

## 513.

# Electrical matters – PLCs and functional safety information

In considering the above mentioned subject, NAFLIC has compiled the following technical bulletin for information purposes.

On new devices where risk reduction has been provided using a programmable logic controller (PLC), it is necessary to consider its performance requirements in relation to the requirements of the device's safety functions.

The PLC should be selected, designed and installed to meet both the functional and performance requirements of the safety function(s) to be performed, in particular, by means of

- architectural constraints (the configuration of the system, its ability to tolerate faults, its behaviour on detection of a fault, etc.),
- selection, and/or design, of equipment and devices with an appropriate probability of dangerous random hardware failure, and
- the incorporation of measures and techniques within the hardware to avoid systematic failures and control systematic faults.

The design of the PLC should be such that the probability of random hardware failures and the likelihood of systematic failures that can adversely affect the performance of the safety-related control function(s) is sufficiently low.

When the PLC used is of a standard (non-safety) type, its complexity precludes the determination of failure modes and its behaviour in the event of random hardware faults can be unpredictable.

For this reason, the use of a single standard PLCs in safety-related applications is not recommended, and is limited or precluded by the requirements of standards such as BS EN 13849, BS EN IEC 62061, and BS EN ISO 14118.

Further information can be found in the above standards and in BS EN ISO 12100 and BS EN 60204.

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