

1 Problem

What	Problem(s)
When	Date
	Time
	Different, unusual, unique
Where	Facility, site
	Unit, area, equipment
	Task being performed

Impact to the Goals

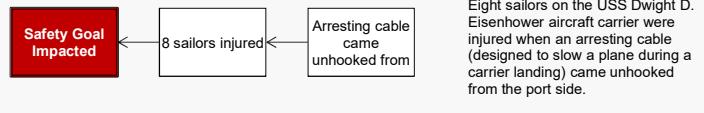
Safety	8 sailors injured (4 flown off ship) Potential for death/ serious injury of aircraft crew
Environmental	N/A
Mission	Flight operations shut down for 2 days
Production/ Schedule	
Property/ Equipment	Potential for loss/ serious damage to plane
Labor/ Time	Response, investigation

Frequency

Since 1980, 3 deaths and 12 major injuries associated with arresting cable failures

2 Analysis

Basic Level Cause Map - Start with simple Why questions.



Basic Cause-and-Effect

Eight sailors on the USS Dwight D. Eisenhower aircraft carrier were injured when an arresting cable (designed to slow a plane during a carrier landing) came unhooked from the port side.

More Detailed Cause Map

Add detail as information becomes available.



3 Solutions

The last step of the Cause Mapping process is to determine solutions to reduce the risk of the incident recurring. More investigation is needed to ensure that the cable and connection were correctly installed and maintained. If it is determined that there were issues with the connection and cable, the processes that lead to the errors will be improved. However, it is determined that the cable and connection met design criteria and the detachment resulted from the plane landing at an unusual angle, there may be no changes as a result of this investigation.

It seems unusual that an investigation that resulted in 8 injuries would result in no action items. However, solutions are based on achieving an appropriate level of risk. The acceptable level of risk in the military is necessarily higher than it is in most civilian workplaces in order to achieve desired missions. Returning to the frequency from the outline, these types of incidents are extremely rare. The US Navy currently has ten operational aircraft carrier (and an eleventh is on the way). These carriers launch thousands of planes each year yet over the last 36 years, there have been only 3 deaths and twelve major injuries associated with landing gear failures, performing a dangerous task in a dangerous environment. Additionally, in this case, PPE was successful in ensuring that all sailors survived and limiting injury to them.

ARRESTING CABLE FAILURE

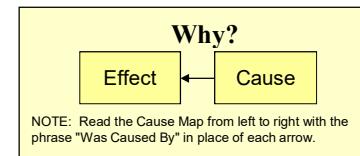
Cause Map

8 sailors injured on Aircraft Carrier

The USS Dwight D. Eisenhower (CVN 69) has about 500' for landing planes. In order for planes to be able to successfully land in that distance, it is equipped with an arresting wire system, which can stop a 54,000 lb aircraft travelling 150 miles per hour in only two seconds and a 315' landing area. This system consists of 4 arresting cables, which are made of wire rope coiled around hemp. These ropes are very thick and heavy and cause a significant risk to personnel safety if they are parted or detached.

"Eight Sailors aboard the Norfolk, Va. based aircraft carrier USS Dwight D. Eisenhower (CVN 69) were injured this afternoon when an arresting gear parted during a routine landing by an E-2C Hawkeye aircraft. There were no fatalities and the Sailors are listed in stable condition with non-life-threatening injuries."

- Statement from Naval Air Force Atlantic



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



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