Part A1	**SAFETY SCIENCE AND RISK PREDICTION**
	1 Historical Need for Risk Assessment
	2 Hazards Versus Risks
	3 Safety Triad Concept
	4 Safety Science Developments
	5 Risk Assessment Overview
	6 Socio-Technical System Approach
	7 Effects of Big Data & Analytics
	8 Risk Communication Issues
Part A2	**NEW CONCEPTS and METHODS**
	1 System Resilience in Minimizing Losses
	2 Physical and Cyber Security Intro
	3 Uncertainty and Sensitivity Analysis
	4 Advanced statistics, Machine learning, Artificial Intelligence
Part A3	**HAZARD IDENTIFICATION AND CHARACTERIZATION**
	1 Material properties
	2 Accident Cause Structures
	3 HAZID Methods, PHA, STPA
Part B	**CONSEQUENCE ANALYSIS**
	1 Overview Consequences
	2 Source Terms, Releases
	3 Cloud Dispersion
	4 Fire Phenomena
	5 Explosion Types
	6 Natural Hazards
	7 Domino Effects and Escalation
	8 Cryogens (LNG, LH_2), LPG, NH_3, And CO_2
	9 Impact Types
	10 Hazmat Transportation Risks
	11 Pipeline Corrosion Risks
	12 Hydrogen Embrittlement Risks
	13 Aging Plants
	14 Multi-Hazards
Part C	**CHANCE EFFECTS**
	1 Human, Procedural, and Organizational Failures
	2 Event Probability
	3 Expert Elicitation
	4 Fault and Event Tree, Lopa, Bayesian, and Petri Nets
	5 Inspection and Maintenance, RBI
Part D	**RESULTING RISKS, MITIGATION, AND DECISION MAKING**
	1 Risk Determination Methods
	2 Dynamic /Operational Risk Assessment
	3 Cyber-physical Security Risks
	4 Risk and Resilience Management
	5 Risk-Informed Decision-Making