

BOOK REVIEW

Iván Nagy:

Introduction to Chemical Process Instrumentation

Akadémiai Kiadó, Budapest 1992.

This book is essentially a handbook intended for chemists, chemical, mechanical, instrumentation and control engineers involved in the design of chemical plants or in the operation or improvement of existing process control equipment in the chemical industries. In spite of its limited size (XX + 428 pages, 276 figures, 215 references) it at least mentions every problem encountered with in chemical process control. It contains a list of international (East and West) Abbreviations; in its Appendix it gives the Code for Identification of Instrument Functions and a very useful Subject Index. The references are listed directly after each chapter.

The book is mainly practical. No control theory is treated, it gives answer to the question 'How' and not to 'Why'. Basic equations for the processes to be controlled are given without discussion. Operation principles of the hardware elements (sensors, transducers, control valves etc.) are mentioned very briefly.

Part I of the book is concerned with the Fundamentals. Chapter 1 is Information n Measurement (selection of measurements, signal classes, frequency and recording of measurement, measurement error, reliability, economic considerations). Chapter 2., Fundamentals of Process Control, lists the types of mathematical models, defines the concepts of identification, degrees of freedom, controllability, stability and quality of control, multivariable control complex control schemes, Chapter 3., Principles of Process Instrumentation Design may be a help for design engineers: it describes process documents, flowsheets, logic and instrumentation diagrams, computer aided design.

Part II is furnishing information hardly found elsewhere. Industrially approved control schemes are gathered for many processes: 4. Hydro-mechanical Unit Operations (liquid, gas and solid storage resp. transport, blending weighing, filling, mechanical separations, crushing, grinding, mixing, pressing, extruding); 5. Thermal Unit Operations (heat transfer, direct and surface heat exchange, furnaces, refrigeration, evaporation, boilers); 6. Mass Transfer Unit Operations (crystallisation, drying, adsorption, ion exchange, absorption extraction distillation); 7. Chemical Reactors (21 pages); 8. Unit Processes (oxidation, hydrogenation, polymerisation, fermentation, pH etc., in 26 pages).

Part III deals with the aspects of instrumentation itself. Chapter 9. gives description of Process Control Hardware Elements (sensors, transmitters, receivers and controllers for analogue signals, annunciators and logic control systems, design sizing of final control elements). Chapter 10., Computer Control is a summary for the use of non-electric engineers, listing basic notions and hardware element descriptions. Chapter 11., Information and Management of Chemical Plants is on information management, hierarchy levels, description and layout of control rooms resp. panels, plant layout and instrumentation, piping and cabling, utilities for control systems. Chapter 12., Economic Effects of Instrumentation is on instrument prices, installation, maintenance and operation costs, in 16 pages.

Hajnalka HAJDU