

1 Problem

What	Problem(s)	USS Milwaukee broke down, had to be towed back to port
When	Date	December 11, 2015
	Time	Evening
	Different, unusual, unique	Ship commissioned 20 days prior; fine metal debris collected in lube oil filter
Where	Facility, site	Offshore near Halifax, Canada
	Unit, area, equipment	USS Milwaukee (LCS 5)
	Task being performed	In transit

Impact to the Goals

Safety	?	
Environmental	?	
Mission	Complete loss of propulsion on ship	?
Production/ Schedule	Significant time in shipyard for repair	?
Property/ Equipment	Metal filings throughout both engine systems	?
Labor/ Time	Investigation, repair	?

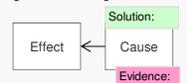
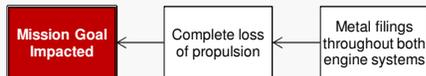
Frequency	This issue has not been seen on this class of ship before, but there have been other issues	This incident ?
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2 Analysis

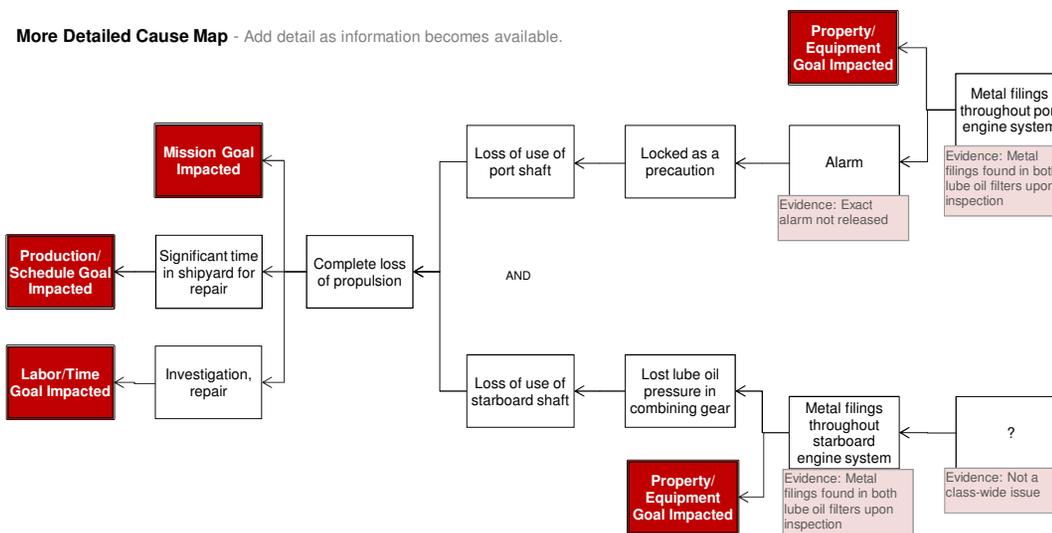
Basic Level Cause Map - Start with simple Why questions.

Basic Cause-and-Effect

Metal filings throughout both the port and starboard redundant engine systems resulted in the complete loss of propulsion of the ship, impacting the mission goal.



More Detailed Cause Map - Add detail as information becomes available.



Newly commissioned USS Milwaukee breaks down, is towed into port

On December 11, 2015, just 20 days after commissioning, the USS Milwaukee completely lost propulsion and had to be towed back to port. This obviously brought up major concerns about the reliability of the ship.

"Reporting of a complete loss of propulsion on USS Milwaukee (LCS 5) is deeply alarming, particularly given this ship was commissioned just 20 days ago. U.S. Navy ships are built with redundant systems to enable continued operation in the event of an engineering casualty, which makes this incident very concerning. I expect the Navy to conduct a thorough investigation into the root causes of this failure, hold individuals accountable as appropriate, and keep the Senate Armed Services Committee informed."

- Senator John McCain (R-Arizona), head of Senate's Armed Services Committee

Timeline

Date	Time	Description
November 21, 2015		USS Milwaukee commissioned in Milwaukee, Wisconsin
		Ship transmits through the Great Lakes to Halifax
December 7, 2015		Ship's computer system triggered an alarm indicating a problem with the propulsion system
		Engineers cleaned metal filings from the lube oil filter
		Port shaft locked
December 11, 2015	Early morning	Ship gets underway from Halifax towards Florida
	Evening	Ship began to conduct steering tests
		Ship lost lube oil pressure in the starboard combining gear (also due to metal filings)
		Ship dropped anchor
		Salvage ship Grapple towed ship to Little Creek, Virginia

3 Solutions

Once all the causes of the breakdown are determined, engineers will have to determine solutions that will allow the ship to return to full capacity.

Additionally, because of the number of problems with the class, the investigation will need to take a good look at the class design and manufacturing practices to see if there are issues that could impact the rest of the class going forward.

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?

For a free copy of our Root Cause Analysis Template in Microsoft Excel, used to create this page, visit our web site.

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