AWESOME stories

A NUCLEAR ACCIDENT

A member of the U.S. Navy, on duty aboard a plane flying over the North Atlantic on the 29th of February 1972, took a picture of a Soviet ship below. It is believed to be the *K-19*, a vessel once massively disabled (in 1961) because of a nuclear accident which had occurred in the ship's power plant. In February of 1972 it was disabled again, this time due to a fire which ended the lives of 29 sailors. This US Navy image is included in *Cold War Submarines*, by Norman Polamar and K.J. Moore (at page 112).

As *K-19* continued her homeward trip, following a successful testing of her missile systems, she was at a depth of 100 meters. Everything had gone well, so far. Lt. Yuri Povstyev, the ship's 28-year-old officer in charge of the sub's propulsion system, had worked hard to make sure everything was working properly.

Inside the ship's power plant, conventional and nuclear technology worked together. Yuri wasn't really sure how radioactive material (in the primary coolant system) could end up as clean steam which ran the ship's propulsion and generator systems. Part of the system he trusted and understood; the other he wasn't so sure about.

Just before he planned to get a few hours of rest, Yuri looked at the controls one last time. What he saw was the first hint of impending disaster.

The needle in the primary coolant pressure gauge for the port reactor inlet began to vibrate and point counter-clockwise. It could only mean one thing: The reactor's cooling loop had malfunctioned and the material inside would get hotter—a lot hotter. In fact, it would get so hot that a nuclear meltdown could occur unless something was done to reverse the process.

Yuri saw that the system's pumps were unable to maintain pressure. He made an immediate judgment which later proved correct. *K-19* had a leak in her primary coolant line. A leak, that is to say, in the worst of all possible places. A leak in the line that contained highly radioactive material.

Later, after the investigations, the cause of the accident was clear. Captain Zateyev saw photographs which confirmed Yuri's suspicions:

> *(T)hey showed us photographs of the rupture in the pulse tube and allowed us to read the conclusions of the accident investigation committee. The rupture of the tube was attributed to the following factors: During installation of the primary cooling loop pipelines, welding safety procedures had been violated. These procedures called for all surfaces to be covered with asbestos drop cloths in order to keep even a single drop or spark from a welding rod from falling on the polished surface of the pipelines. This rule was disregarded because of the cramped spaces in which the work was performed. Drops of liquid metal from the welding electrodes fell on an unprotected surface. Wherever these drops fell on the pipeline, i.e., its surface layer of metal, molecular tension developed and led to the appearance of micro cracks in the metal.* (*K-19*, page 152.)

Perhaps, had the submarine not been on military maneuvers, requiring it to dive, the minute cracks would not have grown. But that was not the case. Captain Zateyev continues:

> *When those micro cracks later came into contact with chlorides (seawater inevitably makes its way into the bilge and from there, as vapors, it enters recesses), the micro cracks gradually developed into ordinary cracks extending through the entire wall of the pipeline, forming so-called "plugs." The strength of the pipelines wherever drops fell on them from welding rods was thus greatly compromised. After prolonged and intensive operation of the reactor with coolant circulating through the primary loop under a high working pressure (200 atmospheres), a pressure gauge pulse tube finally ruptured.* (*K-19*, page 153.)

Because a welder was careless, Soviet sailors would die.

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