

1 Problem

What	Problem(s)	Fire, release of brakes, derailment, crash, explosions, more fires
When	Date	July 6, 2013
	Time	~1:15 a.m.
Where	Different, unusual, unique	Train unmanned; parked in Nantes, Quebec
	State, city	Lac-Megantic, Quebec
	Facility, site	Railway
	Task being performed	73-car train; 72 tanker cars contained crude oil

Impact to the Goals

Safety	24 known dead; 26 presumed dead
Environmental	Leakage of crude oil (amount unknown)
Customer Service	High potential for litigation
Production-Schedule	Possible impact on rail shipments?
Property, Equip, Mtls	Much of town destroyed
	Damage to train
Labor, Time	Emergency response, cleanup

Frequency	High death toll rare; worst rail disaster in North America in more than 20 years
-----------	--

TRAIN DISASTER KILLS 50

Train rolls down hill with insufficient braking

Cause Map

A 73-car train was parked uphill, and left unmanned in a town in Quebec, Canada. After the main engine was turned off, the brakes released and the train rolled downhill. The derailment, subsequent explosions and fires resulted in 50 assumed deaths.

"This tragedy notwithstanding, movement of hazardous material by rail not only can be, but is being, handled safely in the vast majority of instances."
- Spokesman for Canadian National

More Detailed Cause-and-Effect

For the train to roll backwards down the hill, both sets of brakes had to be ineffective. The railway company has stated that the air brakes released because the main engine had been shutdown. However, "since the 19th century, railways in North America have used an air-braking system that applies, rather than releases, freight car brakes as a safety measure when it loses pressure." This certainly makes more sense than having brakes be dependent on engine power.

The hand brakes functioned as backup brakes. The number of cars (which, when on a hill, affects the force pulling on the train) determines the number of handbrakes required. In this case, the engineer claims to have set 11 handbrakes, but the rail company has now stated that they no longer believe this. No other information - or evidence that could help demonstrate what happened to either sets of brakes - has been released.

Also of concern are the style of train cars - believed to be the same that the NTSB identified as "subject to damage and catastrophic loss of hazardous materials".

Cause Mapping is a Root Cause Analysis method that captures basic cause-and-effect relationships supported with evidence.

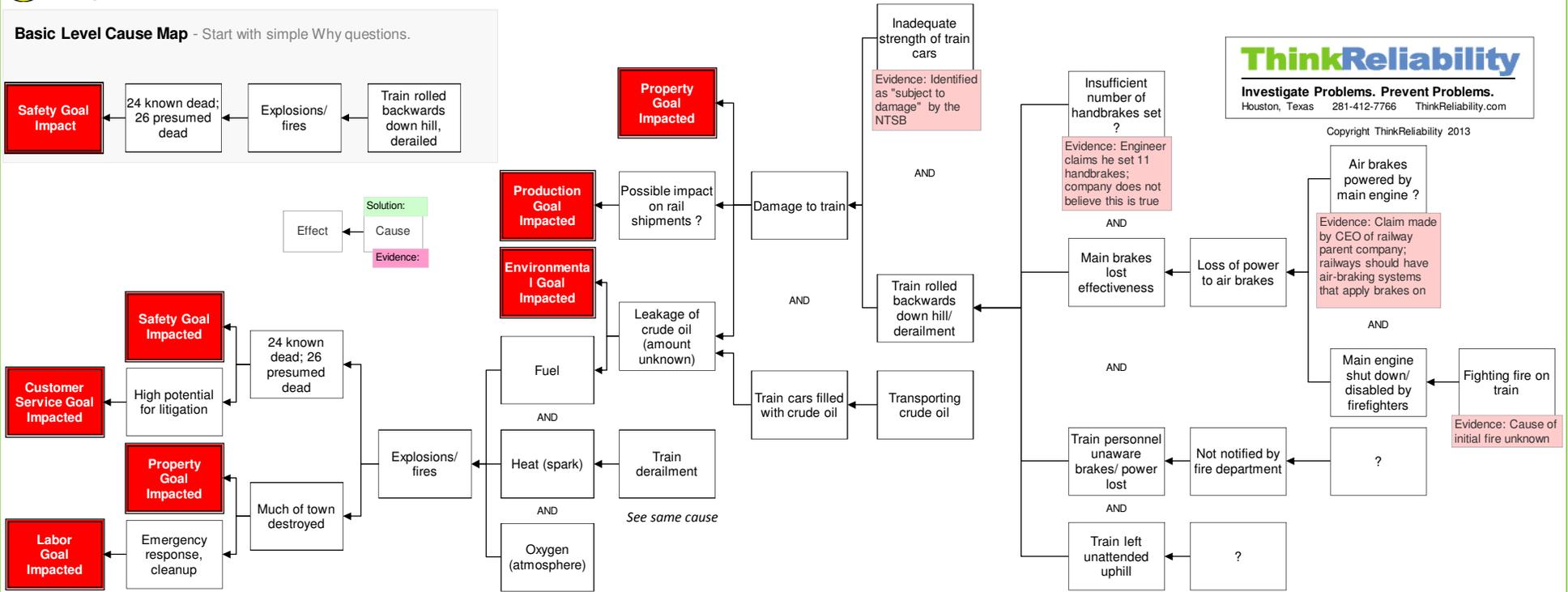
CAUSE MAPPING

Problem Solving • Incident Investigation • Root Cause Analysis

- Step 1 Problem** - What's the Problem?
- Step 2 Analysis** - Why did it happen?
- Step 3 Solutions** - What will be done?

2 Analysis

Basic Level Cause Map - Start with simple Why questions.



Copyright ThinkReliability 2013