



# Marine Safety Forum – Safety Flash 15-20

**Issued: 29<sup>th</sup> June 2015**

**Subject: Lithium Battery Contents in Eyes**

## **Event Description**

One of our vessels reported an incident which highlighted the importance of wearing eye protection when carrying out activities that predispose you to eye injury. Fortunately for this crew member, due to the excellent emergency medical crew response on-board, no permanent damage was sustained.

The incident occurred offshore whilst the ship's Electro Technical Officer (ETO) was engaged in the repair of a ship's instant reaction electronic welders mask. The tablet style lithium ion battery to the mask needed replacing and due to the compact nature of the equipment it was considered that this could only be done by soldering connections on to the new battery.

The original mask battery was soldered by machine soldering. The repair required manual soldering for obvious reasons. The first connection was made successfully and whilst soldering the second connection that battery overheated and popped causing the battery contents to spray out contacting the IP eyes.

The Chief Engineer was working in the Engine Control Room (ECR) at the time he heard the battery pop and went to the ETO's aid taking him immediately to the workshop sink and applied copious water to both eyes for 10-15 minutes using the emergency eye station sachets to spray thoroughly into both eyes.

The Master was called for medical assistance for battery electrolyte eye injury. The Master, medic and ships safety officer proceeded to the ECR where the IP was receiving treatment from the Chief Engineer. Both eyes were red from irritation and there was a sharp stinging pain experienced as the water was being applied.

The Master checked the internet in the ECR for lithium ion battery contents eye injury which suggested copious water for 15 minutes and seek medical advice. Chief Engineer informed of treatment and the Medic took over using an eyewash cap to flood the eye.

Master proceeded to the bridge and called Inmarsat medical advice and was informed by an eye specialist doctor on call to apply cortisone steroid drops 3 daily and analgesic drops as necessary. The Doctor didn't feel it was necessary for medevac as the damage would have already been done but to monitor and call back if necessary. The treatment prescribed via Sat phone was checked with ships medic and this was already being administered.

After the first dose IP eye condition improved rapidly with a significant noticeable reduction in redness and irritation after 15 minutes.

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### **Findings / Root causes:**

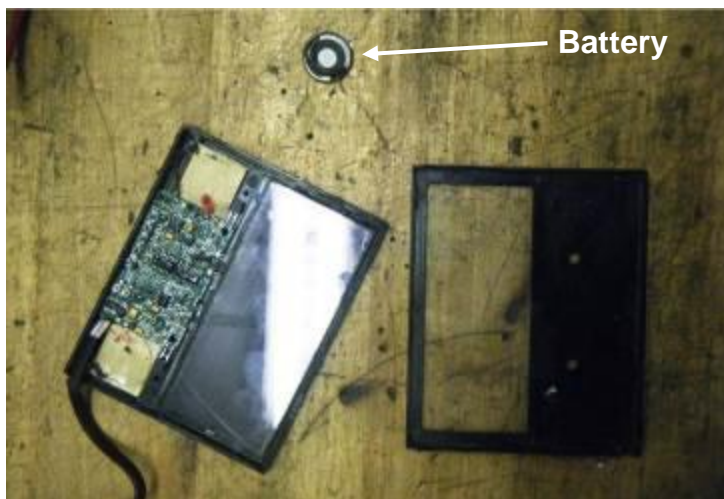
- Failure to use PPE - The lack of guards or barriers was due to the task being thought of as a low risk, everyday work so no formal R/A was undertaken. The small tablet size battery (see fig.1) appeared to be inconsequential as a hazard. Soldering connections onto batteries is not a rare event for an electrician. The original battery connections were soldered on via machine during manufacturing. The precise nature of the work drew the ETO's concentration and he neglected to wear effective PPE (Safety glasses or mask) to undertake the repair.
- Inadequate time was allowed between soldering operations for the battery to cool down causing it to over pressurise and fail resulting in the injury.
- Inadequate work planning or programming – The work was viewed as everyday which resulted in an inadequate risk assessment. When working with ships main battery systems technical staff have to wear full PPE protection as a matter of course as the risks are known and the hazards easily recognised. The harmless looking tablet battery contains similar hazards but its size diminishes the perception of risk. The chemical was small in volume but eyes are very susceptible to even small amounts. In hindsight the work should have been conducted with an effective safety barrier in place (full face mask) and adequate cooling period between solder applications.

### **Actions / Recommendations:**

- Requirement to undertake adequate Risk Assessment – The importance of adequately assessing risk needs to be emphasized. Though this task appeared innocuous it could have resulted in a more serious injury. Master has since called an extra safety meeting to discuss the accident with crew.
- Adequate PPE to mitigate against potential injury – All risks to be assessed and correct PPE for task to be worn.
- If the IP had carried out the Risk Assessment he would have most likely recognised and addressed the hazard.
- The Master used the Sat B Service Address Calls quick dial 32# for advice regards the accident on board. There are other services available but the Inmarsat one is tailored specifically for seafarers (Is free) and have contacts to cope with a multitude of situations.

The Master advised being able to talk with a specialist ophthalmologist relatively quickly regards dealing with someone's eyesight was very reassuring and suggested that we highlighted this service to other ships.

**Fig.1 Lithium Ion Battery**



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