Submission No. LC/16
Received
Road Safety Committee

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BY:.....

2/10/07

The Executive Officer
Road Safety Committee
Parliament House
EAST MELBOURNE VIC 3002

Dear Sir,

I note that the Road Safety Committee is conducting an inquiry into existing, new and developing technologies for implementation to improve safety at level crossings.

I have attached a copy of my submission to Road Safety Committee and based on the content of this submission I would like to be heard by the committee.

Yours sincerely,

Gary Piper
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2/10/07

Submission by Gary Piper from Saft Batteries Pty Ltd to the Road Safety Committee regarding the Inquiry into Improving Safety at Level Crossings.

Background

The majority of Victoria's Railway Level Crossing Boom Gates and Warning Lights are mains powered. Should there be a mains power failure then each level crossing has a battery, as emergency backup, to operate the crossing for a specified length of time. The backup battery is typically housed in an outside metal cubicle which is located trackside near the level crossing.

The original battery type selected for use in level crossings was the Flooded Nickel Cadmium (NiCd) battery. The Nickel Cadmium battery is well suited for this harsh application because of its high reliability and long service life.

In the mid 1990's the operator of the day, the Public Transport Corporation (PTC), began a program of phasing out the Nickel Cadmium Battery in favour of the Valve Regulated Lead Acid (VRLA) battery. The reason given to me for this change was that the NiCd battery had a high water usage and as such required more maintenance than the " Maintenance Free" VRLA battery. This high water usage as it turned out was due to maintenance staff attending at a level crossing after a power outage and manually adjusting up the voltage output of the battery charger/rectifier in an effort to recharge the battery in a short period of time. The problem with this was that there was no later follow up to reduce the high charge rate back to the normal operating voltage and hence a high water usage was experienced. Also, the reduction in maintenance staff in the lead up to and since the privatisation of the PTC rail network in 1999 has perpetuated the need for a battery requiring less perceived maintenance. There has never been any mention at any time of the NiCd batteries having suddenly failed.

After the introduction of the VRLA batteries the PTC found that they were failing considerably earlier than expected. The root cause of these failures was that the VRLA batteries were not suited for use with the originally installed

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Ironcore battery charger/rectifiers. VRLA batteries themselves are not well suited for this application because they do not tolerate the harsh environment of being housed in a metal cubicle and exposed to temperatures of anything up to +60C.

It has been an ongoing exercise for the PTC and its successors to try and "Make Fit" the VRLA battery into this application for which it is not suited. There are still NiCd batteries installed in these level crossing applications. My recent inquiries have found that NiCd batteries are only removed and replaced with VRLA batteries when they are deemed to have come to the end of their service life of 15-20 years.

VRLA batteries will ultimately fail by design. They have a number of causes of failure as follows: Sudden Death Failure, Dry Out, Corrosion, High Ripple Current, Electrical Abuse (Overcharge, Overdischarge), Thermal Runaway and Extreme Temperatures.

Submission

It is my submission to the Road Safety Committee that as VRLA batteries are susceptible to Sudden Death Failure they therefore are to be regarded as a "Hazard" (as defined in the Rail Safety Act 2006) with the potential to cause a "Major Incident" (as defined in the Rail Safety Act 2006) and as such are a risk to Public Safety in a Railway Level Crossing application.

The risk that arises due to the totally unpredictable nature of Sudden Death Failure of VRLA batteries is that just when they are required to work, as a backup power source, they don't. This effect has the very real potential for personal injury to the public because, after a mains power outage, the Boom Gates and/or Warning Lights at a Railway Level Crossing failed to operate as required before the arrival of an oncoming train.

VRLA battery monitoring equipment in Railway Level Crossing applications, regardless of what the operator thinks, Is Not able to predict Sudden Death Failure as it is exactly that "Sudden and Unpredictable".

Conclusion

By implementing a battery replacement program which uses an improved version of the existing Nickel Cadmium battery technology, which does not suffer sudden death failure, you will improve safety at Level Crossings.

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