Destroying Chemical Warfare Agents in Russia: A Hypothetical Scenario

Russia has a large stockpile of chemical warfare agents stored in an area that has a high population density. Russian engineers are planning to destroy this stockpile using a technology developed by the U.S. Army. An analysis of the technology shows that there is a probability of 5×10^{-4} that there would be a catastrophic accident at a plant using this technology. The engineers are considering two alternatives, as follows:

1. Destroy the stockpile at the location where the agents are stored. If a catastrophic accident occurs at this location, which has a high population density, the number of deaths is expected to be 1000.

2. Transport the stockpile by rail 3000 miles to a location in Siberia where the population density is very sparse. A catastrophic accident in the Siberian location would result in only 2 deaths. However, the probability of an accident on the poorly maintained Russian rail system is 1×10^{-5} per mile. A rail accident is expected to result in 2 deaths.

The Russian government has hired you as a consultant to help decide which alternative poses the lowest risk. Calculate the risk of each alternative. What is your recommendation?