

19-Cent Rag Becomes \$195,000 Headache

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Rags—people use them for every thing imaginable, but that doesn't mean the saying, "A place for everything, and everything in its place," doesn't apply. A Sailor forgot this adage, and his mistake with a 19-cent rag cost taxpayers \$195,000.

His ship, an MCM, was returning to its homeport in Ingleside, Texas, from a local operating area. The special-sea-and-anchor detail was set, and the restricted-maneuvering doctrine was in effect. At 2355, watchstanders in the main-machinery room responded to an unusual noise and vibration on the No. 2 ship's-service diesel generator (SSDG). At the same time, watchstanders in central control observed a high differential pressure across the lube-oil-filter strainer and stopped the diesel.

To find out what had caused this casualty, engineers went back to the last maintenance that had been done on the SSDG. They learned that an EN2 had done PMS¹ to the high-speed SSDG. Specifically, he had replaced the elements in the lube-oil filters.

Further investigation revealed metal shavings and particles from the Nos. 2 and 3 main bearings in the lube-oil filters of the No. 2 SSDG. Diesel-engine inspectors from SIMA, Ingleside, determined that someone had left a rag in one of the filters, restricting the flow of lube oil and causing the casualty.



Navy photo by USS Carl Vinson (CVN 70) photo lab

Engineers often use rags like the ones these Sailors have. Just make sure you still have the rags when a job is done.

Applying operational risk management (ORM) could have prevented this mishap. Keeping in mind that ORM is a five-step process, here's an example of what these engineers would have found had they applied ORM to this task:

Identify hazards. Improper completion of this maintenance could have resulted in these hazards:

- Loss of oil pressure to the engine
- Major lube-oil leak
- Class B fire in the machinery space
- Contaminated lube-oil sump
- Improper filtration of the lube oil
- High differential pressure in the lube-oil

strainer

Assess the hazards. Here's how the hazards identified could affect the maintenance personnel or operator, equipment and mission:

A fire could kill operating personnel. Casualties in the lube-oil system can cause maintenance personnel to spend excessive time replacing the engine or changing out the lube oil in the sump. This time could be spent on more productive endeavors, such as doing scheduled maintenance, taking care of personal business, or spending time with family. *If you're an owner-operator (you maintain the equipment that you operate), this rule applies doubly for you.*

All hazards identified would have an adverse effect on the equipment. In a worst-case scenario, there would be loss of lubrication to high-speed, rotating machinery, which would require complete overhaul or replacement to correct.

The mission impact could be major in a worst-case scenario. A machinery fire could kill people and disable the ship.

Make risk decisions. Think about the task you're about to start and how you're going to complete it. Ask yourself these questions:

Does the benefit of completing this maintenance according to the MRC and good engineering practices outweigh the cost of doing it wrong?

Does the benefit of completing this maintenance by cutting corners and saving 30 minutes outweigh the cost of missing a step that could result in the loss of lube oil and wipe out a main-engine bearing? Cutting corners also could put the SSDG out of commission and cause shipmates to stay late, working to put the SSDG back in commission. How would I feel standing in front

of my peers, LPO, CPO, and CO explaining to them why I was so inattentive to leave a rag in a lube-oil-strainer basket? Keel hauling would be better than that!

If the cost outweighs the benefit, it's probably not a good idea to follow that course of action.

Implement controls. Take a look at the way your shop is doing business. Think about what can be done to improve its effectiveness. Here are some ideas to consider:

- Provide only qualified personnel to do maintenance on your equipment.
- Get specific training on equipment and maintenance procedures for people before designating them as "qualified."

- Make sure your shop fosters a sense of pride and professionalism, where excellence in maintenance is the norm and re-work is frowned on.

Supervise. A second set of qualified eyes (LPO, CPO, or division officer) is extremely useful and helpful. People in supervisory roles need to know what they are looking at, especially in the maintenance world. When doing preventive and corrective maintenance, attention to detail and good engineering practices aren't just helpful; they're prerequisites for quality work. These items guarantee a long life and maximum readiness for the equipment we rely on so heavily while underway.

After this mishap, the ship had several recommendations. The first one was to include a step in the PMS requiring maintenance people to inspect the housing of lube-oil filters for metal particles and other debris before reinstallation. The second recommendation was to open and inspect filter elements for metal particles, and the third was to count rags before and after PMS.

In an era of dwindling assets, we can stop such mishaps by applying this simple formula: attention to detail (don't cut corners) + good engineering practices (count rags, inspect filter housings and filters) + ORM = success. ☺

The author was assigned to the Naval Safety Center when he wrote this article. Send comments or questions on this article to afloat@safetycenter.navy.mil.



For More Info...

¹The EN2 was doing PMS check 3122/009-C7 R-9.