



Design by the Numbers - BBBB (Buy)

Successful Instrumentation and Control Systems Design by Michael D Whitt

Reviewed by Nick Sands

This book, by Raytheon project engineer and manager Michael Whitt, covers the basics of instrumentation and control (I&C) design for projects in a way unlike any other. Only a truly experienced project leader could reveal the secrets that Whitt shares. Even after a half dozen major DCS projects, I found new insights in *Successful Instrumentation and Control Systems Design*. If you want to excel in I&C project work, this is a must read.

The book, like many projects, is divided into three parts, each more detailed than the one before. The first part gives an overview of the project process. In the second part, Whitt shares design basics, from background information to good design practices for instrumentation and control systems. Part three is about execution of design. Using an example problem, Whitt completes the engineering documentation for the project, highlighting the connections to good project management and good design covered in the earlier chapters.

Projects 101 is the first part, giving an overview of the organization and process of a project. Whitt explains the different types of projects and why the old adage is true: a project can meet any two of three objectives; cheap, good, or fast. Project structure, flow, and deliverables are outlined. The roles and the responsibilities for the team are defined. The basics of project management, scope, estimate, and schedule, are discussed, along with why they are important to the project.

Design 101 is the second part, giving many practical tips. Whitt starts with some background on ranges and scaling, then covers wiring practices, with some good information on electrical classification. A whole chapter is dedicated to control systems, including background on PLCs, typical system functionality, I/O count and arrangement, networking, and HMIs. While this is a very good section there is no comment about ensuring the right upstream and downstream diameters for flowmeters.

Documentation 101 is the third part, using an example to apply the design practices in part II and the management practices in part I. These chapters are full of the design documents generated as instruments are added, cables and conduits are selected and sized, I/O blocks are specified, and construction design package is assembled. Whitt uses the project tools to coordinate information and generate estimates and bill of materials. It's clearly a project design book since construction, checkout and startup are covered in less than three pages at the very end.

Whitt filled a void in the library of control books by writing *Successful Instrumentation and Control Systems Design*. Too often designers, engineers, and project managers learn good project practices the hard way, by first doing it wrong. Whitt shows the project as a product in itself, and how the many parts are connected. Even project management is critical to the success of a project despite what you may read about project managers (see G K McMillan's early books). There is an optional CD of project tools. This is a book definitely worth buying (BBBB), and it's available from ISA for \$79 (member price) or with the toolkit CD for \$89.