

Be Alert for Common-Cause Failures

Hartsfield-Jackson Atlanta International Airport is the busiest airport in the world, serving an average of 275,000 passengers each day). At about 1 pm on Sunday, Dec. 18, 2017, a fire disabled the airport's main power supply, as well as the backup power supply. The airport completely lost power for 11 hours during one of the busiest travel times of the year. Approximately 30,000 people were in the airport at the time and hundreds of people were stuck in airplanes on the ground or diverted in the air. More than 1,000 flights were canceled over two days, flight schedules were disrupted throughout the U.S., and one airline reported a loss of \$50 million due to the incident.

Failure of an electrical switch in a utility tunnel at the airport started the fire. The airport had two separate power supplies from separate substations, but the cables for both power supplies went through the utility tunnel near the failed switch. The fire disabled both the main power supply and the alternate power supply.

This is an example of a common-cause failure — a single event (*i.e.*, the common cause) that causes two or more failures in other pieces of equipment or systems. In this instance, the fire was the common cause and the failures were to the main power supply and the alternate power supply to the airport.

Common-cause failures can occur in process plants during both normal operations and emergency situations. For example, if a technician incorrectly calibrates two high-temperature shutdown

sensors at the same time, using the same procedure, both will give an incorrect temperature reading.

A common cause was a contributing factor to the 1984 Piper Alpha oil platform disaster. The firewater pumps that pumped water from the sea had been set to manual start because divers were in the sea near the platform. A gas leak on the platform ignited, starting a fire. The fire made it impossible to reach the switches to turn on the firewater pumps. The fire was the common cause, creating the need for firewater and preventing access to the pump switches. There was no alternate location to turn on the firewater pumps.



What Can You Do?

- Look for common-cause failures in your plant, which can disable multiple systems, particularly a primary system and its backup, at the same time.

- When you are involved in an emergency drill, look for common-cause failures, including things that can both initiate the emergency and also prevent personnel from following established emergency procedures or using required emergency response equipment. For example, if operators have to start an emergency generator after a power failure at night, will they be able to see well enough to start the generator if the lights

are not working due to the power failure?

- Evaluate safety systems and backup safety equipment for their potential for common-cause failures. In particular, if primary and backup systems are located in the same room or physically close together, consider the potential for a fire, flood, or other major event that could disable both systems.

- Report common-cause concerns to management so that measures can be taken to eliminate conditions that could result in a common-cause failure.

Look for common-cause failures in normal operations and during emergencies!

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