



## **Preventing defeat of protective equipment by providing well-defined fault clearance concepts - High bay storage facilities-**

### Problem:

Absence of clear instructions for handling faults occurring in a complex installation or machine:

- Opening or removing interlocking guards interrupts the programme sequence in such a way that after restoring the safe state the programme will not continue at the point of interruption.
- Long ways or complicated opening mechanisms make it difficult and time-consuming for the operator to remedy faults.

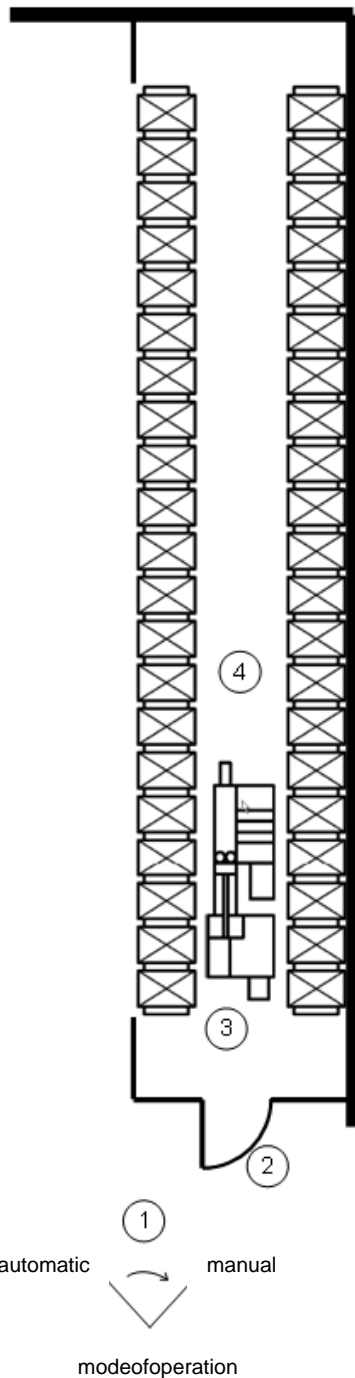
Both for reasons of convenience and for the purpose of optimizing sequences are the protective devices defeated such that fault clearance is as easy as possible for the user.

### Measure:

In certain production processes, it is not possible to completely avoid faults. The user is offered fault clearance solutions facilitating fault clearance such that defeating protective equipment would not offer any advantages. Fault clearance concepts are laid down in instructions for use.

### Example: Key system in high bay storage facility

In a high bay storage facility, access to the danger zone is prevented while the installation is running. One key for operating the associated storage and retrieval machine within the danger zone and one key for the respective access door are inseparably connected by a welded ring. In automatic mode, the key must be inserted in the control panel. When the „automatic“ mode selected, it is not possible to remove the key from the control panel. Thus, the user has to select „manual“ mode to be able to open the access door.



Failure to observe the following sequence will prevent the storage and retrieval machine from being operated:

1. Change mode selector switch on control panel outside the danger zone from “automatic” to “manual” and remove key
2. Take key and enter the danger zone through the door (monitored by limit switch); close door to prevent other persons from entering
3. Use key to activate the storage and retrieval machine
4. Drive hazardous movements of the storage and retrieval machine in manual mode

Leave storage area and re-activate automatic mode by following above steps in reverse order.

Fig 1: Key system in high bay storage facility  
(in acc. with DIN EN 528)

Further reading:

- [1] Information sheet "Fördertechnik in Hochregallägern - Störungsbeseitigung in Regalanlagen". Berufsgenossenschaft Handel und Warendistribution  
[http://www.bghw.de/medienangebot/sparte-grosshandel-und-lagerei/spezial/spezial-pdf-dateien/SP\\_05.pdf](http://www.bghw.de/medienangebot/sparte-grosshandel-und-lagerei/spezial/spezial-pdf-dateien/SP_05.pdf)
- [2] DIN EN 528: Rail dependent storage and retrieval equipment - Safety requirements. Beuth, Berlin 2009