Course Syllabus for:

Foundry Process Improvement

Course Code	CEUs
6-340	1.4 CEUs

Course Introduction

This course provides participants with basic root cause analysis training, which can serve as a refresher, a preparatory course for the ASQ Six Sigma Green Belt Certification program, or as a follow-up to any quality certification training. Metalcasting facilities today often struggle with problem solving, and have a need for training with a focus on metalcasting issues. At its core, this course provides personnel with disciplined problem solving techniques, and emphasizes tools to better understand process data and performance using unique examples and case studies drawn from metalcasting facility settings.

Discussion on the first day will include problem solving approaches, problem statement development, team and project management, process thinking, problem characterization and a look at types of data. Day two will focus on collecting and analyzing data, tools for analyzing process variation, process capability, and testing the root cause. Day 3 will focus on developing solutions and countermeasures and methods for sustaining improvement, and conclude with a capstone problem solving exercise that lets you put what you've learned to work. Participants will also have an opportunity to bring specific problems and/or process improvement challenges to class for discussion and analysis.

Benefits to Taking the Course:

Benefits to taking this course include the ability to obtain a higher level of knowledge about problem solving and process improvement practices used in established metalcasting facilities. You'll be armed with the know-how to begin working through process-based problems and understand ways to solve issues that may plague your organization. This course also provides an opportunity for hands-on practice using metalcasting-specific examples.

Learning Outcomes

At the end of this course, participants should be able to:

1. Describe structured problem solving approaches.
2. Develop effective problem statements.
3. Characterize problems to develop possible root causes.
4. Recognize various methods for collecting and analyzing data.
5. Explain why process stability is required for improvement.
6. Identify process sampling strategies for determining root cause.
7. Determine process improvement solutions and countermeasures.
8. Implement corrective action to sustain improvement.

Lesson Plan

Overview of Structured Problem Solving
- Structured Problem Solving for Metalcasting Facilities
- Problem Solving Basics
- Effective Problem Definition
- Managing Customer Expectations

Teams, Project Management and Process Thinking
- The Project Team
- Process Thinking
- Understanding Process Variation

Driving Toward Root Cause
- Root Causes
- Tools for Identifying Possible Root Cause

The Nature of Data
- Types of Data Used in Metalcasting Facilities
- Distributions
- Using Statistics to Understand Your Process Data

Problem Solving Exercise
- Group Problem Solving Activity

Collecting and Analyzing Data
- Measurement Defined
- Handling Data

Analyzing Process Variation and Examining Process Capability
- Is the Problem Due to an Out-of-Control Process?
- Stability
- Is the Process Capable of Consistently Meeting Customer Requirements?

Testing the Root Cause
- Root Cause

Developing and Evaluating Solutions/Countermeasures
- Developing Solutions
- Evaluating Solutions
- Sustaining the Improvement
- Long-Term Process Monitoring

Problem Solving Exercise
- Group Problem Solving Activity

Instructional Methods:
- Group activities
- Class discussion
- Problem solving exercises
- Case studies
- Games

Assessment Methods:
No formal assessment will take place in this course; however, attendees will participate in informal activities such as knowledge check and Q&A sessions with the facilitator to verify that learning outcomes are being met. Assessment of successful achievement of learning outcomes must be included throughout the course in order to meet the ANSI/IACET 1-2013 standard for continuing education programs and for CEUs to be awarded.

Course Prerequisites:

Prior to taking this course, participants should be able to:
- Identify general opportunities for potential process improvement projects involving specific metalcasting quality defects
- Work well in team environments
- Communicate well with plant floor personnel and management
- Value the fundamentals of data analysis and appreciate a careful and deliberate approach to problem solving.

Prior to taking this course, participants should know:
- Basic statistical concepts and terminology
- Some basic working knowledge of Excel, Minitab, or similar software to manage and analyze data
- The basics of gathering necessary data required for developing control strategies
- How to read engineering drawings

Attendee Requirements to Earn CEUs:
1. Present at least 13 hours of the total 14 hours of instructional time, which does not include lunch or breaks.
2. Active participation (can include asking questions, communicating with other attendees during and taking part in group activities, providing responses during whole class or group discussions).
3. Successful achievement of learning outcomes.

Who Should Attend?
The target audience for this course consists of individuals responsible for technical problem solving, especially in a casting environment; process improvement (technical/manufacturing); resolving acute and/or chronic quality or productivity issues; developing problem solving and/or process control plans and effective control strategies; effecting process improvement change within their own organization.

This may include:
- Production management personnel such as Area/Plant Managers, Foundry Superintendents, and Production Foreman/Supervisors interested in quality efforts
- Process and Quality Engineers
- Selected operating personnel such as technicians, floor personnel, cleaning and maintenance personnel, students or others involved in quality efforts