ProNamics Control Inc.

Process Optimization and Troubleshooting Techniques

A way to Improve Productivity and Quality

COURSE TOPICS:

- Process Variability
- Process Dynamics
- Tuning PID Controllers
- Attenuating Disturbances
- Troubleshooting Loop Problems
- Impact of Process Design
- Identifying Process Variability
- Managing Process Variability

High process variability compromises the economic performance of continuous processes. Off-quality product, higher raw material costs and reduced process efficiency are the result. Minimizing process variability is a difficult, multi-disciplinary activity that extends from the process design engineer to the operator. Process design flaws, poor control loop performance and inadequate stock chest mixing are important factors that lead to high variability in key process variables. Moreover, there is often a lack of the troubleshooting skills required to identify and correct variability problems. This allows higher than acceptable variability to persist for an extended period compromising product quality and profitability.

COURSE DESCRIPTION

This four day course is intended to strengthen the student's ability to optimize process performance. The first half of the course focuses on improving control loop performance. The measurement of process dynamics and Lambda tuning are the key topics. The second half of the course focuses on time series analysis techniques to characterize variability, troubleshooting techniques, and management approaches to maintaining a low variability operation. Particular attention is paid to the upgrading of consistency control performance. Approximately 40% of the course is devoted to a computer-based lab that illustrates the main concepts.

INSTRUCTORS

Doug Nelson, P.Eng. has over 24 years of pulp and paper process control experience. He has authored papers on paper machine dryer control, control valve selection and the uses of process simulation in optimization surveys.

George Jablonsky, AScT has 21 years of industry experience in process control, instrumentation and optimization in the pulp and paper industry. He has held positions both in operations and maintenance management.

WHO SHOULD ATTEND

The course is primarily intended for process engineers, instrumentation engineers and operations management personnel who want to improve their ability to troubleshoot process control and variability problems. The course explores the implications of process equipment design and process variability and therefore would be beneficial for maintenance and design engineers.

REGISTRATION

Registration fee is $2200 CDN ($2354GST included) or $2000 US for the 4-day course. Attendees need to register 3 weeks in advance to ensure space and materials will be available. ProNamics reserves the right to cancel the course based on a minimum number of registrants. The course is limited to 15 participants.

Please contact us by phone, fax or email for further information.

Phone: (604) 898-1376 **Fax: (604) 898-1378** **sale@pronamicscontrol.com**

In order to ensure the attendees position, payment by purchase order, check or money order should be received 2 weeks prior to the course. Cancellations within 1 week of the course will be subject to cancellation penalties.

COURSE SCHEDULE

Day One

Lecture 1 — **Process Variability Overview**
08:00 - 09:30

Lecture 2 — **Process Control Basics**
09:30 - 11:00
Control Terminology
Control Block Diagram
Process Dynamics

Lab 0 — **Simulator Introduction**
11:00 - 12:00

Lecture 3 — **Process Dynamics**
1:00 - 2:00
Types of Responses, 1st Order Processes
Integrating Processes, Non-linearities

Lab 1 — **Process Dynamics**
3:00 - 4:30

Day Two

Lecture 4 — **Tuning the PID Controller**
8:00 - 10:00
PID controller Introduction
Lambda tuning procedures
PID controller capability

Lab 2 — **Attenuating Process Disturbances**
10:00 - 12:00

Lecture 4 — **Tuning the PID Controller**
1:00 - 2:00
Tuning strategy development
Defining process objectives, interactive loops, cascaded loops

Lecture 5 — **Troubleshooting Control Loop Problems**
2:00 - 3:30
Identifying the problem source
Dealing with complex loops and strategies

Day Three

Lab 3 — **Troubleshooting Control Loop Problems**
8:00 - 10:00

Lecture 6 — **Consistency**
10:00 - 12:00
Measurement/Control
Control Strategies
Impact of Stock Chest Mixing

Lab 4 — **Consistency Control**
1:00 - 2:30

Lecture 7 — **Variable Speed Drives**
2:30 - 4:30
Application
Maintenance Benefits
Energy Benefits

Day Four

Lecture 8 — **Identifying Process Variability**
08:00 - 10:00
Identifying variability pathways

Lecture 9 — **Managing Process Variability**
10:00 - 12:00
Economic Benefits
Skill Requirements
Organizational Models

Lab 5 — **Managing Process Variability**
1:00 - 3:30

Wrap-Up
3:30 - 4:30

Lunch Breaks between 12:00 & 1:00 each day

COURSE LOCATION

The course will be held at hotel in the Vancouver area, to be advised. Attendees are responsible for arranging their own accommodations.

ABOUT ProNamics

ProNamics Control Inc. is a Vancouver based pulp & paper and petroleum pipeline process and control optimization and process troubleshooting consulting company. The company conducts process and control optimization field surveys, prepares process simulations to establish best practices and provides a range of training courses related to process and control optimization.

ProNamics Optimization and Evaluation Field Surveys are designed to maximize the mill's economic returns. The surveys are focused on improving product uniformity, increasing mill production efficiency and reducing operating costs. Visit our web site at www.pronamicscontrol.com for further information.

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