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(Control Theory, DCS, PLC Equipment, Control Systems, Optimization and Final
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2.A.3 Chemical Resistance of Materials (2.A.4)
2.A.4 Composition of Metallic and Other Materials (2.A.4)
2.A.5 Steam and Water Tables (2.A.5)
2.A.6 Friction Loss in Pipes (2.A.6)
2.A.7 Tank Volumes (2.A.7)
2.A.8 Partial List of Suppliers (2.A.8)


CHAPTER 1: THE OVERALL PLANT DESIGN
CHAPTER 2: DESIGNING A SAFE PLANT
CHAPTER 3: CONTROL CENTER AND WORKSTATION PLATFORMS
CHAPTER 4: BUSES AND NETWORKS
CHAPTER 5: SOFTWARE PACKAGES

CHAPTER 1: THE OVERALL PLANT DESIGN (Symbols, Terminology, Practices and Costs)
3.1.1 Auditing Existing Plants for Upgrading (Integration of Old and New Technologies) Author: G. Kevin Totherow, President, Solution Consulting
3.1.2 Project Management and Documentation (incl. Maintenance) Author: Emmanuel Shibi, Head of I&C, Dar Al Riyadh Consultants
3.1.3 Operator Training, Commissioning and Start-up
Author: George C. Buckbee, Control Engineer, Top Control

3.1.4 Flowsheet Symbols for Digitally Implemented Control Loops (Incl. tag naming and loop descriptors)

3.1.5 Historical Data Storage and Evaluation (incl. short-term for process control trends)
Author: George C. Buckbee, Control Engineer, Top Control

3.1.6 Integration of Process Data with Maintenance Systems
Author: G. Kevin Totherow, President, Solution Consulting

3.1.7 Applications, standards and products for grounding, shielding (screening)
Author: Doug Morgan, Project Engineer, Control Systems International

3.1.8 Concepts of Hierarchical Control,
Author: Herold I. Hertanu, President HLP Associates, E: HeroldH@aol.com

3.1.9 Analog or Discrete I/O, Costs, Features and Digital Signal Processing
Author: Dr. Halit Eren, professor at Curtin University of Technology, Perth, Australia,

3.1.10 Estimating the Costs of Control System Packages
Author: George C. Buckbee, Control Engineer, Top Control

CHAPTER 2: DESIGNING A SAFE PLANT (Types of Hazards, Methods of Protection)

3.2.1 Hazardous Area Classifications and Instrument Design Options
Author: Edward M. Marszal, P.E., Principal Engineer, Exida

3.2.2 Intrinsic Safety Rules for Fieldbus Installations, Author: Jonas Berge, Engineer, Smar

3.2.3 Purging and Inerting Systems, Authors: Dr. M. Sam Mannan and Dr. Harry H. West, Professors of Chem. Eng. at Texas A&M University

3.2.4 High Integrity Pressure Protection System (HIPPS), Author: Dr. Angela Elaine Summers, President, SIS-TECH Solutions, LLC

3.2.5 Process Safety Management (PSM), Authors: Dr. M. Sam Mannan and Dr. Harry H. West, Professors of Chem. Eng. at Texas A&M University

3.2.6 Redundant or Voting Systems for Increased Reliability, Author: Ian H. Gibson, Principal Technical Specialist, Process & Control.com Systems, Fluor Australia Pty Ltd,
3.2.7 Network Security, (In-Plant levels of access, remote or out-of-plant access and passwords), Author: Michael Frank Hordeski, P.E., Consultant, Jablon Computer

3.2.8 Safety Instrumented Systems - Design, Analysis, Inspection
Author: Harry L. Cheddie, P.E., Principal Engineer, Exida

3.2.9 Reliability Engineering Concepts, Author: Harry L. Cheddie, P.E., Principal Engineer, Exida

3.2.10 Intelligent Alarm Management - IAM , Author: David A. Strobhar, P.E., President, Beville Engineering Inc. E:

3.2.11 Safety Instrumentation and the Justification of its Costs, Author: Hashem Mehrad Hashemian, President, Analysis and Measurement Corp.

3.2.12 International Safety Standards and Certification (ANSI/ISA-S84, IEC 61511/61508, ISO 1158), Author: Ian H. Gibson, Principal Technical Specialist, Process & Control Systems, Fluor Australia Pty Ltd.

CHAPTER 3: CONTROL CENTER AND WORKSTATION PLATFORMS (DCS, HMI, PLC and Hybrid Platforms)

3.3.1 Operator Interface Evolution, Author: G. Kevin Totherow, President, Solution Consulting

3.3.2 Virtual Reality Tools for Testing Control Room Concepts
Author: Bruce J. Geddes, P.E., I&C Design Consultant, Constellation Nuclear

3.3.3 Upgrading the Control Room (Integrating the Various Information Systems)
Author: Bruce J. Geddes, P.E., I&C Design Consultant, Constellation Nuclear

3.3.4 Manufacturing Platforms and Workstations (Linux, Unix, RISC, Windows NT)
Author: Robert J. Smith II, Information Technology Manager, Associated Professional Engineering Consultants

3.3.5 Workstation Hosts: Design Concepts and Classification
Author: Gurbinder Singh, Control Systems Engineer, SEWA

3.3.6 Integration of DCS, PLC, HMI and SCADA Systems (Integration of Proprietary Protocols), Author: Daniel Miklovic, Vice President and Research Director, Gartner

3.3.7 Integration with RTUs, Multiplexers, Fieldbuses and Data Highways
Author: Stuart A. Boyer, President, Iliad Engineering Inc.

3.3.8 Hybrid Systems with Discrete and Analog Capability
Author: Jonas Berge, Engineer, Smar

3.3.9 SCADA—Supervisory Control and Data Acquisition, Author: Stuart A. Boyer, President, Iliad Engineering Inc.  3.3.10 PLC Programming, Author: Vipul A. Bhavsar, Consultant, vipulabhavsar@yahoo.com

3.3.11 Fault Tolerant Programming, Real Time Operating System
Author: Gurbinder Singh, Control Systems Engineer, SEWA

3.3.12 Standard Language (IEC 1131-3) for Ladder Diagram, Function Block, Instruction List and Sequential Chart, Author: Ann Tuck, Senior Control Systems Engineer, Bechtel Corporation

CHAPTER 4: BUSES AND NETWORKS
3.4.1 An Introduction to Networks in Process Automation, Authors: Dr. Peter Graham Berrie (marketing communications) and Klaus Peter Lindner (new technology specialist) of Endress+Hauser Process Solutions AG

3.4.2 Proprietary and Open Networks, Author: Chet S. Barton, P.E., Senior Process Automation Engineer, Jacobs Engineering

3.4.2 Hardware Selection and Specification (Cable, terminations, barriers)  
Author: Ian Verhappen, P.E., Engineering Associate, Syncrude Canada, Ltd.

3.4.3 Sorting Out the Protocols (OSI/RM), Signal & Data Integrity, Compression, Bandwidth, etc.  Author: Wallace A. Pratt Jr., Chief Engineer, HART Communication Foundation

3.4.4 Overall Fieldbus Trends, Relative Acceptance, Author: Stefano Vitturi, Researcher, CNR-LADSEB

3.4.5 Fieldbus Advantages and Disadvantages, Interconnectivity, Economics, Options and Trends (control migrating to the field)  
Author: Ian Verhappen, P.E., Engineering Associate, Syncrude Canada Ltd.

3.4.6 Fieldbus Design, Installation, Redundancy, Economics and documentation, Author: Scott C. Clark, Project Engineer, Merck & Co., Inc.

3.4.7 Instrumentation Network Design and Upgrade, Cost and Other Considerations,  
Author: Dr. Miguel J. Bagajewicz, Professor, University of Oklahoma

3.4.8 Global System Architectures with Field and Control Network Layers, LANs, WANs, Author: Richard H. Caro, Vice President, ARC Advisory Group Inc.

3.4.9 The Advantages and Limitations of Open Networks
(bandwidth, indeterminism, security), Author: Richard H. Caro, Vice President, ARC Advisory Group Inc.

3.4.10 HART Networks, Author: Wallace A. Pratt Jr., Chief Engineer, HART Communication Foundation

3.4.11 Foundation Fieldbus Network (Control Programming Language, ISA SP50/IEC 61158), Author: Richard H. Caro, Vice President, ARC Advisory Group Inc.

3.4.12 Profibus-PA, Authors: Dr. Peter Graham Berrie (marketing communications) and Ludger Füchtler (marketing manager) of Endress+Hauser Process Solutions AG.

3.4.13 Field Device Installation for Foundation Fieldbus and Profibus Authors: Dr. Peter Graham Berrie (marketing communications), Ludger Füchtler (marketing manager) and Klaus H. Korsten (marketing manager) of Endress+Hauser Process Solutions AG

3.4.14 Ethernet and High-Speed Ethernet (HSE) Systems and TCP/IP Connectivity, Author: Eric J. Byres, P.E., Research Faculty, British Columbia Institute of Technology,

3.4.15 Fieldbus Networks Catering to Specific Niches of Industry Author: Stefano Vitturi, Researcher, CNR-LADSEB

3.4.16 Proprietary Buses (data highway, modbus, and genius LAN) Author: Daniel E. Capano, President, Diversified Technical Services, Inc.,

3.4.17 Fiber-optic Networks Author: Eric J. Byres, P.E., Research Faculty, British Columbia Institute of Technology,

3.4.18 Satellite, IR, Radio, Wireless LAN Networks Author: Daniel E. Capano, President, Diversified Technical Services, Inc.

CHAPTER 5: SOFTWARE PACKAGES (Operation, Diagnostics, Simulation, Optimization, Modeling)

5.1 (5.11) Optimizing Control Loops Author: John Gerry, ExperTune Inc.

5.2 Data Reconciliation Authors: Dr. Miguel J. Bagajewicz, Professor, University of Oklahoma, Dr. Derrick Keith Rollins, Sr., Associate Professor, Iowa State University

5.3 (5.6) Post Trip Review, Sequence of Event Recorders Author: Dr. Alberto Rohr, Consultant
5.4 OPC (OLE for Process Control), Allowing Individual Software Components to Interact and Share a Data Base, Author: Jonas Berge, Engineer, Smar

5.5 (5.3) Batch Software State of the Art, Author: Asish Ghosh, ARC Advisory Group,

5.6 (5.9) Plant-wide Optimization, Author: Michel Ruel, P.E., President, TOP Control USA Inc.

5.7 (5.7) Plant-wide Loop-performance Monitoring and Assessment
Authors: Dr. Karlene A. Hoo, Associate Professor at Texas Tech University and Dr. Michael J. Piovoso, Associate Professor at Penn State

5.8 (5.8) Virtual Plant, A Testing and Training Package
Author: Gregory K. McMillan, Senior Fellow, Solutia Inc.,