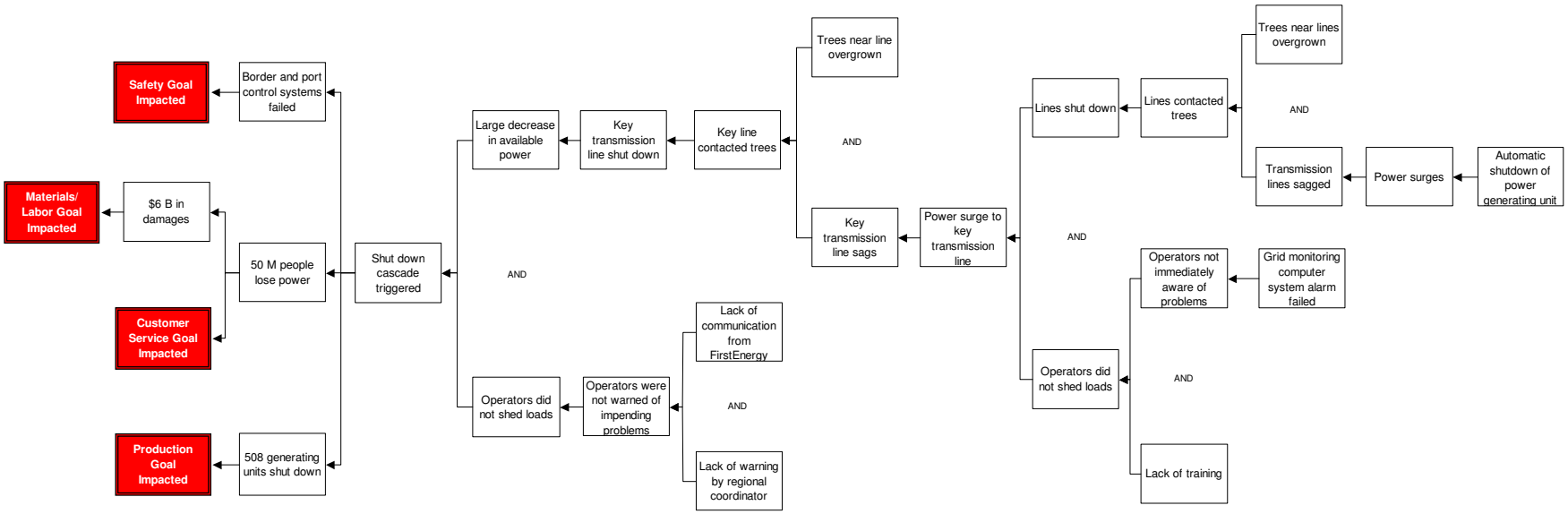
Northeast Blackout of 2003

On August 14, 2003, over 50 million people in the U.S. and Canada were without power, some for several days. Damages from the loss of power - including damaged refrigerated items and looting - totalled approximately $6 billion (U.S.). 508 generating units shut down, resulting in the loss of border and port control systems. After the blackout, a U.S.-Canada Power System Outage Task Force was appointed to investigate the cause. We will use the data they obtained to perform a root cause analysis of the event. 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.

The blackout was triggered by a shut-down cascade, unsustainable power surges in numerous transmission lines. This occurred due to a supply/demand mismatch - a large decrease in available power without load shedding (where operators drop some consumers off the grid to prevent outages). Operators did not shed loads because they weren't warned of impending outages, due to a lack of communication from FirstEnergy, the company whose lines began shutting down first, and a lack of warning by the regional coordinator.

The decrease in available power was due to a key transmission line being shut down. This happened because the line contacted overgrown trees when it sagged due to a power surge thanks to other, smaller lines shutting down when they sagged and touched overgrown trees. The lines originally sagged due to power surges caused by an automatic shutdown of a power generating unit. The power surge could have been stopped by operators shedding loads, but they did not because they were not immediately aware of problems, thanks to a failure in their grid monitoring equipment, and due to a lack of training.



Cause Map
Detail Level

ThinkReliability
Houston Office 281-489-2904
www.ThinkReliability.com

Why?

Effect ← Cause

NOTE: Read the Cause Map from left to right with the phrase "Was Caused By" in place of each arrow.

Due to the complexity of the event, it is possible to make a much more detailed Cause Map. As with any investigation the level of detail in the analysis is based on the impact of the incident on the organization's overall goals. For example, this map has 21 boxes. The detailed map of the findings of the Task Force has more than 70 boxes, and is at a more appropriate detail to find solutions to ensure that this sort of energy reliability problem does not happen again.