

Process Optimization & Troubleshooting Techniques

A way to Improve Productivity and Quality

Topics covered include:

- Process Variability
- Process Dynamics
- Control Loop Performance
- Impact of Process Design
- Identifying Process Variability
- Attenuating Disturbances
- Troubleshooting Loop Problems
- 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.

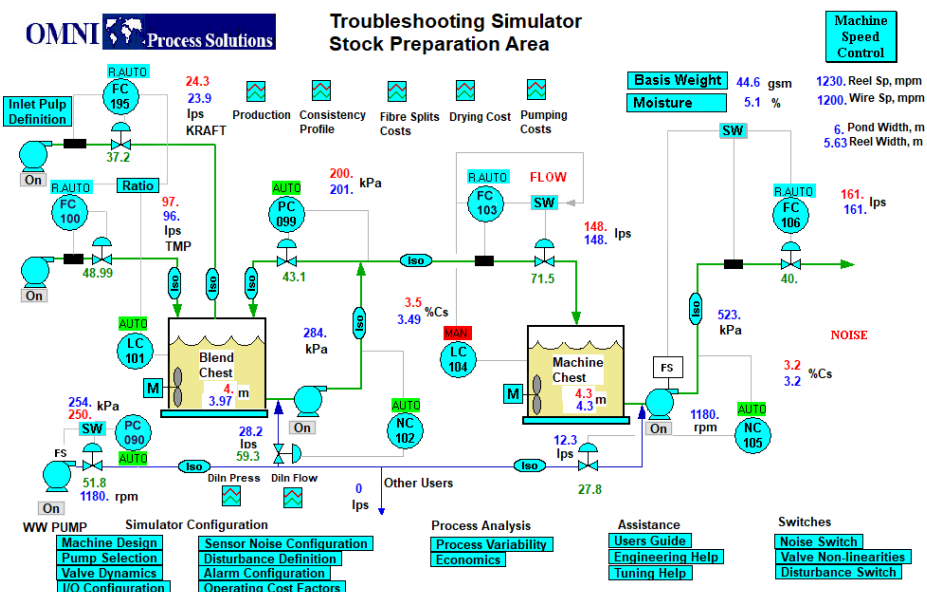
Course Fees

CDN \$ \$2,500.00
 USD \$ \$2,200.00

(Canadian Taxes Included.)
 Fees include a full set of course notes.

The remote course is limited to 5 attendees. to ensure individual attention and allow time to address specific mill issues.

An on-site course is limited to 8 attendees.



Course Schedule

DAY 1

08:00 Process Variability Overview

- Sources of variability
- Cost of variability
- Minimizing variability

09:30 Process Control Basics

- Control terminology
- Loop Components
- Control loop block diagram

11:00 Lab Introduction

- Process and Control simulation

12:00 Lunch Break

13:00 Process Dynamics

- Modelling the response
- 1st Order response
- Integrating response
- Complex responses
- Non-linearities

15:00 Lab - First Order Dynamics

16:30 Adjourn

DAY 2

08:00 Tuning the PID controller

- PID algorithm
- Lambda tuning procedures
- Lambda selection
- Robustness
- Filtering

12:00 Lunch Break

13:00 Lab – Lambda tuning

- 1st Order Loops
- Integrating Loops

16:30 Adjourn

Course Location...

The course is held at either a conference facility or by video conference. Attendees are responsible for arranging their own accommodations.

Accommodations...

For convenience, we recommend that registrants stay at the hotel course site.

DAY 3

08:00 Control Performance

- Setpoint and Load response
- Attenuation capabilities, Bode plots

- Impact of Non-linearities

9:00 Advanced Strategies

- Cascade, Ratio, Feedforward
- Split ranging, Mid ranging
- Dealing with non-linearity
- Developing tuning strategies

12:00 Lunch Break

13:00 Lab – Tuning strategies

15:00 Optimization Tools

- Data collection fundamentals
- Descriptive statistics
- Time series analysis techniques

16:30 Adjourn

DAY 4

08:00 Loop Troubleshooting

- Identifying the problem source
- Developing a solution

09:30 Lab – Troubleshooting control loop problems

12:00 Lunch Break

13:00 Managing variability

- Roadmap
- Economic benefits
- Auditing the process

15:00 Lab – Control Survey

16:30 Adjourn

About Omni

Omni Process Solutions is based in Vancouver, BC. The company conducts process and control optimization surveys and provides a range of training courses related to process control optimization.

Visit our web site at

www.omniprocesssolutions.com

for more information about our services.

About the Course ...

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 control strategy design, 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.

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.

Instructor, Doug Nelson

Doug has over 30 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.