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5.8 Submarines

5.8.1 Summary

The used international market for submarines can be considered balanced when comparing those vessels that will be available for resale from 2004 through 2013 and those nations that may have existing requirements for used vessels or future plans for a new submarine force. Currently, 41 navies operate submarines with three possible new entrants through 2013. However, only sixteen of those navies will need to replace their submarine forces over the next decade (includes the three additional entrants that could possibly enter the market).

The majority of the modern submarines that will be available for resale will originate from Europe, with several units from Turkey and South Korea. There will be about 50 hulls for resale to the sixteen potential recipient navies during the next 10 years. It must be noted that the submarines discussed in this section are strictly diesel powered.

The following table depicts those nations that must be considered prospective suppliers and prospective recipients for used vessels from 2004 through 2013:

Prospective Suppliers of Used Submarines (2004-2013)	Prospective Recipients of Used Submarines (2004-2013)	
France	Brazil	Peru
Germany	Canada	Philippines
Greece	Colombia	Portugal
Italy	Ecuador	Poland
Netherlands	Egypt	Thailand
Norway	Indonesia	Ukraine
Russia	Egypt	United Arab Emirates
South Korea	Libya	Venezuela
Spain	Malaysia	
Sweden		
Turkey		

5.8.2 Navies With Submarine Requirements

As of the early 21st century many nations operate submarines in their naval fleets however, only a minority of these fleets operate submarines that were built indigenously. As a consequence most navies that elect to maintain a submarine fleet must decide whether to buy a new or used submarine from a very select group of providers.

Today those countries designing and building non-nuclear submarines are limited to Germany, France, Japan, Spain, Italy, Russia, China, Sweden and South Korea.



Australia, Greece, Turkey, India, Pakistan, and Brazil can build/assemble submarines based on an existing design.

In recent years there has been a growing trend for navies without submarines to look into the procurement of submarine fleets and a growing number of nations that are embarking on indigenous programs. A few submarine owners have made the geo-political decision to acquire and support an indigenous submarine construction program to satisfy its own requirements and are hoping eventually to be able to build submarines for export as well. This is an extremely costly and risky decision. The skill set necessary for the submarine labor force is unique and requires a very large investment. If the once-trained labor force cannot be continually employed the investment will be lost. It is a major industrial policy decision and investment for a country to enter into this market, which can only be rationalized if there is a relatively steady workflow, at least building one new submarine every two years, maximum every three years.

These new builders will join a very small list of nations that have historically built submarines for either indigenous use and or for export, and currently control the new and used submarine market.

The navies of the world that currently operate submarines include:

- | | |
|----------------------|------------------|
| • Argentina | • Pakistan |
| • Australia | • Peru |
| • Brazil | • Poland |
| • Canada | • Portugal |
| • Chile | • Romania |
| • China | • Russia |
| • Colombia | • Singapore |
| • Denmark | • South Africa |
| • Ecuador | • South Korea |
| • Egypt | • Spain |
| • France | • Sweden |
| • Germany | • Taiwan |
| • Greece | • Turkey |
| • India | • Ukraine |
| • Indonesia | • United Kingdom |
| • Iran | • United States |
| • Israel | • Venezuela |
| • Italy | |
| • Japan | |
| • Libya | |
| • Malaysia (ordered) | |
| • Netherlands | |
| • Norway | |

The nations most recently expressing an interest in acquiring submarines are:

- Philippines
- Thailand
- United Arab Emirates

5.8.3 Prospective Suppliers

As stated earlier, only a handful of navies operate the majority of the world's submarines. These same nations are typically the largest producers of submarines for indigenous use and for export. As a general rule, for submarines built for indigenous use will typically remain in service with the builder's country for a 25-30 year life cycle and then be replaced by new construction submarines. These vessels will then normally be offered for resale to another country.

It must be noted that there are two exceptions to this rule, one being nuclear-powered submarines and the second being Japan. As the United States, the United Kingdom, and France have all committed themselves to an all-nuclear submarine force and as such have no submarines to offer. Russia and China operate a mixture of nuclear and diesel submarines and as a consequence still have diesel boats for offer.

Japan is also a producer of submarines, although they are for indigenous use only. Japan's policy still does not allow for the export of any military weaponry, but this policy could change in the future.

Prospective suppliers that may have submarines available in this study period include:

- | | |
|---------------|---------------|
| • Germany | • South Korea |
| • Italy | • Spain |
| • Netherlands | • Sweden |
| • Norway | • Turkey |
| • Russia | |



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Of the candidates listed above, Germany and Russia may have the most to offer. Germany will begin decommissioning its twelve Type 206A class as the Type 212A begins entering service in 2004. Although the Type 206 is advanced in age, they are in excellent material condition and could be offered as part of a package deal including new construction submarines built at HDW, currently the largest exporter of conventionally powered submarines.

Russia currently has nine Kilo and Improved Kilo class submarines in service that were commissioned in the mid-1980s. However, due to the nation's naval downsizing and its attempts to improve its export shipbuilding industry, Russia would probably transfer some of its active Kilo submarines in order to gain hard currency or as part of a new and used submarine agreement with a recipient nation. It must be noted that the Kilo and Improved Kilo classes due to their size and equipment have a limited market.

Italy is currently building two Type 212A submarines at Fincantieri that are expected to commission in 2005 and 2006. These two units will replace the Sauro class currently in service freeing them up for resale. The Italian Navy will probably build two additional Type 212As for commissioning early in the next decade in order to replace the two oldest Improved Sauro class submarines, with both of these units also possible candidates for resale.

The Netherlands currently operates four Walrus class submarines that were commissioned in the 1990s. The current political climate in the Netherlands' is for the downsizing of the Dutch Armed Forces, including the Royal Netherlands' Navy (RN1N). Although the submarine force is very modern, it was not mentioned

in the present cutbacks as has been recently witnessed with the decision to decommission some of its surface fleet, including frigates built in the early 1990s. The Netherlands is only mentioned in the event that the Dutch Government decides on additional military cuts, which could include the submarine force. The Netherlands, like other members of the North Atlantic Treaty Organization (NATO), is beginning to realize that some cutbacks are possible since other member nations may have the same capability, and that retaining that capability may be duplicative in nature, justifying the action to remove the indigenous capability.

Norway currently operates six Ula class submarines built since the late 1980s. Once a member of the Viking consortium, the Royal Norwegian Navy (RNoN) officially left the program in 2003. However, the RNoN will have to replace its six units by next decade if it intends on operating a modern submarine fleet. The RNoN could very well begin a new submarine program by 2009 in order to have the first unit in service by 2013. If this program comes to fruition, Norway would probably make the six units of the Ula class available for resale.

South Korea began a new construction program for three Type 214 submarines in 2001. The first unit began construction in late 2002 of a program that could reach up to nine units. The first four units will probably commission from 2005 through 2011 possibly freeing up the Jang Bo Go (Type 209) class for resale. Although the Jang Bo Go class of nine submarines has only seen service since 1993, the South Korean Navy may offer some of these units for resale in an effort to establish a steady flow of new work for its submarine industry without which it could be confronted with a serious gap in work. A resale of the Jang Bo Go class may be offered as a package of used submarines and new construction vessels of different types, not necessarily submarines. Indonesia has already contracted for the overhaul of one its submarines with South Korea and is reportedly also discussing the procurement of used submarines for a later date.

Spain took the next step in its new submarine procurement program on 05 September 2003 when the Minister's Council approved the construction of the first four units of the S 80 class. Construction will begin in 2004 with the first four units commissioning from 2007 through 2010 freeing up the two oldest units of the Galerna class for resale. The two remaining units of the Galerna class will not be available for resale until after 2012.

Sweden currently operates three Gotland and four Vastergotland class submarines. A Swedish



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Government decision to reduce the submarine fleet to only five units will result in the decommissioning of the two very young units of the Vastergotland class. These units could become available at any time. Sweden is also involved in the Viking Program and expects to replace the two newest Vastergotland class by 2011 freeing up those two hulls in the 2011-2012 timeframe.

Turkey is currently building four units of the Prevez (Type 209/1400) class in addition to the four units that were delivered by 1999. The final four units of the class will commission from 2004 through 2007 and free up the oldest four units of the Atilay (Type 209/1200) class for resale.

Transfer candidates are listed as follows with the prospective decommissioning date, vessel class, number available and country:

Projected Years of Decommissioning	Class	Number Available	Country
2004-2011	Type 206A	12	Germany
2005-2006	Sauro	4	Italy
2012-2020	Walrus	4	Netherlands
2013-2017	Ula	6	Norway
Anytime	Kilo/Improved Kilo	9	Russia
2005-2010	Jang Bo Go	4	South Korea
2003-2006	Delfin	4	Spain
2012-2015	Galerna	4	Spain
Anytime	Vastergotland	2	Sweden
2011-2012	Vastergotland	2	Sweden
2008-2013	Atilay	6	Turkey

5.8.4 Prospective Recipients

Nations that have historically procured submarines from the used international market and may continue to do so, and those seeking to gain their first experience with submarines are the most likely to take advantage of the used market.

However, funding issues could also push some countries that have in the past purchased new submarine to consider a used boat solution. Navies that may need to utilize the used international market as an alternative to a new construction include:

- Colombia
- Ecuador
- Egypt
- Indonesia
- Iran
- Libya
- Peru
- Poland
- Philippines
- Romania
- Thailand
- Ukraine
- United Arab Emirates
- Venezuela

5.8.5 Situational Assessment of Potential Recipient Navies

Colombia

The Colombian Navy is currently operating two Pijao (Type 209) class submarines commissioned in 1975. Although Colombia has expressed an interest in new submarines to replace the Pijao class, funding for new vessels must be considered unrealistic. Internal crisis such as the drug cartels and other insurgent groups have forced the Colombian Armed Forces to focus internally, negating any efforts to fund new construction programs for the navy.

The Colombian Navy will probably continue to extend the service lives of the Pijao class until a suitable replacement can be found.



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For Colombia, those options will be limited to the used international market. If Colombia prefers a German solution, the South Korean Jang Bo Go class and the Turkish Atilay class are possibilities. Considering that the submarines are used not for ASW but rather for surveillance in coastal waters, the small German Type 206As might also be considered as a practical solution.

In regards to other choices, the majority of submarines that may appear on the used international market are actually older than the current Colombian submarine fleet. The only candidates available in the near term include the Italian Sauro and Swedish Vastergotland classes built in the late 1980s. In the long-term, the Norwegian Ula and Dutch Walrus classes built in the late 1980s to mid-1990s could be considered.

Ecuador

The Ecuadorian Navy is currently operating two Shyri (Type 209) class submarines commissioned in 1977 and 1978. Although Ecuador would probably prefer to replace its submarine fleet with new submarines, funding is probably in the distant future if at all. Ecuador, with its submarine fleet acquired in the late 1970s will be confronted with the same choices as listed for Colombia above. Ecuador also has the option of completely shutting down its submarine force.

Egypt

Egypt is currently operating four Chinese-built Improved Romeo class submarines built in the early 1980s. Considered obsolete by modern standards, the Egyptian Navy has been planning since the early 1990s for the procurement of up to four Western-built submarines.

Many political obstacles have stalled this acquisition and it is still not certain that Egypt will receive new submarines. The Egyptians were hoping for a submarine design built by the United States in order to utilize Foreign Military Assistance (FMA) programs offered by the US. However, this program has been stalled since it became tied to the Taiwan submarine project and as a consequence remains uncertain.

The Egyptian Navy maintains that it will procure new submarines to replace the Improved Romeo class, however, if the new procurement continues to be delayed, the sea service may have no choice but to attempt a used submarine purchase. If this avenue is chosen, it will probably happen around the end of the decade, limiting the choices to the Italian Improved Sauro class which may be available by around 2010 as well as the Netherlands' Walrus class in 2012 or the Norwegian Ula class in 2013. It must also be noted that a used solution will not be covered by funds from a US FMA program, forcing the Egyptian Navy to fund the purchase on its own.

Indonesia

In late 2003, Indonesia announced that it was continuing forward with its modernization plans for the naval service. Under the US\$1.95B plan, the Indonesian Navy is planning to procure at least two submarines to supplement its two existing Cakra (Type 209) commissioned in 1981. Although details are far from final, there has been public discussion about acquiring submarines from South Korea. South Korea operates nine units of the Jang Bo Go class (also Type 209s) but are now beginning a new program of Type 214s possible freeing up the Jang Bo Go class for resale.



It is not certain if South Korea would offer to build new Type 209s for the Indonesians or offer two units of the Jang Bo Go class when the Type 214s begin entering service in 2005. Due to severe funding limitations in Indonesia, the sea service may opt for the Jang Bo Go class if offered. The Indonesian Navy has remarked that it would like to contract for some submarine capability (new or used) by 2009.

Libya

The Libyan Navy currently operates two Foxtrot class submarines transferred from the former Soviet Union in the early 1980s. From the early 1980s through 2003, Libya was under United Nations sponsored international sanctions for supporting terrorist organizations. During that timeframe, only the former Soviet Union was willing to sell military hardware to the country.

As of September 2003, the United Nations lifted international sanctions that had been in place for the better part of two decades. The lifting of sanctions against Libya essentially welcomes the country back into the world of nations and opens the prospect for unfettered economic and trade relations with all nations of the world with the exception of the US, which will retain its sanctions under the Iran-Libya Sanctions Act. The lifting of sanctions also clears the way for the sale of military systems to Libya opening up the country to future business opportunities.

Now that Libya is essentially free to do business with almost any nation in the world, it may begin to look at its options to begin replacing its seriously depleted Soviet-era naval

fleet including submarines. If the nation intends on keeping a submarine force, it will have to begin searching for replacements at the soonest possible date.

Prior to the Soviet Union being the largest supplier to Libya, the French and Italians were both suppliers to the Libyan Armed Forces. Italy has also been the first nation to do business in post-sanction era Libya, when in July 2003 it signed a security cooperation agreement to help stem the flow of illegal immigrants from North Africa to Southern Europe. Under that agreement, both nations will cooperate in joint patrols, the sharing of intelligence information and the sale of Italian security systems to Libya. This relationship could also extend to other naval vessels.

Italy must be considered the primary candidate to supply Libya in the future. The Italian Sauro class could be available by 2005 and the Improved Sauro class could be available by around 2010. Russia, with its Kilo and Improved class submarines must also be considered a candidate for the Libyan Navy.

Peru

The Peruvian Navy is currently operating six Angamos/Islay (Type 209) class submarines commissioned from 1974 through 1983. Although Peru would probably prefer to replace its submarine fleet with new submarines, funding is probably in the distant future if at all. Peru, with its fleet acquired in the late 70s through early 80s will be confronted with the same choices as Columbia and Ecuador.

Should Peru wish to continue with a German solution, the South Korean Jang Bo Go class and the Turkish Atilay class are possibilities.

In regards to other choices, the only candidates available in the near term include the Italian Sauro and Swedish Vastergotland classes built in the late 1980s. In the long-term, the Norwegian Ula and Dutch Walrus classes built in the late 1980s to mid-1990s could be considered. It must be noted that the Peruvian Navy has taken delivery of Dutch and Italian surface combatants in the past and may well consider these sources for its submarine requirements as well.

Philippines

The Philippines continues to plan for the procurement of three submarines for its fleet under the Armed Forces of the Philippine Modernization Program (AFPMP). However, funding limitations continue to plague the AFPMP and all new programs are virtually



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at a stand still. Higher priorities include a corvette and offshore patrol vessel (OPV). If this requirement ever comes to fruition, it will most definitely be through the used international market. All submarines listed in the Transfer Candidate Table could be prospective candidates.

Poland

Poland is currently in the midst of acquiring four Kobben class submarines from Norway as an interim measure until new vessels can be procured.

The first two units of the Kobben class were transferred to the Polish Navy in 2002 followed by a third unit in 2003. The fourth and final unit is expected to arrive in Poland by the close of 2004.

The four Kobben class will remain in service until replaced by a new submarine beginning in 2014. However, the budget will drive whether there will be new construction or if Poland will again find a solution in the used ship market.

Romania

Romania has a decision to make, whether to have a submarine fleet or not, as its one inoperable Kilo sits alongside the pier. There is no pressing need for the Romanian Navy to make a decision immediately but if it should decide to establish a submarine fleet it will need to be established with used ships, as the costs of new construction exceed the Navy's present budget capability. All of the candidates listed above would likely come into consideration. Realizing that they would primarily be operating in the Black Sea the smaller but older Type 206A submarine of Germany could still provide an excellent and inexpensive fleet.

Thailand

Thailand continues to speak of acquiring a submarine force and has publicly in the past shown interest in the Israeli Gal class submarines decommissioned in the 1990s.

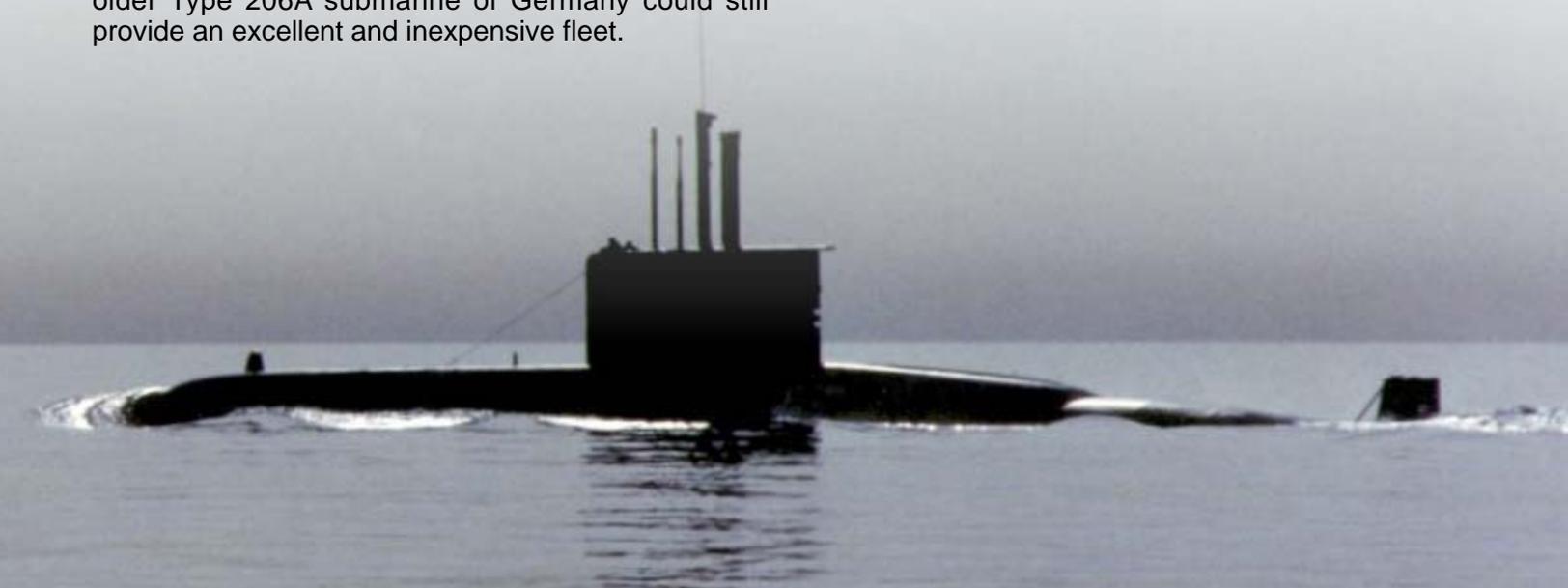
However, actual planning was canceled following the inauguration of the current Chief of Naval Operations (CNO) in early 2003. The CNO spoke of higher priorities for the Royal Thai Navy (RTN) including the acquisition of offshore patrol vessels (OPVs) and other surface combatants.

A future submarine procurement for the RTN must be considered remote as of this writing, however, will likely resurface again following the modernization of the surface fleet. The RTN will not have funding for any submarines, new or used until around the end of this decade or beginning of the next. In all likelihood, if the RTN does procure a submarine, it will be from the used international market.

All submarines listed in the Transfer Candidate Table could be prospective candidates for the RTN if they are still available at the end of the decade.

Ukraine

The Ukrainian Navy currently operates one Foxtrot class submarine inherited from the former Soviet Union. Built in 1970, the Ukrainian Navy will need to replace this unit if it decides that a submarine force is necessary for its fleet. The most likely candidate for replacement of the Foxtrot is probably a Russian Kilo or Improved Kilo built in the mid-1980s.



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It must be noted that although Ukraine is a member in the Partnership for Peace (PfP) Program and wishes to become a member of the North Atlantic Treaty Organization (NATO), only in the event of NATO membership would the Ukrainian Navy be able to procure a new or used submarine of Western European origin.

United Arab Emirates

The United Arab Emirates continues to speak of acquiring a submarine force and has publicly in the past shown interest in Pakistani built Agosta 90B class submarines. However, funding limitations have prevented this transaction from ever taking place. In the unlikely event that the United Arab Emirates Navy does procure a submarine force, it will probably be through the used international market for its first vessels. All submarines listed in the Transfer Candidate Table could be prospective candidates.

Venezuela

Venezuela currently operates two Sabalo (Type 209) class submarines built in the mid-1970s.

Planning by the Venezuelan Government has called for the procurement of two new submarines to replace the Sabalo class by 2010. However, funding shortfalls have prevented this program from getting underway. Original plans were to procure additional submarines from HDW, possibly the Type 214 variant. With continued delays in the procurement of new submarines, Venezuela may well have to utilize the used international market as an interim measure until funding allows the purchase of new submarines.

Used options for Venezuela will likely include the German designs of the South Korean Jang Bo Go, which is also a Type 209 built in Korea from 1993 through 1996 and the older Atilay Type 209/1200 built in Turkey. Non-German submarines that could be available include the Improved Sauro, Norwegian Ula and the Swedish Vastergotland.

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