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THE OSCAR CLASS AND OTHER NEW SOVIET SUBMARINE TYPES
CONTINUE VIGOROUS EX. (U) NAVAL INTELLIGENCE SUPPORT
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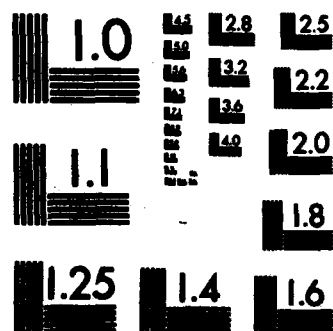


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TITLE: THE OSCAR CLASS AND OTHER NEW SOVIET
SUBMARINE TYPES CONTINUE VIGOROUS
EXPANSION OF THE SOVIET SUBMARINE FORCE

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Die OSCAR-Klasse und andere neue sowjetische U-Boottypen

Schiffe dieser Klasse der sowjetischen Flotte

Stephan Dreyer

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Fig. 1: The Oscar Class And Other New Soviet Submarine Types
Continue Vigorous Expansion of The Soviet Submarine Force

[Breyer, Siegfried: Soldat und Technik, Vol. 8, Aug. 1983, pp. 438 - 441; tower step can be noted, which might contain an unwinding radio communications antenna.]



Of the 26 letters of the NATO alphabet currently 22 are used as code* designators for Soviet submarine classes; the spectrum goes from ALFA to ZULU. These 26 alphabetical names would have been exhausted long ago, if sub-divisions had not been made within the individual classes, which are provided with a suffix, either with a Roman number, or - more unusually - with symbolical term. Examples of this are VICTOR I, VICTOR II, etc. on the one hand and WHISKEY LONG BIN and WHISKEY CANVAS BAG on the other hand. On the basis of this manipulation, only the alphabetical names UNIFORM and SIERRA are not used (both had been assigned previously used, but had been revoked) as well as MIKE and X-PAY, and this despite the fact that the Soviets have built no less than 43 classes of submarines since 1945. The most recent classes have the codenames OSCAR, VICTOR III and KILO.

The OSCAR Class is certainly the most important of these latest classes (The new strategic nuclear submarines are not included here and we refer to our article on the TYPHOON Class in Vol. 3/83). The OSCAR Class assumes a special position (if the to an extent even larger strategic nuclear submarines are not included here) as the currently largest submarine type in the world, less in regard to its dimensions and more in regard to its volume. This can be noted in its L/B* ratio of approximately 8), a figure which was exceeded only in WWII by the German

* The L/B ratio describes the ratio of the ship length to the ship beam as measured at the design water line (KWL). This plays an important role as the degree of fineness. The numerical figure is a multiple of the width.

Type XIV submarine - a supply type not intended for combat - in which the L/B was 7.1, whereas it was usually at between 10.0 and 12.0 and today even reaches 13. The fact that the OSCAR Class has such a full hull form is caused to an extent by its operational mission; it is designed as a carrier of surface-to-surface missiles and in this regard is a development, which could be realized only a radical design innovation and not by a continuous gradual design evolution. This is apparent when the missile component of all previous Soviet guided missile submarines is considered and compared. Their development was originally characterized by the doubling of the number of missiles carried, and from a later point in time of this evolution, the development was characterized respectively by the addition of two missiles. The WHISKEY SINGLE CYLINDER experimental type carried only a single missile; its successor the WHISKEY TWIN CYLINDER carried only two missiles and the following WHISKEY LONG BIN Class carried four missiles. Thereafter the increase in missiles occurred at the rate of two: In the ECHO II Class the missile capacity was increased to six and in the following ECHO II Class to eight. With this that standard was reached, which was retained until the 1970's, because both the units of the CHARLIE I Class and those of the CHARLIE II Class each had eight missiles. Only in the PAPA Class, which was built in the interim, have ten missiles been installed, but this Class has only one unit, since it was not produced in series*. Despite an increase of approximately 300 tons,

* The construction of this unit might be explained on the basis that it was designed for the development and testing of the SS-N-9 missiles modified for submarine application, with which the last units of the CHARLIE II class were equipped, whereas the first units apparently had the SS-N-7 installed.

* Numbers in the right margin indicate pagination in the original text.

the number of missiles in the CHARLIE II Class remained at eight; the reason for this might have been that these units are also equipped with the SS-N-15 ASW missiles which can be launched from torpedo tubes, for the storage of which an additional section of ca. 8 meters was required - the CHARLIE II Class was lengthened by this amount as compared to the CHARLIE I Class. /438

A gradual increase was also manifested in the in the missile weapons systems: Whereas until the ECHO II Class only the SS-N-3 were installed, which could be launched only when the submarine was surfaced, with the SS-N-7 a weapons system was obtained which could be launched submerged. The units of the CHARLIE I and the initial units of the CHARLIE II Class were equipped with this missile. Thereafter the SS-N-9 missiles modified for submarine installation (installed in the PAPA Class and on several units of the CHARLIE II Class) and the SS-N-12 missiles (installed* on modernized units of the ECHO II Class)

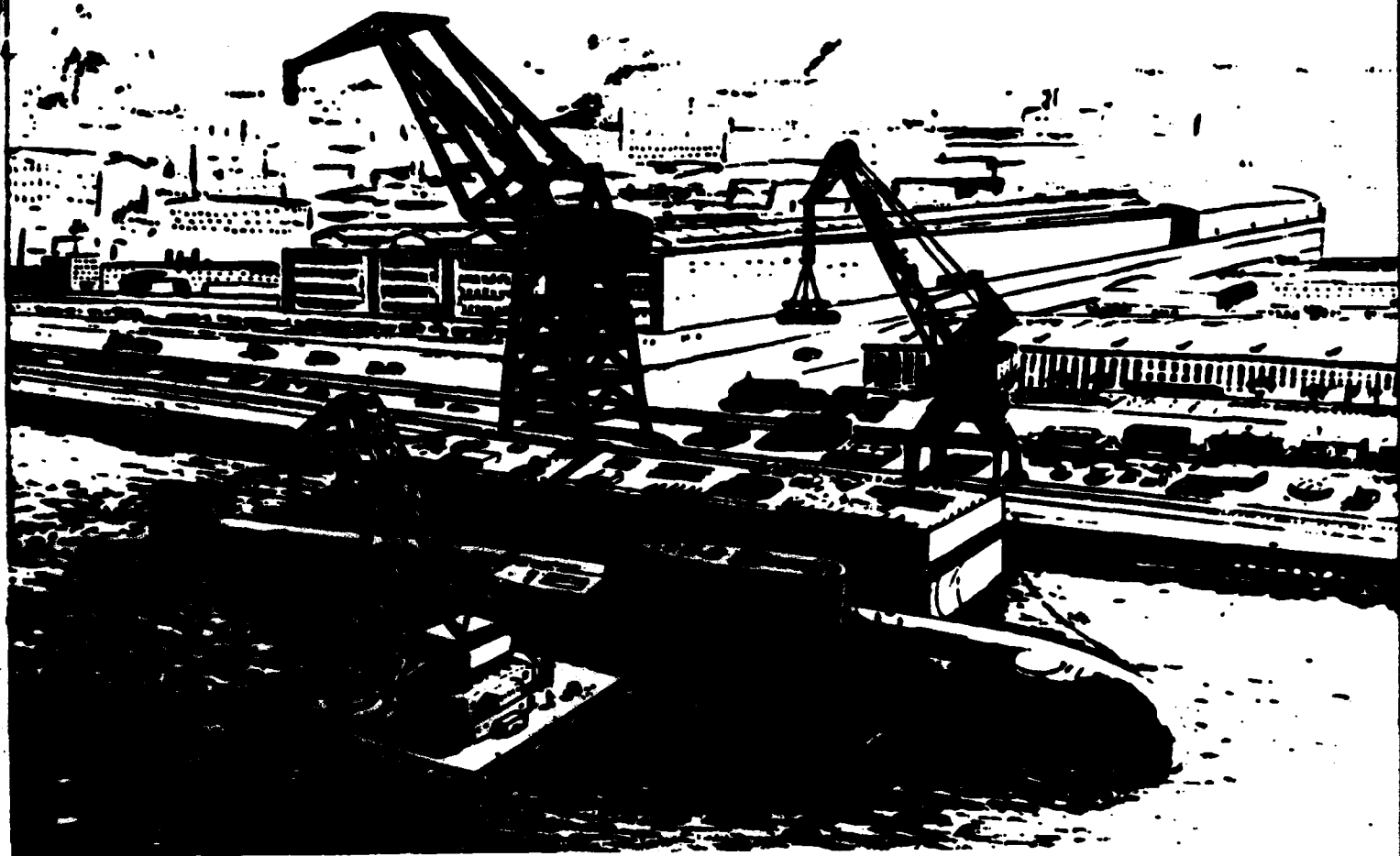
*Designated in NATO as the ECHO II MOD Class.

would only have the character of interim solutions, with which combat power enhancement was attempted until the development of a new considerably more effective weapon system. This new weapon system became available for the first time in the form of the SS-N-19 missile, which was installed in the nuclear guided missile cruiser KIROV, whereby most probably as with the SS-N-9 and SS-N-12 it would the version modified for submerged launching. The carrier for this SS-N-19, which can be equipped either with TNT or nuclear warheads and which has a range of 300 sm - is the OSCAR Class, whose existence has been known since launching in April 1980. This Class is built at the large shipyard at Severodinsk north of the Polar Circle, one of five Soviet submarine shipyards; there the keel of the first unit was probably laid in 1978. Commissioning would have occurred in the second half of 1981 or at the beginning of 1982, because the trials had begun already in June 1981. A second unit of this Class is reported to be under construction. This was reported during 1982 from Norwegian sources, and also the second "Pentagon Paper" assumes the existence of a second unit*, which is currently being fitted out. /439

*Soviet Military Power, Second Edition, March 1983, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

The Cruise Missile Submarines of the OSCAR Class (SSGN) are equipped with 24 SS-N-19 missile tubes, four more tubes than the KIROV has. The missiles are carried in containers, which are located between the pressure hull and the outer hull and therefore must be pressure-tight. Apparently two of these tubes are consolidated, because on each side of the hull only six gates are present, which however with approximately 6.50 meters long and ca. 2 meters width are dimensioned so large, that they can each accommodate the openings of two SS-N-19 tubes. According to some information these tubes are oriented as in the KIROV at 40 degrees forward; their gates are apparently opened and closed by flaps or sliding gates. /440

In addition to these cruise missile systems, the OSCAR units also have a torpedo armament. According to "Jane's Fighting Ships 1982/83" there are eight torpedo tubes ("Combat Fleets 1982/83" reports that the tubes are in the bow) and 24 reserve torpedoes, so that a total of 33 torpedoes would be available. Probably optionally SS-N-15 ASW missiles can be launched from all (or some specially adapted) torpedo tubes, which are regarded as the counterpart to the American SUBROC.



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Fig. 2: This illustration, which is derived from the latest study of Soviet armament published by the American Department of Defense shows a unit of the OSCAR Class during fitting-out in the major shipyard of Severodinsk located north of the Polar Circle, the former Molotovsk. This shipyard had been built in the area of a former monastery during the Stalin era and since then has been expanded considerably. The nuclear strategic missile submarines of the DELTA and TYPHOON Classes are built there primarily. This complex is only one of a total of five submarine shipyards which are available, but this is the largest and best equipped shipyard.

The sail, which is extraordinarily large with a length of 27 meters and a height of 6 meters appears to have a rather large antenna system in the forward half; this could possibly be a radar system to be assigned to the SS-N-19 missile system. Probably it can be completely retracted into the conning tower and is erected or deployed when it is needed. According to the initial photographic analysis it appears that a second device is installed behind it; but this cannot to date be definitively stated. A deck step which is hardly 1 meter high is connected to the conning tower, in a way this is similar to the missile "saddle" on board strategic nuclear submarines.

but it is considerably smaller; presumably it contains an VLF-
position buoy or an ELF-trailing wire antenna*, perhaps both together, /44

***VLF = Very Low Frequency, ELF = Extreme Low Frequency**

and this is released and unwound by opening a horizontal two-section flap. Astern the rudder cross protrudes, which has become symbolic for modern submarines. The rear termination of the ship is a stern form, which has variously been designated as a "Högner" stern. This apparently refers to the double tail fins behind the rudder cross, at the ends of which the propellers are mounted. It is imagined that the drive is provided by two geared turbine sets, which are powered by two reactors.



Fig. 3: One of the latest nuclear submarines of the VICTOR III Class, a further improved successor of the series begun with the VICTOR I Class. There a tear-drop shaped object of undetermined purpose over the rudder fin.



Fig. 4: Photographed in Far Eastern waters: The first photo of the new conventionally powered submarines of the KILO Class: apparently this class is intended for operation in Far Eastern littoral seas and is intended to replace obsolescent units of the WHISKEY and ROMEO Classes.

If - as it is stated in the British naval handbook - there is a distance of 1.80 to 2.10 meters between the pressure hull and the outer hull, then that would mean a pressure hull diameter, whose limit would be at 11 meters, in order to make possible positions on both sides for the SS-N-19 tubes, which are estimated as being more than 2 meters wide.

The OSCAR Class constitutes a new major threat on the seas of the world, and this threat is directed very specifically against the fleet units of NATO operating in these seas, and particularly against the very feared American carrier battle groups. The OSCAR Class has a considerably increased degree of operational freedom because of the

the missile arsenal, which has been tripled as compared to the preceding classes of cruise missile submarines; these units are therefore capable to stay in their operational areas for a considerably longer period of time. Because of this, these units are considerably less dependent upon their bases than their predecessors were, which after firing their eight missiles had to return to their supply bases to replace the missiles. In addition, the SS-N-19 missiles are a very far-ranging weapon system; these fly - probably with the help of ocean reconnaissance satellites - up to 300 sm, and therefore this system also assumes a strategic character. The fact that the carriers of this system are assigned a very special priority by the Soviet naval command can be regarded as being certain. American analysts anticipated that in the future each unit of this OSCAR Class will be assigned one or two nuclear attack submarines, which would have the mission of defending against hostile submarines attacking the SSGN*.

*Milan Vego: Their SSG's/SSGN's (in: Proceedings, October 1982, p. 60 ff.)

Principal Data of The New Soviet Submarines

	OSCAR Class	VICTOR-II Class	KILO Class
Displacement surfaced t	~ 10,000	4,600	2,500
Displacement submerged t	~ 13,000	5,800	3,200
LOA m	143.0	106.0	67.0
Beam (max.) m	17.5	10.0	9.0
Draft m	.	17.0	.
Type of propulsion/ number of shafts	Nuclear/2	nuclear/1	Conventional/2
Drive Power kW	.	22,075	.
(HP)	.	30,000	.
Speed surfaced kn	.	.	.
Speed submerged kn	.	29	.
Armament			
a) Missile system ship/ship	24 SS-N-19	none	none
b) ASW weapon systems	SS-N-15	SS-N-15	?
c) Torpedo tubes	~6	6 to 8	4-6
Crew	.	85	.

The VICTOR III Class, which was first observed in the Pacific in November 1979, is the next most important of the new Soviet submarine types, which has been built since 1975 at the Leningrad Admiralty Shipyard and since 1978 at the Amur Shipyard in Komsomolsk in the Far East*. This is a further development of the VICTOR-I and VICTOR-II

*The first unit built by the Admiralty Shipyard was launched in 1976 and commissioned in 1977.

Classes (which is apparent on the basis of external appearance), which themselves were developed by gradual enlargement. Two facts are particularly distinctive for the VICTOR-III Class:

- △ The equipment with the first towed sensor, which can be deployed from submarines, for the detection of enemy submarines*, which

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* Cf. Soviet Military Power (II), p. 60.

indicates a special capability as ASW attack submarine type, and

- △ A protective coating of the hull against the reflection of sonar waves. in the British technical literature designated as "Cluster Guard hull coating"*.

*Jane's Fighting Ships 1982/83. p. 468

With a very similar appearance as in the preceding class variants, the VICTOR-III Class differs in one point: On the protruding fin of the rudder cross there is a teardrop-shaped (hollow?) cylinder, whose function is variously interpreted. Perhaps the previously mentioned anti-submarine towed sensor is housed in thus cylinder.

The armament of the VICTOR-III Class consists of torpedoes and ASW-missiles. Jane's Fighting Ships 1982/83 states that there are six torpedo tubes and Combat Fleets 1982/83 and Weyers Flottentaschenbuch 1982/83 states that there are eight torpedo tubes, which are exclusively in the bow. The English naval reference states that the supply of torpedoes is 18 and notes that facilities for SS-N-15 ASW-missiles are also present; the number of SS-N-15 missiles is not stated. They would doubtless be included in the number of torpedoes carried.

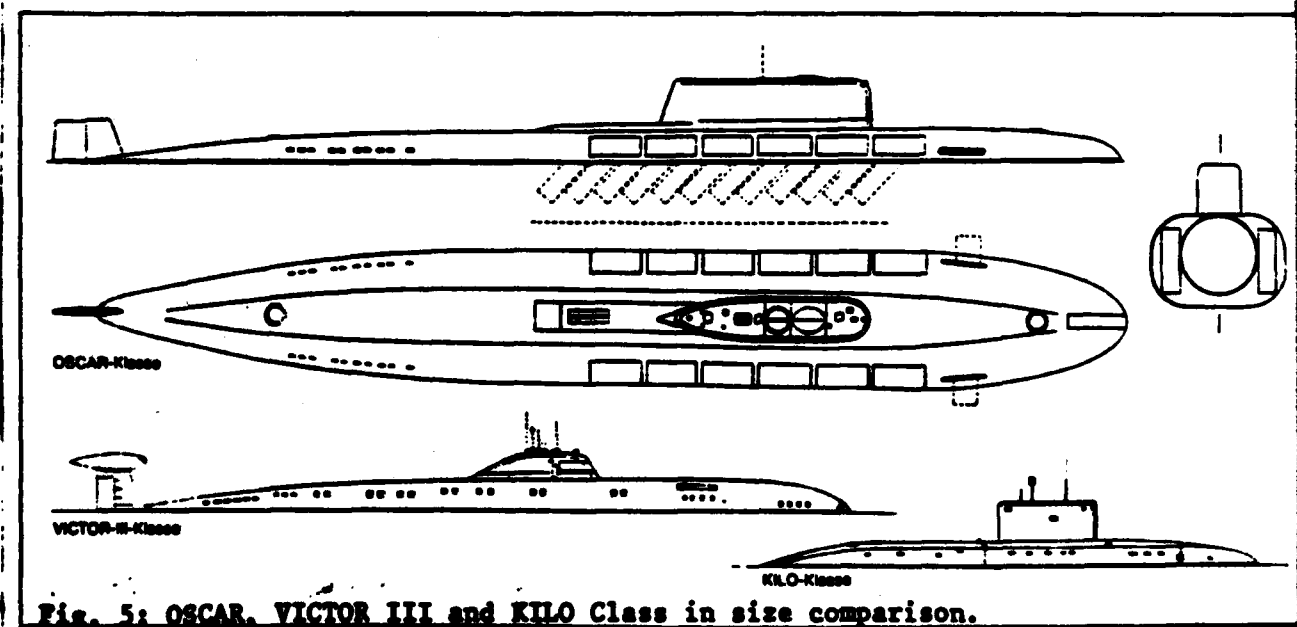


Fig. 5: OSCAR, VICTOR III and KILO Class in size comparison.

The units of the VICTOR-III Class like their Class predecessors have nuclear propulsion, but the reports differ in this regard, since Jane's states that there are two reactors and two turbines on a (main) shaft and also "two auxiliary propellers", which necessarily suggests the presence of a secondary propulsion system - perhaps for silent running operation. The other naval journals do not mention this, and report only one reactor.

There are very differentiated estimates of the number of units in the VICTOR-III Class. Jane's cites in its last edition twelve units in service and three under construction; Combat Fleets and Weyer state eight units. In the near future, according to the new Pentagon Paper, however, the series construction of a new class of attack submarines can be anticipated, which two shipyards will build, and again according to the Pentagon Paper, this class will have even a higher degree of quality than the VICTOR-III Class. This suggests that the VICTOR Class will not continue to be built, and perhaps a VICTOR-IV Class will appear. /44

The last new development of a submarine to be presented within the parameters of this report is the KILO Class, which currently is designated by NATO as the PAC-SUB I Class, derived from "Pacific Submarine". This is a non-nuclear powered type. The first unit of this class, of which two are known to date, was apparently begun in 1979 and is reported to have been launched in September 1980 and commissioned in the following year. It was built at the Amur Shipyard in Komsomolsk; the completion and fitting-out could be performed in Vladivostok, because there for the first time in April 1981 a representative of this Class was observed. The second unit which is also under construction in Komsomolsk will follow shortly. This submarine type, which is estimated at 67 meters long and 9 meters beam and 2,500/3,200 tons, shows the typical form elements of the "tear-drop" design. In this regard externally there is a certain similarity with the American BARBEL Class of the 1950's (this was the last conventionally powered submarine type of the US Navy) and with the Dutch ZWAARDVIS Class of the 1970's, which was based on the BARVEL Class, which are both very similar in dimensions. There is no specific information available in regard to propulsion system, propulsive power and speed, aside from the fact that in "Combat Fleets" "Diesels, electric drive" is noted. This KILO Class is doubtless exclusively a torpedo-carrier; there is no information in regard to number of tubes and torpedo supply. It may however be assumed that there are four to six torpedo tubes and that approximately twelve to fifteen torpedoes can be carried. On the basis of the size it can be assumed that this is a submarine with a small radius of action. If this Class continues to be built in this Far Eastern shipyard - and currently there is no indication that any shipyard located in the European area of Soviet Russia has been included in this program - it could be assumed that this Class is intended for Far Eastern waters (Sea of Japan, Okhotsk Sea and Bering Sea, where it would presumably primarily play a defensive role. Therefore, it is problematical whether or not - as indicated in "Combat Fleets" this program is actually intended to replace the obsolescent units of the WHISKEY and ROMEO Classes.

The most recent developments make it apparent that the Soviet submarine fleet is in the process of a rejuvenation and restructuring program. Very apparently the objective of this program is the replacement of the standard type submarines deriving from the 1950's and the 1960's, particularly the conventionally powered WHISKEY, ROMEO and ZULU Classes. The figures* most recently published by the Bundesministerium der Verteidigung (FRG Ministry of Defense) indicate

*Bundesministerium der Verteidigung, Information And Press Staff, Press Section: Strength of the Soviet Naval Forces and of Soviet Naval Aviation, Status: 1.1.1983.

the degree of progress: of the total of 465 submarines listed (including the strategic nuclear submarines), no less than 175 are nuclear-powered and 117 are equipped with missile weapons systems. As compared to this, NATO (with France) has 283 submarines, of which indeed 121 have nuclear propulsion, but of which only 41 have missile systems, in this case exclusively strategic nuclear systems (ICBM), while the equipment with tactical missile systems (cruise missiles) is just being initiated. □

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