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assessment; 3.3 Procedure for risk assessment; 3.4 Hazard study methods; 3.5 Risk estimation; 3.6 Risk reduction principles
3.7 Outcomes of the risk assessment; 3.8 Documentation methods for the risk assessment; 3.9 Conclusions; References; 4. Design procedures for safety controls; Contents summary; 4.1 Introduction to design techniques; 4.2 Review of design standard EN 954-1; 4.3 Procedure for the design of safety controls based on EN 954; 4.4 Design considerations; 4.5 Safety categories; 4.6 Conclusions; References; 5. Emergency-stop monitoring and the safety relay; 5.1 Introduction; 5.2 Definitions and implications of stop functions; 5.3 Safety relay terminology; 5.4 How does an E-stop safety relay work?
5.5 Practical safety relays; 5.6 Certification; 5.7 Functional overview of monitoring relays; 5.8 Electronic and programmable E-stop monitors; 5.9 Using monitoring safety relays for guards (safety gate monitors); 5.10 Review of other monitoring relay functions; 5.11 Conclusions; References; 6. Sensors and devices for machinery protection; 6.1 Contents summary; 6.2 Purpose and objectives; 6.3 Review of guards; 6.4 Sensing devices for guards; 6.5 Mechanical trapped key interlocking; 6.6 Presence sensing devices; 6.7 Control devices for safety; 6.8 Safety networks and sensors; 6.9 Conclusions
7. Application guidelines for protection devices; 7.1 Introduction; 7.2 Choosing protection methods; 7.3 Guarding devices; 7.4 Point of operation devices; 7.5 Application guidance notes for light curtains; 7.6 Conclusions; 8. Programmable systems for safety controls; 8.1 Introduction; 8.2 Benefits and disadvantages of safety PLCs; 8.3 Characteristics of safety PLCs; 8.4 Application software; 8.5 Safe networking; 8.6 Classification and certification of safety PLCs; 8.7 Summary; References; 9. Introduction to standards for programmable systems; 9.1 Introduction; 9.2 Objectives
9.3 Outline of IEC 61508

Sommario/riassunto

Practical Machinery Safety aims to provide you with the knowledge to tackle machinery safety control problems at a practical level whilst achieving compliance with national and international standards. The book highlights the major international standards that are used to support compliance with EU regulations and uses these standards as a basis for the design procedures. It looks at the risk assessment processes used to identify hazards and to quantify the risks inherent in a machine. It introduces the concepts of safety categories as defined by standard EN954-1 (Safety of M
