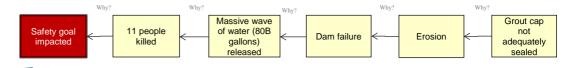
Teton Dam Failure

On June 5, 1976, the Teton Dam failed releasing approximately 81,800,000,000 gallons downstream in about five hours. Eleven people lost their lives. The flood waters reached almost 300 square miles of land which included 100,000 acres of agricultural land and 32 miles of rail lines. This accident cost the Bureau of Reclamation close to \$400 million dollars.

5-Why Cause Map



Start Simple An analysis breaks a problem down into basic cause-and-effect relationships. The 5-Why Cause Map (above) is a simple and quick way to start an investigation, but with the exception of the simplest incidents you need to continue asking questions and expand the Cause Map. Adding more causes naturally leads to a wider range of solutions being considered. A quick 5-why may focus on the stresses applied to the dam,

Basic Cause-and-Effect Relationship

Expand as Needed By continuing to ask "why" questions, the 5-why Cause Map guickly becomes a 19-why Cause Map, including more useful detail. Earthquake Evidence: No seismic events larger than M 2.2 during construction or filling Dam filled to of the dam capacity Settlement AND / OR Cracking of core Beginning of the dam failure material filling AND / OR key trench Differential 19-Why Cause Map strains Massive wave of water (80B Impact to Highly erodible Stresses on dam 1 people killed Scarcity of more AND Safety gallons) present material used suitable rock eleased for core Evidence: Core material was silt, or soil classification ML AND / OR Residential & Impact to AND agricultural Property, Equipmen property Open joints in upstream & Erosion downstream faces of abutment AND Dam failure AND Grout cap not adequately sealed Geometry of key trenches weakened dam AND / OR Imperfect Strength of dam routing of rock compromised below grout cap AND / OR Cracking in the key trench fill End of the dam failure Cause Mapping[®] Why? Because. **::: ThinkReliability** To learn more visit our website at www.thinkreliability.com Effect Cause Copyright 2018 ThinkReliability, Novem, Inc. email: info@thinkreliability.com phone: 281-412-7766