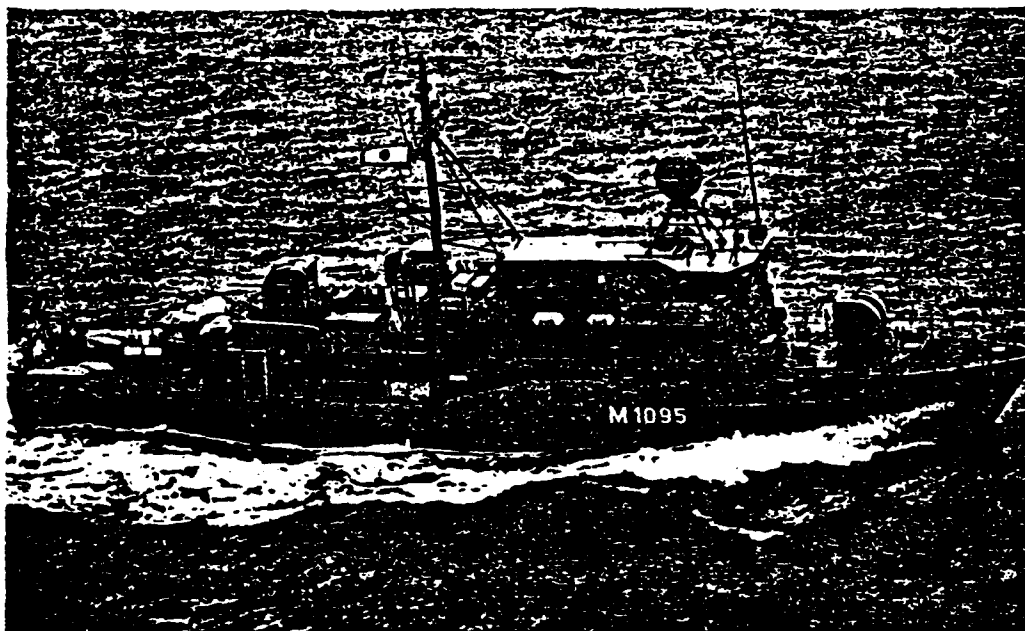
The Überherm was the fifth Type 343 minesweeper completed for the German Navy and the second of three built by Abeking & Rasmussen.

(Preston, 1991, p. 77)
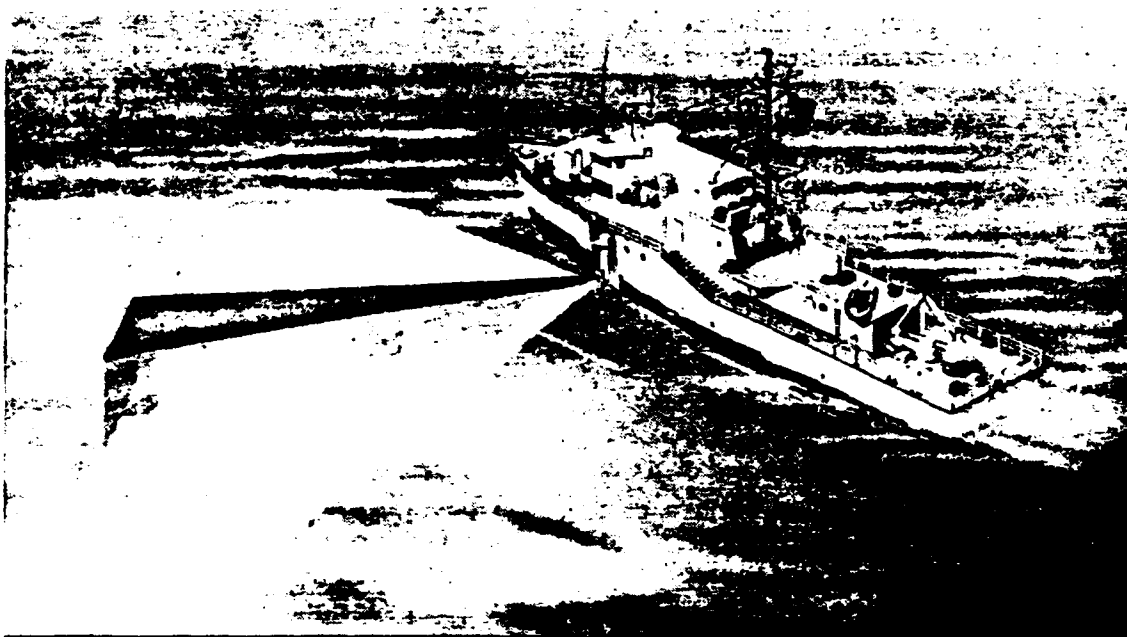
Artist's impression of MWS 80-equipped Type 332 minehunter

(Lok, 1991, p. p. 322)

The German Navy also includes a very powerful aviation component. German naval aircraft include 41 helicopters, 18 maritime patrol aircraft (MPA), and 109 Tornado fighter-bombers. Some of the Tornados may be transferred to the air force, but no definitive plans have been released. The MPA's are French built and are aging. They will need to be replaced in the next five to ten years.

On 6 March, 1991, the German Government decided to send a mine countermeasures force to the Persian Gulf to assist in the mine clearing efforts that were underway. This decision was a difficult one, coming so quickly after German unification. Sending German forces out of NATO's area of responsibility required German Parliament approval. In the future, Germany will be ready to support international military response efforts to regional crises worldwide, albeit in an unpretentious manner. (Wallner, 1991, p. 68)

Five years from now, if all goes according to current plans, the German Navy will be a smaller organization while retaining the same capabilities that it has today. Some of the fast attack craft are reaching the end of their productive lives and will need to be replaced. They will probably be replaced on less than a one-for-one basis, by larger, more flexible units. Future force structures will not include as many units, but those produced will be more capable. The next section will analyze the largest regional navy, the Soviet Baltic Fleet.

F. SOVIET BALTIC FLEET

Historically, the Baltic Fleet has been a major factor in Soviet as well as Russian history. The Baltic is the only Soviet Fleet twice honored with the Red Banner. According to former Fleet Admiral of the Soviet Union (FASU) Gorshkov, Russia has always had the need for a powerful navy, in the Baltic and elsewhere, as an integral part of her armed forces. The Privateer Fleet of Ivan The Terrible in the Baltic is one example of this historical Russian use of a navy. (Gorshkov, 1974, p. 12)

Peter the Great decided in October 1696 that Russia must become a naval power with its own ships. The first ships intended for the Sea of Azov were ordered that year. He used the Azov naval experience for the development of naval forces for the Baltic Sea. The first ships for the Baltic were built in 1702. During the Northern War with Sweden (1700-1721), the Baltic Fleet supported the army with galleys and ships of the line. In 1718, the Baltic Fleet consisted of 27 ships of the line. (Gosolov, 1988, p. 20)

In 1721, Sweden was forced to sign a peace treaty with Russia, relinquishing forever the areas of the Baltic coast taken by Russian troops. Russia had become firmly established on the shores of the Baltic, and the importance of a navy operating in concert with ground troops was made clear. (Gorshkov, 1974, p. 16) St. Petersburg, later

renamed Petrograd and Leningrad, has always served as a main shipbuilding center and naval base for the Baltic Fleet.

Catherine II decided that the Russians should have a fleet equal in strength to the neighboring Danish and Swedish navies, specifying that the ships of the line must exceed the others. In 1881, the decision was made that Russia should have more ships than all other Baltic countries and reliable bases in the most ice free portions of the Gulf of Finland. (Gosolov, 1988, pp. 21-2) Seeking expanded naval influence in the Baltic continued, at least in the planning stages, into the early 1900's. An intensified ship construction program (1912-1916) called for construction of four warships, four battleships, four light cruisers, 36 destroyers, and 12 submarines for the Baltic Fleet. World War I prevented completing the full program, but the fleet did receive four warships and several Novik destroyers. (Gosolov, 1988, p. 25)

Baltic Fleet sailors played a major role in the 1917 Bolshevik Revolution against the Kerensky government. Sailors enthusiastically joined the revolting populace without hesitation. Lenin said, "You, sailors, are needed by the revolution in the most dangerous places." (Morskoy Sbornik, # 7 1985, p. 3) The battleship Slava covered the withdrawl of Bolshevik loyal ships through Moonsund Strait and was scuttled in the narrowest part of the strait to bar

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the German fleet from pursuit. The battle of Moonsund was the first act of military defense of the socialist revolution and was conducted under the direction of the Bolshevik Party. (Kulvadin, 1987, pp. 28-30) The cruiser Aurora fired blank shells to signal the assault on the Winter Palace. Navy men of the Baltic Fleet formed the core of the CHEKA, the forerunner of the KGB. (Polmar, 1986, p. 20)

After seven years of armed struggle, Russia emerged in 1921 wounded and disorganized, with a considerable loss of territory. She was, however, united under a strong ruler. After two revolutions and a civil war, the Russian Navy had practically ceased to exist. The Union of Soviet Socialist Republics was officially founded on 30 December 1922. The only Soviet fleet that survived in the early 1920's was the Baltic Fleet, and it was in wretched condition. By 1924, the Baltic Fleet consisted of one battleship, one cruiser, eight destroyers, and nine submarines. The only other Soviet naval assets were five ships in the Black Sea Fleet. (Gardiner, 1980, p. 318)

Soviet industrial production recovered slowly; by 1926 it was only at 75% of the pre-war level. After three five year building programs (1926, 1933, and 1938), the Soviet Navy had grown substantially, with the Baltic Fleet becoming the largest of the four Soviet Fleets. On 1 January, 1939,

the Baltic Fleet consisted of two battleships, one cruiser, one flotilla leader, 12 destroyers, and 56 submarines. (Gardiner, 1980, pp. 318-9)

One Baltic engagement that received little publicity in the Soviet press, as well as in Western literature, is the Winter War of 1939-40 resulting from the Soviet invasion of Finland. The Great Patriotic War (World War II) overshadowed the importance of the 105 day Winter War. During this war, many Soviet naval deficiencies were highlighted, including the need to plan the navy's role in land operations. Tne importance of naval subordination to a theater commander was also evident. Soviet naval theorists began an intensive review to eliminate these shortcomings. (Monakov, 1990, pp. 35-47)

In operations against Finnish troop positions along the Karelian Isthmus, a number of the Soviet ships suffered structural damage from return fire by Finnish shore batteries. (Nicholas, 1986, p. 121) Although the Soviet Navy was ten times stronger than the Finnish Navy, it was unable to influence the course of events in the war. The Baltic Fleet was not prepared for combat during the winter months. (Gardiner, 1980, p. 320)

During the Winter War with Finland, the Soviets also realized the importance of ice free ports in the Baltic. Four months after its conclusion, the Soviets took control

of the three Baltic Republics.   Unlike the Finns, who
fought heroically and finally signed a peace treaty
relinquishing some territory to the Soviets, the Baltic
Republics were taken without a fight.   In 1941, the Baltic
Fleet was the largest grouping of naval forces in the Soviet
Union.   By July 1941, the Baltic Fleet had increased in size
to include two battleships, two cruisers, two flotilla
leaders, 17 destroyers, 65 submarines, 39 mine warfare
craft, 48 torpedo boats, and 15 submarine chasers.
(Gardiner, 1980, pp. 320-21)

During World War II, the Baltic Fleet was largely
restricted to the immediate Leningrad area.   The larger
ships provided fire support for ground forces during the
three year siege of Leningrad.   Several articles in _Morskoy_
Sbornik describe the valiant efforts of Baltic Fleet sailors
engaged in mine warfare, ASW, reconnaissance, and support
activities during the war.   The lessons learned by the
Soviets during the Great Patriotic War in the Baltic are too
numerous to discuss in detail, but some highlights may be
useful.   From August 1941 on, over 100,000 Baltic Fleet
seamen were transferred to the Leningrad front and served in
ground operations.   Baltic Fleet personnel were responsible
for sinking 624 transports and 581 ships during the war.
The Baltic Fleet and Ladoga Flotilla landed 44 separate
amphibious assault forces. (Samoylov, 1990, pp. 33-8)

By September 1945, the Baltic Fleet had been reduced to one battleship, two cruisers, two flotilla leaders, eleven destroyers, 25 submarines, and 106 torpedo boats. (Gardiner, 1980, p. 322) After World War II, the Baltic Fleet was reorganized into two units, the Fourth and Eighth Fleets. They were reunited in a major reorganization in 1956. (Scott, 1984, p. 226) Expansion of the Northern and Pacific Fleets during the 1960's and 1970's made the Baltic Fleet the smallest by the mid-1980's.

The chart below provides a fifteen year breakdown of the forces assigned operational duties in the Baltic Fleet. The actual number of ships assigned to the Baltic Fleet is often difficult to accurately document because of the large number of forces that are built and trained in the Baltic Sea prior to deployment to one of the other three Soviet Fleets.

Category	1975	1980	1985	1990	1995
Surface Ship	117	67	46	⁻0	37
Submarine	76	59	32	39	30
Patrol/FAC	185	151	165	170	140
Amphib ships	19	31	22	18	18
MCM craft	122	146	125	120	90
Naval Air	225	255	275	260	250
Manpower	110,000	105,000	107,000	107,000	95,000

When considering the data above, it is important to identify the differences in force structure that exist

between the Soviet Baltic Fleet and the other navies that are operated in the Baltic Sea. At first glance, the naval air power may seem significant, but in the other countries, the navies either have a strong naval air arm (Germany) or operate closely with capable air forces (Sweden, Denmark, Finland). The primary difference is the presence and size of a significant amphibious capability. The Soviet Baltic Fleet also includes a greater number of large surface combatants than the other Baltic navies.

Russian or Soviet naval presence in the Baltic Sea has been consistent for almost 300 years. Those naval forces assigned to the Baltic Fleet have very seldom been sent outside the Baltic for naval engagements. The two occasions the Baltic Fleet did operate offensively outside the confines of the Baltic Sea ended in failure. Peter the Great used the fleet in 1716 to secure the island of Zealand with the goal of controlling the approaches to the Baltic. The British Government sent a powerful squadron to the Danish island to convince the Russian ships to leave, and they did. In 1904 the Russian Baltic Fleet was sent to counter the Japanese blockade of Port Arthor. After a long, difficult voyage, it was soundly defeated by the Japanese off the island of Tsushima. (Nicholas, 1986, p. 120)

The preceding pages emphasize the important history of Russian and Soviet naval activity in the Baltic. The Baltic

persists as an important area for the Soviet Union and its navy. The mission of the Baltic Fleet has changed with history, but defense of the homeland has always been a primary mission. Today, the main wartime missions of the Baltic Fleet are generally accepted as: control of the area, support of Soviet ground forces in the region, special operations against Germany and Denmark, and disputing control of the Baltic Approaches. (Nicholas, 1986, p. 124) These missions are consistent with the defensive orientation of the current military doctrine. The Soviets consider the Baltic as an inner zone, a region they would need to control in any war.

Although the shift to a defensive military doctrine will continue to have a major impact on naval planning in the Soviet Union, it may have less impact on the Baltic Fleet than on the Northern and Pacific Fleets. The Baltic Fleet has not included nuclear submarines or significant numbers of forces assigned blue water operational missions. The retirement of six nuclear ballistic missile carrying Golf II submarines in 1990 were the last to be deployed in the Baltic Fleet. The Soviets had used the Golf II's in discussions with Scandinavian leaders as a centerpiece for a non-nuclear Baltic arms control proposal. The effort was for naught, and the submarines were retired because of age. (Clarke, 1989, p. 21-2)

Most of the forces assigned to the Baltic Fleet are conventional submarines, patrol craft, ASW forces, mine warfare units, amphibious forces, special operations units, and reconnaissance forces. The primary mission of these forces have been defensive for use in the Baltic region. The Soviets realize the Baltic can be closed to outsiders through joint sea, air, and land operations. They also realize it can be closed by external forces, making naval reinforcements difficult, if not impossible. (Nicholas, 1986, p. 120)

The ethnic unrest in the three Baltic Republics in 1991 complicates naval issues in the region. Kaliningrad Oblast, surrounded by Poland, the Baltic Sea, and Lithuania, hosts the headquarters for the Soviet Baltic Fleet at Baltyisk. Between Kaliningrad and Leningrad lie the three Baltic Republics. They provide the Soviet Union most of its Baltic ports. Political independence for the Baltic states will have enormous consequences for the Soviet Baltic Fleet. The ethnic aspects of the independence issue are interesting. Slightly over half the people living in Estonia and Latvia are Estonian or Latvian. The rest are mainly Russian. Lithuania, who has been in the lead on the independence issue, has 79% of the population of Lithuanian origin. (Galeotti, June 1990, p. 275) With such large percentages of Russian people, ethnic problems could be difficult for the independent Republics.

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Recent articles in <u>Morskoy</u> <u>Sbornik</u> discuss the current problems facing Soviet sailors stationed in the Baltic Republics. Housing for naval personnel and their dependents has been a particular concern. Local party and government officials have made the Soviet sailors feel unwelcome, with a negative impact on force readiness, sailor morale, and political cohesion. (<u>Morskoy</u> <u>Sbornik</u>, #2 1990, pp. 4-5) Elections are another issue that has received negative attention in recent articles. The Estonian legislature has passed laws with long residency requirements for voting. This has reduced the political power of the military. (Urban, 1990, p. 13) Independence arrangements, including those addressing naval issues, will have to be made with both the Russian Republic and whatever vestiges of the central Soviet Government that remain.

Operationally, political independence in the Baltic Republics will affect the Baltic Fleet greatly. As discussed earlier, naval bases are located in all three republics. Although there are other important factors in the consequences of complete Republic independence, Soviet naval concerns will continue to play a significant role. Independence agreements may include basing rights for the Baltic Fleet. Decisions concerning the control of naval assets will influence this situation. Under a centralized federation arrangement, the naval forces could come under

central Soviet control. If no central control exists, the
Baltic Fleet may be under Russian Republic control. The
operational control of the Baltic Fleet is a very important
issue as the Soviet Union begins to disintegrate. It is
vital to know who holds the reins for operational control of
the Baltic Fleet.

Although tightly bound within the Soviet economic
system, the Baltic Republics are disproportionately
valuable. Their infrastructure is second to none in the
Soviet Union. It is a center for light and high technology
industries. The strategic importance was highlighted when
Admiral Chernavin stressed that independent Baltic Republics
would open a window in Soviet air defense coverage and cut
land routes to the Baltic Fleet headquarters at Kaliningrad.
(Galeotti, June 1990, p. 275)

Without continued basing rights in the Republics, the
Kaliningrad Oblast would be totally isolated from the rest
of the Russian Republic. The obvious difficulty of
defending and resupplying it must be a concern to the
leadership of the Soviet Navy. The West should expect some
agreement that allows Soviet naval access in and supply
routes through the Republics now that independence has been
granted.

Soviet naval forces in the Baltic Fleet are intended
almost exclusively for operations in that area. The

exceptions are ships undergoing trials and training. The
principal missions in wartime appear to be supporting army
operations and conducting landing and other naval operations
to gain control of the Danish Straits. (Polmar, 1986, p. 19)
In 1989, the commander of the Baltic Fleet, Admiral V. P.
Ivanov, said that operational and combat training had
increased by practically 40%. He went on to say that the
Baltic Fleet had been named the best fleet by the Soviet
Minister of Defense for that year. (Ivanov, 1990, p. 73)

The areas that should be of primary concern to regional
navies are the presence of amphibious forces, amphibious
troops, and special operations forces. These forces have
offensive capability and are large enough to be a problem.
The large number of submarines, mine warfare units, and fast
attack/patrol craft are designed to defend Soviet coastal
areas and support ground troops in a crisis.

One other area worth close monitoring is the
construction of new naval ships. Current Soviet naval
building programs include: conventional submarines
(Kilo's), two classes of destroyers (Sovremenny and Udaloy),
three classes of frigates (Neustrashimy, Krivak-III, and
Gisha-V), six classes of fast attack/patrol craft (Nanuchka
III, Tarantul III, Pauk, Stenka, Turya, and Svetlyak), and
two classes of amphibious air cushion vehicles (370-ton
Pomornik and 105-ton Tsaplya). They are also building

several classes of auxiliaries. (Sharpe, 1991, p. 581) Many

of these units will be deployed to the Soviet Baltic Fleet,

and most of them are being built in Baltic shipyards. For a

country that has such severe economic problems, the Soviets

certainly have a healthy ship construction program. Western

European countries with strong economies pale in comparison

to the numbers and classes of ships being produced in the

Soviet Union. Shown below is the newest Soviet frigate, the

3,800-ton Neustrashimy.

▲An excellent beam view of the Neustrashimy.

(Schultz-Torgue, 1991, p. 214)

The next section will discuss some of the trends in

regional naval development in the Baltic region. From the

preceding sections, budgetary constraints and force

structures appear to have several common characteristics in

all the countries being discussed.

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G. REGIONAL SUMMARY

The preceding six sections have provided detailed
information about the history, development, and
modernization of the navies that operate in the Baltic. The
charts at Appendix A on pages 165 through 167 provide the
current naval force structure for the six navies. The
information is taken from Jane's Fighting Ships 1991-92.
The regional summaries at Appendix B on page 168 have
summarized the force structures into unit types and provides
a good overview of regional naval forces. Generally, the
forces designed in the Baltic Sea fall into three main
categories: conventional submarines and forces designed for
shallow water ASW, mine and counter mine vessels, and fast
attack/patrol craft. The corvette class was included as a
separate category in Appendix A, but because of the small
displacement they were included in the fast attack category
in Appendix B.

There are several classes of fast attack, conventional
submarines, and mine units currently being built by the
Baltic navies. Each of these navies serve important
functions in national and alliance security missions. The
similarities in naval force structures support the theory
that geography has influenced their development. The
littoral aspects of naval warfare predicate a certain type
of naval development.

The regional naval balance is also in transition. The Soviet Baltic Fleet is the largest regional navy and is the only navy continuing to modernize all classes of ships. All the other regional navies, except the Finnish Navy, are reducing both the number of personnel and number of ships. The most dramatic reduction is the German Navy. The Polish Navy will also be much smaller in five years. The Swedish Navy could be much smaller in five years if current defense budget proposals are adopted by the Swedish government. The Danish Navy is using one ship to replace several classes of different ships on a less than one for one basis.

The next chapter will analyze the importance of the littoral naval technologies developed and deployed by the Baltic navies. One example of this technology is the use of remotely controlled minecountermeasures ships by the German and Swedish Navies. Pictured below are the German _Troika_ and the Swedish _SAM_. Both of these units were evaluated in the 1991 Persian Gulf mineclearing efforts. (Philpott, 1991, p. 13)
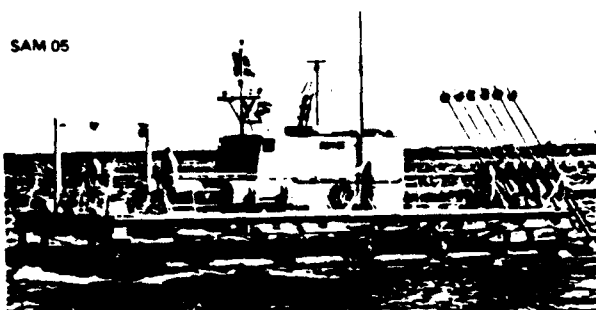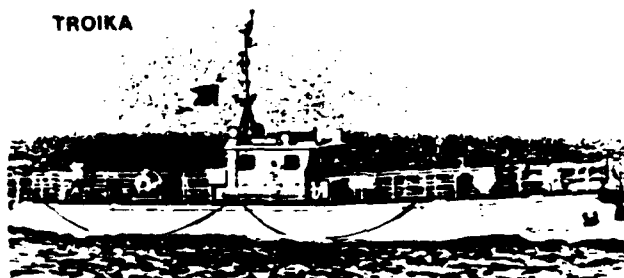
(Sharpe, 1989, p. 503)   (Sharpe, 1989, p. 220)

V. THE BALTIC NAVAL TECHNOLOGIES

The importance of the Baltic Sea as a naval weapons
testing ground should not be overlooked. The Soviets have
always used the Baltic as their primary training area for
submarines as well as some classes of surface vessels.
Almost half of all Soviet shipyards are located al   the
Baltic coast. Sweden and Germany are also on the leading
edge of naval technology. They build, train, and operate in
the Baltic Sea. In World War II, it was Germany's primary
submarine training area and the Germans held the region into
the war's final stages.

Unique Baltic conditions have dictated the type of naval
systems developed and deployed. Unfortunately, these
systems are being exported to regional naval powers in the
third world. Mine warfare, coastal defense, conventional
submarines, missile patrol craft, and special forces
dominate the posture of the Baltic navies. Air power comes
in the form of either dedicated naval air or integration
with the national air forces. From the information provided
in the last chapter, it is apparent that the navies are
acquiring fewer units and smaller ships with more flexible
systems on board. These developments seem to be as much in
response to budget constraints as to any actual threat, but
the capabilities are impressive.

In the Fiscal Year 1991 Department of the Navy Report to
the Congress, Chief of Naval Operations C.A.H. Trost
included the following areas when describing the threat of
the future: the naval mine threat includes 41 countries
worldwide with mining capability; over 40 countries now have
diesel attack submarines; in the third world alone there are
nearly 250 diesel submarines; and forty countries worldwide
are arms producers. (Trost, 1990, pp. 29-30) Mine warfare,
conventional submarine operations, shallow water ASW, and
missile equipped fast attack craft dominate the navies
deployed in the Baltic. The Soviet Union, Germany, and
Sweden all design, build, and export highly capable naval
vessels and equipment in these categories. Such forces
contribute substantially to today's third world naval
threat, as well as potential regional threats. As naval
technology matures, and smaller forces become more potent,
the naval exports of these countries will become important
to regional stability in littoral areas worldwide.

It is extremely important to retain and expand existing
cooperative intelligence programs with the countries
surrounding the Baltic to exploit the littoral naval systems
being developed. It is also important to operate in the
same environment to gain an adequate understanding of the
true capabilites of the systems being deployed. This is
crucial when the systems are deployed by potential enemy

forces. It is just as important when the systems are
deployed by allies in joint operations. The objective of
this chapter is to analyze the specific systems being
developed by the Baltic nations and postulate on how they
might affect future naval operations. The three areas of
specific concern are diesel submarines, mine warfare, and
fast attack craft.

A. CONVENTIONAL SUBMARINES

In March 1991, Rear Admiral Anthony Less, Deputy Chief
of Naval Operations for Plans, Policy, and Operations, told
the House Seapower Subcommittee, "Our most likely areas for
future U.S. naval operations will be in the littoral seas of
coastal nations, where the threat posed by smaller and
quieter conventional submarines could be significant."
(Zimmerman, June 1991, p. 76) This statement clearly
identifies conventional submarines as a significant
challenge to the U.S. Navy.

The nations surrounding the Baltic Sea are the primary
producers of conventional submarines. The Soviet Union has
exported them to Albania, Yugoslavia, Algeria, Egypt, Libya,
the People's Republic of China, India, North Korea, Cuba,
Poland, Bulgaria, and Romania. Germany has exported them to
Venezuela, Peru, Ecuador, Columbia, Chile, Brazil,
Argentina, Indonesia, India, Norway, Denmark, and South
Korea. (Heisbourg, 1990, pp. 44-182) Sweden has built its

own submarines for over 85 years, and was recently selected to manufacture six submarines for Australia. Other countries interested in acquiring or modernizing their conventional submarines include Canada, Spain, Malaysia, Egypt, Greece, Israel, Iran, Saudi Arabia, Syria, and South Africa. (Preston, 1991, pp. 18-24) The countries listed above include most of the regions considered likely for regional/low intensity conflict. Any crisis in the littoral area surrounding these countries could include the conventional submarine threat.

Today's diesel electric submarines are considerably more difficult to hunt than their larger, noisier nuclear counterpart. The presence of one operational diesel submarine in the Argentine Navy in the 1982 Falklands conflict posed a considerable ASW element in all British naval tactical planning. (Wettern, January 1991, p. 3) A majority of the countries that operate diesel submarines deploy them close to shore in shallow water with conditions similar to those in the Baltic. This threat demands focused attention by the U.S. Navy. Equipment, training, operations, and tactics should be developed to meet the conventional submarine threat in a shallow water environment. This emphasis is especially important in the low intensity conflict/amphibious environment. There is no better training ground than the Baltic. If training in the

Baltic is not feasible, then the expertise of Baltic naval
personnel should be incorporated in exercise planning,
training exercises, and wargaming. The Baltic experience is
worthwhile because the most advanced conventional submarines
operate there routinely.

The importance of Germany, the Soviet Union, and Sweden
in conventional submarine construction has taken on added
significance in the past decade. As the U.S., British, and
French continue to build nuclear submarines, the three
Baltic submarine producers meet the third world demand for
affordable conventional submarines. Conventional submarine
technology development in Sweden, Germany, and the Soviet
Union is ahead of the three nuclear submarine producers.
The French Navy does not plan on acquiring any new
conventional submarines. If no export orders are found,
France could stand to lose its ability to produce
conventional submarines. Royal Dutch Marine, Holland's
submarine production company, is searching for export
orders. If none are found, the only conventional submarines
produced will be for domestic use by the Dutch Navy.
Britain is reducing its conventional submarine force to four
units, two of which have been completed. The last two
Upholder class submarines should be completed by 1993. (Lok,
15 December 1990, pp. 1237-40) None of these three countries
currently have contracts for export sales. The Soviet Union

is producing <u>Kilo</u> submarines in serial production for export at a rate of four per year. India has purchased eight of them. The Soviet desire to raise hard currency with the sale of military equipment may increase pressure to make <u>Kilo</u>'s available at lower prices. (Zimmerman, June 1991, p. 76)

The German government announced it was prepared to finance an Israeli program for two submarines as part of an economic support deal for Israel. Germany has allocated $511 million to the project with cost overruns to be borne by Israel. (Sandler, 11 May 1991, p. 774) As the Baltic countries reduce their defense budgets and reduce orders for domestic naval systems, there may be more pressure for government assistance in making export deals. *This will enhance the already problematic proliferation problem.* Efforts to limit the export of highly capable conventional submarines is one way of approaching the problem, but should not be counted on.

Sweden and Germany have been operating air-independent propulsion submarines since 1989. Although this technology has not been produced in large numbers, it could enhance the conventional submarine threat substantially. This system, along with the affordability of the conventional option, will make submarine proliferation even more dangerous in the future than it is now. An example of the cost comparison

between small nuclear and conventional submarines is the Canadian proposal to acquire new submarines. A British company tried unsuccessfully to sell Canada Trafalgar class nuclear attack submariness last year for about $500 million each. Modern German Type-209's cost between $100 and $200 million. (Zimmerman, June 1991, p.76)

The Swedish Navy successfully completed sea trials of a Stirling air independent external combustion engine installed on one of their older submarines, the Nacken. The tests increased the time submerged without having to snorkel to recharge its batteries by factors of three to five. According to Captain Ulf Edman, Commander of Sweden's First Submarine Flotilla, the Stirling engine will revolutionize conventional submarine warfare. He reported that the goal of 1,000 hours running time has been reached. The system is reportedly very easy to run and maintain. During a 750 mile transit to a patrol area and a 20 day patrol with five attacks, a conventional diesel submarine would have to snorkel 72 hours out of the 672 patrol hours, or 11% of the time. With a Stirling installation, both transists and the entire patrol could be run without snorkeling once. (Schemmer, August 1990, p. 40)

Kockums Marine builds the Stirling engine and has also built all of Sweden's submarines since 1914. They have built 50 submarines, averaging a new type every fifth year.

Kockums has also built about 100 warships and 400 commercial ships. The President of Kockums said that the <u>Nacken</u> has the longest underwater endurance of any conventional submarine in the world. He is confident that they will be able to sell Stirling systems to several foreign navies. Installation in a 1,000-ton diesel submarine would cost about $20 million. He reports that more than 100 conventional submarines will have to be replaced before the turn of the century. Kockums is working on a 1,300 ton export version of the <u>A-19</u> called the <u>T-96</u> for tropical waters to meet anticipated demands. (Schemmer, August 1990, p. 41) The drawing below is the <u>A-19</u>, the latest development in Swedish submarines.
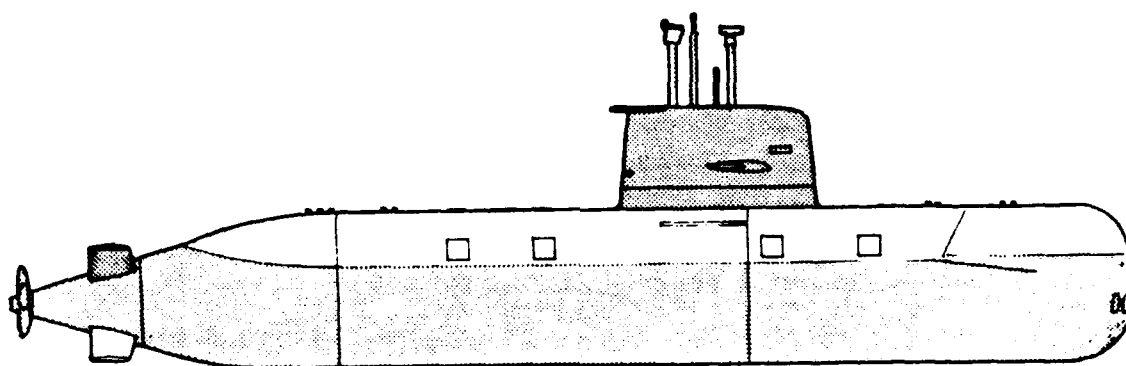
GOTLAND class   1990, Kockums

(Sharpe, 1991, p. 513)

The German approach to air independent propulsion has been the use of fuel cell technology. A 450-ton <u>Type-205</u> submarine with a hull extension has been used to demonstrate this technology. In the future, if technical difficulties

can be overcome, up to one month of submerged operation may
be achievable for fuel cell equipped diesel submarines.
This is especially significant because it would be a
relatively silent operation, as the fuel cells rely on no
rotating machinery to produce electricity. (Fitzgerald,
August 1990, p. 62) The figure below depicts the next
generation of German submarine, the Type-212.
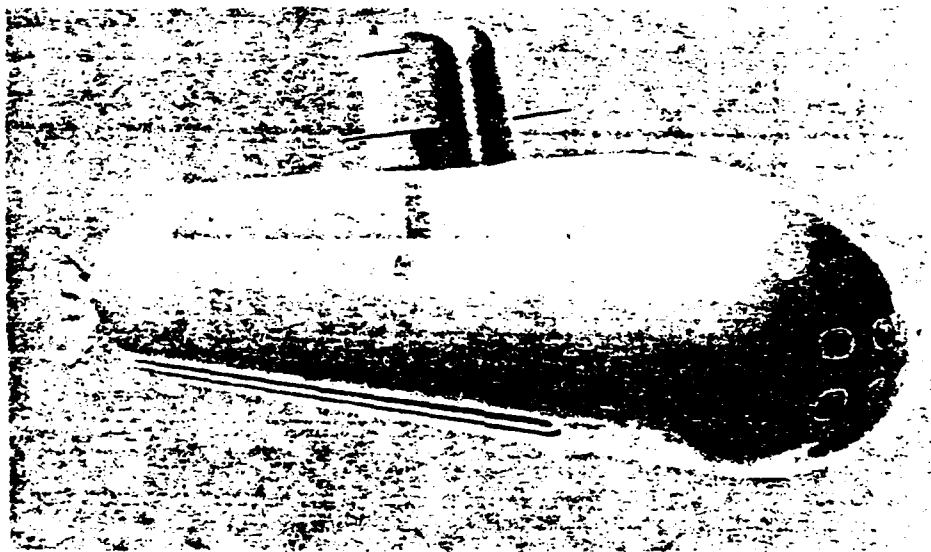
(Sharpe, 1991, p. 216)

The Kilo, Kockums Type-471, and German Type-209
submarines all use state-of-the-art sonars and combat
systems and include modern armaments such as wire-guided
torpedoes. They can also feature anechoic coatings to
reduce sonar reflection, acoustic damping tiles, raft mounts
and active noise cancellation to cut noise emissions.
(Zimmerman, June 1991, p. 76) The Soviets have exported

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Kilo submarines to Poland, Romania, India, and Algeria.
Soviet non-nuclear submarine construction will continue,
probably with a follow-on to the Kilo class. Shown below is
a Soviet Kilo. (Sharpe, 1991, p. 595)
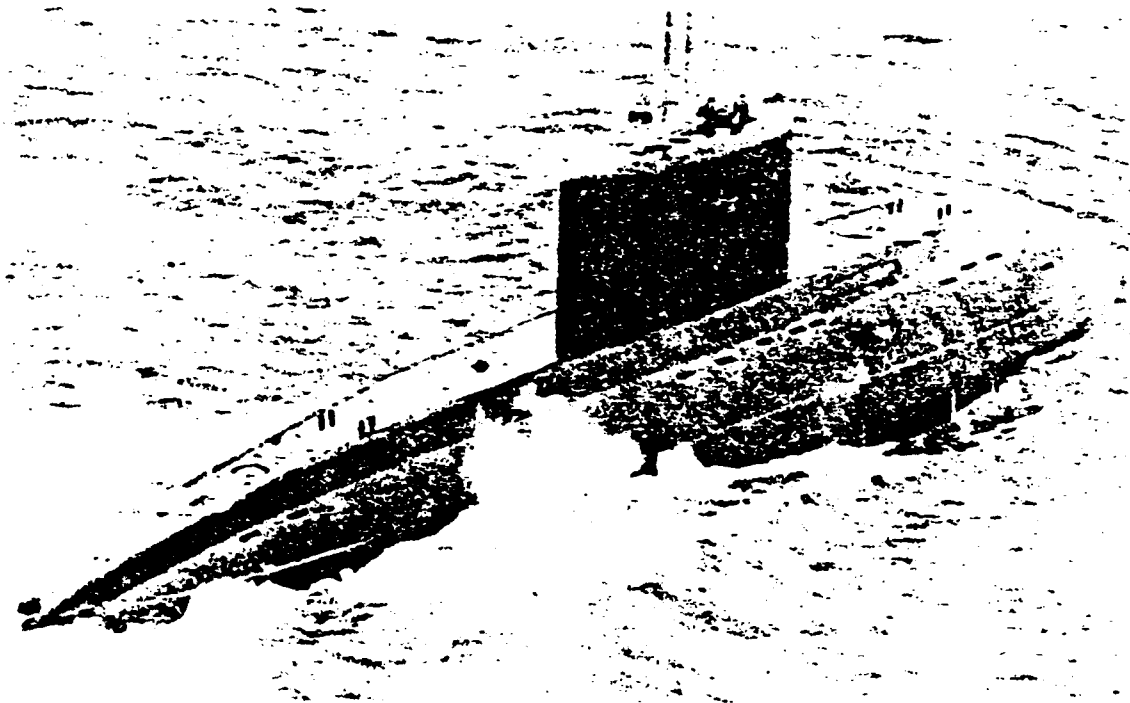
(Sharpe, 1991, p. 595)

The German U-boat campaigns in the two world wars
demonstrated that submarine operations required dedicated
and costly ASW efforts to counter successfully. Even though
only a few submarines can be brought to bear in many third
world regions, it will require a large ASW force to counter
them. In the Falklands conflict, the one Type-209 submarine
employed by the Argentine Navy was manned by a newly
assembled and inexperienced crew. The British had two ASW

carriers, 15 frigates and destroyers with additional ASW aircraft, and several British submaries to counter the threat. The submarine traveled 800 nautical miles, conducted a six week patrol, and made three torpedo attacts. Although none of the torpedo attacks were successful, things could have been different. The British were lucky not to have lost a ship. More than 200 pieces of ordnance were expended against the submarine to no avail. (Fitzgerald, August 1990, pp. 62-63) With the additional possibility of an air independent propulsion system, either the Stirling engine or fuel cells, this threat is certainly magnified.

B. MINE WARFARE

Mines are one of the world's oldest low technology naval weapons and continue to be one of the most deadly. History points out that sea mines have been a very important factor since the middle of last century. Since then, their influence has steadily grown in both the scope and role of utilization. In the Crimean War (1853-56), approximately 2,600 mines were laid; in the Russo-Japanese War (1904-5), 6,500; during World War I, over 310,000; and during World War II, more than 700,000. Since World War II, mines have been used in numerous conflicts, often tied to limited goals and small military operations. (Dotsenko, 1987, p. 8) Mine warfare is one of the most frequently discussed topics in Morskoy Sbornik. From 1984 to 1989, there were a total of
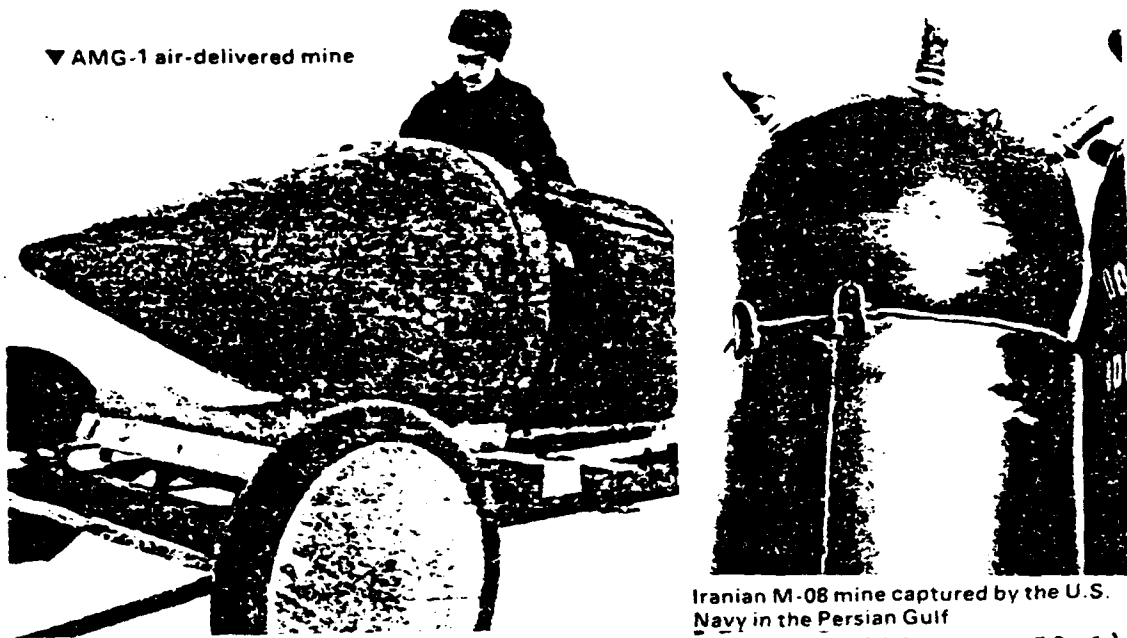
19 dedicated articles discussing various aspects of historical or current mine warfare topics. Many other articles mention mine warfare, especially those dealing with historical lessons from past naval operations. The Soviets take mine warfare very seriously.

In the 1950's, mines were used with considerable success by North Korea to delay an amphibious assault by the United Nations forces at Wonsan. After eight days with over 200 American casualties and two sunk minesweepers, the force commander, Rear Admiral Allan E. Smith, reported in a dispatch to Chief of Naval Operations, Admiral Forrest P. Sherman, that the U.S. Navy had lost command of the sea in Korean waters. Sherman observed, "When you can't go where you want to, when you want to, you haven't got command of the sea. And command of the sea is a rockbottom foundation of all our war plans. We've been plenty submarine conscious and air conscious. Now we're going to start getting mine conscious - beginning last week." (Wettern, March 1991, pp. 38-9) This statement could have application today. During the Persian Gulf War, it was reported that U.S. Central Command decided to avoid mine-strewn waters by engaging in a land campaign instead of a direct amphibious assault by the Marine Corps. (Howard, 6 April 1991, p. 543) An actual amphibious assault might have resulted in thousands of marine casualties from mines alone. (Philpott, 1991, p. 12)

Even without an amphibious landing through mined waters, mines have recently had tremendous consequences for the U.S. Navy. During the Gulf War, an Aegis cruiser, USS Princeton, and an LPH, USS Tripoli, were both taken out of action after hitting mines. To face the mine threat, forces from the U.S., Britain, Germany, France, Belgium, the Netherlands, Norway, Italy, and possibly others have been sweeping the Persian Gulf. (Howard, 6 April 1991, p. 543) Without the expertise of the coalition allies, the mine threat could have been much deadlier. Although the U.S. Navy has increased emphasis on mine warfare, it would appear that the current mine countermeasures program is too small to effectively deal with any serious regional crisis involving thousands of mines. Without a strong mine countermeasures capability, the U.S. will be forced to rely on other nations to perform mine clearing operations.

All of the Baltic countries have extensive mine warfare units. A significant portion of the mines that have been encountered in the Persian Gulf during the past decade have been low technology Soviet mines. Mines played a major role in World War I and II naval engagements in the Baltic. The development of mines, capability to lay mines, and countering the mine threat are primary considerations for Baltic naval planning.

The Soviet Union has over 300,000 naval mines in their inventory, with at least eleven different variants. The Soviets have exported mines to China, Finland, Egypt, Iran, Iraq, Libya, North Korea and Syria. (Carus, February 1989, p. 50) The Soviet M-08 mine, developed by the Czarist Navy in 1908, remains operational today. It was an M-08 that hit the USS Samuel B. Roberts in the Persian Gulf in 1987. Four years later, another M-08 hit USS Tripoli. The photographs below include some of the mines known to be in the Soviet inventory.

▼ AMG-1 air-delivered mine

Iranian M-08 mine captured by the U.S. Navy in the Persian Gulf
(Carus, 1989, pp. 50-1)

The Soviets are known to have at least eleven different types of contact mines, with an inventory of around 100,000. They are estimated to have 200,000 bottom influence mines that use magnetic and acoustic firing devices. They are

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also believed to have developed several special purpose

mines. These mines include rising mines, underwater

electric potential mines that detect electrical fields

generated by a submarine, and mines attached to torpedoes,

similar to the U.S. Captor mine. (Carus, February 1989, pp.

50-3)

Most of the surface ships, submarines, and aircraft in

the navies of the Baltic countries are capable of laying

mines. Commercial ships have also been equipped to lay

mines. Because of the mine laying capability and assured

mine threat, countering the mine threat dominates naval

thinking in the Baltic. The mine countermeasure forces of

the Soviet Baltic Fleet, Sweden, Denmark, and Germany are

highly capable units designed to operate in a mine-infested

environment.

The Soviet Union has been building and modernizing its

mine countermeasures vessels since World War II. The

Soviets built about 200 T-43 500-ton minesweepers in the

late 1940's and early 1950's. About 40 T-58 800-ton

minesweepers were built in the 1960's. The 400-ton Yurka

and 34 750-ton Natya class fleet minesweepers entered

service in the 1970's. The newest class of Soviet

minesweeper is the 1,100-ton Gorya class. This new

minesweeper is designed to sweep and hunt mines in deeper

waters than was previously possible for the Soviet Navy.

Surge deployments of the Soviet Navy have often been preceded by the departure of mine countermeasures forces a few days ahead of the main force. There is speculation that Gorya may have a specific anti-Captor role in support of the Soviet submarine fleet. (Foxwell, 1991, p. 74) The photographs below and on the following page show the mine countermeasures vessels currently under construction for use by the Baltic navies.
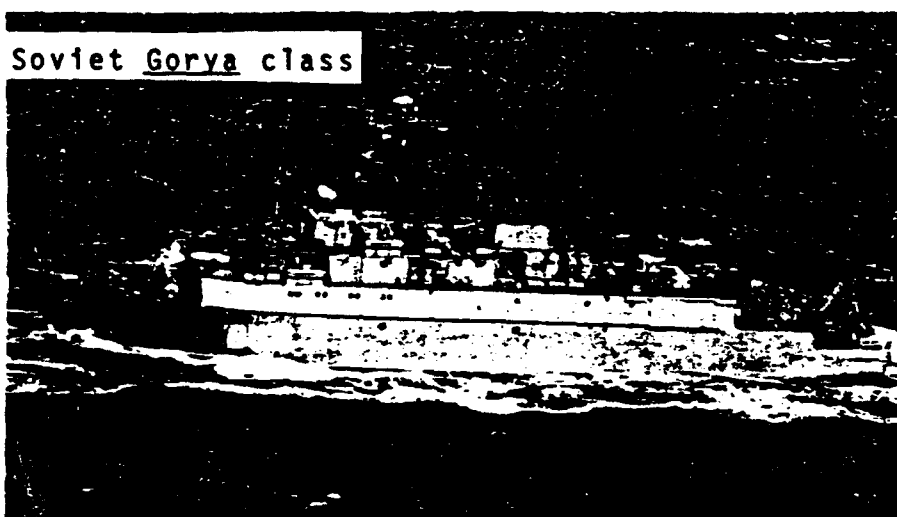
Soviet Gorya class

GORYA   (Sharpe, 1991, p. 626)
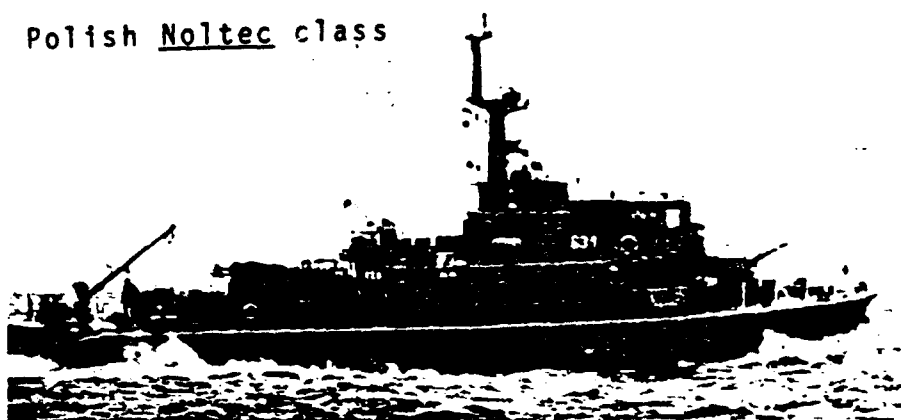
Polish Noltec class

NOTEC 631   (Sharpe, 1991, p. 454)

Danish **Stanflex-300** class
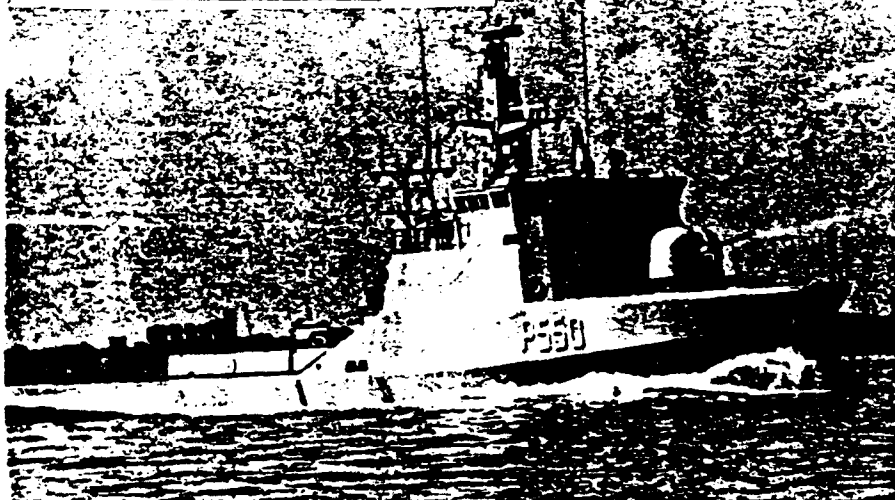
The Flyvefisken is the first STANFLEX-300 ship to be commissioned.

(Preston, 1990, p. 47)

Swedish **Landsort** class

KOSTER

(Sharpe, 1991, p. 520)

German **Type-332** class
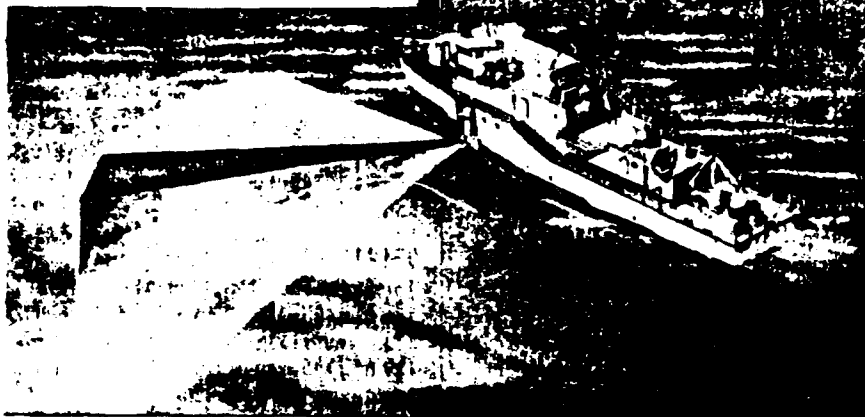
Artist's impression of MWS 80-equipped Type 332 minehunter

(Lok, 1991, p. 322)

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During the 1950's and 1960's, the U.S. and other NATO allies were extremely mine conscious. Then came a twenty year hiatus in U.S. construction of mine countermeasures ships. Currently there are 14 Avenger class and eight Osprey class minehunters active, under construction, or planned. The Avenger class has been delayed by more than 1,000 design changes during construction. The Avenger program began in 1982. Since then, the other NATO members have built approximately 110 mine countermeasures vessels. (Wettern, March 1991, p. 39) The European countries have maintained a constant mine conscious attitude in development of their navies, while the U.S. has not. The Baltic navies have between seven and 80 dedicated mine warfare units apiece. Sweden, for example has 31 such vessels. Collectively, there are over 220 mine warfare craft in the Baltic navies.

The U.S. Navy should take advantage of the mine expertise in the Baltic, and work toward increased cooperative training efforts with the Baltic countries. One example of a useful cooperative effort was a product of the mine situation in the Gulf War. A majority of the mines cleared from the Persian Gulf were done by WEU navies. Of the more than 1,000 mines cleared, WEU vessels cleared almost 850 of them. (Porteous, 27 July 1991, p. 159) Any cooperative efforts with the navies that operate in the

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Baltic would be beneficial to the U.S. Navy. This should include meetings, exercises, exchanges, or formal talks. The regional threat and continued Soviet modernization activities suggest that the U.S. Navy may need to put more emphasis into mine warfare aspects of all naval operations in the near future. Some of the equipment being developed in the Baltic may provide a cost effective answer to this problem.

C. FAST ATTACK/PATROL CRAFT WARFARE

Another area which Baltic naval expertise could prove useful to the U.S. Navy is familiarity with the capabilities and tactics of missile equipped patrol/attack craft. Although many of the 320 patrol/coastal craft operating in the Baltic are old, just as many are highly capable. If a small speed boat with rocket propelled grenades and 50 caliber guns is a threat, then a fast attack craft capable of 40 knots, armed with guided anti-ship missiles, poses a serious threat. Finland, Germany, Sweden, and the Soviet Union are among the leaders in design, construction, and operation of these craft.

Denmark, another country with a long shipbuilding and seafaring tradition, is building 16 Stanflex-300 multipurpose craft that will be equipped with a 76mm gun and four anti-surface missiles. This ship is designed for flexibility and can be quickly outfitted for minelaying and

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mine countermeasures missions. Containerized equipment
includes a towed variable depth sonar. (Watts, March 1990,
p. 110) These are the type of naval units that third world
navies are requesting and acquiring. They are made for
operations close to shore, can effectively use coastal
geographic features to their advantage, and pack a lethal
punch. Finally, they are available and relatively
inexpensive.

In Sweden, the 320-ton Stockholm is a remarkable example
of a conventional 50 meter steel hull packed with all the
latest Swedish weaponry and equipment. The ship has the
fighting capacity of a much larger ship and includes an ASW
capability. Armament includes eight RBS-15 anti-ship
missiles, one Bofors 57mm gun, one 40mm anti-air gun, a
variable depth sonar, and deck launched TP 427
anti-submarine torpedoes and grenades. Both Finland and
Denmark produce ships of similar size and weaponry.
(Burnett, May 1986, p. 276)

Another prime example of the capability of new fast
attack craft are the two that were purchased by Bahrain from
Germany. The FPB-62 class displaces 600 tons and measures
63 meters. These ships have a helicopter hangar, 76mm gun,
twin 40mm guns, two 20mm guns, four anti-surface missiles,
and four anti-air missiles. Some of the newer craft are
equipped with self protection systems and chaff launchers.

(Watts, March 1990, p. 108) As these patrol/fast attack craft become more sophisticated with high technology, well built systems, they pose a real threat to any surface, subsurface or aviation units in their vicinity. Germany's Lurssen Yard has supplied fast patrol boats to Turkey, Persian Gulf Arab countries, Thailand, Singapore, Indonesia, and Malaysia. (Zimmerman, June 1991, p. 98)

The Soviet 770-ton Nanuchka-III and 540-ton Tarantul-III classes are also heavily armed vessels. The Nanchukas carry six SS-N-9 surface-to-surface missiles, two SA-N-4 surface-to-air missiles, a 76mm gun, and a 30mm anti-air gun. It is equipped to carry and deploy mines. The Tarantuls carry four SS-N-22 surface-to-surface missiles, four SA-N-5/8 surface-to-air missiles, one 76mm gun, and two 30mm anti-air guns. (Lenton, March 1989, p. 111)

Small navy preference for fast attack craft is easily understood from an economic viewpoint. These ships can be used for coast guard duties and fishery protection craft. In maritime geography that includes narrow, sheltered, island strewn, and shallow water areas, fast attack craft designed for speed, maneuverability, and stealth have a positive advantage over larger warships. Where the security and defense of long broken coastlines is a priority, strategically stationed craft can provide the ideal answer. (Burnett, May 1986, p. 273) The photographs below and on

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the following page identify some of the most modern fast attack craft being deployed in the Baltic.

Soviet <u>Tarantul III</u> class
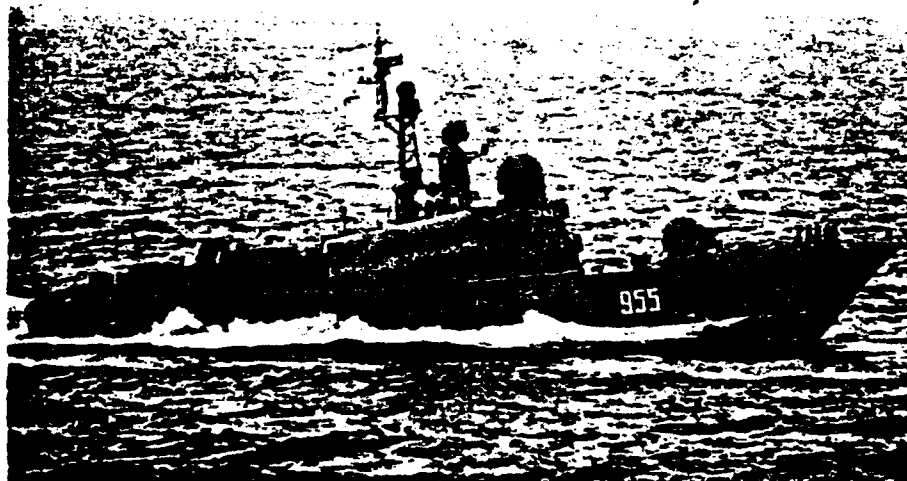
(Sharpe, 1991, p. 622)

Soviet <u>Nanuchka IV</u> class
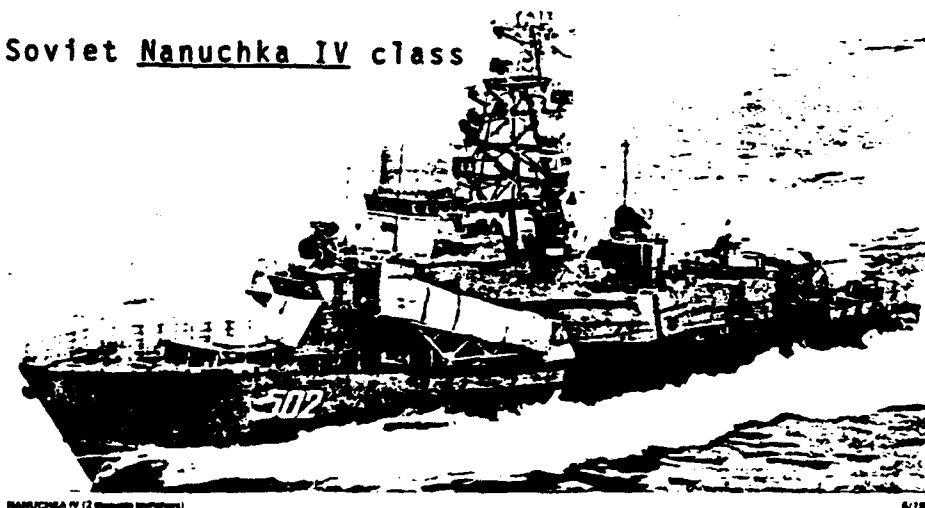
(Sharpe, 1991, p. 621)

Danish Stanflex-300 class

HAJEN (with SSM and TT)   1990 Royal Danish Navy
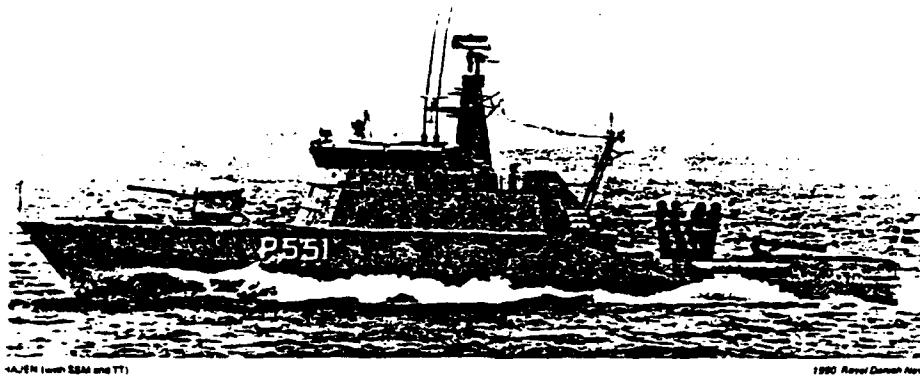
(Sharpe, 1991, p. 149)

Finnish Helsinki class

KOTKA (new light armament)   (Sharpe, 1991, p. 176)

Finnish Rauma class
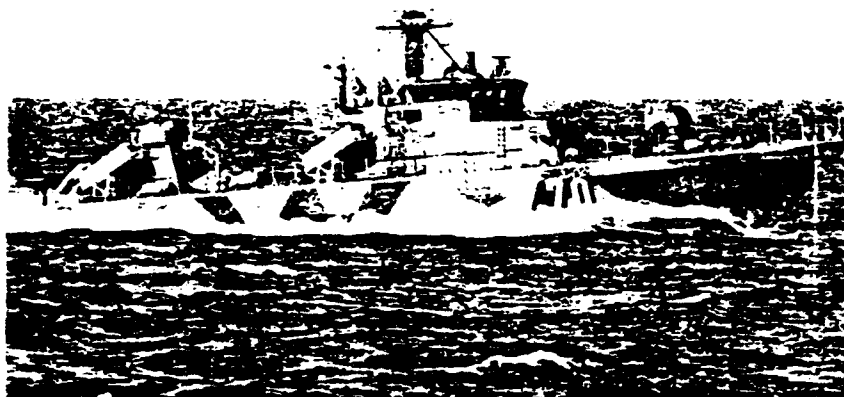
RAUMA   (Sharpe, 1991, p. 176)

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Swedish <u>Stockholm</u> class
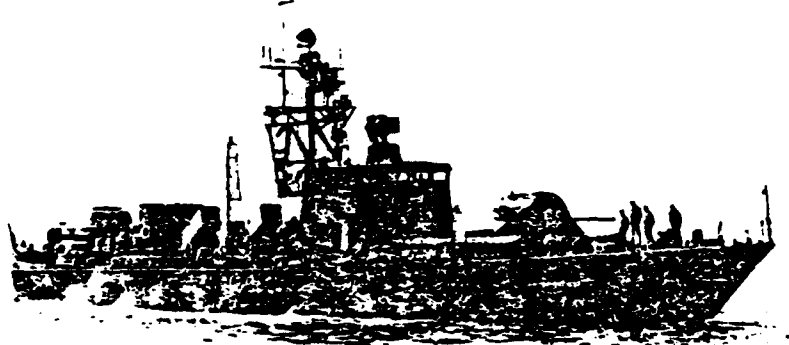
MALMÖ

(Sharpe, 1991, p. 515)
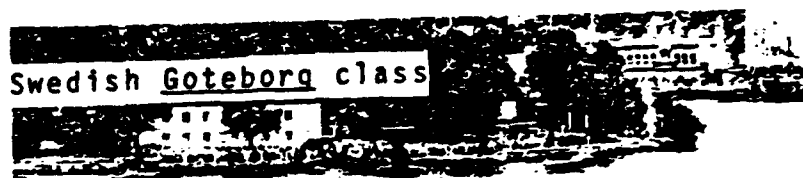
Swedish <u>Goteborg</u> class

GOTEBORG

(Sharpe, 1991, p. 516)

German <u>Type-143A</u> class

P6128

(Cable, 1989, p. 226)

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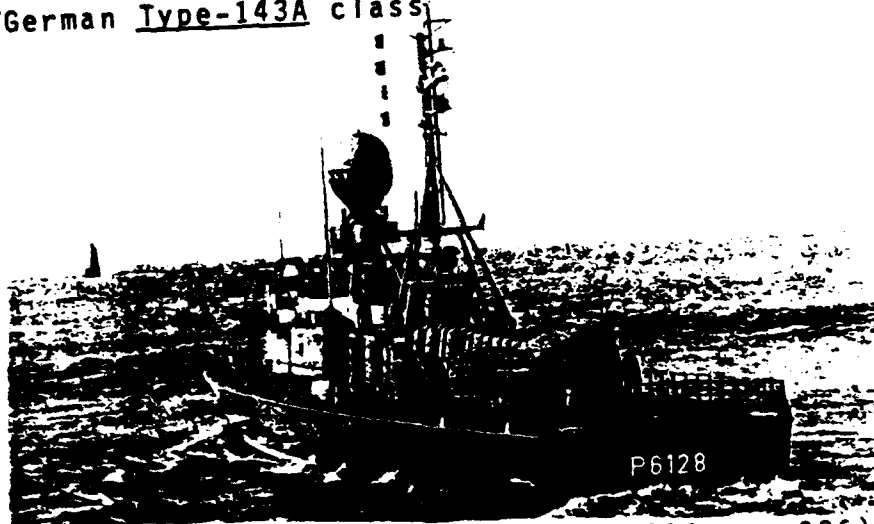
D. THE IMPLICATIONS

As the U.S. Navy plans for the future, the threat posed
by conventional submarines, mines, and fast attack craft
should not be overlooked. These are the naval forces that
will make up the third world navies of the future. Although
efforts to limit the transfer of technologically advanced
equipment is ongoing, there is little hope that it will stop
the flow of highly capable equipment. If the West does not
export the systems, the Soviets or Russians probably will in
order to earn hard currency. The perfect environment for
gaining knowledge about these threats is the Baltic Sea.

Any naval operation short of war with the Soviet Union
will include some of the naval technologies and capabilities
discussed above. Any maritime conflict involving the Soviet
Union will most certainly include a significant mine threat,
conventional submarines, and fast attack/patrol craft.
Recent events have highlighted the significance of all
three. Without a thorough knowledge of the capabilities and
tactics employed by these coastal forces, their effect
cannot be properly determined. Wargaming in the
regional/low intensity crisis situation cannot be complete
unless these threats are realistically included.

Amphibious operations are especially vulnerable to the
threats discussed above. The decision not to make a large
amphibious landing during the Gulf War was a wise one. The

mine threat was one of the primary reasons for not conducting it. Two or three conventional submarines and some effectively managed fast attack craft would have made sea control even more difficult. The best way to develop forces and tactics for countering this threat is to operate and train routinely in an environment dominated by that threat. There is no other geographic region that presents such a fantastic educational opportunity. The Baltic is a gold mine for experience with the naval systems of the future naval threat deployed by small thirld world navies. Because so much naval equipment is exported from the Baltic, knowing the capabilities of that equipment is important. If expanded exercises are not possible for political reasons, then the experience and technology should be incorporated into U.S. naval training and educational facilities. The next chapter will summarize the thesis and provide some considerations for U.S. naval strategists and planners.

VI. SUMMARY AND CONCLUSIONS

The preceding chapters have been a useful tool for detecting regional trends in naval development. By focusing on a maritime area instead of one country, it is also evident that the regional naval balance is undergoing substantial changes. The Baltic navies are well established navies with long histories and firm traditions. The littoral aspects of the region have stressed emphasis in conventional submarine warfare, small fast attack/patrol craft warfare, and mine warfare. Forces designed to counter these threats are also prominent. These trends in regional naval system development and acquisition are significant in all maritime environments and merit close attention by U.S. naval leadership.

Navies are not built or operated in a vacuum. Their development is affected by history, the national and international security environment in which they operate, and national economic structures which finance them. Six separate navies designed to operate in the same small body of water have been discussed. These navies have many of the same missions but are structured differently and are taking differing approaches to modernization. The national governments of the six countries discussed are basing naval

decisions on unique security considerations. It is
noteworthy that such diverse political systems all emphasize
conventional submarine, mine, and fast attack naval warfare.
Geographic conditions and economic factors are two primary
reasons for these common trends in naval development. The
high level of naval technology deployed by the Swedes,
Germans, and Soviets in the Baltic region require counter
forces equally advanced.

The Baltic Sea is clearly a maritime region in
transition. The next five to ten years should provide ample
opportunity for the U.S. Navy to play an important role in
that transition. The Baltic Sea may also provide the U.S.
Navy an opportunity to examine future third world naval
threats before they are deployed to other regions. This
chapter will discuss some implications that appear worthy of
attention.

A. THE TECHNOLOGY

Exportation of highly capable naval systems is perhaps
the most significant regional trend. The navies of Sweden,
Germany, and the Soviet Union are being downsized. All of
them export, or have contracts to export, conventional
submarines that are a technological generation ahead of any
conventional submarine ever encountered in naval warfare.
The proliferation aspect of conventional submarines is one
issue, but more important is the new technology that will be

available for modernization of existing submarines. Air independent propulsion systems incorporated in conventional submarines will alter current naval warfighting strategy in littoral regions. This is especially true in the low intensity conflict arena. Naval forces deployed within 150 miles of a coast will be extremely vulnerable in an environment that includes enemy submarines equipped with air-independent propulsion systems. The threat posed to the British Navy by one conventional submarine in the Falklands War would have been magnified if it had been equipped with the newest technology propulsion and weapon systems.

The Persian Gulf War rehighlighted the significance of the naval mine threat. The only serious naval casualties to warships during the war were from naval mines. The casualties to USS Tripoli and USS Princeton were serious, but they could have been much worse. Fortunately, U.S. Navy damage control expertise and crew proficiency quickly minimized the damage. The real problem with mines is that they are silent, terrorist weapons when used offensively. Fortunately, those deployed in the Persian Gulf did not incorporate the latest mine technology. The naval mine threat is not new, and unfortunately, modern technology is making it more difficult to counter. Low technology mines were effective against the most advanced warships in the world during the Persian Gulf War. The presence, or even a

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report, of a minefield can restrict naval operations and put control of the sea in question. Without control of the sea, naval missions are much more difficult to complete successfully.

Mines sank more shipping during World War II than any other weapon. Fifty years later they damaged more ships in the Persian Gulf War than any other weapon. Mines are still effective and inexpensive. Mine warfare deserves inclusion in all phases of naval training. The navies in the Baltic are very mine conscious. Over 230 naval units are dedicated to mine warfare in the Baltic Sea. Most of these ships are advanced mine countermeasures ships. A majority of the vessels employed in the Baltic also have a secondary minelaying mission. Mines influence all aspects of naval development in the region. All of the Baltic countries are currently building mine countermeasures ships, but more importantly, they have been modernizing their mine forces continuously. The mine countermeasures systems developed and deployed by the Baltic navies could potentially be valuable for the U.S. Navy.

Fast attack/patrol craft warfare is another area on which the Baltic navies have concentrated. These forces have not been effective in modern naval warfare, but recent advances in system development could enhance their survivability and effectiveness. The most modern units

being produced displace between 150 and 700 tons and are equipped with surface-to-surface missiles, surface-to-air missiles, guns, torpedoes, mines, and electronic countermeasures systems. Some of the larger units provide helicopter facilities, increasing their flexibility significantly. The presence of an organic helicopter, or a remotely piloted vehicle, could extend the range of patrol craft and provide over the horizon targeting data for surface-to-surface missiles. The helicopters could also be effective weapons, if armed with missiles. British Lynx helicopters, armed with Sea Skua missiles, destroyed the Iraqi Navy during the Persian Gulf War. (Slade, 1991, p. 12)

The Swedish Smyqe program is incorporating stealth technology to significantly reduce its radar cross section. The use of camouflage (maskirovka) by the Soviet Union on their small naval craft is another measure that may make countering this threat more difficult. These forces could pose a substantial threat if deployed as a group, under central control. The German Navy deploys its fast attack craft squadrons in this manner. A squadron consisting of five to ten of these ships, if effectively managed, could be a significant threat to air, surface, and even submarine forces. These small platforms carry a big punch. Current developments are making it easier for them to deliver ordnance on target. The Soviet Union, Germany, Sweden,

Denmark, and Finland are all developing and producing highly capable fast attack/patrol craft. Almost 40% of the combatants deployed in the Baltic are in this category.

These three areas of naval warfare are significant because they are inexpensive and available. Small countries cannot afford high technology destroyers and frigates. They also have trouble manning larger combatants. Small regional powers can acquire high technology fast attack craft with slightly less armament per unit at an affordable price. Mines have no conscience and are inexpensive, and conventional submarines are much less expensive than nuclear submarines. A small navy consisting of modern forces in these three categories would pose a serious threat to any country. This is not an open ocean threat, but within 100 miles of a coast it could be significant. Missions such as evacuation of civilians, show of force, freedom of navigation transits, and naval gunfire support could be restricted if the maritime environment included forces in these categories.

As defense budgets in the Baltic countries are reduced, orders for domestic navies will correspondingly decrease. This trend is evident in all the nations discussed except Finland. Governments are subsidizing naval system exports to ensure national shipbuilding industries do not have serious financial difficulties. The Soviets may emphasize

arms sales to gain hard currency. Russian, Estonian, Latvian, and Lithuanian shipyards face the same problems that those in the West are facing. All these Republics need hard currency now, and one item they have on hand and can produce is military hardware.

Efforts to control the exportation of military weapons are ongoing, but they focus primarily on nuclear, biological, and chemical weapons. The proliferation of conventional naval systems will likely remain a serious problem. New, high technology systems are being produced and exported. The capabilities of these systems demand continued attention. As discussed earlier, intentions can change quickly, but capabilities take years to develop.

The presence of modern coventional submarines, fast attack/patrol craft, and mines in the Baltic maritime region have required dedicated efforts to counter those forces. Shallow water ASW, mine countermeasures warfare, and small craft warfare are all high priority missions of the Baltic navies. It may be beneficial to use the experience and expertise of the Baltic nations for assistance in developing U.S. Navy systems and tactics in these warfare areas. Naval systems designed to counter littoral naval threats take time and money to construct. Some of the most advanced shallow water ASW and mine countermeasures forces in production are already deployed in the Baltic Sea.

The navies that operate in the Baltic Sea provide the U.S. Navy with an opportunity to exercise and operate in a difficult littoral environment with the most advanced systems in production. Efforts to increase the current exercise program in the region can do nothing but improve capabilities to counter the evolving third world/regional naval threat of the future. Regional exercises will also improve bilateral and multilateral command and control measures. Multinational military responses are here to stay. Naval forces will continue to play a major role in any regional crisis response effort. Increased familiarity with naval systems and foreign navies should improve current capabilities in thwarting the next regional crisis.

B. REGIONAL NAVAL BALANCE

The regional focus of this thesis revealed that a small geographic region is undergoing rapid, fundamental political shifts. The Soviet Baltic Fleet is the largest navy in the region. It has more ships, personnel, and aircraft than any of the other navies. It is also the only navy that is continuing to build several classes of new ships. Although Soviet defense reductions have been announced, clear indications of any naval reductions are absent. The Baltic coastline has changed considerably in the past year. The dissolution of the Warsaw Pact, German unification, and Baltic Republic independence have reduced Soviet access to

the southern Baltic ports. The devolving Soviet Union has
transformed one nation's Baltic coastline (Soviet Union)
into four separate national coastlines (Russia, Estonia,
Latvia, and Lithuania). The question of who controls Baltic
Fleet naval assets is a major issue. This situation is too
fluid to even hazard a guess, but Russia will be an
important factor. Leningrad and Kaliningrad will most
likely absorb units that were previously stationed in
Poland, East Germany, and possibly the Baltic Republics.

The regional focus of the thesis also provided a useful
tool for examining the Soviet Navy. The Baltic Fleet is
designed and deployed almost exclusively for use in the
Baltic region. Regional naval developments have limited
significance in other regions. The Baltic Sea is linked to
other Soviet Fleet activities because a large percentage of
the surface combatants have been built in the Baltic and
many depend on Baltic facilities for training and repair.
Each of the four Soviet Fleets can similarly be viewed in
their regional context. The Baltic Fleet will probably not
be deployed to the Pacific or Indian Ocean. Likewise, the
Black Sea and Pacific Fleets will probably not be deployed
to the Baltic Sea. Each Soviet Fleet is an independent unit
that is restricted by geography into regional operational
areas. The Baltic Fleet is structured to operate in the
Baltic Sea.

In light of the political changes taking place in the
Soviet Union, other countries in the region are reducing
their navies. The most significant is the German Navy,
which will be significantly smaller in ten years with less
emphasis on the Baltic Sea and more emphasis on
out-of-area/North Atlantic operations. The Polish, Swedish,
and Danish Navies are also facing budget reductions. The
Finnish Navy appears to be on a steady course. It is the
smallest and most integrated with other coastal defense
efforts. Finland also shares the longest border with
Russia.

It does not seem prudent for major defense reductions in
the face of continued naval building programs in the Soviet
Union. Economic conditions appear to be driving acquisition
decisions in the region more than any perceived threat. In
this environment, naval arms control measures may become
more attractive to the Baltic countries.

C. NAVAL ARMS CONTROL

The prospect for introduction and adoption of naval arms
control measures in the Baltic region is excellent. The
independence of the three Baltic Republics will likely add
to regional arms control momentum. The commander of the
Soviet Baltic Fleet has proposed a security conference for
all Baltic states to discuss regional military strengths.
(Schulte, 25 May 1991, p. 868) Both Sweden and Finland

have supported confidence building measures for naval arms in the past. It seems logical that Estonia, Latvia, and Lithuania would also support some type of naval arms control measures since they do not currently have navies. Future treaties with Russia may include provisions that sway them in that direction.

The Soviets have continuously championed arms control measures for navies deployed in the Baltic region. Germany has recently expressed desires for measures to limit Soviet amphibious capabilities. All of these developments indicate that the Baltic Sea is prime for naval arms control measures. The U.S. Navy should ensure that it has some voice in any naval arms control negotiations.

It may be beneficial to review notification, observation, and verification confidence building measures that will likely be proposed. The recent Chief of Naval Operations decision to declassify ship departures and returns 90 days prior is a step that could be used as a basis for regional confidence building measures. It is important that any measures adopted do not hinder traditional freedom of the seas activities. There may actually be some notification and verification regimes that do not hinder freedom of the seas, while still enhancing regional security. Nuclear sensitivity in Sweden, Finland, and Denmark is another regional situation worth continued

attention. Latvia, Estonia, and Lithuania, in light of the Chernobyl accident, may also have anti-nuclear tendencies. The U.S. Navy neither confirm nor deny policy may require delicate negotiations for port visits in those countries.

D. CONCLUSIONS AND PROPOSALS

The Baltic Sea would be an extremely difficult environment for naval warfare. The large concentration of naval forces deployed by several different countries would make friendly-foe identification decisions troublesome. The presence of mines, conventional submarines, missile-equipped small craft, and land based air would make naval warfare in the region that much more difficult. The Baltic Sea may be the most difficult training environment in the world for naval forces. If politically acceptable, efforts to increase training in the region would provide valuable insight into future littoral conflicts and regional crises.

One way to utilize the Baltic geograpical conditions and naval expertise would be to increase personnel exchange programs with an eye towards training. Littoral naval warfare threats should be incorporated in all phases of naval training and wargaming. The experience and expertise of the Baltic navies provide a source of knowledge for designing and implementing naval tactics and strategies to counter the littoral threat.

The presence of new technology conventional submarines

during predeployment training is needed to adequately address the submarine threat. Efforts to buy or lease German, Swedish, or Soviet submarines would not include the personnel expertise that the foreign navies possess. A program that included deployment of a foreign conventional submarine fully manned to assist in U.S. Navy training activities on a routine basis would be beneficial.

The end of the Cold War and improving U.S.-Soviet relations should allow more open cooperation with Sweden, Finland, and Poland. If feasible, expanded navy-to-navy contacts with these countries could be explored. Existing U.S. Navy-Soviet Navy ties can be expanded, and the Baltic provides an excellent site at which to begin. U.S. Navy port visits to Estonia, Latvia, and Lithuania would be a positive step in relations with those countries. Port visits to Russia (Leningrad or Kaliningrad) could be accomplished at the same time. The U.S. Navy is the best tool the U.S. government has for showing the flag. It should be in the forefront of our developing relations with Poland, Latvia, Estonia, Lithuania, and Russia. In a region of political instability, presence of the U.S. Navy can provide regional stability.

The maritime importance of the Baltic Sea is significant. The region has historically been important to world events, and it still is. The U.S. Navy should expand

its exercise program in the region and increase navy-to-navy contacts with all the Baltic countries. The U.S. Navy does not need to develop its own conventional submarines or fast attack craft, but it must be able to wage war against them. In that event, the Baltic Sea is a gold mine and should be realized as such. The U.S. as well as the Baltic countries will benefit from expanded navy-to-navy ties.

1991 Swedish Navy Force Composition
Personnel: 9,150 (3,100 regulars and 6,050 national service)

Category	Class	Quantity	Tonnage	Origin	Launched
Submarine	*A-19	0+(5)	1250	Sweden	1994-97
	A-17	4	1150	Sweden	1986-88
	A-14	3	1085	Sweden	1978-79
	A-12	5	1210	Sweden	1967-68
FAC	Stockholm	2	335	Sweden	1984-85
	Goteborg	4	399	Sweden	1989-91
	Hugin	16	150	Norway	1978-82
	Norrkoping	12	230	Sweden	1973-76
Patrol	Jagaren	1	150	Norway	1972
	Dalaro	3	50	Sweden	1984-85
	Skanor	6	25	Sweden	1977-83
Minelayer	Carlskrona	1	3550	Sweden	1982
	Alvsborg	2	2660	Sweden	1971-76
	Coastal	3	20-200	Sweden	1954-83
MCM	Landsort	7+(1)	360	Sweden	1984-91
	Various	18	70-300	Sweden	1941-74
Naval air	19 helicopters and 1 CASA C-212				

* A-19 to replace A-12 class submarine. Parentheses ()
indicate building programs in all Appendix A charts.

1991 Finnish Navy Force Composition
Personnel: 1,800 (Does not include 600 in Frontier Guard.)

Category	Class	Quantity	Tonnage	Origin	Launched
Corvette	Turunmaa	2	770	Finland	1967-68
FAC	Helsinki	4	300	Finland	1981-86
	Tuima(OsaI)	4	245	Soviet	1974-75
	Nuouli	6	40	Finland	1961-66
	Rauma	4+(4)	200	Finland	1991-99
Patrol	Ruissalo	3	130	Finland	1959
	Rihtniemi	2	110	Finland	1957
Minelayer	ML-90	2	1000	Finland	1990-92
	Pohjanmaa	1	1100	Finland	1978
	Various	3+(3)	90-450	Finland	1955-92
MCM	Kuha	6	90	Finland	1974-75
	Kiiski	7	20	Finland	1983-84

1991 Polish Navy Force Composition
Personnel: 19,000 (6,000 conscripts, 4,100 coastal defense and 2,500 naval aviation included)

Category	Class	Quantity	Tonnage	Origin	Launched
Destroyer	Kashin	1	4,900	Soviet	1969
Frigate	Kaszub	1	1,200	Poland	1986
Submarine	$Foxtrot	2+(1)	2,500	Soviet	1987-88
	Kilo	1	3,000	Soviet	1986
Corvette	$Tarantul-I	4+(4)	455	Soviet	1983-89
FAC	$Sassnitz	0+(3)	370	Germany	1991-93
	Osa-I	10	210	Soviet	1960's
	Obluze	8	150	Poland	1960's
MCM	Krogulec	8	500	Poland	1964-67
	Noltec	13+(2)	250	Poland	1981-91
	Leniwka	2	300	Poland	1984
Amphibs	Polnochny	16	800-1150	Poland	1964-70
	Lublin	3+(2)	1650	Poland	1989-91
	Deba	1+(2)	195	Poland	1991-93
Naval Air	10 IL-28, 39 Mig-17F, 40 Mig-19, and 15 helos				

$ Economic problems may delay foreign acquisition programs.

1991 Danish Navy Force Composition
Personnel: 5,350 (1,150 officers, 3,050 regular, 1,040 national service) 5,900 reserves
Naval Home Guard: 4,100 and 35 small patrol craft

Category	Class	Quantity	Tonnage	Origin	Launched
Frigate	Skram	2	2720	Denmark	1965
	Niels Juel	3	1320	Denmark	1978-80
	*Thetis	2+(2)	3500	Denmark	1989-92
	Hvidbjornen	5	1650	Denmark	1961-75
Submarine	Kobben	3	524	Norway	1964-65
	Narhvalen	2	450	Denmark	1968-69
FAC	Willemoes	10	260	Denmark	1976-78
	Soloven	6	120	Denmark	1965-67
Patrol	Daphne	3	170	Denmark	1960-64
	Agdlek	3	330	Denmark	1974-79
	Maagen	2	190	Denmark	1960
	Barso	9	155	Denmark	1969-73
Minelayer	Falster	4	1900	Denmark	1963-64
	Lindormen	2	570	Denmark	1979
MCM	Sund	3	376	U.S.	1954-56
STANFLEX	**Flyvefisken	11+(5)	300	Denmark	1987-94
Naval Air	17 helicopters and 3 Gulfstream III				

* Thetis class to replace Hvidbjornen class.
** Flyvefisken class to replace Daphne, Soloven, and Sund classes. Class also called Stanflex-300, designed to change roles within 48 hours.

1991 German Navy Force Composition
Personnel: (includes 6,000 officers and 6,700 naval air arm)

Category	Class	Quantity	Tonnage	Origin	Launched
Destroyer	Adams	3	4,500	U.S.	1967-69
	Hamburg	3	4,680	Germany	1960-62
Frigate	Bremem	8	3,600	Germany	1979-87
	*Duetschland	0+(4)	4,500	Germany	1992-94
Submarine	#Type-212	0+(7)	1,200	Germany	1991-95
	Type-206A	12	498	Germany	1973-75
	Type-206	6	498	Germany	1973-75
	Type-205	6	450	Germany	1973-75
Corvette	Thetis	5	732	Germany	1961-63
FAC	Type-143A	10	391	Germany	1982-84
	Type-143	10	398	Germany	1976-77
	Type-148	20	265	France	1972-75
Amphibs	LCU	20	400	Germany	1965-66
	LCM	17	168	Germany	1964-67
MCM(Sweep)	**Troika	18	100	Germany	1980-82
	Schutze	4	305	Germany	1959-61
	Frauenlob	10	246	Germany	1966-69
	Hamelin	10	635	Germany	1989-91
	Ariadne	8	252	Germany	1961-63
MCM(Hunt)	Lindau	12	463	Germany	1958-60
	**Troika	6	465	Germany	1958-60
	##Frankenthal	0+(10)	650	Germany	1992-95
Naval Air	109 Tornado, 18 maritime patrol, 41 helicopters				

* Duetschland class to replace Hamburg class.
# Type-212 to replace Type-205 and Type-206.
** Troika remote control drones operate as groups of three with parent Troika ship.
Frankenthal class to replace Lindau class mid-1990's.

1991 Soviet Baltic Fleet Force Composition
Personnel: 95,000 (25% volunteers, remainder 2 or 3 years national service)

Category	Quantity	Category	Quantity
Submarine(diesel)	26	MCM	80
Cruiser		Amphibs	
CGN	1	LPD	1
CG	1	LST	12
Destroyer	5	LSM	9
Frigate		Hovercraft	16
FFG	10	Naval Air	
FF/FFL	24	Fighter-Bomber	105
FAC	44	Recce/EW	40
Patrol	107	ASW	60
		Training	60

APPENDIX B

1991 Regional Naval Summary (Numbers of ships by type)

	SWEDEN	FINLAND	POLAND	DENMARK	GERMANY	BALTIC FLT
CG/DD/FF*	0	0	2	10	14	41
SUBS	12	0	3	5	24	26
FAC**	44	25	22	33	45	151
MINE#	31	19	23	7	50	80
AMPHIB##	0	0	19	0	20	22
MULTIROLE	0	0	0	11	0	0

* CG/DD/FF category includes ships with dispacement greater than 1,000 tons.

** FAC category includes fast attact/patrol craft with displacement less than 1,000 tons.

\# MINE category includes both dedicated minelayers and mine countermeasures vessels.

\#\# AMPHIB category includes amphibious vessels with displacement of 400 tons or greater.

1991 Regional Naval Summary (Percentages of ships by type)

	SWEDEN	FINLAND	POLAND	DENMARK	GERMANY	BALTIC FLT
CG/DD/FF	0%	0%	3%	15%	9%	13%
SUBS	14%	0%	5%	8%	16%	8%
FAC	50%	57%	32%	50%	29%	47%
MINE	36%	43%	32%	10%	33%	25%
AMPHIB	0%	0%	28%	0%	13%	7%
MULTIROLE	0%	0%	0%	17%	0%	0%

NOTE: All data for Appendix A and Appendix B was extracted from Jane's Fighting Ships 1991-92.

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