Kursk's potential environmental impact

While desperate measures are being taken to rescue possible survivors, there are several unanswered questions concerning the condition of the two reactors onboard Kursk.

, Frederic Hauge and Thomas Nilsen, 2000.08.16 23:54

Kursk is equipped with two 190 MW third generation Russian submarine reactors. These are the most modern operational reactors in the Russian navy. The reactors are reportedly shut down, and so far no traces of radiation neither in air nor water in the area surrounding the sunken submarine have been detected. The submarine's hull, at the part where the reactors are situated, is not reported damaged. The super structure is of very solid construction. It is not been reported any radio-contact with the submarine after the accident on Saturday, which indicates that the command-bridge also might be flooded, or in another way, been put out of operation.

The reactors have an automatic shutdown system in case of an accident. In the event of a shutdown of the reactors, a passive cooling system is activated. This system will activate whether the reactor has been shut down manually or by the automatic shutdown-system. When reactors are shutdown, they still need a certain degree of cooling. Batteries operate the active cooling system. The batteries are situated aft of the reactor-department, and has not been reported damaged. Different factors can indicate that the electrical system broke down immediately after the accident, at least in parts of the submarine.

Third generation reactors are, in opposite to the first an second generation reactors, equipped with a passive cooling system that operates mechanically independent of external power sources.

Kursk has been in operation for five and a half-year, but it is not known how long it has been since, or if, the fuel rods have been changed. This will affect the isotope composition in the reactors. In addition, information regarding the lengths of time the reactors had been operating on the fatal cruise before it sank is not available. This may have great significance for the temperature in the reactors after the shutdown.

It is highly unlikely that the reactors can re-start by themselves, but the heat-development in the reactor core can involve that the fuel elements will get cracks in the cladding.

The Barents Sea, is today one of the cleanest, and at the same time, most vulnerable ocean-areas in the world. Measurements the last years show that the level of radioactivity up to 1 becquerel (Bq) per kilogram fish, this is far lower than, for instance, the Baltic Sea where levels is more than 10 Bq per kilogram. The radioactivity that can be traced has been transported to the Barents Sea there by the Gulf stream, mainly from the two European reprocessing-plants, Sellafield in England and Le Hague in France.

It is reason to believe that the pollution first and foremost will strike local areas surrounding the area of the accident, and that the dilution in the Barents Sea will insure that this area broadly speaking will still be one of the worlds most important and cleanest fishing-areas.

The challenge regarding Kursk's two reactors will first and foremost be attached to the more long-term perspectives. Like Bellona's Northern Fleet Report documents, there are plenty

storages for spent nuclear fuel from submarines and discarded submarines, still containing nuclear fuel in their reactors, which need resources and technology. The fear of contamination of the Barents Sea must therefore be attached to the problems regarding the lack of maintenance, security and technology, to prevent gradual leakage the coming years.