



### **Five Gallons of Control in a Three Gallon Book - BBB (Borrow)**

*The Condensed Handbook of Measurement and Control 3<sup>rd</sup> Edition*

By Nabil E. Battikha

Reviewed by Nick Sands

There are several books that provide an overview of the field of automation, and some are best sellers. One is *The Condensed Handbook of Measurement and Control* by Nabil (Bill) Battikha, now in its third edition. Battikha, a professional engineer in Ontario, is the president of BergoTech Inc, an instrument and control consulting company. He has over 30 years of measurement and control experience with suppliers, end users, and consultants. He has contributed to several standards, published numerous articles and written two other books.

Battikha begins, as he must, with an introduction that answers such questions as “what is measurement and control?”. Another chapter explains the symbols and identification method for instruments. Strangely, the next chapter covers the most complex instruments, analyzers, and it is an excellent overview of analyzer technologies, including cost of operation and maintenance considerations. The next few chapters describe the different technologies for flow, level, pressure, and temperature measurement. Most available technologies are covered with excellent comparison tables to assist in meter selection.

The chapter on control loops is not as good as the earlier chapters. The requisite types of control are all included; on-off, PID, cascade, ratio, and feedforward. Tuning methods, from open loop to auto-tuning are reviewed. Battikha builds from controllers to control systems, from single loop controllers to PLCs and DCSs. There is a brief mention of the programming languages for control systems, typical control loop power, Fieldbus and other networks, and operator interface considerations. A chapter is dedicated to alarm and interlock systems. The basics of safety integrity levels and fail-safe design are included as is guidance on documentation, testing, commissioning and management of change.

Other chapters include ergonomics and other factors for control room design as well as practical considerations for panel boards both inside and outside. Another oddly placed chapter provides a concise overview of control valve sizing and selection. Engineering drawings are covered in some detail followed by installation scope and practices and maintenance practices, including the consideration of work hazards. There is an interesting chapter on calibration that breaks down the instruments into classes based on the calibration requirements.

The final chapters explore the areas of project management, with more detailed design in each project phase. The development of project deliverables follows from business strategies to equipment specifications. The topic for another chapter is auditing of the control systems to determine if the objectives are being met. The final chapter is advice for consultants. The appendices include typical job descriptions and control system audit tools.

Battikha covers a tremendous amount of ground in *The Condensed Handbook of Measurement and Control*, some of it very well, like the section on analyzers, and some of it not so well, like the sections on controllers, programming, and safety systems. It is difficult for one person to master all areas of automation, though Battikha has broad experience. Given the highs and lows of the sections, this is probably a better borrow than a buy (BBB) at \$99 (member price). It is available from ISA.org.