

Step 1. Outline

What	Problem(s)	Power outage		
When	Date	March 14, 2010		
	Time	~8:50 p.m.		
	Different, unusual, unique	Area hit by earthquake on February 27th, 2010		
Where		Chile (2,000 km; ~80% of population)		
	Task being performed	Producing electricity		
Impact to the Goals				
	Safety	?		
	Environmental	?		
	Cust. Service	Power outage		
	Production-Schedule	Power outage		
	Property, Equip, Mils	Repair to damaged transformer		
	Labor, Time	Repair to damaged transformer		
		This incident	\$0	
	Frequency	?	Annualized Cost	\$0

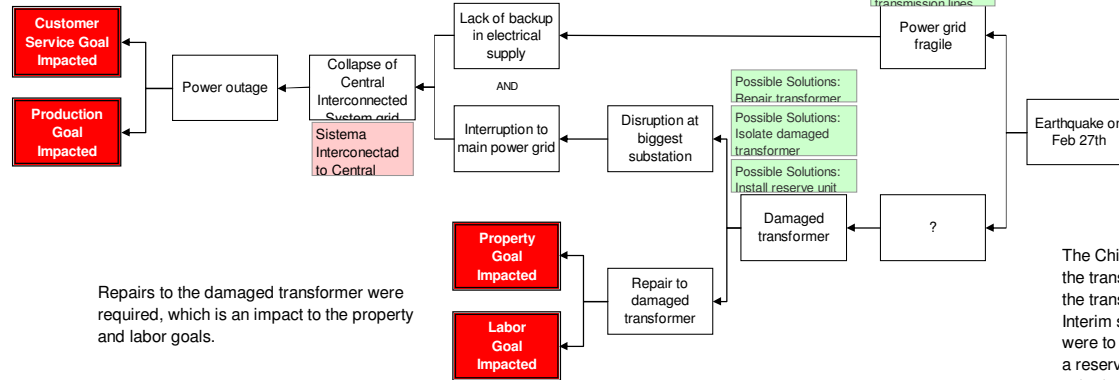
A power outage struck Chile less than a month after an earthquake struck. The power outage affected an area of nearly 2,000 kilometers and roughly 80% of Chile's population. Power in most areas was restored within several areas. However, it was estimated that power to some in the Bio Bio region - which received more severe infrastructure damage - might be out for the better part of a week.

Power Outage Chile March 14, 2010

Timeline		
Date	Time	Description
February 27, 2010		8.8 magnitude earthquake hits Chile
March 14, 2010	8:43 p.m.	Power out for most of Chile
	9:45 p.m.	Power restored to some areas in Santiago
March 15, 2010		Power restored to normal in all areas except the Bio Bio region
	8:08 a.m.	Aftershock of magnitude 6 hits offshore Maule
	11:00 a.m.	Power restored to 80% of the population in the Bio Bio region

Step 2. Cause Map

A power outage is an impact to the customer service and production/ schedule goal. The power outage was caused by the collapse of the Central Interconnected System (Sistema Interconectado Central). The grid collapse was due to a lack of backup power capabilities, which was caused by a fragile power grid as a result of the earthquake, and interruption to the main power grid. This interruption was caused by a disruption at the biggest substation due to a damaged transformer. It's unclear what caused the damage to the transformer, but it is believed to be related to the earthquake that hit in February. We show this by adding a cause box with a question mark between "damaged transformer" and



Repairs to the damaged transformer were required, which is an impact to the property and labor goals.

The Chilean government pledged to repair the transformer within 48 hours and stabilize the transmission lines within a week. Interim solutions to get the electricity flowing were to isolate the damaged unit and install a reserve. Additionally, Chileans have been asked to conserve electricity to minimize the amount of power transmitted through the lines.

Step 3. Solutions

No.	Action Item	Cause
1	Conservation of electricity	Power grid fragile
2	Stabilize transmission lines	
3	Repair transformer	Damaged transformer
4	Isolate damaged transformer	
5	Install reserve unit	

Cause Map Detail Level



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