

Welcome to the 2022 CPI Biennial Health and Safety Conference

Safety Design and Emerging Safety Technologies

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Presentation Overview

As machinery becomes more automated, faster, bigger and more complex, the pace of technological safeguarding and safety related control systems is accelerating.

Keeping up to date with these innovations and knowing why or how to apply these to existing machinery or as part of a new machine build can be challenging.

This interactive presentation will discuss some of these trends and explain ways the latest solutions can be incorporated into your equipment to give enhanced safety and increased productivity.



Contact with Machinery – An industry picture.

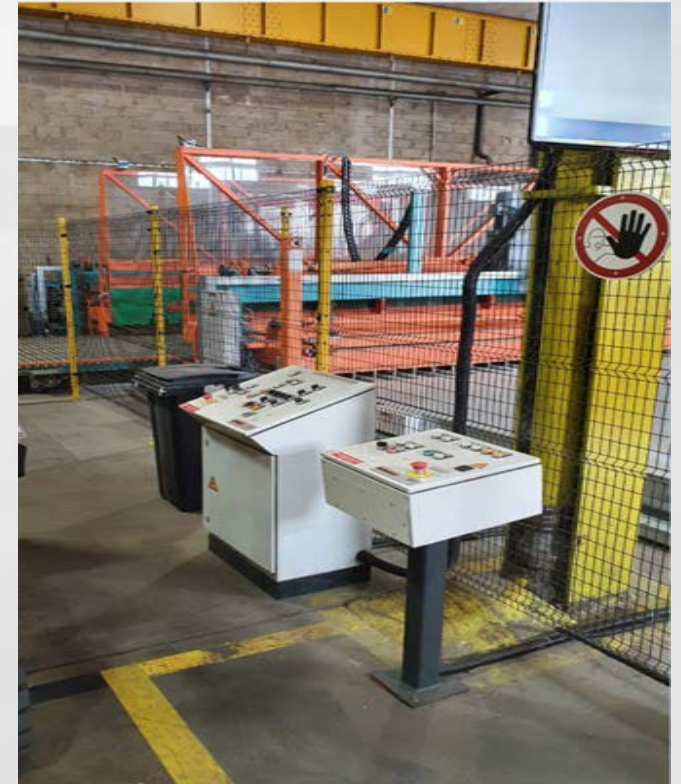
- Every year, the UK Paper Industry invests £millions on purchasing and installing new machinery, plant and equipment.
- Every year the UK Paper Industry invests £millions on refurbishing and upgrading existing machinery, plant and equipment.
- Every year employees working in the UK Paper Industry are injured, some seriously as a result of a ‘contact with machinery’ incident.
- Over the last 5 years 88 employees have been injured as a result of a ‘contact with machinery’ incident. 23 were reported as RIDDOR specified (major) injuries.
- On average 9 people a year are injured as a result of some form of intervention with moving machinery.

Last year the corrugated sector reported a **71% increase** in contact with machinery injuries and was the third highest by type after STF and Manual Handling.





The pallet squarer had been suffering intermittent faults all shift. The maintenance technician was called to investigate.



Machine Intervention – Points to Consider



- Safeguards (correct selection and installation)
- Safe maintenance
- Safe access

- Procedures
- Training
- Human factors

- Warning signs
- Competence
- Intended and unintended interventions

- Mode selection
- Incorrect design / modification
- Other?

Safeguards

Maintenance

Technological
Procedures

Interventions from an
operators perspective

Machine
Procurement

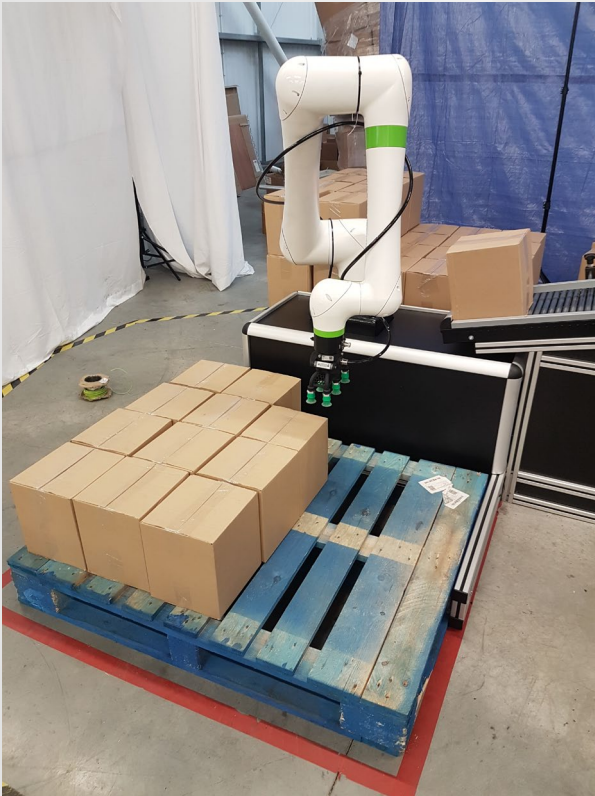


Trends in safety automation

- RFID Technology- switches and keys
- Scanners
- Radar
- Multi functional gate boxes
- Fluid power safety
- Advances in configurable controllers
- Safety PLC
- Safety networks
- Cyber security
- Cobots and mobile robotics



Collaborative robots and mobile robots are expected to grow 20-30% year on year through to 2028.



Risk assessments

Safety validation



How do you get it right? - Sources of Information

BS EN 1010-1:2004+A1:2010



BSI Standards Publication

Safety of machinery. Safety requirements for the design and construction of printing and paper converting machines Common requirements

BS EN 1034-17:2012



BSI Standards Publication


Safety of machinery. Safety requirements for the design and construction of paper making and finishing machines
Tissue making machines

BS EN ISO 13857:2019

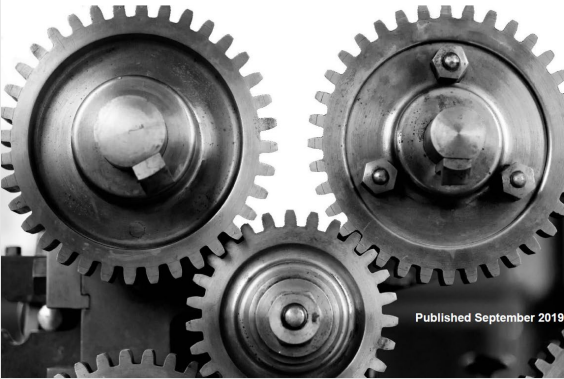


BSI Standards Publication

Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs



Health & Safety Procedure for the Procurement and Installation of Machinery, Plant and Equipment in the Papermaking, Corrugated and Recovered Paper Industries

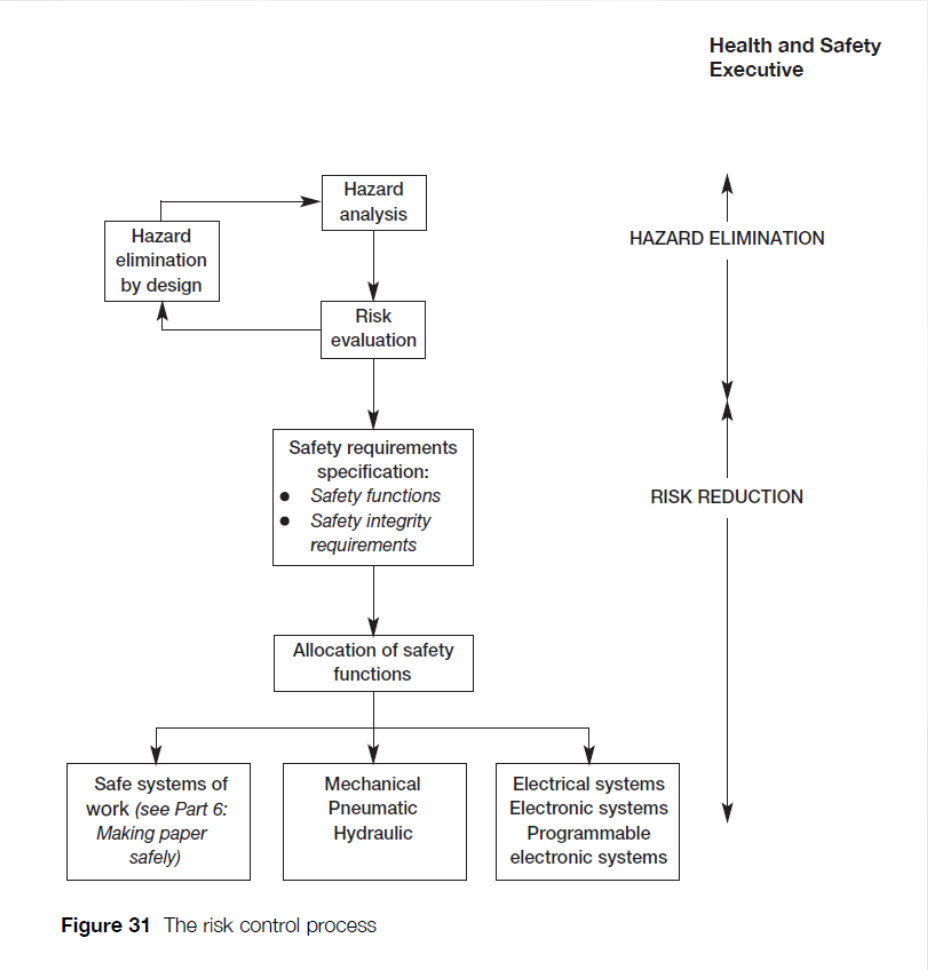


Published September 2019

PABIAC Procurement Document.



Prevention of designing an inadequate safety system by creating a Safety Requirement Specification



Phase	Description
1	Safety requirements specification <ul style="list-style-type: none">Functional requirements specificationSafety integrity requirements specification
2	Design and implementation
3	Installation and commissioning
4	Operation and maintenance <ul style="list-style-type: none">Action by operational workersMaintenance activities
5	Changes after commissioning <ul style="list-style-type: none">Modification and retrofitDe-commissioning

Table 1 Incident classification scheme

Supplier Machinery Acceptance



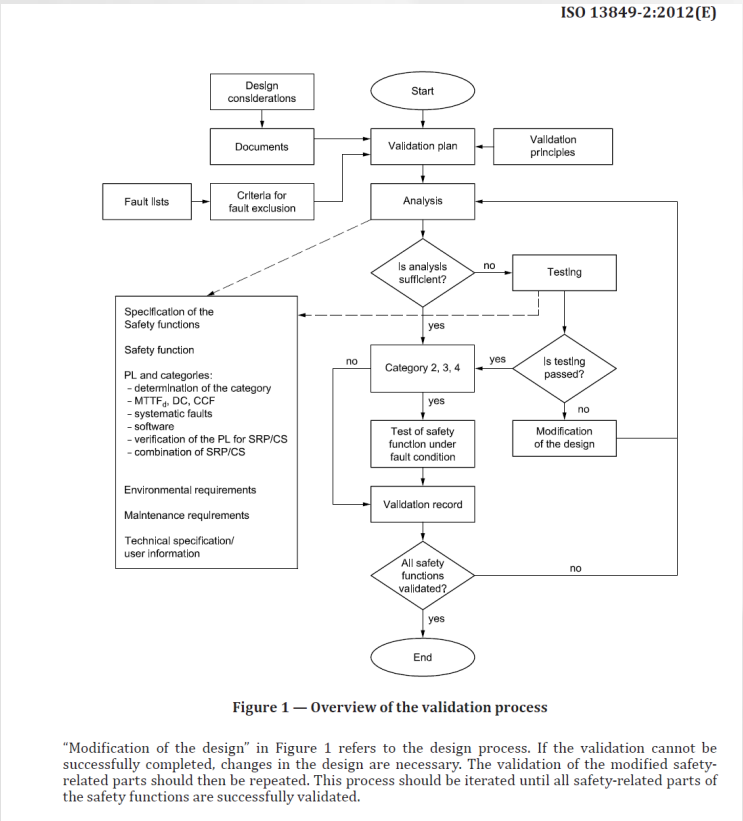
Factory Acceptance Testing (FAT)



Site Acceptance Testing (SAT)

Validation.

BS EN ISO 13849-1.2. Safety of machinery. Safety-related parts of control systems - Part 1. General principles for design.




Safety requirement spec
Functional testing
Fault injection
Safety calculations
Electrical drawings

HSE Out of Control

Making Paper Safely

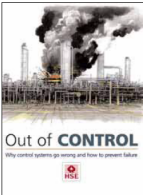
PABIAC Corrugated Guidance



Health and Safety Executive

Out of control

Why control systems go wrong and how to prevent failure



This is a free-to-download, web-friendly version of HSG238 (Second edition, published 2003). This version has been adapted for online use from HSE's current printed version.

You can buy the book at www.hsebooks.co.uk and most good bookshops.

ISBN 978 0 7176 2192 7
Price £11.95

This publication aims to raise awareness of the technical causes of control system failure by publicising the details of actual incidents and showing how they could have been prevented by the application of straightforward precautions. The guidance is aimed at managers, engineers and technicians who hold responsibility at appropriate phases in the lifecycle of a control system.

The publication provides:

- guidance on the legal requirements relating to control systems;
- information about a systematic, risk based approach to the design, engineering, operation, maintenance and modification of control systems;
- an analysis of incidents with causes and solutions; and
- references to further sources of advice.

This publication contains a comprehensive revision of references and some minor changes in the guidance from the first edition, published in 1995.



Health and Safety Executive

Making paper safely

Managing safety in the papermaking process



This guidance is for managers and users of paper and tissue manufacturing machinery. It provides practical guidance to manage the risks on papermaking machinery and associated tasks and describes the law that applies.

Changes since the last edition:

- This edition updates references to legislation, standards and links to further guidance
- The document has been restructured to cover tasks in papermaking as well as the machine itself
- New sections have been added to cover areas of papermaking machinery/tasks not previously covered
- The machinery section has been restructured to follow the papermaking process

HSG279
Published 2015



Paper and Board Industry Advisory Committee

CORRUGATOR GUARDING AND SAFE WORKING PRACTICES

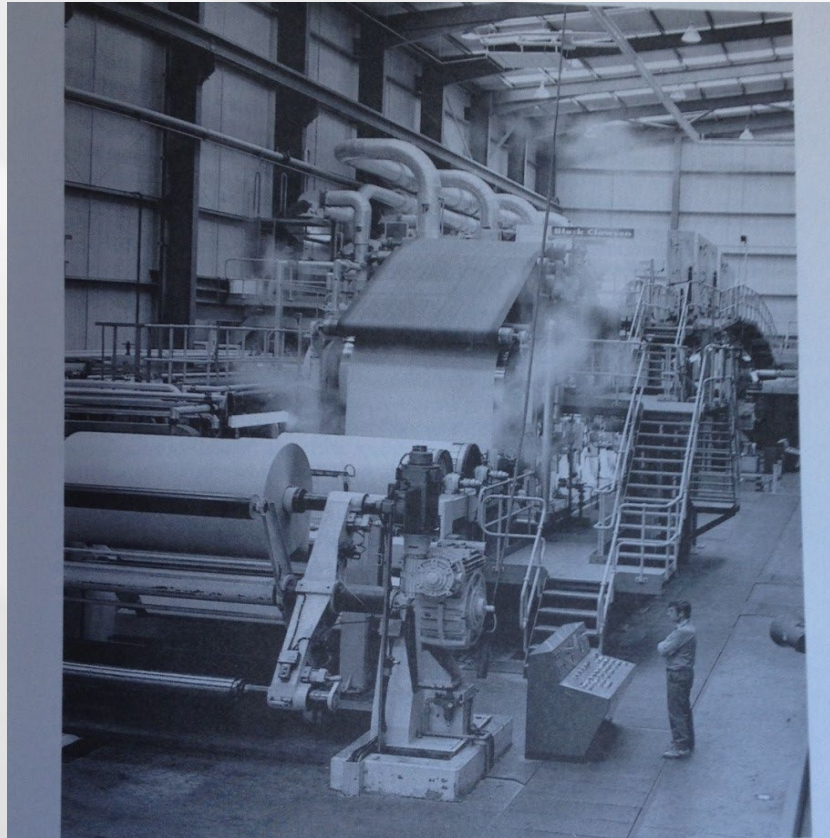
Inspection Checklist



PUBLISHED: September 2019



What was acceptable in the past is NOT acceptable NOW!



Thank you and come and see us if you have any questions