

Contents

1	Preamble	1
2	Development of Technical Safety	5
3	Interdisciplinary Approach	9
3.1	Need for a Safety Methodically Concept	9
3.1.1	The Need for Action in Safety Engineering	9
3.1.2	Introduction to the Application Area Safety Engineering	11
3.1.3	Reasons for this Publication	12
3.1.4	The General Framework for Technical Safety	14
3.1.5	Legal Basis of Technical Safety	15
3.1.6	Ethical Principles	17
3.2	Generating Safety	18
3.2.1	Principles of Safety Engineering	18
3.2.2	Procedures for an Interdisciplinary Safety-Methodical Concept	25
3.2.3	Implications of a Safety Methodically Concept	43
3.3	Limits of Safety	46
3.3.1	Socially Accepted and State-Defined Limits	47
3.3.2	Unattainability of Absolute Safety	49
3.3.3	The Understanding of Risk	50
3.3.4	Factual Relationship Between Risk, Safety Engineering and Technical Safety	51
3.3.5	Safety-Engineering Feasibility	52
3.4	Verifiability of Safety	57
3.4.1	Limits of Verifiability	57
3.4.2	Learning as a Continuous Task	59
3.4.3	Controlling Technical Safety in the Product Life Cycle	64

3.5	Social Considerations	82
3.5.1	Prevention of Safety-Critical Failures	82
3.5.2	Communication with the Public About Technical Safety	86
3.6	Recommendations	89
3.6.1	The Research Landscape	90
3.6.2	Education and Training Options of the Universities	91
3.6.3	Thematic Focuses	92
3.6.4	Emergency Planning	95
3.6.5	Internationalization	96
4	Interdisciplinary Safety Guideline	97
4.1	Understanding of the Term Safety	97
4.1.1	Safety as a Legal Term	97
4.1.2	The Term “Technical Safety”	98
4.1.3	Technical Safety as a Requirement for Product Design and Implementation	99
4.2	Introduction to Interdisciplinary Safety Engineering	102
4.2.1	Organization and Management	102
4.2.2	Systematics	107
4.3	Generating Safety	119
4.3.1	Safety Methodology	119
4.3.2	Implementation of the Safety Concept	127
4.3.3	Software-Based Functionality and Human Factors	149
4.3.4	Supportive Management	154
4.4	Safety-Compliant Design in Civil Engineering and Process Plant Engineering	170
4.4.1	Notes to the Flow Chart	172
4.4.2	Definitions with Regard to the Flow Chart	175
5	Proposal of the VDI “Technical Safety” Committee	177
6	Summary—Lessons Learned	179
	VDI “Technical Safety” Committee	181
	References	183

Technical Safety – An Attribute of Quality

An Interdisciplinary Approach and Guideline

Keller, H.; Pilz, W.-D.; Schulz-Forberg, B.; Langenbach, C.

2018, VIII, 190 p. 6 illus., Hardcover

ISBN: 978-3-319-68624-0