CAUSE MAPPING®

Problem Solving • Incident Investigation • Root Cause Analysis • Risk Mitigation

Example - Case Study

A Root Cause Analysis of the Titanic - Simple to Detailed

Investigating and preventing complex problems in your business.

How a Simple 5-Whys can Turn Into a Complete and Thorough Analysis

ThinkReliability
Investigate Problems. Prevent Problems.

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Houston, Texas 281.412.7766

Root Cause Analysis - Cause Mapping Method

Step 1. Define the Problem

Step 2. Conduct a Cause-and-Effect Analysis (visual, simple to detailed)

Step 3. Identify Solution Options to Mitigate Risk (select the best ones)

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Root Cause Analysis - Cause Mapping Method

Step 1. Define the Problem

What	Problem(s)	Titanic sank, ship hit iceberg, people died, weak rivets
When	Date, time	April 14th, 1912, ~11:40 pm
	Different, unusual	Maiden voyage, five ice warnings, nighttime
Where	Geographic location	North Atlantic
	Company	White Star Line
	Equipment, unit, area	RMS Titanic, starboard bow
	Task (work process)	Transporting passengers from UK to US

Impact to the Overall Goals

Safety	1500 Fatalities (705 survivors)	
Customer Service	Major ?	
Operations, Schedule	Major ?	
Property, Equip.	Lost entire ship	$ 7,500,000
Frequency	1x	

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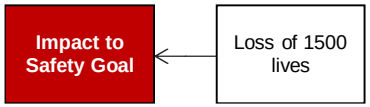
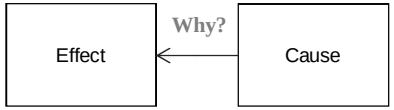
Step 2. Analysis

Titanic Sank

Cause Map





Basic Cause-and-Effect Relationship

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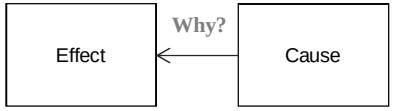

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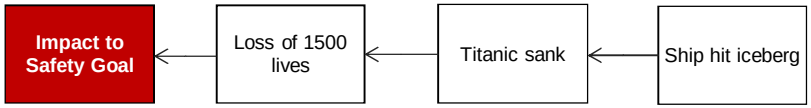

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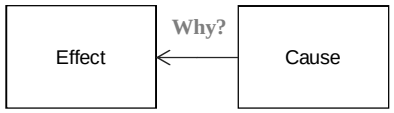

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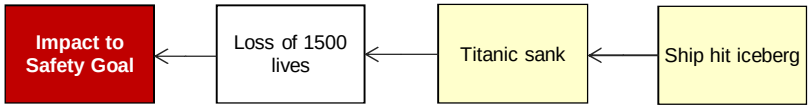

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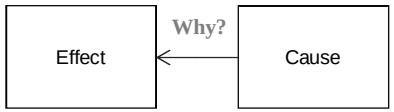

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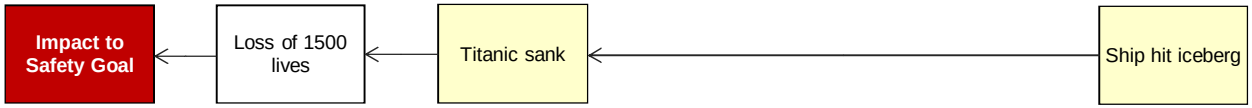

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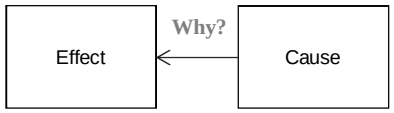

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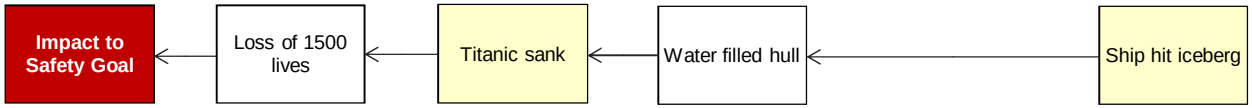

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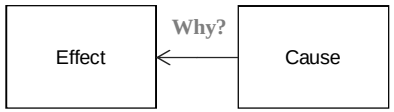

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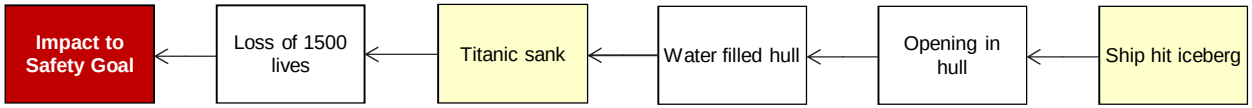

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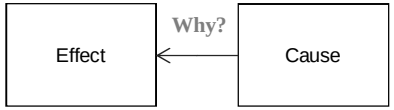
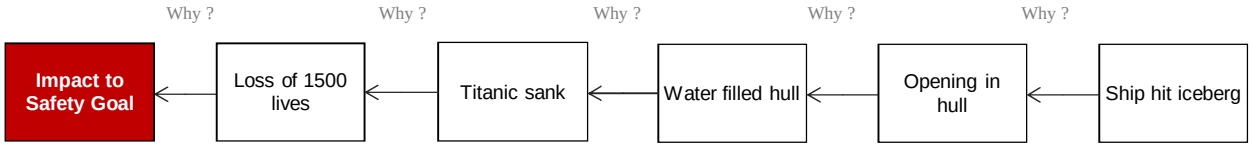


Basic Cause-and-Effect Relationship

Cause Map

5-Whys is simply a Cause Map with 5-Why questions, but there are more....



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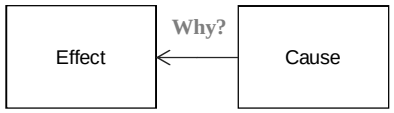

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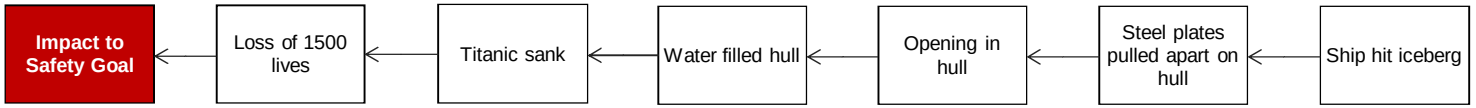

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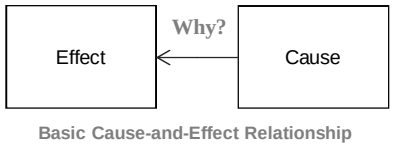

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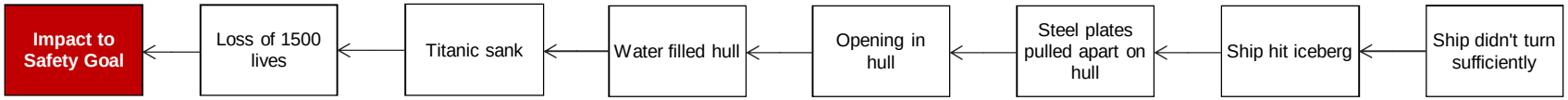

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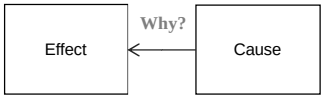

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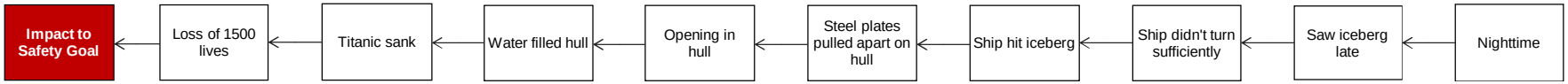

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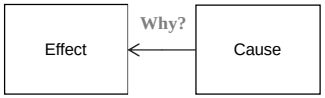

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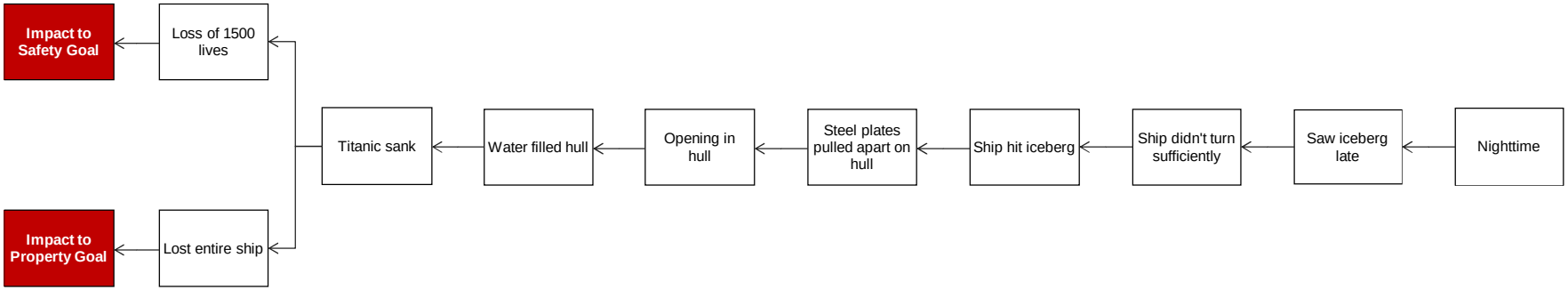

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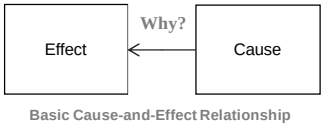

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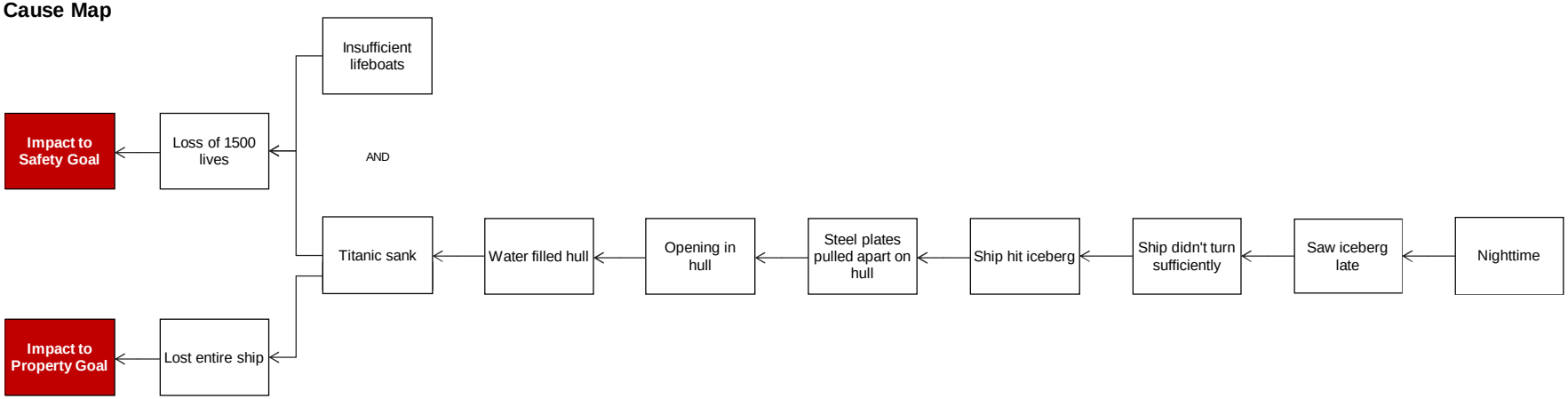

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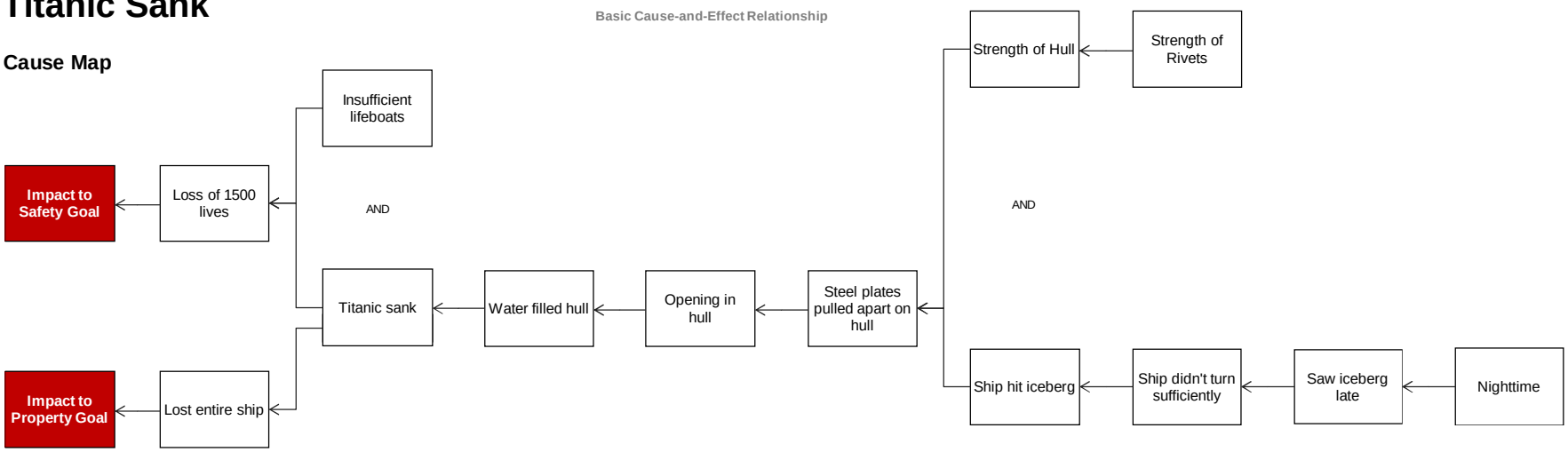

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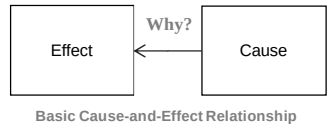

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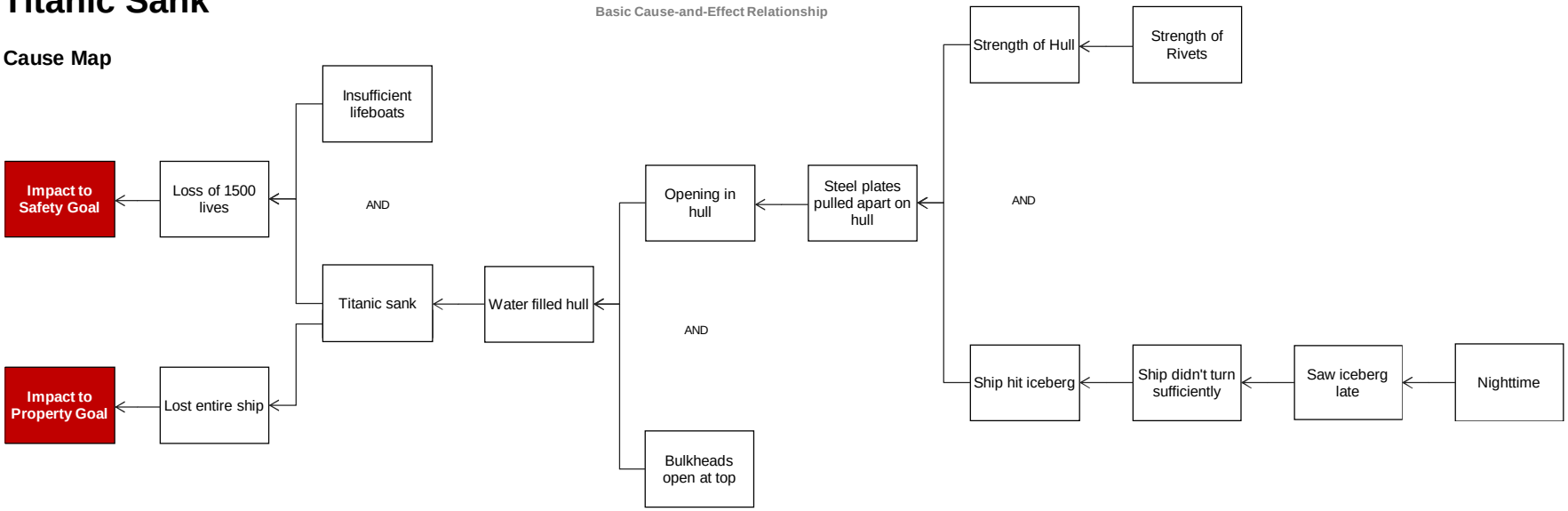

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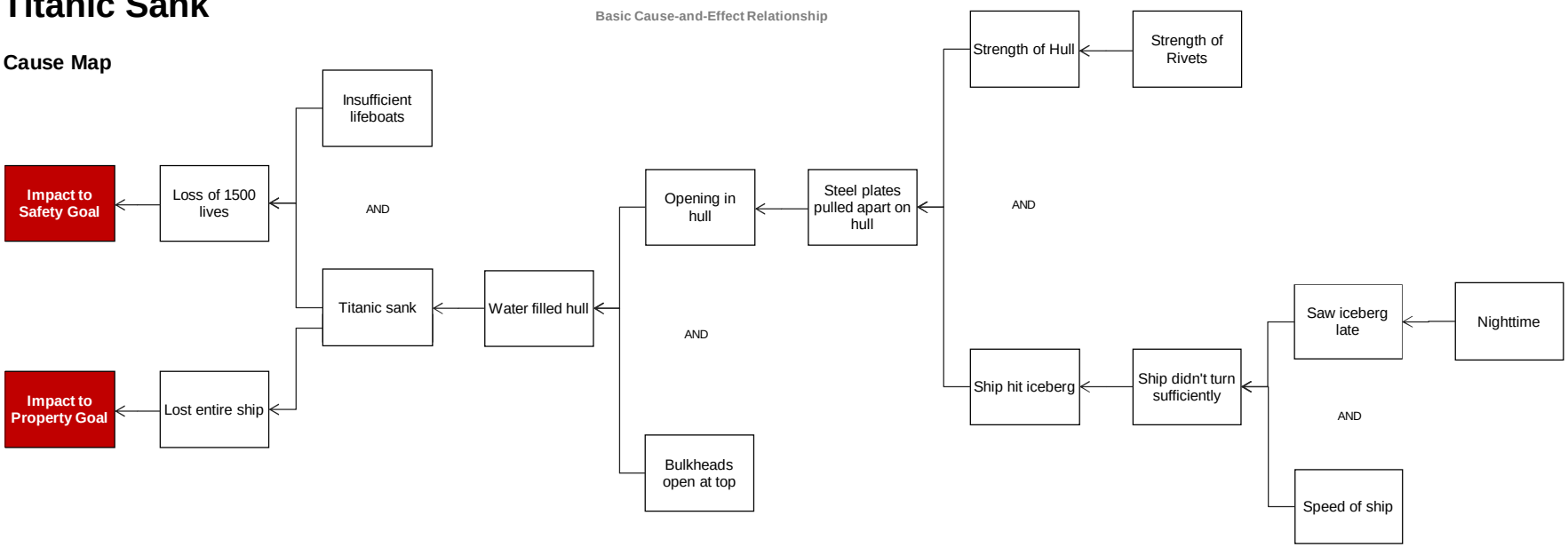

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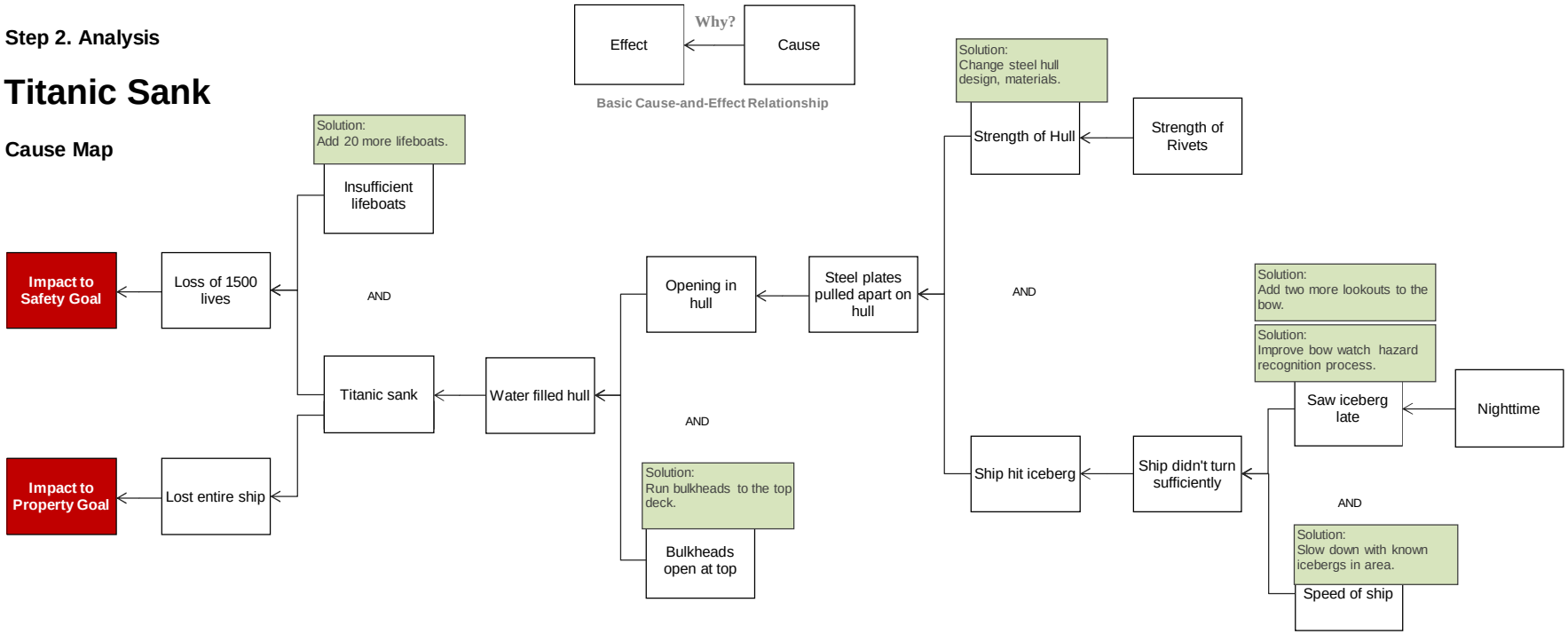

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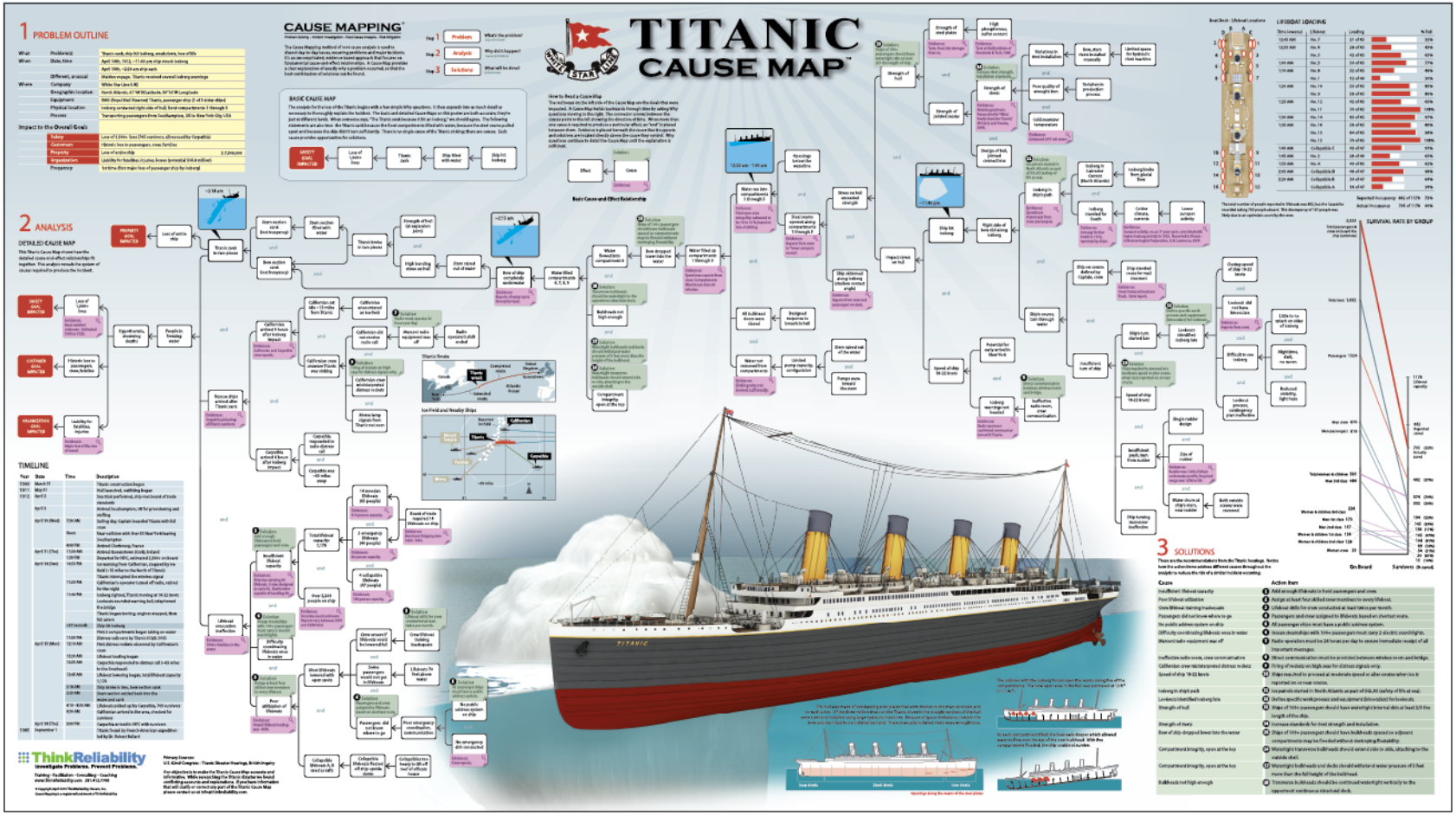
TITANIC
CAUSE MAP
CAUSE MAPPING
1 PROBLEM OUTLINE
2 ANALYSIS
3 SOLUTIONS
TIMELINE
LIFEBOAT LOADING
SURVIVAL RATE BY GROUP
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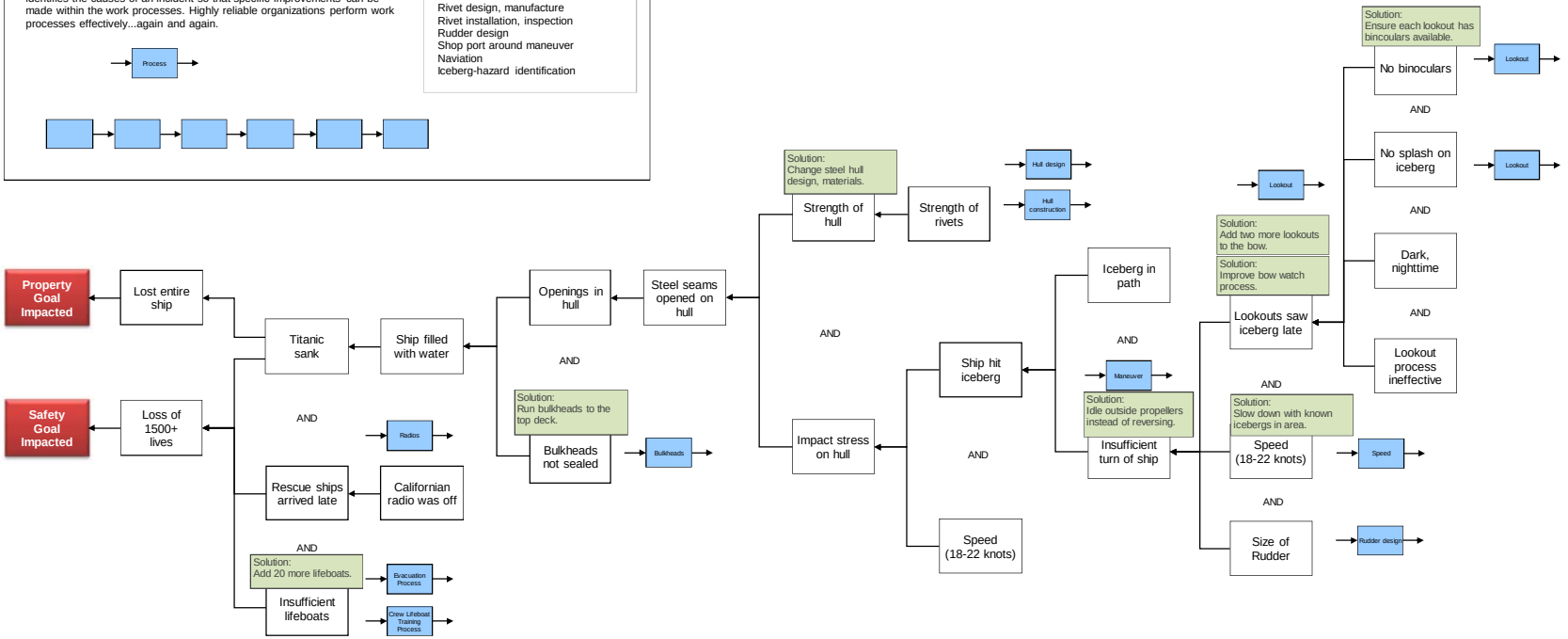
Work Process - A series of steps to produce an end.

Every task in an organization is part of a work process. An investigation identifies the causes of an incident so that specific improvements can be made within the work processes. Highly reliable organizations perform work processes effectively...again and again.

Work Processes the Broke Down

- Lifeboat evacuation
- Rescue communication
- Rivet design, manufacture
- Rivet installation, inspection
- Rudder design
- Shop port around maneuver
- Naviation
- Iceberg-hazard identification

Titanic Cause Map with "Broken" Work Processes Identified



NOTES

- A Cause Map shows the causes that produced a particular incident (**the Analysis**).
- Each causal path reveals specific work processes that broke down (**Pinpoints Necessary Changes**)
- Solutions are implemented as changes within those particular work processes (**Best Practices going Forward**).
- Every cause and every work proccess does not need to be solved (**Lowest Acceptable Risk**).

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