

**Loss of submarine KURSK  
August 12, 2000**

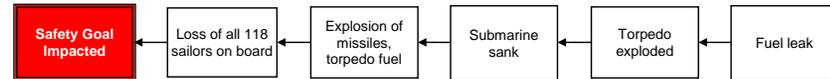
On August 12, 2000, a torpedo exploded on KURSK, leading to the eventual loss of the submarine and all on board. We can demonstrate the causes of the KURSK tragedy by performing a visual root cause analysis, or Cause Map. A thorough root cause analysis built as a Cause Map can capture all of the causes in a simple, intuitive format that fits on one page.

**Step 1. Outline the Problem**

<b>What</b>	Problem(s)	Torpedo explosion, sinking
<b>When</b>	Date	August 12, 2000
	Time	Initial explosion 11:28 a.m.
	Differences	Fuel leak on torpedo
<b>Where</b>	Physical Location	Southern Barents Sea
	Unit/Process/Equipment	KURSK - Russian attack submarine
	Work/Task Being Done	Torpedo firing drill
	<b>Impact to the Goals</b>	
	<b>Safety</b>	Loss of all 118 sailors on board
	<b>Materials, Labor</b>	Loss of submarine

First we define the problem(s). Here, the problems include a torpedo explosion and submarine sinking. This is the "what". The initial explosion on KURSK occurred at 11:28 a.m. on August 12, 2000. This is the "when". The KURSK (a Russian attack submarine) was in the southern Barents Sea, performing a torpedo firing drill. This is the "where". We'll also frame this incident with respect to the impact to the goals. The safety goal was impacted because all 118 sailors on board were killed. The materials goal was impacted because of the loss of the submarine. There are other goals that were impacted, but for our basic analysis, we will stop here.

**Step 2. Cause Map  
5-Whys (High Level)**



Next we perform the analysis portion of the root cause analysis. We can begin by using the "5-Whys" technique. We start with the impact to the safety goal, and ask "why" 5 times. For example: Why was the safety goal impacted? Because 118 sailors died. Why? Explosion of missiles and torpedo fuel. Why? The submarine sank. Why? A torpedo exploded. Why? A fuel leak on the torpedo. This Cause Map is shown above. Though the resulting Cause Map is accurate, it's not complete.

**Cause Map  
Detail Level**

We can add additional causes to make our map more complete. For example, although 95 sailors were killed directly by the explosion, the remaining 23 sailors actually died from carbon monoxide poisoning because they were trapped in the aft compartment due to the submarine sinking.

A higher detail Cause Map is shown to the right. Even more detail can be added as the root cause analysis investigation continues. The level of detail in a Cause Map is determined by the impact to the organization's goals. Because of the tragically high number of deaths in this incident, it will be worked to a very high detail. The highest detail level Cause Map has more than 150 causes.

