# Engine Room Fire Results in Cruise Ship Nightmare

**Gulf of Mexico**
**February 10, 2013**

## 1 Problem

| | | |
|---|---|---|
| **What** | Problem(s) | Engine room fire on cruise ship, cruise ship delayed |
| **When** | Date | 02/10/13 |
| | Time | ~ 5:30 a.m. |
| | Differences | ?? |
| **Where** | Physical Location | 150 miles off the coast of the Yucatán Peninsula in the Gulf of Mexico |

**Impact to the Goals**

| | |
|---|---|
| Schedule | Cruise ship was delayed returning to port |
| Material | Cruise ship requires repairs |
| Material | Massive clean-up of cruise ship required |
| Safety | Potential for illness |
| Customer Service | Negative press |
| Customer Service | Unhappy passengers |

Coast guard helicopter delivering supplies to stranded cruise ship.

On February 10, 2013, an engine room fire on the Carnival Triumph cruise ship knocked out a significant portion of the ship's electricity and crippled the propulsion system. Passenger descriptions of the rest of their "vacation" have included the words hellish and nightmare.

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
Step 2 Analysis — Why did it
Step 3 Solutions — What will

## 2 Analysis

Effect ← Cause
Evidence:

This incident ??

**Material Goal Impacted**
- Cruise ship requires repairs
  - Evidence: 12 cruises scheduled on the ship have been canceled.
- Partial loss of electricity
  - Electrical generators were damaged
    - Fire in the aft engine room
      - Evidence: Statement by cruise ship, confirmed by investigators.
      - Leak in a fuel oil return line
        - Evidence: Findings from initial investigation.
        - ?
        - Evidence: Investigators are working to determine the cause of the fire.
        - AND
        - Inadequate maintenance?
          - Evidence: The cruise industry has a history of fires. There were 79 cruise ships fires from 1990 to 2011.
          - Cost
            - Evidence: A cruise company loses tens of millions of dollars if a ship is out of service for one week of maintenance.
            - AND
            - Schedule impacts

**Schedule Goal Impacted**
- Cruise ship was delayed returning to port
  - Evidence: Cruise ship returned to post 3 days later than scheduled.
  - Cruise ship had to be towed into port
    - Evidence: Statements by cruise company and passengers.
    - Loss of propulsion
- AND
- Uncomfortably hot cabins
  - Air conditioning not functional
- AND
- Issues with the food
  - Unable to cook hot meals
  - AND
  - Diminished supplies
    - Cruise ship was delayed returning to port
      - See same cause
- AND
- Unsanitary conditions onboard ship
  - Evidence: Statements by passengers.
  - Human waste on the floors
    - Many toilets overflowed
      - Toilets in aft portion of the ship couldn't flush
        - Sewage system inoperable
      - AND
      - Movement of ship caused wastes to spill

**Customer Service Goal Impacted**
- Unhappy passengers
- Unpleasant experience on cruise

**Customer Service Goal Impacted**
- Negative press
  - Evidence: This cruise has been heavily covered by the media. Passengers have described the cruise as hellish and a nightmare.

**Safety Goal Impacted**
- Potential for illness

**Material Goal Impacted**
- Massive clean-up of cruise ship required

**Cause Map**
**High Level**

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