**Background**

Alarm systems are used in environments that are always characterised by a certain amount of danger. However, surprisingly little is known so far about the impact of risk perception on operators’ decision-making with alarm systems. Yet, it is well known that system characteristics such as number and type of errors do influence operators’ behaviour. In particular false alarms (FAs) can have a strong negative effect on decision-making.

**Research question**

How does risk influence participants’ cross-check behaviour when operating alarm systems with different types of errors?

**Method**

72 students worked under a high or a low risk condition using either a false alarm-prone, a miss-prone or a neutral alarm system. Re-check frequencies were assessed.

**Results**

![Graph showing re-checking frequencies for false alarm-prone, neutral, and miss-prone conditions](image)

**Alarm systems**

Even though alarm systems are very sophisticated in terms of detection quality, they are not 100% reliable. The threshold setting determines whether the system is prone to misses or to false alarms. As designers usually try to avoid misses, false alarm-prone systems are more common (Swets, 1992). Yet, high numbers of FAs can reduce operators’ trust in the systems, which can lead to delate responses or even the ignorance of alarms (e.g. Getty et al. 1995; Bliss et al. 1995). Furthermore FAs do also reduce operator’s reliance on cues indicating the absence of targets (e.g. Meyer, Wiczorek & Günzler, 2013).

**Stimulus material**

![Stimulus material image](image)

**Implications**

False alarm-prone systems make users more sensitive towards risk levels. High risk amplifies the differentiation of behaviour towards different cues.

Risk has to be considered when designing alarm systems!