



LESSONS LEARNED

- Follow the manufacturer's recommendations for which battery to use in flashlights and other equipment. Read the warnings and small print before installing.
- Never mix batteries, not by manufacturer or by type.
- Never mix old and new batteries. Always remove and replace all the batteries in any device at the same time. Always replace the batteries with batteries from the same package or with the same expiration date. Avoid at all costs batteries that have unequal charges.
- Do not carry lithium powered flashlights close to the face or use close to flammable material.

Lithium Battery Safety

February 2008

Description:

Lithium batteries are used daily in our work activities from flashlights, cell phones, cameras, laptop computers and etc. A recent incident at ORNL involved a SureFire G2 Nitrolon flashlight containing one SureFire 3-volt non-rechargeable 123 lithium battery and one Interstate 3-volt non-rechargeable 123 lithium battery. A Garage Mechanic had the SureFire flashlight in his shirt pocket with the lens facing up when the flashlight spontaneously combusted and vented inside the flashlight. The energy force venting inside the sealed flashlight body resulted in both ends of the flashlight being propelled from the body of the flashlight, splitting the bottom seam of the employee's shirt pocket. The employee received only minor abrasions to his upper chest not requiring treatment.

This incident is similar in nature to several other recorded nationwide events, involving flashlights and lithium cell batteries and shows that we must be cautious when choosing batteries.



Analysis:

An Operational Review was conducted with the following observations being noted:

- The flashlight contained a SureFire 3-volt non-rechargeable 123 lithium battery and an imported Interstate 3-volt non-rechargeable 123 lithium battery. When the batteries were changed out in the flashlight, one SureFire was installed and an imported Interstate battery was purchased at the garage stockroom, thinking it would compliment the other battery.

- This type of lithium battery has a vent safety feature design and when used in a sealed flashlight, the safety feature is partially defeated by not allowing a vent path.
- In this case, the manufacturer strongly recommends that the user use only their brand of lithium batteries, which contain built-in fault/heat protection, or those of other well-known manufacturers that have the same safety feature.
- The Interstate battery data sheet stated that this replacement battery was not recommended for use in flashlights.
- The instructions on the battery packaging is usually in very small print and difficult to read. Normally a battery is picked by the voltage, size and type since these numbers are in larger print, and small print is not read.
- The flashlight was being carried in a pocket close to the face and if the employee had been in a little different position, the force of the venting could have been directed toward the eyes.



Corrective Actions:

- Removed the Interstate lithium batteries from the garage stockroom.
- Communicate this incident through this Safety Flash to all DOE sites as a reminder that by following certain guidelines when using lithium batteries, an injury might be prevented.

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