

FIRE ON A RUSSIAN NUCLEAR SUBMARINE

Three days before the New Year at the ship repair plant N82, which is on the Kola Peninsula, there was an emergency - the submarine standing in the dock caught fire. This event did not go unnoticed by the media, but in the pre-holiday bustle few people realized the danger of what happened. In reality, Russia was on the verge of the largest man-made accident since Chernobyl for almost 24 hours: 6 km from Murmansk, the nuclear submarine strategic missile carrier K-84 Ekaterinburg was on fire, carrying missiles with nuclear warheads, torpedoes and two nuclear reactors. And all the efforts of firefighters for long hours did not give results.

How the submarine ended up in the dock

2011 was a year, rich in events for K-84: the launch of the R-29RMU2 "Sineva" rocket in April, the test launch of the newest rocket R-29RMU2.1 "Liner" in May and another launch of "Sineva" in July.

In late summer or autumn, the K-84 damaged its nose - the details of the accident are unknown. A number of technical details are needed to better understand the situation. Project 667BDRM missile carriers are built according to the classic Soviet submarine scheme: crew, reactor, turbines, rocket shafts, other critical systems and mechanisms are in the so-called solid hull, able to withstand high water pressure. Outside is a "light" hull that gives the boat a streamlined shape. Between it and the sturdy inner hull when the sub is submerged, is water, so the lightweight body is not subjected to its pressure. Outside, the lightweight body is covered with a rubber anti-hydrolocation coating that reduces the noise of the boat. Between the sturdy and light hulls are various devices - for example, ballast tanks, allowing the boat to dive and pop up, torpedoes, as well as a "GAC fence" which is housed in a fairing in the bow, where the main antenna and other structural elements of the hydroacoustic complex (GAC) "Scat-BDRM" are located.

As a result of damage to the front of the sub, this fairing was damaged. However, the GAC antenna and torpedoes remained operational, and urgent repairs were not required. Apparently, the military took into account that in early 2012 K-84: "Ekaterinburg" was to go to combat service, and, according to the rules established in the navy had to pass the so-called dock inspection. So, it was decided to correct the damage during this inspection.



In early December (according to the website of the Deepstorm.ru, the 8th) K-84 was put for inspection in the floating dock PD-50 82nd ship repair plant in the village of Roslyakovo Murmansk region. Next to it, a large anti-submarine ship of Project 1155 "Vice-Admiral Kulakov" was repaired.

Floating dock PD-50 in December 2011. On the left is the large anti-submarine ship Vice-Admiral Kulakov, on the right - K-84 "Ekaterinburg"

Photo: forums.airbase.ru

Was there ammunition in The Ekaterinburg at the time of the fire?

The K-84 was in the dock with missiles and torpedoes on board. Rumors about the presence of missiles and torpedoes on the submarine began to be refuted almost immediately after the reports of the fire. Experts and commentators of different levels of expertise made assurances that at any stage in the docking process, both conventional and nuclear ammunition from warships and submarines is removed.

Nevertheless, the "Powers that be" had every reason to believe that at the time of the fire there *was* ammunition on "Ekaterinburg".

First, putting in the dock for inspection with ammunition is often practiced. Sometimes the ammunition is unloaded: the final decision is made by the commander responsible.

Secondly, unloading and loading torpedoes and especially missiles is not an easy procedure and can last up to two weeks. It can significantly delay the dock inspection (originally conceived as short-term) and disrupt the schedule of the rocket carrier on combat duty. This, in turn, is usually regarded as a tangible (albeit temporary) violation of nuclear parity with the United States (American missile carriers already go out to sea much more often than Russian ones).

Thirdly, according to the "Powers that be", after the fire was extinguished, K-84 did not stay at the plant, and in the first days of January hastily went first to the bay (lip) Roundabout, and then to the lip of Jagielnaya - to a permanent base. In those places are weapons bases of the Northern Fleet, including warehouses of intercontinental missiles and nuclear warheads, as well as equipment for their loading and unloading. It is unlikely that "Ekaterinburg" was urgently withdrawn from Roslyakovo for loading ammunition: after the fire the submarine was out of service for a long time. The only point of this relocation was the task of unloading the missiles and torpedoes that were on the K-84.

Fourthly, the fact of the presence of ammunition at the time of the fire was confirmed by several independent sources in the Northern Fleet naval command.

Thus, it is safe to say that on December 29 at "Ekaterinburg" were:

16 (according to several sources) intercontinental missiles on the R-29RM2 "Sineva" type subs; each of which, according to official data, usually carries four warheads. Each torpedo contains up to 300 kg of explosives. It is possible that one or two torpedoes or rocket torpedoes had nuclear warheads. It is also possible that some of the ammunition was mines. Sources close to the investigation into the fire say three torpedoes were in the first compartment, only the K-84 can carry up to 12 torpedoes; two VM-4SG water-water nuclear reactors with a thermal capacity of 90 MW.



This is what "Ekaterinburg" looked like 15 minutes after the fire
Photo: forums.airbase.ru

How the fire started, developed and was extinguished

After being put in the dock, damage to the GAC fairing was found. To carry out repairs, the workers cut a hole in the bow of the light hull on the left side. Since the morning of December 29, so-called 'fireworks' (metal cutting) was carried out. On the submarine were about 60 crew members led by the commander, Captain of the first rank Igor Stepanenko.

The fire originated at 15:45 (local time coincides with Moscow time) in the bow of the submarine, at the bottom of the space between the light and sturdy hulls. The fire originated in wooden construction structures, it began when droplets of molten metal, sparks or open flames ignited the scaffolding erected by workers around K-84. In such works, scaffolding should be metal, but wooden scaffolding still continues to be used - for example, as temporary structures in places where it is difficult to put metal scaffolding (for example, below the waterline). The rule that wooden scaffolding should be made of specially soaked wood, which does not catch fire from sparks, is almost always neglected.

Finally, in the nose where the repairs were going on, there could have been things brought here by sailors or workers for convenience: for example, wooden boards, or old cotton wool to sit on. Once the sparks hit them, these objects could have been the source of a fire.

Some blogs written about the fire state that the external rubber anti-hydrolocation coating had caught fire. Many eyewitnesses of the fire mention the strong smell of burnt rubber in Roslyakovo. On the one hand, the high-strength special-covering of NPPRK-7D does not just burst into flames, according to the sailors, they can light a fire without any risk. On the other hand, in conditions of long-term exposure to high temperatures, this rubber can begin to smolder and burn, but it is not easy to put it out. In addition, the sound-absorbing rubber coating, which is plastered on all sides of the inside fence GAC, could catch fire.



For repairs, workers cut a large hole in the lightweight hull
Photo: forums.airbase.ru

The flames spread rapidly in the space between the two hulls. A column of smoke rose above the dock, the flames could be seen, even from the shore. On Roslyakovo, Murmansk and Severomorsk bases there were alarming rumors about a burning nuclear submarine. A couple of hours later the information got to the media; at 17:37 the fire was reported by the website of the Murmansk broadcaster TV-21.

First, the fire was extinguished by the fire department and the sailors on the watch, and the fire brigade was called soon after that. The fire boat project 1461.1 approached the dock. Soon emergency parties arrived with vice-admiral Kulakov, firefighters from Murmansk and Severomorsk arrived to help; at least three tankers poured water onto the boat directly from the staple deck of the dock. A fire helicopter arrived and two more fire boats and a rescue tug SB-523 arrived a short time later.

The fire spread in a narrow, hard-to-reach space between the sturdy and light hulls, which was clogged with all sorts of devices. Near the fire center there were a lot of explosive substances and devices: torpedo ammunition in the first compartment and batteries in its hold, cylinders with high-pressure air. It was almost impossible to determine where the fire was burning and in which directions the fire was spreading; it was also extremely difficult to reach the fire.

Unable to get into the GAC fence, firefighters flooded the boat from the outside - through holes in the light hull. Since the GAC fence is leaky, most of the water just flowed down to the dock deck through the holes in the lower part of the lightweight hull. Perhaps in such a situation foam would be more effective, but none of the videos taken showed it being used.

The situation was aggravated by the firefighters' lack of special training in extinguishing fires on submarines, especially nuclear ones. According to experts, in the current situation it would have been possible to make cutouts in the submarine's light case to access the fire, but this wasn't done.

The strongest fire raged next to the torpedoes, just 40m from the missile shafts and 100m from the nuclear reactors. In order to avoid an explosion, the sailors began unloading torpedoes from the craft in the first compartment. However, this was not easy: the hydraulic systems did not work, and the torpedoes had to be pulled out by hand. If there were spare torpedoes on the racks in the compartment, at first, they had to be moved somewhere and thus make room for those that were being extracted from the racks. According to rumors, one of the torpedoes remained in the torpedo loading machine: it is unknown whether it was stuck during unloading, or it simply had nowhere to go. However, the official government line was that the sailors managed to unload all the torpedoes.



Mid-afternoon December 30: Firefighters continue to flood the fire through emergency and emergency holes in the light hull

Photo: forums.airbase.ru

By the evening, the flames continued to spread and it was not possible to control the fire. Amateur video footage clearly shows a pillar of fire coming out of the boat, regularly increasing in size. At some points, the pillar of fire reached the height of the mast "Kulakov" - 15-20 m. In Roslyakovo (population about 9 thousand people), Murmansk (300,000) and Severomorsk (50 thousand), a regime of increased radiation control was implemented. The water area of Kola Bay was closed for navigation.

According to rumors, some high-ranking officials of the Ministry of Defense demanded that the K-84 be withdrawn to Kola Bay, where it was to go under water, in order to eliminate the fire. However, no one knew how to organize the withdrawal from the dock or how to make the burning submarine dive underwater with only half the crew and jammed reactors.

A simpler idea, to flood the PD-50, so that sea water flooded at least part of the fire was immediately suggested. However, first it was necessary to find out whether the water would flood the interior rooms of the Kulakov BPC. As a result, the dock was slightly flooded but it did not work. It had to be flooded a second time, only then did the intense flames reduce in height, but small pockets of fire still remained. The firefight was urgently joined by a brigade of firefighters who arrived from Moscow, they specialized in extinguishing "special objects." These were particularly hazardous fires involving explosives or inflammable chemicals. The authorities flew to the places where these types of events occurred. During the event described here, the head of the navy Vladimir Vysotsky arrived in Severomorsk, early in the morning along with the chief of the general staff Nikolay Makarov.

By the morning of December 30, the situation had been brought under control, but firefighters continued to flood the hot parts of the boat's structure in order to cool them down. In fact, the extinguishing lasted until midday on December 30, and the Ministry of Emergency Situations of the Russian Federation only reported on its website about the completion of work to eliminate the fire at 18:19 on that day.

According to official information, 408 people and 72 units of equipment were involved in the fight against the fire, including 172 people and 30 units of equipment from the Ministry of Emergency Situations. Seven crew members and two firefighters were poisoned by smoke, officials said. Residents of Murmansk, Severomorsk and Roslyakovo wrote on social media that there were at least 15 victims, injuries included burns and frostbite, and that one person was hospitalized.

What could have happened

The question: "what could have happened if..." is only possible in general terms, but it is clear that the consequences of the spread of the fire could have been extremely tragic.

If even part of the torpedo ammunition in the first (nose) compartment was detonated, it would not have been possible to continue extinguishing the fire: the firefighters would simply have been swept away by an explosive wave. The second (residential) and third (central) compartments in the submarine would most probably have been destroyed in the explosion. This is confirmed by experience on January 11, 1962, when an explosion of torpedoes on the submarine B-37 in the base of the Northern Fleet Polar submarines tore off the entire bow part on the cabin, its elements were scattered for several kilometers.

The explosion of the rockets would have caused further large-scale destruction of the boat - and the seventh (reactor) compartment could have been in the fire zone. High temperatures and shock waves could have led to the destruction of the active zones of reactors and several tons of radioactive substances (active zone, cooling liquid, structures of the first circuit, etc.) would have been in the fire zone and could have further entered the environment (water, air and soil).

As a result, not only residents of Roslyakovo, but also neighboring Murmansk and Severomorsk would have been at risk. To evacuate almost 400,000 people in the conditions of the polar winter from the Kola Peninsula is a practically unsolvable task. There could have been panic among the population, and it is not known how the authorities would have managed to calm the citizens and organize their rescue.

In addition, dozens of people in and around the dock would have been killed in the Ekaterinburg explosion. The dock itself, the boat and the entire Kulakov BPC docks would have been destroyed, and the Kola Bay area would have been contaminated.

What exactly saved us from such a disaster: whether the skillful actions of the people who put out the fire, the heroism of the sailors pulling the torpedoes out of the red-hot torpedo racks; the competent actions of commanders; the timely decision to sink the dock or a simple accident, is not known for sure. However, one of these factors or a combination of them avoided a large-scale catastrophe!