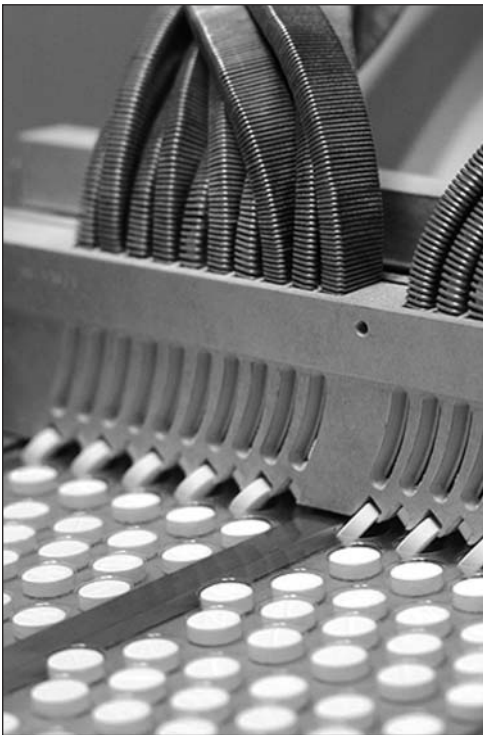


Practical

BATCH MANAGEMENT & CONTROL (INCLUDING S88)

for Industry



YOU WILL LEARN HOW TO:

- Automate batch processes using the appropriate standards and techniques
- Design a batch manufacturing control system for new or upgrade projects using principles supported by the ISA S88 standard
- Obtain guidance in the integration of batch control systems with manufacturing information systems
- Design and specify instrumentation and batch controls in modules leading to complete unit operations
- Carry out the detailed design of batch control operations including the sequencing and interlocking functions
- Develop batch operations into complete recipe based production systems
- Evaluate the choices in the range of batch control system products.
- Avoid the pitfalls of not having the batch control system package match your requirements

WHO SHOULD ATTEND:

- Engineers and Technicians in process or control/instrument fields who are involved in batch process control projects
- Production Supervisors or Managers interested in developing improved batch management techniques through the use of automation systems
- System Integrators seeking to provide a design service to clients
- Those in businesses that have automated batch manufacturing as a part of their production activity
- Instrumentation and Design Engineers
- Chemical Engineers
- Electrical Engineers
- Design Engineers
- Electrical Technicians
- Plant Operators
- Process Engineers
- Project Engineers
- Field Technicians
- Electricians



Technology Training that Works

THE WORKSHOP

This workshop shows you how to:

- structure the activities of batch control into easy to understand tasks
- choose, design and manage an automated batch management control system
- save your business time and money by choosing and designing the correct, and therefore efficient batch process control system

The workshop is presented in learning modules. At the end of each module we will examine the way in which the particular feature we have built contributes to the overall scheme. The scheme can be simple or it may be a complete manufacturing scheme integrated to a sales operation.

For example we will examine situations such as:

- businesses where the weekly tally of sales is collected into a shopping list for the factory production campaign
- how the plant responds quickly to the shopping list
- how we report back on what was actually produced
- how we report on batch numbers
- tracing which batch tanks were used
- identifying if a tank was contaminated
- how do we know which products to recall?

Historically batch control systems were designed in individual ways to match the basic arrangement of plant equipment. They lacked the ability to convert to new products without having to modify the control systems. These schemes did not lend themselves to recipe based operations or to integration with manufacturing management systems.

This workshop, concentrates on getting the building bricks right and arranging the structures into flexible schemes suitable for automated batch management e.g being able to work in response to new recipes that use the same plant equipment in different combinations.

The material in this workshop aligns with current practices in the automation of batch processes, including the drive for integration with MES and ERP products from major IT product companies. References and examples will be drawn from DCS/PLC batch control products in the market place.

WORKSHOP OBJECTIVES

This workshop is designed for you to:

- be able to plan, structure and manage a batch manufacturing project
- gain a basic knowledge of the S88 standard and be aware of critical design issues in batch control systems
- have a basic knowledge of current technologies in batch control and how to utilise them in the implementation stages of a project
- be able to plan for growth into a production management facility with ERP integration potential

Your knowledge of batch control system fundamentals, will assist you to avoid the expensive mistake of choosing the incorrect package for your business requirements.

THE PROGRAM

DAY ONE

WORKSHOP OUTLINE & OBJECTIVES

- Identification of batch processes, characteristics and examples
- Background to the demand for integrated batch systems
- Overview of batch systems engineering
- Introduction to Standards: ISA S88, IEC 849/BS 7716

IDENTIFY & DEFINE PHYSICAL MODELS

- We begin with a hypothetical but typical process in batch manufacturing
- Presentation of a typical P&ID with several units linked to supply systems
- Show how this is structured into elements, equipment modules, units, cells and trains using the physical models technique in S88
- Show how well structured batch plants can save on equipment costs
- *1st Practical Session*

IDENTIFY & DEFINE PROCESS MODELS, ACTIONS, OPERATIONS, STAGES

- Relationship between physical and process models
- A unit operation example based on the typical P&ID shown in the first practical session
- *2nd Practical Session*

IDENTIFY & DEFINE PROCEDURAL MODELS

- Sequence steps, phases, operations, unit procedures
- Introduction to co-ordination control
- *3rd Practical Session*

THE CONCEPTS OF EQUIPMENT ENTITIES

- The relationship between procedural control, physical model and procedural model
- Explanation of basic control, procedural control and co-ordination control
- This concept illustrated by using the example process
- Show how batch control is built up around the common, functional entities of control modules, equipment modules and units
- *4th Practical Session*

INTRODUCTION TO RECIPES

- The use of recipes to define all requirements for batch manufacture of a given product
- The concepts of master and control recipes
- Using and creating recipes
- How to hide the complexities of unit operations and create flexibility for the production team
- *5th Practical Session*

BATCH MANUFACTURING BASICS

- Batch numbering, tracking and reporting
- Batch planning and scheduling

DAY TWO

BATCH & SEQUENCE PROGRAMMING FUNDAMENTALS

- Practical techniques for batch control elements
- Implementation of valve elements, motor controls, interlocks, permits etc.
- Interactions with continuous process sections
- *6th Practical Session*

PRACTICAL TECHNIQUES IN SEQUENCE CONTROL DESIGN

- How to capture the need, design the operation and document it for programming into PLC/DCS
- Practical methods for functional specifications; flowcharts and structured text
- Defining equipment and process states using transition diagrams
- Dealing with sequencing problems such as alarms, holds, aborts and restarts

INTERFACING TO THE OPERATOR & THE SUPERVISOR

- Display screens for recipes, monitoring of sequence operations, trouble shooting, maintenance
- Illustrations using currently available software packages

BATCH MANAGEMENT ISSUES

- Introduction to batch control activities and activity models as described in ISA S88
- Practical problems in batch management
- Ownership issues and conflict
- Using command structures to resolve problems
- *8th Practical Session*

PRACTICAL BATCH CONTROL TECHNOLOGIES

- Overview of DCS/PLC architectures
- Examples of current products
- Integration of batch control systems to production management and ERP systems
- ERP requirements as inputs to batch production
- Sending process quality and production reports back to ERP

PRACTICAL SOFTWARE PROJECT PLANNING & IMPLEMENTATION

- What to look for in batch software packages
- Batch Control Software products
- Overview of S88 compliant packages
- Examples and demonstrations of key features from existing vendor packages
- *9th Practical Session*

PRE-REQUISITES

A basic knowledge of electrical engineering principles and concepts will be an advantage.