Three Mile Island

On March 28, 1979, there was a partial meltdown of the core in the number 2 reactor at Three Mile Island Nuclear Generating Station (TMI-2) near Harrisburg Pennsylvania. This incident remains the worst accident in the history of U.S. commercial nuclear power. No one was injured and there was no significant release of nuclear radiation, but there was the real potential for a major disaster. The accident also stoked concerns about the safety of nuclear power and led to drop in public support for nuclear power.

26-Why Cause Map

A Cause Map visually lays out the cause-and-effect relationships that contributed to an incident. It is built by starting at the impacted goals (the red boxes) and asking "why" questions to add additional detail.

Production goal impacted

Safety goal impacted

Environmental goal impacted

TMI-2 permanently shut down

Potential for serious injuries

Potential for significant nuclear release

PARTIAL MELTDOWN OF REACTOR CORE

Reactor core uncovered

Large volume of primary coolant lost

Automatic emergency cooling system manually overridden

No actions were taken to block or close relief valve for several hours

Operators didn’t recognize loss of coolant event was occurring

Operators didn’t know pressure relief valve was open

Valve didn’t reseat as designed

Primary plant pressure increased

Plant design - see diagram above.

Evidence: Post accident investigation determined that about half of the fuel had melted.

Evidence: A large amount of coolant was lost from the primary. Coolant overflowed tank the pressure relief valve overflowed into.

Evidence: Rapid pressure drop.

Evidence: Plant indications.

Evidence: All feedwater pumps tripped off, plant indications.

Evidence: Rapid pressure drop.

Evidence: Plant indications.

Evidence: Main feedwater pumps tripped off.

No flow to secondary side of steam generators

No heat was removed through steam generators

TMI-2 was too badly damaged and contaminated to result operations. It has only been online

NRC graphic of TMI-2. Copied from the NRC website.

Simplified plant diagram of TMI-2. Copied from the NRC website.

Copyright 2018 ThinkReliability, Novem, Inc.

To learn more visit our website at www.thinkreliability.com
Email: info@thinkreliability.com Phone: 281-412-7766