

1. Record Nr.	UNINA9910564694803321
Titolo	Nuclear power plants : innovative technologies for, innovative technologies for instrumentation and control systems, the Sixth International Symposium on Software Reliability, Industrial Safety, Cyber Security and Physical Protection of Nuclear Power Plant (ISNPP) // edited by Yang Xu [and five others]
Pubbl/distr/stampa	Singapore : , : Springer, , [2022] ©2022
ISBN	981-19-1181-9
Descrizione fisica	1 online resource (691 pages)
Collana	Lecture Notes in Electrical Engineering ; ; v.883
Disciplina	621.483
Soggetti	Nuclear power plants - Safety measures Nuclear power plants - Instruments
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Contents -- Two-Warehouse Inventory Models: Considering Lead Time and Continuous Review -- 1 Introduction -- 2 Notations and Assumptions -- 3 Mathematical Formulation -- 3.1 Model with constant lead time -- 3.2 The Proof Was Over -- 3.3 Model with Continuous Stochastic Lead Time -- 3.4 Model With Discrete Stochastic Lead Time -- 4 Numerical Examples -- 5 Conclusion -- References -- Cause Analysis and Improvement of Abnormal Triggering Event in Radiation Monitoring Channel of NPP -- 1 Introduction -- 2 Channel Introduction -- 3 Fault Process -- 4 Treatment Process -- 5 Cause Analysis -- 5.1 Channel Composition and Principle -- 5.2 Cause Analysis -- 6 Treatment Measures -- 6.1 Signal Circuit -- 6.2 Signal Transmission Mode -- 6.3 Drag Chain Cable -- 7 Conclusion -- References -- Discussion on Hydrogen Economy Solution Under Carbon Peak and Neutrality Background -- 1 Introduction -- 2 Development of Nuclear Power, Wind Power and Photoelectric Industry in China and America -- 3 Development of Hydrogen Energy Industry and Power Generation Costs -- 4 Current Status of Hydrogen Fuel Gas Turbine and Related Technologies -- 4.1 Physical Characteristics of Hydrogen Fuel -- 4.2 Current Status of Hydrogen Fuel Gas Turbine Technology --

5 Analysis of Electric-Hydrogen-Electric Power Generation -- 6 Conclusion -- References -- Introduction of Network Architecture for Real-Time Information Management System in Nuclear Power Plant -- 1 Introduction -- 2 Network Architecture of Real-Time Information Management System -- 2.1 Classification of Cyber Security in Nuclear Power Plants -- 2.2 DCS OPC Interface -- 2.3 Proposed Network Architecture -- 3 Introduction for Multi-Control System Interface -- 4 Conclusion -- References -- Seismic Analysis and Qualification of Nuclear Safety Axial Flow Fan -- 1 Preface -- 2 Finite Element Model. 3 Load Combination and Evaluation Criteria -- 4 Analysis -- 4.1 Modal Analysis -- 4.2 Seismic Safety Analysis -- 5 Result Evaluation -- 5.1 Shell and Plate Department -- 5.2 Impeller -- 5.3 Bolt -- 5.4 Operability -- 6 Conclusion -- References -- Application Verification of Wireless Sensor Network in Nuclear Power Plant -- 1 Introduction -- 2 Wireless Sensor Network Structure Design -- 2.1 Wireless Sensor Network System Framework -- 2.2 Wireless Sensors and Gateways -- 3 Test Verification -- 3.1 Functional and Performance Test -- 3.2 Environmental Test -- 3.3 Field Bench Test -- 4 Conclusion -- References -- Treatment of Flashing Primary Alarm of Scintillator Radiation Monitoring Device in NPP -- 1 Introduction -- 2 Principle of Detector and Main Functions of Equipment -- 2.1 Principle of Scintillator Detection -- 2.2 Major Function -- 3 Failure Mode Analysis -- 3.1 High Real Radioactivity -- 3.2 Equipment Collision -- 3.3 External Interference -- 3.4 Circuit Occasional Failure -- 3.5 Device Performance Degradation -- 3.6 Failure Mode Judgment -- 4 Data Analysis and Follow-Up Measures -- 4.1 Historical Events and Underlying Data Analysis -- 4.2 Four Point Two Inspection of Equipment Installation Site -- 4.3 Conclusion and Follow-Up Measures -- References -- Research on Cyber Security Standards of Nuclear Power Industry Control System -- 1 Introduction -- 2 American Standard -- 2.1 Federal Standards -- 2.2 NRC Standards -- 3 International Standards -- 4 Chinese Standards -- 4.1 Security Standards Related to SAC/TC 260 -- 4.2 Security Standards Related to SAC/TC 124 -- 4.3 Security Standards Related to SAC/TC 30 -- 5 Conclusions and Suggestions -- References -- Analysis and Treatment of Accidental Drop of Shutdown Bank -- 1 Introduction -- 1.1 A Brief Introduction -- 1.2 Introduction to Rod Cluster Control Assembly -- 2 Background Description. 3 Incident Analysis -- 3.1 Cause Analysis of Accidental Drop -- 3.2 Plant Safety Analysis -- 3.3 Common Cause Failure Analysis -- 3.4 Full Scope Simulator Verification Analysis -- 3.5 Functional Analysis of Rod Drop -- 4 Problem Handling -- 5 Conclusion -- References -- The Software Modeling and Sensitivity Study of Computer Based I& -- C System in Probabilistic Safety Assessment of Nuclear Power Plant -- 1 Introduction -- 2 Method for Software Modelling -- 2.1 Failure Mode of Software -- 2.2 System Reliability Capability -- 2.3 Cut-off Value Modeling for Software -- 3 Method for Sensitivity Study of Software -- 3.1 Sensitivity Study Modelling -- 3.2 The Selection Sensitivity Study Value -- 4 Case Study for Software Modeling and Sensitivity Study -- 4.1 Configuration of Typical I& -- C Function in NPP -- 4.2 The Model of Typical I& -- C Function -- 4.3 The Analysis Result of Case Study -- 5 Conclusion -- References -- Research on Sensitivity of Axial Inductive Displacement Sensors with Constant Flux for Magnetic Bearings -- 1 Introduction -- 2 Working Principle of Axial Displacement Sensor with Constant Flux -- 3 The Influence of Mechanical Parameters on the Sensitivity -- 3.1 Theoretical Derivation -- 3.2 Simulation Result -- 3.3 Experiment Result -- 4 The Influence of Electrical Parameters on the Sensitivity -- 4.1 Theoretical

Derivation -- 4.2 Experiment Result -- 5 Conclusions -- References --
A Primary Review on Team Performance in Automated Systems -- 1
Introduction -- 2 Issues Introduced by Automation -- 2.1 Use, Misuse,
Disuse, and Abuse of Automation -- 2.2 Trust and Complacency -- 2.3
Levels of Automation and Related Models -- 3 Team and Automation
-- 3.1 Models on Team Performance -- 3.2 Team Process
and Performance Measurement -- 4 Team-Automation Model -- 5
Conclusions -- References.

Economic Analysis of PROFIBUS Fieldbus Control System
in Conventional Island of Nuclear Power Plant -- 1 Introduction -- 2
Fieldbus Application Strategy for Conventional Island in Nuclear Power
Plants -- 3 Structure of the Fieldbus Control System -- 4 Economic
Analysis of FCS System in the Partial Application Stage of Conventional
Island -- 4.1 Description of System Configuration -- 4.2 Economic
Analysis -- 5 Economic Analysis of FCS System in the Full Application
Stage of Conventional Island -- 5.1 Description of System
Configuration -- 5.2 Economic Analysis -- 6 Conclusion -- References
-- Reliability Analysis of Tripping Solenoid Valve Power System Based
on Dynamic Fault Tree and Sequential Monte Carlo -- 1 Introduction --
2 Structure and Failure Principle of Trip System -- 2.1 System Structure
and Failure Principle -- 2.2 Improvement Plan -- 3 Reliability Models
of Various Distribution Schemes -- 3.1 Reliability Model Based
on Dynamic Fault Tree -- 3.2 Monte Carlo Simulation -- 4 Reliability
Analysis -- 5 Conclusion -- References -- Troubleshooting of Frequent
False Alarms on Low-Low Speed of the Main Pump in Nuclear Power
Plants -- 1 Introduction -- 2 Theory for the Main Pump Speed
Measuring -- 3 Troubleshooting of Frequent False Alarms on Low-Low
Speed of the Main Pump -- 3.1 Parameter Optimization of Speed
Conditioning Modules -- 3.2 Software and Hardware Optimization -- 4
Conclusion -- References -- Research on Switch Signal Transmission
System Based on Optical Fiber -- 1 Introduction -- 2 System Design --
2.1 Multi-channel System Design -- 2.2 Dual-Channel System Design
-- 3 Prototype Manufacturing and Integration -- 4 Functional
Performance and Environmental Test -- 4.1 Multi-channel Prototype
Transmission Function and Self-checking Function Test -- 4.2
Frequency Response Range Test of Multi-channel Prototype.
4.3 Transmission Delay Test of Multi-channel Prototype -- 4.4
Reliability Test of Multi-channel Prototype -- 4.5 High-Low
Temperature and Temperature Difference Test of Multi-channel
Prototype -- 5 Anti-radiation Analysis of Optical Cable -- 6 Conclusion
-- References -- Research on Transient Control Performance
Improvement of Complex Control System in Nuclear Power Plant -- 1
Introduction -- 2 Causes and Phenomena of Insufficient Transient
Performance in NPP -- 2.1 Failure of Level Control in Moisture
Separator -- 2.2 Failure of Level Control System in Deaerator (ADG) --
3 Transient Control Performance Optimization Method -- 4 Transient
Control Performance Optimization Effect -- 4.1 Optimization Analysis
of Moisture Separator Reheater -- 4.2 Optimization Analysis
of Deaerator Level -- 4.3 Results Analysis -- 5 Conclusion --
References -- Analysis of the Influence of Decision Module
Performance on Transient Events in Steam Generator Level Control -- 1
Introduction -- 2 Steam Generator Level Control System -- 2.1 Main
Water Control and Bypass Feed Water Control -- 2.2 Feed Water Pump
Speed Control -- 3 Decision Module Function Introduction -- 3.1
Function Introduction of Two-Input Decision Module VOT2 -- 3.2
Function Introduction of Three-Input Decision Module VOT3 -- 3.3
Common Configuration Structure of Decision Module and Controller --
4 Application of Decision Module and Transient Event -- 4.1 Transient

of Level Approaching Trip Value by Decision Failure -- 4.2 Transient
of Unexpected Reactor Trip Transient by Decision Failure -- 4.3
Analysis of Transient Events -- 5 Optimization of Decision Module
According to Transient Response -- 6 Conclusions -- References --
Research on Fault Diagnosis Method of Bus Type Intelligent Electric
Valve in Nuclear Power Plant -- 1 Introduction -- 2 Failure Modes
and Causes Analysis of Electric Valve.
3 Signal Acquisition of Bus Type Electric Valve.
