Invest in knowledge

Cement seminars and courses 2014
Expertise to excel

The latest knowledge, expertise and new ways of thinking that translate directly into on-the-job results: Training from the FLSmidth Institute quickly pays for itself.

**New levels of excellence**
In 2014, we invite cement industry engineers and plant managers to participate in a relevant course or seminar and gain new knowledge and skills that will have a positive impact on daily work and plant performance.

The FLSmidth Institute constantly keeps the syllabus fresh and up to date; offering training in production, maintenance, process control and quality control, as well as introductory courses for newly hired staff. Last year, more than 4500 people experienced first-hand the highly specialised and professional trainers who set the industry standard for cement education.

**Blended learning**
The Institute helps to ensure that plants have the right talent and expertise to excel, keeping employees up-to-date on the very latest technologies and best practices in the industry. Training can significantly contribute to a reduction in plant downtime and help increase equipment availability and reliability.
Blended learning combines face-to-face teaching with computer assisted instruction, using the best methods to ensure that learning is optimised. We use our Intelligent Collaboration Environment (ICE) centre for online training, giving participants the opportunity to learn together and individually, regardless of their location. This approach provides effective, efficient learning and reduces travel expenses and time.

**Measuring success**
The FLSmidth Institute’s offerings follow the plant’s lifecycle and are tailored to meet specific needs and real-life performance goals. We test participants’ knowledge before and after courses, to establish the level of competence and analyse the next step, ensuring effective training and the greatest return on investment. We also evaluate all our courses and have received a high satisfaction rating of 8.6 out of 10, as measured by a neutral analysis company. The average in the industry is 7.75.

Value comes from putting training into context and 95% of our customers report making good use of the training material after a course has concluded. Our certified, experienced trainers are skilled at converting competency into on-the-job results and exceeding expectations.

**Close to customers**
The FLSmidth Institute will also come to you, providing the right training and support exactly when and where you need it. We value a close dialogue with customers and can offer tailored training, onsite at your plant or in a hotel or conference centre convenient to you.

We strongly believe that investing in staff through training means investing in future business growth and competitiveness. We look forward to being your cement industry partner in learning, development and performance improvement, and to a rewarding 2014.

On behalf of FLSmidth,

Cristina Holmark
General Manager,
Global FLSmidth Institute

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**What our customers say**

“The International Seminar on Cement Production is a once-in-a-lifetime experience for all process engineers and plant managers. The course opens new doors to technology, experiences, best practices and innovation, which will increase our area of influence in order to achieve our goals.

The three weeks of the seminar seem very short when you look at its huge content, but FLSmidth has structured it well and there is a perfect balance between the theory of the process, maintenance aspects, new technologies and technical visits, which reinforce the knowledge acquired. The Cement Seminar has the strength to create knowledge networks in which chemical, electrical and mechanical engineers can share their knowledge and experience to improve and resolve new challenges in the cement industry. The seminar is undoubtedly a must for those wishing to attain new levels of excellence.”

Brian Luján
Production Manager, Cementos Progreso, S.A., Guatemala
All lecturers conducting FLSmidth Institute courses and seminars are highly skilled, professional and with vast experience within the industry. This is only some of our renowned lecturers.

**Lecturer profiles**

**Kim Dam-Johansen**  
MSc, PhD, Professor at Technical University of Denmark (DTU)  

Kim is director of the Combustion and Harmful Emission Control Research Center which he founded in 1987. Being an expert in high temperature processes with more than 200 ISI publications and many patents, Kim was the world’s most cited researcher in Combustion in the period 1998-2008. In the late 1990s, Kim was Group Vice President of Hempel – a chemical company with factories and laboratories all over the world. Since 1997 he has worked with research programs in close cooperation with FLSmidth, and he is an extremely popular guest speaker at the International Cement Production Seminar.

**Kirsten Theisen**  
Senior Research Engineer, MSc. Chem. Eng  

Kirsten has worked in Chemical Research and Development during her more than 40 years with FLSmidth. The first projects dealt with development of new and improved laboratory methods. The work area expanded to small- and large-scale grinding and burning tests, characterisation of raw materials, and responsibility for cement plant laboratories delivered by FLSmidth world-wide. Later Kirsten’s extensive knowledge and experience have been used for trouble-shooting and training assignments.
Henrik Rask Sønderborg  
Training Manager, Valby

Starting his career with FLSmidth in commissioning, Henrik gained a solid knowledge of most areas in the cement plant. After nearly a decade in commissioning, Henrik took up position as process manager in the FLSmidth Brazil office and spent 6 years overseeing FLSmidth process design and process troubleshooting. Upon return to FLSmidth Copenhagen, Henrik has been employed both in the process design department and is now process training manager in the Institute.

Delvi Rodriguez  
Manager of Training, Bethlehem

Delvi Rodriguez has been in the industry of cement for more than 20 years with a Bachelor of Science in Mechanical Engineering. He started his career in the cement industry as project engineer, working at the installation of several equipment such as crusher and stacker, wet and dry kiln, coolers, ball mills and vertical mills. Before joining FLSmidth, Delvi was manager of maintenance for 13 years, working in Mexico, Dominican Republic, Puerto Rico and United States. He joined FLSmidth as a senior training engineer in 2012 and from March 2013 is the manager of training of FLSmidth Institute for the Americas.

Walter M. Gebhart  
Vice President, FLSmidth Sioux City

Graduated from the University of Toronto in 1969 with Bachelor of Applied Science in Mechanical Engineering. Since then he has been active in the field of bulk materials handling in the areas of dust collection, pneumatic conveying and pyro-processing. Mr. Gebhart has had many technical articles published in various trade journals covering aspects of hot kiln alignment, and other mechanical issues of trunnion supported rotary equipment. He has also developed the only hot kiln alignment system that has ever been patented. He holds several patents in the field of trunnion supported rotary equipment alignment including the Method of Dynamic Thrust Balancing.

Bjarne Ivar Jensen  
Training Manager, Valby

Bjarne started his career with FLSmidth in the FLSmidth workshop in Valby 1967. Since then, he has been installing cement plants for 10 years in various countries as well as worked as a mill specialist in Copenhagen for 13 years. Bjarne has done numerous mill and kiln jobs while working in the mill department, and he is our top specialist within the field of ball mills. Bjarne is now part of the FLSmidth Institute as training manager, but he still does selected jobs on site; His latest site job was a change of a heavy kiln section with fixed support for planetary coolers in Sweden in July - September 2013.
# Cement seminars and courses 2014

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## General

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## Registration

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Production
General
Our goal is to provide participants with information covering the entire production process and a forum where global cement specialists can benefit from the exchange of ideas.

Learning objectives
The learning objective is to illustrate the cement manufacturing process step by step throughout the factory:

- Module 1: The participants will gain knowledge of different technologies and their advantages in connection with optimization of the process.
- Module 2: In this module, the participants will gain knowledge of which factors influence the cement quality and how to investigate problems.
- Module 3: The participants will gain deeper knowledge of the pyro-process and the inherent processes related to environment and alternative fuels.

Benefits
The experience gained at the seminar will:
- Inspire new ideas for optimizing your plant operation
- Present potential upgrading of your equipment
- Present potential modernization of your equipment
- Create a valuable network among the participants.

Seminar plan
The International Cement Production Seminar consists of more than 40 lectures, group work and discussion groups. The complete seminar is comprised of 3 modules. For all 3 modules the main areas of focus are:
- Review of the cement processes
- Function and design of main equipment, including the newest technology methods for optimization and proposals for improvements, plant modernization and plant operation
- The lectures will be supported by group work.

Target group
This seminar is designed for production managers, plant managers, general managers and production engineers with at least one year of experience in the cement industry.

Features
It is possible to register for one or several modules. This modular structure enables delegates to target their needs and gain maximum benefit of the modules they choose. It is also possible to participate in one module this year and participate in the others the following years.

- Plant visit tour to a modern cement plant to supplement the theoretical knowledge during the plant visit tour to two cement plants (module 2).

Included in registration fee for module 1 and 3 are
- Training sessions
- Seminar documentation
- Single accommodation including full board and lodging (breakfast, lunch, and dinner) at DGI-Byen Hotel, Copenhagen
- Emergency medical insurance
- Laundry service
- Free internet

Note: The fee does not include private telephone calls, faxes, beverages outside meals, dry cleaning, room service, or extra nights.
Module 1:
Crushing and grinding of raw materials, coal and cement
The subjects covered start with quarry operation, then crushing, raw material grinding and cement grinding:
- Types of raw materials
- Quarry operations
- Crushing and grinding
- Process and equipment for raw material handling
- Raw material grinding
- Commination and separation theories
- Homogenisation and storage of raw meal
- Grinding theory of vertical mills and roller presses
- Cement grinding
- Coal grinding
- Dedusting of cement plants
- Safety
- Lectures will be supported by group work.

Module 2:
Cement chemistry and plant visit tour
Aspects of cement chemistry and cement quality are illustrated by theory and examples:
- Basic cement and clinker theory
- Burnability of clinker
- Grindability of clinker
- Chemical changes in cement during grinding and storage
- Quality of cement
- Blended cement, including Supplementary Cementitious Materials (SCM or CRM)
- Influence of particle size distribution on strength & water demand
- Quality control throughout the production line.
- Microscopy
- Quantitative X-ray diffraction (Rietveld theory) - XRD
- Visit to a modern cement plant to supplement the theoretical knowledge.

Module 3:
Pyro technology
Aspects of the pyro-process itself and also derived environmental effects will be illustrated:
- Kiln system process
- Pyro-processing
- Plant up-grades
- Cooling of clinker
- Fuel and firing systems
- Heat and power consumption
- Alternative fuels in cement kilns
- Heat and mass balance
- Refractory linings
- Waste Heat Recovery
- Gaseous emissions from cement plants
- Process control structures
- Gas analysis
- Lectures will be supported by group work.
- Collaboration with Technical University of Denmark.

Included in registration fee for module 2 are:
- Plant visit tour to a modern cement plant
- Training sessions
- Seminar documentation
- Single accommodation including full board and lodging (breakfast, lunch, and dinner) at the hotel during the plant visit tour
- All transportation during the plant visit tour with starting point in Copenhagen
- Emergency medical insurance

Note: The fee does not include private telephone calls, faxes, beverages outside meals, laundry, dry cleaning, room service, internet or extra nights.

Registration fee
Seminar fee per participant is as follows:
1 module: EUR 4,645 per participant
2 modules: EUR 8,895 per participant
3 modules: EUR 12,755 per participant

Cancellation
There will be an administrative charge in case of absence or cancellation. The cancellation fees are as follows:
61 days before seminar start = 0% of fee
31-60 days before seminar start = 50% of fee
0-30 days before seminar start = 100% of fee

Absence or cancellations due to missing visa will not be the responsibility of FLSmidth and will be subject to normal cancellation rules.

Registration
Please contact:
Ms. Pernille Beck
Tel: +45 36 18 17 27
Fax: +45 36 18 28 04
E-mail: PEBE@flsmidth.com
or flsinstitute@flsmidth.com

Early Bird: Sign up before 31 January 2014 and get a 10% discount upon registration for all 3 modules
Kiln Process and Operation

COPENHAGEN DENMARK

General
To achieve optimum economy, the kiln system must be in continuous operation for as long a period as possible. By upgrading skills and knowledge of the personnel involved in kiln operation, the effect of internal and external influences on kiln operation can be reduced. This will reduce variations in the plant’s capacity utilisation and energy consumption which will improve overall plant profitability.

Learning objectives
The purpose of the course is to upgrade the skills and knowledge level of process engineers and operators within the field of kiln operation.

Benefits
After the course the participants will have an in-depth understanding of the kiln process and equipment. Their skills in operation control will be improved, hereby increasing the plants’ capacity utilisation.

Course Contents:
- Process and kiln system
- Basic principles of operation
- Fuel types and their characteristics
- Raw material characteristics
- Optimisation of heat consumption
- Alternative fuels
- Kiln refractory
- Heat balances
- Emission of NOx and SOx from cement kilns
- Kiln system process control
- Starting and stopping of the kiln demonstrated with the FLSmidth CEMulator
- Strategies for kiln inspection.
- Visit to the FLSmidth ICE Centre.

Form
The course is a combination of theoretical classroom lectures, exercises and calculations supplemented with realistic demonstrations of kiln operation with the FLSmidth CEMulator. Furthermore, the knowledge gained at the course is measured by tests.

Documentation
Each participant will receive a complete set of training materials.

Target group
The course is designed for process and operational personnel.

Participants
The maximum number of participants is 15.

Duration
4 days

Planned course days
28 - 31 October 2014

Location
The course is held at FLSmidth A/S, Valby Denmark.

Registration fee
Tuition fee per participants is EUR 2,625. Cost of board, lodging and personal expenses are not covered.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact:
Ms. Pernille Beck
Tel: +45 36 18 17 27
Fax: +45 36 46 28 04
E-mail: flsinstitute@flsmidth.com
General
Having a skilled team plays a key role in the optimal utilization of the grinding installation in the cement plant. The operators and process engineers must be able to evaluate all the process variables in order to optimize the production economy. This course provides an in depth understanding of grinding theory and equipment and gives you the tools to audit your own installation.

Learning objectives
The purpose of the course is to give operators and process engineers tools to optimize the output of an existing grinding installation.

Benefits
By having a thorough understanding of the plant power consumption, proper process control and a full understanding of the equipment and grinding theory the participants will be able to evaluate and optimize any existing grinding installation and thereby boost the production rate.

Course contents
- Mass, air flow and heat balances
- Grinding system and grinding of raw materials
- Drying and grinding of coal
- Cement grinding and optimization of grinding system
- Roller press
- Separator types and their mode of operation
- Separator efficiency and particle size distribution
- Ball mills - Internal installations and grinding media charges
- Ball mill operation
- Roller mill operation
- Performance testing.
- Visit to the FLSmidth ICE Centre.

Form
The course is a combination of theoretical classroom lectures, exercises and calculations supplemented with realistic demonstrations of mill operation with the FLSmidth CEMulator.

Furthermore, the knowledge gained at the course is measured by tests.

Documentation
Each participant will receive a complete set of training materials.

Target group
The course is designed for process and operational personnel.

Participants
The maximum number of participants is 15.

Duration
5 days

Planned course days
23 - 27 June 2014

Location
The course is held at FLSmidth A/S, Valby Denmark.

Registration fee
Tuition fee per participants is EUR 3,255. Cost of board, lodging and personal expenses are not covered.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact:
Ms. Pernille Beck
Tel: +45 36 18 17 27
Fax: +45 36 18 28 04
E-mail: flsinstitute@flsmidth.com
Intelligent Collaboration Environment (ICE): How to optimize the operation of the OK Cement Mill

COPENHAGEN DENMARK

General
Our goal is to provide the participants with the knowledge and inspiration to optimize the operation of the OK Cement Mill installation. This training course gives an in depth understanding of all aspects of the OK Cement Mill installation and gives the participants the tools to improve operation of the installation.

Learning objectives
The training course will give process engineers and operators the right tools, thus enabling them to understand and optimize the operation of an OK Cement Mill installation.

Benefits
The participants will have an in-depth understanding of the theory and operation of the OK Cement Mill grinding installation and will be able to optimize the operation and production. By comparing the mill operation figures before and after the course it is possible to measure and document the results obtained.

Course Contents
- OK Mill presentation
- OK Mill typical wear
- Wear measurements
- Hard facing of wear parts
- OK Mill power calculations and friction factor
- Fan curves
- Calculation of mill air flow based on fan curve and pitot measurements
- Operation experience
- Flow sheet
- Process instruction
- Hydraulic system function and change of grinding pressure range
- Gearbox lubrication system
- Roller lubrication system
- Grinding aid system
- Water injection system
- Function of mechanical stoppers and adjustment
- Nozzle ring function and adjustment
- Function of dam ring and adjustment
- Separator measurements
- Separator lubrication and grease systems
- Mill fan measurements
- Mill bag filter function of purging system
- Introduction of the OK Mill CEMulator.

Form
The course is a combination of theoretical classroom lectures, exercises and calculations. Following the classroom lectures, the actual operation parameters are monitored by screen sharing via the internet and based on this further coaching of the client will be carried out followed by a report.

Documentation
Each participant will receive a complete set of documentation. The training material will be partly electronically in PDF format and partly as hard copy in a binder. Furthermore, the training manager will write a report in PDF format on suggestions for improvements for operating and optimizing the OK mill installation.

Target group
The primary target groups are process engineers and operators working at an OK-mill cement grinding installation.

Participants
The maximum number of participants is 10.

Planned course days
Upon request, each course will be planned individually.

Duration
3 days in Copenhagen + ½ day screen sharing and coaching at the plant.

Location
The course is held at FLSmidth, Valby Denmark.

Registration fee
Tuition fee per participants is EUR 2,625. Cost of board, lodging and personal expenses are not covered.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact:
Ms. Pernille Beck
Tel: +45 36181727
Fax: +45 36182804
E-mail: flsinstitute@flsmidth.com
Course Plan
The course consists of 3 sessions.

Session I:
A theoretical session tailor-made for the actual OK-Mill installation from the plant where the participants are coming. This part of the course will be carried out at FLSmidth in Copenhagen during a 3 days training period.

Session II:
After the training in Copenhagen the participants will spend time at their own plant for optimization and get more familiar with the installation.

The second session of the course will be carried out when the participants are ready and here the FLSmidth training manager will study the operation parameters during a 3 hours control screen sharing.

Session III:
Based on the findings in Session II, there will be 1 hour telephone coaching and mentoring session with the client, and the FLSmidth training manager will write a report with suggestions for improvements.

Special Feature
Control screen sharing via a Remote Access Server at FLSmidth headquarters in Copenhagen.

In order to carry out Session II and III, it is necessary to establish internet connection between FLSmidth and the clients control system. A stable internet connection is of importance to the success of the training sessions.

From our state of the art, Intelligent Collaboration Environment (ICE), the connection is established between a process computer at the client and a Remote Access Server in Copenhagen. The connection is secured by a preconfigured Firewall.

FLSmidth will assist on the installation of this totally safe system free of charge.
ILC Kiln System Simulation Course – Based on Realistic Simulation System

COPENHAGEN DENMARK

General
It requires good operators and understanding of the ILC kiln system production process to achieve maximum production rates with a minimum energy input, while maintaining the desired quality. The Simulator environment is a powerful and flexible way to train complex issues in an ILC kiln pyro system.

Learning objectives
The participants will gain knowledge about the ECS system, the ILC kiln system process including process and safety interlocks. The participants are getting an in-depth knowledge about the ILC kiln system installation.

Benefits
The participant’s skills in operation control will be improved at the following points:
- Shorter start-up time
- Better utilization of the materials
- Lower production losses
- Higher availability
- Stabilization of the process.

Course contents
The seminar contains the following topics:
- ILC kiln system operational theory & exercises
- ILC kiln system interlocks & exercises
- ILC kiln system start up and shut down theory & exercises
- Strategy to increase production.

Form
The course will consist of a mix of hands-on training and theoretical content based on the most realistic simulation system on the market.

Documentation
Each participant will receive training materials.

Target group
The course is designed for participants with some previous experience in plant operation such as operators, process engineers and production supervisors. The training will be based on the assumption that the participants have a basic knowledge about the cement process and know the material flow and basic factory departments.

Participants
The maximum number of participants is 15.

Location
The course is held at FLSmidth A/S, Valby Denmark.

Duration
5 days

Planned course days
24 - 28 November 2014

Registration fee
Tuition fee per participants is EUR 3,255. Cost of board, lodging and personal expenses are not covered.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact:
Ms. Pernille Beck
Tel: +45 36 18 17 27
Fax: +45 36 18 28 04
E-mail: flsinstitute@flsmidth.com
Vertical Raw Mill Simulation Course – Based on Realistic Simulation System

GENERAL
It requires good operators and understanding of the vertical raw mill production process to achieve maximum production rates with a minimum energy input, while maintaining the desired quality. The Simulator environment is a powerful and flexible way to train complex issues in a vertical raw mill grinding plant.

Learning Objectives
The participants will gain in-depth knowledge about the ECS system, the vertical raw mill process including process and safety interlocks.

Benefits
The participant’s skills in operation control will be improved at the following points:
- Shorter start-up time
- Better utilization of the materials
- Lower production losses
- Higher availability
- Stabilization of the process.

Course Contents
The seminar contains the following topics:
- Vertical raw mill operational theory & exercises
- Vertical raw mill interlocks & exercises
- Vertical raw mill start up and shut down & exercises
- Strategy to increase production.

Form
The course will consist of a mix of hands-on training and theoretical content based on the most realistic simulation system on the market.

Documentation
Each participant will receive training materials.

TARGET GROUP
The course is designed for participants with some previous experience in plant operation such as operators, process engineers and production supervisors. The training will be based on the assumption that the participants have a basic knowledge about the cement process and know the material flow and basic factory departments.

Participants
The maximum number of participants is 15.

LOCATION
The course is held at FLSmidth A/S, Valby Denmark.

DURATION
5 days

Planned course days
1 - 5 December 2014

REGISTRATION FEE
Tuition fee per participants is EUR 3,255. Cost of board, lodging and personal expenses are not covered.

CANCELLATION
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact:
Ms. Pernille Beck
Tel: +45 36 18 17 27
Fax: +45 36 18 28 04
E-mail: flsinstitute@flsmidth.com
Process Simulation Seminar – Based on a Realistic Simulation System

BETHLEHEM USA

General
The course is based on the ECS/CEMulator which is the state of the art training system for operators. The course will demonstrate the function of the system and train participants by actively trying different scenarios on their individual workstations. Training course provides participants with hands-on experience on operation of the process and realistic feedback to control actions.

To achieve maximum production rates with minimum thermal & electrical input, while maintaining optimum clinker quality requires a great operator and a good understanding of the clinker making process. By upgrading skills and knowledge of the personnel involved in the lines operation, the impacts of internal and external influences to the system can be reduced. The participants will be able to handle different scenarios by themselves and therefore being able to practice. The Simulator Training provides operators with a safe and controlled environment for studying the process dynamics, process equipment and the control systems.

The Cemulator Environment is a powerful and flexible way to manage complex mineralogies and process issues that appear all of a sudden in a cement plant. At the same time it provides the operators with realistic experience of running the process.

Learning Objectives
The purpose of the course is to give control room operators and process engineers the skills and knowledge to handle any upset for the different systems. Learning and practicing process situations such as changes in the material properties, failures of critical equipments, process start-up or shut-down sequences are certainly more safe and cost effective in a simulator environment rather than with a real process.

Benefits
The participants will have an in-depth understanding of the plant process and equipment, from the vertical raw mill, pyroprocessing area, vertical coal mill and vertical cement mill operation. Their skills in operation control will be improved thereby increasing the plants’ production capacity, and overall equipment efficiency.
- Shorter start-up time
- Better utilization of the materials
- Minimize production losses
- Higher availability
- Stabilization of the process.

Seminar plan
The Process Simulation Seminar consists of individual work and group discussions. The complete seminar is comprised of 4 modules.

There are 3 Vertical Mill Modules: OK Mill, FRM, Atox Mill and 1 Pyro Module.

Target group
The course is designed for participants with some previous experience in plant operation such as kiln operators, process engineers and production supervisors.

Participants
The seminar is limited to the first 10 persons who apply.

Duration:
9 days

Planned course days
27 October - 6 November 2014

Location
The seminar is held at FLSmidth Inc. Headquarters in Bethlehem PA, USA.

Registration fee
1) Each Mill module 2 days, $1,500 USD per participant.
2) Pyro module 3 days, $2,000 USD per participant.

The fee includes a lunch daily. A purchase order is required during registration.

Note: This does not include the cost of your lodging or personal expenses.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact
Ms. Lynn Petrak
Training Coordinator
Tel: +1 610 - 264 6017
Fax: +1 610 - 264 6031
E-mail: lynn.petrak@flsmidth.com or flsinstitute.us@flsmidth.com
For all 4 modules the main areas of focus are:
- Review of the cement processes involved in each area
- Overview of the ECS/Cemulator System
- Overview of the Automatic and Manual control loops as well as interlocks
- The details of each module are provided further.

Easy, step-by-step guidance is offered to improve overall operation efficiency.

In the end of each training module selected by the client a final exam is carried out in order to evaluate the learning outcome.

**Form**
The course consists of hands on training. Full interaction of the participants with the trainers is provided in order to maximize the learning experience among the participants. Participants will be guided throughout all the scenarios by the trainers.

**Features**
It is possible to register for one or several modules. This modular structure enables delegates to target their needs and gain maximum benefit of the modules they choose. It is also possible to participate in one module this year and participate in the others the following years.
**Pyro Process – Operations and Process Simulation Seminar**

**BETHLEHEM USA**

**General**
The objective of this seminar is an in-depth understanding of the different components of a pyroprocess system and the technologies utilized to achieve optimum economy, continuous efficient operation and profitability. To attain maximum production rates with minimum thermal and electrical input, while maintaining optimum clinker quality requires a good understanding of the clinker manufacturing process. Using the process simulator software for the pyroprocess systems, the ECS/CEMulator will increase the skills and knowledge of personnel involved in the system operations, the effect of internal and external influences on kiln operation, improving the overall performance indicators (energy consumption, quality, production rate, maintenance, etc) and profitability.

**Learning objectives**
The purpose of the course is to give operators, production supervisors, and process engineers the skills and knowledge to optimize the pyroprocessing system.

**Benefits**
The participants will be provided with in-depth understanding of the Pyro process and equipment. In addition, the understanding of kiln feed properties (chemistry and fineness) will lead to a better pyroprocess system operation, stability, improve the skills on how to manage variations in the system while maintaining equipment reliability, overall equipment efficiency and better profitability. Furthermore;
- Understand the pyroprocess equipment design and their limitations.
- Understand the burnability characteristics and their influence in kiln operation, quality and maintenance reliability.
- Optimize and standardize operating techniques improving the overall equipment efficiency and reducing risky operating practices.
- Review and implementation of the best operating practices to achieve sustainable and stable operation at maximum production rates.
- Develop the necessary skills to cope with the daily operating challenges of kiln feed and fuel variations, volatile materials and their effect in the operation, mechanical faults and how to protect the equipment utilizing hand on training with the use of the FLSmidth process simulator (ECS/CEMulator software).
- Valuable contact networks are created during and after the seminar.

**Seminar plan**
- Kiln Operation
- Process and kiln system design considerations
- Kiln Zones
- Raw Material characteristics
- Chemical Reactions in the Kiln
- Liquid Phase and importance of Iron and Aluminum content
- Calciner operation
- Fuel types and their characteristics
- Alternative fuels use in the calciner and impact in system operation

**Target group**
The course is designed for participants with previous experience in pyro system operation and process such as engineers, control room operators, production supervisors and managers.

**Features**
- Direct contact with technical specialists and trouble-shooters
- Group work
- Intensive discussion groups.

**Participants**
The maximum number of participants is 15.

**Duration**
5 days

**Planned course days**
28 April - 2 May 2014

**Location**
The course is held at FLSmidth Inc. Headquarters in Bethlehem PA, USA.

**Registration fee**
Tuition fee per participants is $2,500 USD. Tax may apply. A purchase order is required during registration.

The fee includes all course materials, and daily lunch.

*Note: This does not include the cost of transportation to and from the airport, lodging or personal expenses.*

**Cancellation**
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

**Registration**
Please contact
Ms. Lynn Petrak
Training Coordinator
Tel: +1 610 - 264 6017
Fax: +1 610 - 264 6031
E-mail: lynn.petrak@flsmidth.com or flsinstitute.us@flsmidth.com
- Combustion Theory
- Heat transfer
- Flame formation
- Main burner, changes that affect flame formation and lead to better burning conditions
- Clinker coolers
  - Clinker cooler types
  - Cooler operating philosophy and optimization of clinker coolers
- Heat Balances
  - Heat and Material flows
  - Measurements in the pyro process system (temperature, pressure, O2 profile)
  - Measurements in the cooler, airflows, temperatures and pressures
  - Heat Balance calculations
- Optimization of heat consumption
  - Kiln Feed Burnability
  - Distribution of air and losses in the cooler
  - Clinker formation
  - Behavior of volatile matter
  - Volatile matter work session
- Emissions of NOx, SOx, particulates, mercury etc from cement kilns
- New emission standards
- Bag House, operation and maintenance
- Refractory Considerations.

Practical sessions with the Use of Pyroprocess Simulation / ECS Cemulator software
- Starting and Stopping the kiln using the ECS Cemulator software
- Interaction of Control Loops between the Kiln and Cooler areas
- Various Disturbances
  - System cooling down
  - Loss of fuel in the calciner / or kiln burner
  - High bed depth in the cooler
  - Kiln push
  - Change in pressure profiles in the Preheater
  - Main Bag House issues
  - Kiln Ring formation / Kiln ring fall
  - Cyclone plug
  - High CO
  - Etc.
- Kiln system shut down
- Considerations during a short shut down
- Considerations during a maintenance shut down
- Evaluation running the kiln system to full production.

Form
The course consists of theoretical classroom lectures, case studies, work sessions and hands on practical sessions based on process simulation with the ECS/CEMulator software. Full interaction with the trainer in the classroom is provided in order to maximize the learning experience among the participants.

Documentation
Each participant will receive a manual with a complete set of training materials. In addition a soft copy of training materials in PDF form will be handed to each participant in a USB drive.
Cement Grinding Technology

BETHLEHEM USA

General
The objective of this seminar is an in-depth understanding of the different grinding technologies utilized in the cement industry with focus on potential energy reduction and throughput optimization using the process simulator software for cement grinding systems, the ECS/CEMulator. The operators and process engineers must be able to evaluate all the process variables in order to optimize the production performance and profitability. This course provides a full understanding of grinding theory and equipment and provides the basic tools to audit your own installation.

Learning objectives
The purpose of the course is to give operators, supervisors, and process engineers’ tools to optimize the output of an existing cement grinding installation. It highlights the operating parameters that impact the grinding stability and mill performance.

Benefits
The seminar offers new ideas for:
- Having a thorough understanding of the proper process control, power consumption, equipment and grinding theory, the participants would be able to evaluate the systems performance and find potential optimization of the existing grinding installations, hence improving the production rate
- Optimizing the cement grinding system operation, including the possibilities for potential upgrading and modernization of your equipment
- Teach the participants to elaborate realistic action plans according to their positions
- Improvement of synergies between the quality, maintenance and production departments
- Valuable contact networks are created during and after the seminar.

Seminar plan
This 5-day seminar uses lectures, case studies, work sessions and the process simulator software ECS/CEMulator which is the state of the art training tool to:
- Review the cement grinding processes
- Study the function & design of main equipment, including the newest grinding technology methods for optimization, potential for equipment improvement, and plant modernization
- Practice different scenarios with the Cemulator software

The topics covered during the seminar are:
- Cement Mill Types. Design, Operating principles and fundamentals
- Ball mills, internal installations and grinding media charges
- Cement Grinding in Vertical mills
- Vertical Mill Components, internal installations and important parameters
- Calculation of power consumption for ball mills and grinding media charges
- Calculation of power consumption for cement vertical mill
- Mill Ventilation and Gas Handling in Milling Systems
- Automatic process control for cement mill systems
- Roller Press
- Separators, types and their mode of operation
- Calculations for separator control
- The influence of separator efficiency on power consumption and particle size distribution
- Cooling and grinding aids
- General measurements and calculations for determination of gas flows
- Optimization of Mill Grinding System
- Sampling and Sample Preparation for clinker and cement
- Dust collector, maintenance and operation
- Recent developments in process control systems
- Practical sessions on the ECS Cemulator
- Case studies on dam ring optimization, nozzle ring velocities optimization, influence of false air entrance and various others.

**Form**
The seminar consists of theoretical classroom lectures, case studies based on real scenarios from operations at different plants, work sessions, and hands on practical sessions based on process simulation with the ECS/CEMulator software. Full interaction with the trainers in the classroom is provided in order to maximize the learning experience among the participants.

**Documentation**
Each participant will receive a binder with a complete set of training materials. In addition a soft copy of training materials in PDF form will be handed to each participant in a USB drive.

**Target group**
This seminar is designed for process, operator, engineers as well as production, process and maintenance managers.

**Features**
- Direct contact with technical specialists and trouble-shooters
- Group work
- Intensive discussion groups.

**Participants**
The maximum number of participants is 15.

**Duration**
5 days

**Planned course days**
21 - 25 July 2014

**Location**
The seminar is held at FLSmidth Inc. Headquarters in Bethlehem PA, USA.

**Registration fee**
Tuition fee per participants is $2,500 USD. Taxes may apply.

The fee includes all training materials, and daily lunch. A purchase order is required during registration.

*Note: This does not include the cost of your lodging or personal expenses. Nor transportation to and from airport.*

**Cancellation**
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

**Registration**
Please contact
Ms. Lynn Pettrak
Training Coordinator
Tel: +1 610 - 264 6017
Fax: +1 610 - 264 6031
E-mail: lynn.petrak@flsmidth.com or flsinstitute.us@flsmidth.com
Seminar de Molienda de bolas (Operaciones y Mantenimiento)

MEDELLIN COLOMBIA

Objetivo
El seminario de molienda de bolas operaciones y mantenimiento, está diseñado para capacitar al personal sobre la tecnología, operación y las mejoras prácticas de mantenimiento necesarias para poder alcanzar ahorros de energía, reducir costos de mantenimiento, así como la mejora continua de la operación de los equipos.

Grupo
Este seminario ha sido diseñado para ingenieros de proceso y mantenimiento, así como, supervisores y gerentes con un mínimo de un año de experiencia en las operaciones de cemento.

Beneficios
Este seminario ofrece nuevas ideas para optimizar las operaciones de los molinos de bola, incluyendo la posibilidad de mejoras potenciales y modernización de los equipos. Después de la participación en este seminario, la experiencia ha mostrado que se ha formado una red valiosa de contactos entre colegas de otras plantas. Además contacto directo con especialistas técnicos e ingenieros de campo de FLSmidth.

Plan del Seminario
Este seminario de 5 días ofrece enseñanza directa del instructor, estudio de casos reales, y sesiones de trabajo para:
- Estudio de la función y el diseño del equipo principal, incluyendo los últimos métodos para la optimización y las propuestas para mejoras en modernizaciones de planta y operaciones
- Trabajos en grupo y discusión intensiva.

Temas
I. Operación de molinos de bolas
- Tipo de molinos de bolas (diseño, principios y fundamentos de operación)
- Flujo de aire en el Molino así como manejo de gases en el sistema
- Desgaste de blindajes, de la carga de bola, y su impacto a la operación
- Desgaste de espesor en las diafragmas centrales y de salida
- Medición de apertura de las ranuras en las diafragmas centrales y de salida
- Cálculo de consumo de energía y la influencia por la carga de bolas
- Tipos de separadores y sus modos de empleo
- Cálculos para el control del separador (tromp curves, rosin rambler etc) y su impacto a la tasa de producción
- Influencia del separador en el consumo energético y la distribución de partículas
- Medición y consumo de carga de bola y su relación a desgastes
- Ayudantes de molienda y enfriadores de material
- Mediciones y cálculos para flujo de aire y gas
- Auditoria y análisis del sistema de molienda de cemento y la posibles mejoras
- Muestreo y preparación para muestreo de clinker y cemento.
- Sistemas de control (experto) para molienda de bolas.

Duración
El seminario tendrá una duración de cinco días e incluye materiales de trabajo, coctel de bienvenida, almuerzos, cafés/refrescos, traducción simultánea de inglés al español y cena de despedida.

Fecha y lugar
Mayo 12 - 16 2014
Medellín, Colombia

Precio de inscripción
La tarifa por participante es USD $2,500 y no incluye alojamiento, ni gastos de transportación.

Cancelación
30 días antes del evento =
El Pago es 100% de la tarifa
De 31 - 59 días antes del evento =
El pago es 50% de la tarifa
60 días antes del evento =
Se reembolsa el 100% de la tarifa.

Contacto coordinación
Ms. Lynn Petrak
Training Coordinator
Tel: +1 610 - 264 6017
Fax: +1 610 - 264 6031
E-mail: lynn.petrak@flsmidth.com or flsinstitute.us@flsmidth.com
II. Mantenimiento de molinos de bolas
- Instalación y medición de blindajes (desgastes y su historial)
- Medición de espesor en las diafragmas centrales y de salida
- Medición de apertura de las ranuras en las diafragmas centrales y de salida
- Medición y tipos de muñón
- Mandos principales y auxiliares
- Sistemas de Lubricación y levante (Análisis de lubricación)
- Sistemas de engrase de corona y piñón
- Mediciones y reemplazo de coraza
- Pruebas No Destructivas (NDT’s)
- Alineación del molino
- Inspección y mantenimiento de los separadores usados en sistemas de molienda de cemento
- Colectores de polvo, operación y mantenimiento.

**Documentación**
Cada participante recibirá una carpeta con un conjunto completo de materiales de capacitación. Además se entregará una copia electrónica de materiales didácticos en formato PDF a cada participante en una unidad USB.
Seminar of Vertical Mills
(Operations and Maintenance)

ANTIGUA GUATEMALA

Objective
The seminar of vertical mills is designed to train personnel on technology, operation, and the necessary improvements for energy savings, reduced maintenance costs, as well as continuous improvement in equipment operation.

Group
This seminar is designed for process engineers, maintenance, reliability, as well as supervisors and managers of the respective areas, with a minimum of one year of experience in cement operations.

Benefits
This seminar offers new ideas to optimize the operation of vertical mills, including potential improvements and modernization of the equipment. After participating in this seminar, the experience has shown that it has formed a valuable network of contacts between colleagues in other plants. Additionally, direct contact with technical specialists and field engineers of FLSmidth.

Program of Seminar
This 5-day seminar offers direct instruction of the instructor, case study, and work sessions:
- Study of the function and design of the main equipment, including the latest methods for optimization and proposals for improvements in system and operations
- Group work and intensive discussion.

Topics
Operation of Vertical Mills and Systems
- Types of mills
- Design and operation principles
- Types of separators and operational mode
- Distribution of particles and separator efficiency
- Milling of raw material
- Systems of feeding to the mills
- Internal design of the mills
- Gas flows in vertical mills
- Operation and control of vertical mills
- Auditing, analysis, and possible improvements of the vertical mill system
- Milling and drying of coal in vertical mills
- Milling of cement in vertical mills
- Auditing and analysis of the cement grinding system, and possible improvements
- Design and operation of dust collectors
- Critical issues
- Practical cases.

Maintenance of Vertical Mills
- Internal maintenance of mills
- Maintenance of separators
- Maintenance of hydraulic rollers, and lubrication system
- Design criteria

Duration
The seminar will have a duration of five days and includes materials of work, welcome cocktail, lunches, beverages, simultaneous translation of English to Spanish, and farewell dinner.

Date and Place
June 23 - 27 2013
Antigua, Guatemala

Registration Fee
The registration fee of $2,500 includes materials and does not include lodging or transportation.

Cancellation
30 days before the event = 100% of the fee
31 - 59 days before the event = 50% of the fee
60 days before the event = Full refund of the fee.

Contact and Coordination
Ms. Lynn Petrak
Training Coordinator
Tel: +1 610 - 264 6017
Fax: +1 610 - 264 6031
E-mail: lynn.petrak@flsmidth.com
or flsinstitute.us@flsmidth.com
- Monitoreo de condición (Lubricación, vibraciones, etc.)
- Repuestos y partes críticas
- Rutinas de mantenimiento preventivo y su importancia
- Desgaste y su impacto en producción
- Mantenimiento preventivo
- Rutinas de mantenimiento para reductores y molinos
- Medidas preventivas y de optimización de los equipos
- Planificación de mantenimiento preventivo
- Mantenimiento de colectores de polvo
- Casos prácticos.

Tipos de Reductores en Molinos Verticales
- Tipos de reductores (MAAG, TTVL, etc)
- Reductores de 2 estaciones (WPU) para todas las aplicaciones de molinos verticales (carbón, crudo y cemento)
- Reductores de 3 estaciones (WPV) para todas las aplicaciones de molinos verticales (crudo y cemento)

- Equipos auxiliares, las unidades de lubricación, acoplamientos e instrumentación
- Sistemas de monitoreo del sistema de lubricación del reductor
- Mantenimiento preventivo mecánica, partes y repuestos necesarios
- Casos Prácticos.

**Documentación**
Cada participante recibirá una carpeta con un conjunto completo de materiales de capacitación. Además se entregará una copia electrónica de materiales didácticos en formato PDF a cada participante en una unidad USB.
Seminario de Producción de Cemento

LIMA PERÚ

Objetivo
El Seminario Latino Americano de Producción de Cemento presenta los últimos avances tecnológicos en la producción de cemento, tomando en consideración los factores que contribuyen a ahorros en energía, reducción de costos de producción, estabilidad de los sistemas así como la mejora continua de la operación de los equipos en una planta de cemento.

Gruppo
Este seminario ha sido diseñado para Ingenieros de producción, de proceso, Supervisores y Gerentes con un mínimo de un año de experiencia en las operaciones de cemento.

Beneficios
Este seminario ofrece nuevas ideas para optimizar las operaciones de la planta, incluyendo la posibilidad de mejoras potenciales y modernización de los equipos.

Después de la participación en este seminario, la experiencia ha mostrado que se ha formado una red valiosa de contactos entre colegas de otras plantas. Además contacto directo con especialistas técnicos e ingenieros de campo de FLSmidth.

Plan del Seminario
Este seminario de 5 días ofrece enseñanza directa del instructor, estudio de casos reales, y sesiones de trabajo para:
- Repaso de las operaciones de fabricación de cemento
- Estudio de la función y el diseño de los equipos principales, incluyendo los últimos métodos para la optimización y las propuestas para mejoras en modernizaciones de planta y operaciones
- Trabajos en grupo, talleres, y discusión intensiva.

Temas
- Trituración de las materias primas
- Diferentes tipos de trituradoras y los parámetros de diseño
- Pre-homogenización y almacenamiento de materias primas
- Diseño y clasificación e importancia de las pilas
- Dosiﬁcación y control de de la alimentación al molino de crudo
- Teoría de la molienda y la clasificación
- Optimización de cuerpos moledores y la inﬂuencia de desgaste en la operación
- Distribución de partículas y eficiencia del separador
- Molienda de las materias primas
- Vibraciones, causas y consecuencias en molinos verticales
- Homogenización de la harina cruda
- Diseño de Silos y la importancia de la buena homogenización de la harina cruda

Duración
El seminario tendrá una duración de cinco días e incluye materiales de trabajo, cocinn de bienvenida, almuerzos, cafés/refrescos, traducción simultánea de inglés al español y cena de despedida.

Fecha y lugar
Octubre 20 - 24 2014
Lima, Perú

Precio de inscripción
La tarifa por participante es USD $2,800 y no incluye alojamiento, ni gastos de transportación.

Cancelación
30 días antes del evento = El Pago es 100% de la tarifa
De 31 - 59 días antes del evento = El pago es 50% de la tarifa
60 días antes del evento = Se reembolsa el 100% de la tarifa.

Contacto coordinación
Ms. Lynn Pettrak
Training Coordinator
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Fax: +1 610 - 264 6031
E-mail: lynn.petrak@flsmidth.com
or flsinstitute.us@flsmidth.com
- Secado y molienda del carbón y coque de petróleo
- Molienda en molinos de bola y molinos verticales
- Sistemas de clinkerization por vía seca
- Diseño de los diferentes componentes de la torre, quemador principal, etc
- Enfriadores de clinker
- Tipos de enfriadores, optimización e impacto de la operación en el consumo térmico y eléctrico y mantenimiento del sistema
- Influencia de los parámetros operativos en el sistema del horno
- Impactos y consecuencias de la entrada de aire falso en los sistemas
- Balances de calor
- Comportamiento del material volátil de los hornos
- Emisiones en los sistemas de clinkerization
- Combustibles alternativos
- Conversiones de hornos

- Influencia de los parámetros de calidad en la quemabilidad del crudo, calidad de clinker y calidad de cemento
- Molienda de cemento
- Molienda en molinos de bola (con y sin prensa de rodillos) y molinos verticales
- Impacto de la optimización del sistema de molienda en el consumo eléctrico
- Desarrollos recientes en los sistemas de control del proceso
- Tendencias y desarrollos para las plantas de cemento del futuro.
Maintenance
General
The objective of this seminar is an in-depth understanding of the different components of a pyro system (Pre-heater tower, kiln and cooler) to learn the proper preventive maintenance to ensure production efficiency and equipment reliability, and the technologies utilized to achieve optimum economy, continuous efficient operation and profitability. Inadequate maintenance may result in shorter run time and cause heavy financial losses. Maintenance performed according to the prescribed procedures will greatly improve the availability of the pyro system and increase plant efficiency.

Learning objectives
The participants will learn how to perform the specified maintenance activities and repair work to prevent breakdowns and ensure availability of the pyro system.

Benefits
The participants will be provided with in-depth understanding of the pyro maintenance and equipment. In addition, a better understanding of the preheater, the rotary kiln’s mechanical characteristics and the third generation of cooler with more efficient and effective maintenance programs both short term and long term can be planned. Overall equipment efficiency, reliability and better profitability. Furthermore;
- Understand the pyroprocess equipment design and their limitations
- Optimize and standardize preventive maintenance techniques improving the overall equipment efficiency and reducing risky of bad practices
- Review and implementation of the best maintenance practices to achieve sustainable and stable run time with the equipments
- Create a valuable network among the participant.

Seminar plan
- Preventive maintenance program and maintenance concepts
- Preheater maintenance, design and function
- Sensitive points for visual inspection
- Gear, pinion and roller alignment concepts
- Roller skew and skew management
- General maintenance knowledge of rotary kilns
- Kiln terminology
- Kiln bearing installation and preventive maintenance
- Roller adjustments and Procedure
- Tire and roller reconditioning
- Lubrication
- Kiln alignment
- Types of clinker cooler, maintenance and trouble shooting
- Maintenance and design of grate coolers
- Clinker breaker.

Form
The seminar consists of theoretical classroom lectures, case studies, work sessions and hands on practical sessions including roller adjustments, ovality measurements and documented inspection at our on-site training kiln.

Documentation
Each participant will receive a manual with a complete set of training materials.

Target group
The seminar is designed for inspectors, supervisors, planners, engineers and managers with previous experience in pyro maintenance systems.

Duration
5 days

Planned course days
21 - 25 July 2014

Location
The course is held at South Sioux City NE USA

Registration fee
Tuition fee per participants is $2,500 USD. Tax may apply.

A purchase order is required during registration.

The fee includes all course materials and daily lunch.

Note: This does not include the cost of transportation to and from the airport, lodging or personal expenses.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact
Ms. Lynn Petrak
Training Coordinator
Tel: +1 610 - 264 6017
Fax: +1 610 - 264 6031
E-mail: lynn.petrak@flsmidth.com or flsinstitute.us@flsmidth.com
General
The International Maintenance Seminar addresses essential cost-efficiency issues by putting great emphasis on the maintenance of the cement plant’s key machinery. The presentations cover some of the most important parameters related to cement plant maintenance such as:

- Availability and cost – the key performance parameters
- State of the art in maintenance.

Benefits
Economic advantages are obtained if the production line remains fully available throughout the campaign period. This is more likely to be the case if a planned and structured maintenance programme is implemented. The International Maintenance Seminar is an excellent opportunity for upgrading of personal qualifications within the maintenance field.

Seminar plan
General maintenance
- Policies and strategies
- The Key Performance Indicators – availability and cost
- Root causes and symptoms
- Effective site inspections
- Safety
- Computerized Maintenance Management Systems
- Ultrasonic analysis

Maintenance of key machinery
- Kilns
- Ball mills
- Vertical mills
- Coolers
- Gears
- Fans.

The failure mechanisms
- Fatigue crack formation
- Vibrations
- Lubrication
- Corrosion.

Analysis and repair methods
- Vibration analysis
- Balancing
- Oil analysis.

Auxiliary machinery
- Cement plant transport equipment
- Electrostatic Precipitators
- Bag filters (Fabric Filters)
- Electrical equipment
- Feeders
- Crushers.

Target Group
This seminar is designed for maintenance managers and maintenance engineers. Future managerial persons, and section heads, whether from maintenance or production, may also benefit significantly by participating.

Participants
The seminar is limited to the first 45 persons who apply.

Duration
13 days

Planned Seminar days
14 – 26 September 2014

Location
The seminar takes place at DGI-Byen Hotel in Copenhagen, Denmark and a cement plant in Europe.

Included in registration fee
- Training sessions
- Seminar documentation
- Single room accommodation including full board (breakfast, lunch, and dinner) at DGI-Byen Hotel in Copenhagen, Denmark
- Plant visit tour including transportation and hotel
- Emergency medical insurance
- Laundry service, except on the plant visit tour
- Free internet, except during plant visit tour.

Note: The fee does not include private telephone calls, faxes, beverages outside meals, dry cleaning, room service, or extra nights.
Features
- Meeting FLSmidth technical specialists and trouble-shooters
- Flexibility of choosing between optional topics
- Group work and structured discussion groups
- International forum on managerial level
- Real-life case studies
- Hands-on presentations with equipment and instruments
- Bring your own case. Send us your maintenance challenge prior to the seminar, and it could be your case that is selected to be presented and discussed at the seminar
- Visit to a European plant, including practical demonstrations of equipment and methods.

Registration fee
Seminar fee per participant is EUR 9,210.

Cancellation
There will be an administrative charge in case of absence or cancellation. The cancellation fees are as follows:

- 61 days before seminar start = 0% of fee
- 31-60 days before seminar start = 50% of fee
- 0-30 days before seminar start = 100% of fee

Absence or cancellations due to missing visa will not be the responsibility of FLSmidth and will be subject to normal cancellation rules.

Early Bird:
Sign up before 31 March 2014 and get a 10% discount

Registration
Please contact:
Ms. Pernille Beck
Tel: +45 36 18 17 27
Fax: +45 36 18 28 04
E-mail: PEBE@flsmidth.com
or flsinstitute@flsmidth.com
Kiln System Maintenance

COPENHAGEN DENMARK

General
The kiln is the main machine in the cement manufacturing process. Kiln maintenance and repair are critical activities in ensuring the efficiency of the cement manufacturing plant. If not maintained properly, kiln runtime will be reduced, causing substantial financial losses. This course introduces maintenance understanding, kiln maintenance procedures and techniques.

Learning objectives
The purpose of the course is to teach the participants the understanding of the maintenance concept. How to perform the specified maintenance activities and repair works to prevent break downs and ensure desirable availability of the kiln system.

Benefits
The increased knowledge of maintenance, maintenance procedures and implementation of them will significantly improve the productivity of the kiln and increase plant efficiency.

Course Contents
- Modern maintenance, maintenance concepts
- Implementation and management
- Preheater maintenance, design and function
- Design of kiln and kiln components
- Maintenance procedures for kiln shell and seals
- Maintenance procedures for kiln drive
- Maintenance procedures for kiln supports
- Maintenance procedures and kiln mechanical balance
- Maintenance and design of grate coolers.

Form
The course is a combination of theoretical classroom lectures, exercises and calculations. Furthermore, the knowledge gained at the course is measured by tests.

Documentation
Each participant will receive a binder with a complete set of training materials.

Target group
The course is designed for maintenance personnel.

Participants
The maximum number of participants is 15.

Duration
4 days

Planned course dates
25 - 28 February 2014

Location
The course is held at FLSmidth A/S, Valby Denmark.

Registration fee
Tuition fee per participant is EUR 2,625. Cost of board, lodging and personal expenses are not covered.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact:
Ms. Pernille Beck
Tel: +45 36 18 17 27
Fax: +45 36 18 28 04
E-mail: flsinstitute@flsmidth.com
Vertical and Ball Mill Maintenance

COPENHAGEN DENMARK

General
Grinding of raw materials, coal and cement clinker is a vital function and involves three major plant departments: Raw material grinding, Coal grinding and Cement grinding.

Mill maintenance and mill repair are two crucial factors in ensuring production efficiency. Inadequate maintenance may result in shorter run time and cause heavy financial losses. Maintenance performed according to the prescribed procedures will greatly improve the availability of the mills and increase plant efficiency. This course introduces mill maintenance procedures and techniques.

Learning objectives
The purpose of the course is to teach the participants how to perform the specified maintenance activities and repair work to prevent breakdowns and ensure availability of the mill system.

Benefits
The increased knowledge and subsequent implementation of maintenance procedures will greatly improve the productivity of the mill and increase plant efficiency.

Course contents
Module I, Vertical Mill Maintenance
- Design features of vertical mills
- Safety issues
- Maintenance procedures for mill stationary parts
- Maintenance procedures for rollers and table
- Maintenance of hydraulic components
- Roller lubrication maintenance issues
- Separator maintenance
- Maintenance of mill drives.

Module II, Ball Mill Maintenance
- Design features of ball mills
- Safety issues
- Maintenance of mill body
- Maintenance of mill supports
- Maintenance of mill drives
- Wear parts and wear
- Mill and mill drive alignment.

Form
The course consists of classroom lectures. Furthermore, the knowledge gained at the course is measured by tests.

Documentation
Each participant will receive a binder containing a complete set of training material.

Target group
The course is designed for maintenance personnel.

Participants
The maximum number of participants is 15.

Feature
It is possible to sign up for one or both modules. This modular structure enables participants to target their needs and gain maximum benefit of the modules they choose.

Duration
5 days

First module of 3 days covering Vertical Mill Maintenance, Second module of 2 days covering Ball Mill Maintenance.

Planned course days
24 - 28 March 2014

Location
The course is held at FLSmidth A/S, Valby Denmark.

Registration fee
Tuition fee per participant is
Module I EUR 1.950
Module II EUR 1.330
Modules I+II EUR 3.230
Cost of board, lodging and personal expenses are not covered.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact:
Ms. Pernille Beck
Tel: +45 36 18 17 27
Fax: +45 36 18 28 04
E-mail: fisinstitute@flsmidth.com
**Pumps and Compressors Maintenance Seminar**

**MANHEIM USA**

**General**
The Pumps and Compressors maintenance seminar will help participants to understand the principles of operation, and proper maintenance best practices across the industry on FK Pumps and Pneumatic Conveying Equipment.

**Learning objectives**
The course is designed for maintenance personnel to be able to properly maintain and troubleshoot the mechanical equipment at the manufacturing facility. With a new hands on approach to allow the participant to fully attain the knowledge from the instructor.

**Benefits**
The participants will be able to address problems related with the equipment as well as review design and operating parameters. They will be exposed to similar problems in the industry and best practices.

**Seminar plan**
- Introduction to pneumatic conveying
- Principles of Pneumatic Conveying
- Pneumatic Conveying Flow
- Pneumatic Conveying System
- Typical Materials Handled
- System Troubleshooting
- FK Pumps type M, H and Z
- Preventive maintenance
- Screw conveyor, wear and characteristics
- Bearing Arrangements
- Seal Arrangement
- Lubrication
- Purge Air Requirements
- Internal Inspection and Repair
- Spare Parts
- Rotary vane compressors
- Compressor Types
- Types of filter and characteristics
- Design & Construction
- Ful-Vane Oil Viscosity Requirements and lubrication system
- Internal Inspection and Repair
- Blade Visual Inspection
- Preventive maintenance
- Sahara compressors
- SK valves.

**Form**
The seminar consists of theoretical classroom lectures, full interaction of the trainer with the classroom in order to maximize the learning experience among the participants. The second part of the seminar will involve hands on approach in dismantling and reassembling the machinery in order to fully understand the lectures.

**Documentation**
Each participant will receive a binder with a complete set of training materials. In addition a soft copy of training materials in PDF form will be handed to each participant in a USB drive.

**Target Group**
The seminar is designed for entry level and experienced maintenance personnel. The participants will typically be maintenance trades personnel, engineers and managers.

**Participants**
The maximum number of participants is 20.

**Duration**
3 days

**Planned course days**
7 - 9 October 2014

**Location**
The course is held at FLSmidth Inc., Manheim PA, USA.

**Registration fee**
Tuition fee per participants is $1,800 USD.
The fee includes all course materials, and lunch daily.

*Note: This does not include the cost of your lodging or personal expenses, nor cost of transportation to and from airport.*

**Cancellation**
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

**Registration**
Please contact
Ms. Lynn Petrak
Training Coordinator
Tel: +1 610 - 264 6017
Fax: +1  610 - 264 6031
E-mail: lynn.petrak@flsmidth.com or flsinstitute.us@flsmidth.com
Ball Mill Maintenance Seminar

General
The objective of this course is to present an in-depth understanding of the best and proper maintenance practices for the Ball Mill and the auxiliary equipment. Mill maintenance and mill repair are two crucial factors in ensuring production efficiency. Inadequate maintenance may result in shorter run time and cause heavy financial losses.

Maintenance performed according to the prescribed preventive and predictive procedures will greatly improve the availability of the mills and increase plant efficiency.

Learning objectives
The maintenance work impacts the equipments reliability and production profitability, the purpose of the course is to teach the participants how to perform the specified maintenance activities and repair work to prevent breakdowns and ensure availability of the mill system.

Benefits
The increased knowledge and subsequent implementation of maintenance procedures will greatly improve the productivity of the mill and increase plant efficiency.

Seminar plan
- Cement ball mill types. (Design, operating principles and fundamentals)
- Design features of ball mills
- Safety issues
- Maintenance of mill body
- Maintenance of mill supports
- Maintenance of main and auxiliary mill drives
- Wear parts and wear analysis
- Mill and mill drive alignment
- Main and auxiliary drives inspection
- Shell and head liner measurement
- Lubrication and jacking systems
- Measurement and types of journal bearings
- Separator, types, maintenance and repairs

- Ball mills, internal installations and grinding media charges in relation to wear
- Dust Collector, Maintenance and operation
- Mill expert control for ball mill.

Form
The course is a combination of theoretical classroom lectures, exercises and real case study.

Documentation
Each participant will receive a binder with a complete set of training materials. In addition a soft copy of training materials in PDF form will be handed to each participant in a USB drive.

Target group
The course is designed for participants such as inspector, supervisor, planner, engineers and technicians with previous experience in mill maintenance systems.

Features
- Direct contact with technical specialists and trouble-shooters
- Group work
- Intensive discussion groups.

Participants
The maximum number of participants is 20.

Duration
3 days

Planned course days
1 - 3 April 2014

Location
The seminar is held at FLSmidth Inc. Headquarters in Bethlehem PA, USA.

Registration fee
Tuition fee per participants is $1,800 USD. Taxes may apply.

The fee includes all training materials and a daily lunch. A purchase order is required during registration.

Note: This does not include the cost of your lodging or personal expenses, nor cost of transportation to and from airport.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact
Ms. Lynn Petrak
Training Coordinator
Tel: +1 610 - 264 6017
Fax: +1 610 - 264 6031
E-mail: lynn.petrak@flsmidth.com
or flsinstitute.us@flsmidth.com

Bethlehem USA
**General**
Grinding of raw materials, coal and cement clinker is a vital function that involves three major plant departments: raw material grinding, coal grinding and cement grinding. Mill maintenance and mill repair are two crucial factors in ensuring production efficiency and equipment reliability. Inadequate maintenance may result in shorter run time and cause heavy financial losses. Maintenance performed according to the prescribed procedures will greatly improve the availability of the mills and increase plant efficiency.

**Benefits**
The purpose of the course is to teach the participants how to perform the specified maintenance activities and repair work to prevent breakdowns and ensure availability of the mill system.

**Seminar plan**
- Vertical Mills Maintenance
  - Design features of vertical mills
  - Internal Maintenance vertical mills
  - Safety issues
  - Maintenance procedures for mill and auxiliary equipment
  - Condition Monitoring (lubrication, vibration, etc.)
  - Stationary and mobile parts inspection
  - Wear life evaluation
  - Spare part and critical parts
  - Preventive maintenance routines and their importance
  - Maintenance procedures for rollers and table
  - Maintenance of hydraulic system

- Roller lubrication – maintenance issues
- Separator maintenance
- Preventive maintenance and optimization of equipment
- Maintenance of mill drives.
- Case studies and root cause analysis

- Types of Gearboxes in Vertical Mills
  - Types of gearboxes (MAAG, TTVL, etc.)
  - Reducers 2-stages (WPU) for all vertical mill applications (coal, raw mill and cement)
  - Reducers 3-stages (WPV) for all vertical mill applications (raw mill and cement)
  - Auxiliary equipment, lubrication units, couplings and instrumentation.
  - Systems monitoring for lubrication system and vibration system.
  - Preventative maintenance, parts and spare parts needed
  - Case studies and root cause analysis.

**Target group**
The course is designed for participants such as maintenance and reliability engineers, planners, supervisors, and technicians with previous experience in vertical mill maintenance systems.

**Features**
- Direct contact with technical specialists and trouble-shooters
- Group work
- Intensive discussion groups.

**Participants**
The maximum number of participants is 20.

**Duration**
3 days

**Planned course days**
9 - 11 September 2014

**Location**
The seminar is held at FLSmidth Inc. Headquarters in Bethlehem PA, USA.

**Registration fee**
Tuition fee per participants is $1,800 USD. Taxes may apply.

The fee includes all training materials, and daily lunch. A purchase order is required during registration.

*Note: This does not include the cost of your lodging or personal expenses, nor cost of transportation to and from airport.*

**Cancellation**
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

**Registration**
Please contact
Ms. Lynn Petrak
Training Coordinator
Tel: +1 610 - 264 6017
Fax: +1 610 - 264 6031
E-mail: lynn.petrak@flsmidth.com
or flsinstitute.us@flsmidth.com
Form
The course is a combination of theoretical classroom lectures, exercises and real case study.

Documentation
Each participant will receive a binder with a complete set of training materials. In addition a soft copy of training materials in PDF form will be handed to each participant in a USB drive.
Hydraulics Maintenance Seminar

BETHLEHEM USA

General
The Hydraulics maintenance seminar will enhance the principles of operation, design and proper maintenance of the different hydraulics systems used in the cement industry. The intent of this seminar is an in-depth understanding of the different components of the hydraulic system, its relationship with operation, and the technologies utilized to increase the skills and knowledge of the personnel involved in the maintenance of this equipment leading to increased availability and equipment efficiency.

Benefits
The participants will be able to address and find solutions to problems related with the hydraulics system as well as review and optimize design and operating parameters. They will be exposed to real situations from other plants, and best practices in the cement industry.

Seminar plan
Introduction to Hydraulics
- Hydraulic Safety
- Hydraulic Symbols
- Hydraulic Components
  - Pumps
  - Valves
  - Actuators
  - Fluid Conditioning Components
  - Accessories

FLSmidth Hydraulic Equipment
- Vertical roller mill spring systems
- Rotary kiln thrust rollers and Rotary kiln friction drives
- Raw material stacker/reclaimers
- Clinker cooler drives and Clinker cooler roll breakers
- Finish grinding roll crushers
- Material gates / triple gate
- Apron feeders

Vertical roller mill spring systems (FRM, ATOX, OK)
- Safety aspects
- Hydraulic Diagram, design and installation
- Hydraulic Cylinders with Hydraulic Accumulators
- Hydraulic Pump Station
- Lubricant cleanliness requirements
- Case study and troubleshooting
  - System
  - Mechanical
  - Electrical

Target group
The seminar is designed for key maintenance personnel involved in hydraulics system operation and maintenance. The participants will typically be maintenance technicians, engineers and supervisors.

Participants
The maximum number of participants is 20.

Duration
5 days

Planned course days
17 - 21 November 2014

Location
The seminar is held at FLSmidth Inc. Headquarters in Bethlehem PA, USA.

Registration fee
Tuition fee per participants is $2,500 USD. Taxes may apply.

The fee includes all training materials, and daily lunch. A purchase order is required during registration.

Note: This does not include the cost of your lodging or personal expenses. Nor transportation to and from airport.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact
Ms. Lynn Petrak
Training Coordinator
Tel: +1 610 – 264 6017
Fax: +1 610 – 264 6031
E-mail: lynn.petrak@flsmidth.com or fslinstitute.us@flsmidth.com
Rotary kiln thrust rollers and Rotary kiln friction drives
- Hydraulic Schematics
- Symbols
- Fluid Paths
- Control Schemes
- General Wiring
- Components
- Local vs CCR
- Troubleshooting
- System
- Mechanical
- Electrical

Clinker cooler drives and Clinker cooler roll breakers
- Identification of components
- Symbols
- Pressure regulator
- Pressure reducing valve
- Sequerce valve
- Pressure compensated flow control valve
- Swash plate pump
- Troubleshooting
- System
- Mechanical
- Electrical

Hydraulics Exercises
- Pump pressure control; pressure regulator
- Pump volume control; swash plate control
- Cavitation
- Entrained air
- Maximum pressure-Pressure relief valve
- Flow rate of pump
- Setting flow rate
- Standard direction valve – piston circuit
- Pressure reducing valve adjustment
- Pressure reducing circuit
- Sequence valve adjustment
- Measuring flow out of a cylinder
- Pressure reducing circuit
- Counterbalance
- Regeneration
- Cylinder leak test
- Closed center pressure buildup
- Troubleshooting
- System
- Mechanical
- Electrical

Form
The seminar consists of theoretical lectures and hands on approach with the Hydraulics Work Station in order to fully understand the principles of operation and maintenance of the system. Full interaction of the trainer with the participants is provided in order to maximize the learning experience.

Documentation
Each participant will receive a binder with a complete set of training materials. In addition a soft copy of training materials in PDF form will be handed to each participant in a USB drive.
Seminario de Molienda de bolas (Operaciones y Mantenimiento)

MEDELLIN COLOMBIA

Objetivo
El seminario de molienda de bolas operaciones y mantenimiento, está diseñado para capacitar al personal sobre la tecnología, operación y las mejoras prácticas de mantenimiento necesarias para poder alcanzar ahorros de energía, reducir costos de mantenimiento, así como la mejora continua de la operación de los equipos.

Grupo
Este seminario ha sido diseñado para ingenieros de proceso y mantenimiento, así como, supervisores y gerentes con un mínimo de un año de experiencia en las operaciones de cemento.

Beneficios
Este seminario ofrece nuevas ideas para optimizar las operaciones de los molinos de bola, incluyendo la posibilidad de mejoras potenciales y modernización de los equipos. Después de la participación en este seminario, la experiencia ha mostrado que se ha formado una red valiosa de contactos entre colegas de otras plantas. Además contacto directo con especialistas técnicos e ingenieros de campo de FLSmidth.

Plan del Seminario
Este seminario de 5 días ofrece enseñanza directa del instructor, estudio de casos reales, y sesiones de trabajo para:
- Estudio de la función y el diseño del equipo principal, incluyendo los últimos métodos para la optimización y las propuestas para mejoras en modernizaciones de planta y operaciones
- Trabajos en grupo y discusión intensiva.

Temas
1. Operación de molinos de bolas
   - Tipo de molinos de bolas (diseño, principios y fundamentos de operación)
   - Flujo de aire en el Molino así como manejo de gases en el sistema
   - Desgaste de blindajes, de la carga de bola, y su impacto a la operación
   - Desgaste de espesor en las diafragmas centrales y de salida
   - Medición de apertura de las ranuras en las diafragmas centrales y de salida
   - Cálculo de consumo de energía y la influencia por la carga de bolas
   - Tipos de separadores y sus modos de empleo
   - Cálculos para el control del separador (tromp curves, rosin rambler etc) y su impacto a la taza de producción
   - Influencia del separador en el consumo energético y la distribución de partículas
   - Medición y consumo de carga de bola y su relación a desgastes
   - Ayudantes de molienda y enfriadores de material
   - Mediciones y cálculos para flujo de aire y gas
   - Auditoría y análisis del sistema de molienda de cemento y la posibles mejoras
   - Muestreo y preparación para muestreo de clinker y cemento.
   - Sistemas de control (experto) para molienda de bolas.

Duración
El seminario tendrá una duración de cinco días e incluye materiales de trabajo, cóctel de bienvenida, almuerzos, cafés/refrescos, traducción simultánea de inglés al español y cena de despedida.

Fecha y lugar
Mayo 12-16 2014
Medellín, Colombia

Precio de inscripción
La tarifa por participante es USD 2,500 y no incluye alojamiento, ni gastos de transporte.

Cancelación
30 días antes del evento =
El Pago es 100% de la tarifa
De 31-59 días antes del evento =
El pago es 50% de la tarifa
60 días antes del evento =
Se reembolsa el 100% de la tarifa.

Contacto coordinación
Ms. Lynn Petrak
Training Coordinator
Tel: +1 610 - 264 6017
Fax: +1 610 - 264 6031
E-mail: lynn.petrak@flsmidth.com
or flsinstitute.us@flsmidth.com
II. Mantenimiento de molinos de bolas
- Instalación y medición de blindajes (desgastes y su historial)
- Medición de espesor en las diafragmas centrales y de salida
- Medición de apertura de las ranuras en las diafragmas centrales y de salida
- Medición y tipos de muñón
- Mandos principales y auxiliares
- Sistemas de Lubricación y levante (Análisis de lubricación)
- Sistemas de engrase de corona y piñón
- Mediciones y reemplazo de coraza
- Pruebas No Destructivas (NDT’s)
- Alineación del molino
- Inspección y mantenimiento de los separadores usados en sistemas de molienda de cemento
- Colectores de polvo, operación y mantenimiento.

**Documentación**
Cada participante recibirá una carpeta con un conjunto completo de materiales de capacitación. Además se entregará una copia electrónica de materiales didácticos en formato PDF a cada participante en una unidad USB.
Seminario de Molinos Verticales (Operaciones y Mantenimiento)

ANTIGUA GUATEMALA

Objetivo
El seminario de molinos verticales está diseñado para capacitar al personal sobre la tecnología, operación y las mejoras prácticas de mantenimiento necesarias para poder alcanzar ahorros de energía, reducir costos de mantenimiento, así como la mejora continua de la operación de los equipos.

Grupo
Este seminario está diseñado para ingenieros de proceso, mantenimiento, confiabilidad, así como supervisores y gerentes de las áreas respectivas, con un mínimo de un año de experiencia en las operaciones de cemento.

Beneficios
Este seminario ofrece nuevas ideas para optimizar las operaciones de los molinos verticales, incluyendo la posibilidad de mejoras potenciales y modernización de los equipos. Después de la participación en este seminario, la experiencia ha mostrado que se ha formado una red valiosa de contactos entre colegas de otras plantas. Además contacto directo con especialistas técnicos e ingenieros de campo de FLSmidth.

Plan del Seminario
Este seminario de 5 días ofrece enseñanza directa del instructor, estudio de casos reales, y sesiones de trabajo para:
- Estudio de la función y el diseño del equipo principal, incluyendo los últimos métodos para la optimización y las propuestas para mejoras en modernizaciones del sistema y operaciones
- Trabajos en grupo y discusión intensiva.

Temas
Operación de Molinos Verticales y Sistemas
- Tipos de molinos
- Diseño y principios de operación
- Tipos de separadores y modo de operación
- Distribución de partículas y eficiencia del separador
- Molienda de materia prima
- Sistemas de alimentación a los molinos
- Diseño interno de los molinos
- Flujos de gases en los molinos verticales
- Operación y control de los molinos verticales
- Auditoría, análisis y posibles mejoras del sistema de molinos verticales
- Molienda de cemento en molinos verticales
- Molienda de cemento en molinos verticales
- Diseño y operación de colectores de polvo
- Enclavamientos importantes
- Casos prácticos.

Cancelación
30 días antes del evento = El Pago es 100% de la tarifa
De 31 - 59 días antes del evento = El pago es 50% de la tarifa
60 días antes del evento = Se reembolsa el 100% de la tarifa.

Contacto y coordinación
Ms. Lynn Petrak
Training Coordinator
Tel: +1 610 - 264 6017
Fax: +1 610 - 264 6031
E-mail: lynn.petrak@flsmidth.com
or flsinstitute.us@flsmidth.com

Duración
El seminario tendrá una duración de cinco días e incluye materiales de trabajo, cóctel de bienvenida, almuerzos, cafés/refrescos, traducción simultánea de inglés al español y cena de despedida.

Fecha y lugar
Junio 23 - 27 2013
Antigua, Guatemala

Precio de inscripción
La tarifa por participante es USD $2,500 y no incluye alojamiento, ni gastos de transportación.
- Monitoreo de condición (Lubricación, vibraciones, etc.)
- Repuestos y partes críticas
- Rutinas de mantenimiento preventivo y su importancia
- Desgaste y su impacto en producción
- Mantenimiento preventivo
- Rutinas de mantenimiento para reductores y molinos
- Medidas preventivas y de optimización de los equipos
- Planificación de mantenimiento preventivo
- Mantenimiento de colectores de polvo
- Casos prácticos.

**Tipos de Reductores en Molinos Verticales**

- Tipos de reductores (MAAG, TTVL, etc)
- Reductores de 2 estaciones (WPU) para todas las aplicaciones de molinos verticales (carbón, crudo y cemento)
- Reductores de 3 estaciones (WPV) para todas las aplicaciones de molinos verticales (crudo y cemento)

- Equipos auxiliares, las unidades de lubricación, acoplamientos e instrumentación
- Sistemas de monitoreo del sistema de lubricación del reductor
- Mantenimiento preventivo mecánica, partes y repuestos necesarios
- Casos Prácticos.

**Documentación**

Cada participante recibirá una carpeta con un conjunto completo de materiales de capacitación. Además se entregará una copia electrónica de materiales didácticos en formato PDF a cada participante en una unidad USB.
Seminario de Mantenimiento

MONTEVIDEO URUGUAY

Objetivo
El objetivo de este seminario es aprender el correcto mantenimiento preventivo, la identificación de fallas y el aprendizaje de análisis de causa raíz de los equipos, logrando con esto la disminución de tiempo y frecuencias de paradas, la reducción de costos de mantenimiento y un aumento en rentabilidad. El Seminario Internacional de Mantenimiento presenta una base sólida en las mejores prácticas del mantenimiento de los equipos principales de la industria del cemento.

Grupo
Este seminario está diseñado para ingenieros de mantenimiento y confiabilidad, así como supervisores y gerentes de las áreas respectivas, con un mínimo de un año de experiencia en las operaciones de cemento.

Beneficios
Este seminario ofrece nuevas ideas para optimizar las mejoras prácticas de mantenimiento de los equipos principales en una planta de cemento, incluyendo la posibilidad de mejoras potenciales y modernización de los mismos. Después de la participación en este seminario, la experiencia ha mostrado que se ha formado una red valiosa de contactos entre colegas de otras plantas. Además, contacto directo con especialistas técnicos e ingenieros de campo de FLSmidth.

Plan del Seminario
Este seminario de 5 días ofrece enseñanza directa del instructor, estudio de casos reales, y sesiones de trabajo para:
- Estudio y diseño de los equipos principales incluyendo los últimos métodos para mejoras y actualización de los sistemas
- Trabajos en grupo, talleres, y discusión intensiva.

Temas
- Mantenimiento del horno
- Alineamiento del horno
- Deformaciones de la coraza
- Alineación, ajuste y cálculos de rodillos
- Coraza del horno, espesores y sus consecuencias
- Llantas: Ovalidad, diseños flotantes Vs. Diseño de suspensión tangencial
- Caso de estudio, análisis e informe de interpretación de caso real de Ovalidad
- Soportes y cojinetes del horno
- Transmisión del horno
- Alineación del horno, medición y sus consecuencias.
- Mantenimiento de molinos verticales y de bolas
- Mediciones y métodos recomendados para el mantenimiento de los molinos
- Lubricación
- Partes de desgaste
- Coraza de los molinos
- Modernizaciones existentes para los molinos de bolas.

Duración
El seminario tendrá una duración de cinco días e incluye materiales de trabajo, cóctel de bienvenida, almuerzos, cafés/refrescos, traducción simultánea de inglés al español y cena de despedida.

Fecha y lugar
Agosto 11 - 15 2014
Montevideo, Uruguay

Precio de inscripción
La tarifa por participante es USD $2,800 y no incluye alojamiento, ni gastos de transporte.

Cancelación
<table>
<thead>
<tr>
<th>Período</th>
<th>Porcentaje de la tarifa</th>
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<tr>
<td>30 días antes del evento</td>
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<td>60 días antes del evento</td>
<td>100% reembolsada</td>
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Contacto coordinación
Ms. Lynn Petrak
Training Coordinator
Tel: +1 610 - 264 6017
Fax: +1 610 - 264 6031
E-mail: lynn.petrak@flsmidth.com
or flsinstitute.us@flsmidth.com
Mantenimiento de piñones, corona y simetrías
- Tipos de coronas usados en los hornos y molinos
- Mediciones de las coronas y piñones.
- Alineamiento
- Problemas de desgaste
- Lubricación
- Y otros temas de interés por definir.

Mantenimiento de enfriadores de clinker
- Diseño, mantenimiento y reparación de enfriadores 1ra, 2da y 3ra generación
- Dimensiones críticas: Como conseguir y mantenerlas
- Secretos de una operación óptima y su relación con mantenimiento
- Instrucciones para la localización y reparación de averías
- Análisis de causa raíz de las fallas más comunes en los enfriadores
- Análisis de partes de desgaste.
Mechanical maintenance of Rotary Dryers

SOUTH SIoux CITY NE USA

General
More than 1,100 maintenance personnel from more than 250 different companies have attended these workshops over the past 8 years. The workshops are designed to cover most areas of preventive maintenance practices, as well as alignment methods, and roller skew adjustment best practices.

A dryer is our generic term for any two pier, non-refractory lined drum which can be a tumbler, cooler, granulator, conditioning drum, rock scrubber and so on.

Learning objectives
- Define dryer component names
- Explain basic design concepts
- Identify the most sensitive points for visual inspection
- Explain simple hands-on inspection methods
- Introduce analytical inspection tools and methods
- Explain various gear, pinion and roller alignment concepts
- Explain roller skew and skew management
- Elevate general mechanical knowledge of rotary dryers.

Benefits
- With a better understanding of rotary dryer’s mechanical characteristics more efficient and effective maintenance programs both short term and long term can be planned
- Definitive understanding of support roller alignment and setting skew will dispense commonly held myths and misunderstandings putting everyone “on the same page”
- Provide contacts and resources for future reference.

Course contents
DRYER – 2-pier, no refractory
- Basic design fundamentals, Inspection and Trouble Shooting
  - Shell
  - Tires, mounting styles and hardware
  - Rollers, thrust Rollers and bases
  - Gear, Pinion and other drives
- Inlet and Outlet Seals
- Alignment – conventional 2 pier alignment
- Roller Adjustment and Skew
- Tire and Roller Reconditioning
- Issues with Spherical Roller Bearings used on trunnions
- Thrust Monitor Alignment explained
- Lubrication (guest speaker)
- Roller adjustments and skew (thrust) control concepts and procedures.

Form
The seminar comprises of classroom presentations and a day of hands-on work making roller adjustments at our training kiln.

Documentation
Each participant receives:
- All the course material in full color hardcover book. This 258-page book (approx.) contains all the pictures, graphics and text
- A memory stick containing all the course materials, videos and animations.

Target group
Maintenance personnel from mechanics to maintenance managers.

Participants
Maximum number of participants is 35.

Duration
4 days

Planned Course days
7 - 10 April 2014 and 29 September - 2 October 2014

Location
South Sioux City NE - USA

Registration fee
Tuition fee per participants is $1,150 USD.

Cancellation
0-30 days before = 50% of fee
31 days before = 0% of fee

Registration
Please contact: anderses@kiln.com.

Note: Registration required no later than three weeks prior to the published date.

Participants need to bring their own PPE and in case of inclement weather, appropriate clothing.
Mechanical maintenance of Rotary Kiln

SOUTH SIOUX CITY NE USA

General
More than 1,100 maintenance personnel from more than 250 different companies have attended these workshops over the past 8 years. The workshops are designed to cover most areas of preventive maintenance practices, as well as alignment methods, shell ovality or flexing measurement, and roller adjustment and skew best practices.

Learning objectives
- Define kiln equipment component names
- Explain basic design concepts
- Identify the most sensitive points for visual inspection
- Explain simple hands-on inspection methods
- Introduce analytical inspection tools and methods
- Explain various gear, pinion and roller alignment concepts
- Explain roller skew and skew management
- Elevate general mechanical knowledge of rotary kilns.

Benefits
- With a better understanding of rotary kiln’s mechanical characteristics more efficient and effective maintenance programs both short term and long term can be planned
- Definitive understanding of support roller alignment and setting skew will dispense commonly held myths and misunderstandings putting everyone “on the same page”
- Provide contacts and resources for future reference.

Course contents
KILN – Multi-pier, refractory
Basic Topics are:
- Basic design fundamentals, Inspection and Trouble Shooting
- Shell
- Tires, mounting styles and hardware
- Rollers, thrust Rollers and bases
- Gear, Pinion and other drives
- Inlet and Outlet Seals
- Alignment – multi pier laser / conventional 2 pier alignment
- Shell Flex (Ovality) concepts, measurement, evaluation
- Roller Adjustment and Skew
- Tire and Roller Reconditioning
- Refractory (guest speaker)
- Lubrication (guest speaker)
- Roller adjustments and skew (thrust) control concepts and procedures.

Form
The seminar comprises of presentations and a day of hands-on work roller adjustments on site training kiln.

Documentation
Each participant receives:
- All the course material in full color hardcover book. This 322-page book (approx.) contains all the pictures, graphics and text
- A memory stick containing all the course materials, videos and animations.

Target group
Maintenance personnel from mechanics to maintenance managers.

Participants
Maximum number of participants is 35.

Duration
4 days

Planned Course days
28 April - 1 May 2014 and 27 - 30 October 2014

Location
South Sioux City NE - USA

Registration fee
Tuition fee per participant is $1,150 USD.

Cancellation
0-30 days before = 50% of fee
31 days before = 0% of fee

Registration
Please contact: anderses@kiln.com
Note: Registration required no later than three weeks prior to the published date.

Participants need to bring their own PPE and in case of inclement weather, appropriate clothing.
Pfister Rotorweighfeeders – Basic system introduction for optimal handling

AUGSBURG GERMANY, BETHLEHEM USA, MONTERREY MEXICO

General
Our wealth of experience as the manufacturer of your equipment enables us to share with you unique insight and information. Our training experts are your global resource for knowledge. They assist you in the application of the best industry practices. If you handle your dosing equipment correctly you will not only improve your equipment’s performance but save maintenance costs, too. We will show you how to accomplish this during the course.

Benefits
The training aims to improve the participants’ skills and knowledge by developing their awareness of applied procedures concerning the operation and maintenance of equipment. Subjects are chosen and sequenced to meet the staff’s recognised requirements.

Course contents
- Function principles
- Troubleshooting
- Access and handling of feeder controllers
- Calibration procedures
- Interpretation of events and messages
- Back up handling; up- and downloads, spare part replacement
- Diagnostic tools – online data logger, trigger monitor
- Maintenance intervals and wear rating
- Replacement of wear parts
- Adjustments and fine tuning.

Form
Theoretical classroom lectures and practical exercises on feeder simulation units.

Documentation
Each participant will receive a binder with a complete set of training materials.

Target group
The course is designed for participants, working as electrical or mechanical maintenance personal. The participants will typically be staff from the maintenance departments with responsibility for feeder equipment.

Participants
The maximum number of participants is 10.

Duration
3 days

Planned course days
For Germany (German/English)
25 - 27 March 2014
15 - 17 July 2014
21 - 23 October 2014

For USA (English)
29 April - 1 May 2014
23 - 25 September 2014

For Mexico (Spanish)
3 - 5 June 2014

Location
The course is held at
a. Pfister, Augsburg, Germany
b. Pfister, Bethlehem, US
c. Pfister, Monterrey, Mexico

Registration fee
Tuition free per participants is EUR 1,950. Cost of board, lodging or personal expenses are not covered.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact:
Mr. Armin Hauser
Tel: + 49 821 7949 392
Fax: +49 821 7949 240
E-mail: service@fismidthpfister.com
Objetivo
El seminario de mantenimiento Hidráulico mejorará los principios de funcionamiento, diseño y mantenimiento adecuado de los diferentes sistemas hidráulicos utilizados en la industria del cemento. El propósito de este seminario es una comprensión en profundidad de los diferentes componentes del sistema hidráulico, su relación con la operación y las tecnologías utilizadas para aumentar la habilidad y conocimientos del personal que participa en el mantenimiento de estos equipos y así lograr aumentar la disponibilidad y su eficiencia.

Objetivos de aprendizaje
El objetivo del seminario es aumentar el conocimiento de los participantes relacionados con el mantenimiento de los sistemas hidráulicos, aumentar las habilidades necesarias para operar y mantener los componentes de los sistemas utilizando las mejores prácticas probadas en la industria, lo que lleva a la reducción de tiempo de parada, el aumento de fiabilidad y el rendimiento del sistema.

Gruppo
El seminario está dirigido a personal de mantenimiento clave que participan en la operación del sistema hidráulico y el mantenimiento. Los participantes suelen ser los técnicos de mantenimiento, ingenieros y supervisores.

Beneficios
Los participantes serán capaces de abordar y encontrar soluciones a los problemas relacionados con el sistema hidráulico, así como la revisión y optimización de diseño y parámetros de funcionamiento. Serán expuestos a situaciones reales de otras plantas, y las mejores prácticas en la industria cementera.

Temas
- Introducción a la Hidráulica
- Seguridad sistemas hidráulicos
- Símbolos hidráulicos
- Componentes Hidráulicos
- Diferentes tipos de bombas y sus funciones

Plan del Seminario
El seminario consta de clases teóricas y prácticas con la Estación Hidráulica de trabajo con el fin de comprender plenamente los principios de funcionamiento y mantenimiento del sistema. Interacción completa del entrenador con los participantes en forma de maximizar la experiencia de aprendizaje.

Documentación
Cada participante recibirá una carpeta con un conjunto completo de materiales de capacitación. Además se entregará una copia electrónica de materiales didácticos en formato PDF a cada participante en una unidad USB.
Automation
ECS/ControlCenter – Daily Use Mimics and Maintenance

BETHLEHEM USA

General
The course focuses on functions of the ECS control system from FLSmidth for daily operation and maintenance of the system.

Learning objectives
The purpose of the course is to teach the participants daily use of the ECS system, how to monitor and analyze the process, and to setup and configure the system. The course will enable the participant to troubleshoot on/with the system and do general maintenance functions when necessary.

Further, participants will be able to create and maintain mimic pictures using the ECS/OpStation Editor.

Benefits
The overview and knowledge gained from the course will improve the operation of the plant, alarm handling, maintenance and use of the ECS system and in this way improve plant performance.

Course Contents
- Alarm handling, trends, reports and point surveys
- Setup and configuration of the system
- Subsystems such as: Data log system, Point System, Alarm System, Event System, I/O Interface
- Dataflow and Algorithms in the system and interaction with PLC
- User Access Control
- Static and Dynamic Mimic Pictures.

The course is a combination of ECS/ControlCenter Daily Use, ECS/ControlCenter Mimics and ECS/ControlCenter Maintenance and is based on ECS version 7.9.

Form
The course is a combination of theoretical classroom PC lectures, hands-on exercises and discussions.

Documentation
Each participant will receive a binder with a complete set of training materials.

Target group
The course is designed for plant engineers with practical experience from a plant, but not yet knowledge about the ECS System.

Requires basic IT skills and basic knowledge of the process of industrial production.

Participants
The maximum number of participants is 10.

Duration
5 days

Planned course days
3 - 7 February 2014
8 - 12 September 2014

Location
The course is held at FLSmidth Automation in Bethlehem USA.

Registration Fee
Tuition fee per participant is $3,200 USD. The fee includes all course materials, and lunch daily.

Note: This does not include the cost of your lodging or personal expenses.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
For registration please contact Customer Service Center
Tel: +1 610 231 6044
Fax: +1 610 264 6045
E-mail: flsinstitute.us@flsmidth.com

Note: Please note that registration shall be made 8 weeks prior to a course start.
ECS/PlantGuide Report Handling

BETHLEHEM USA

General
The course focuses on the management information system ECS/PlantGuide application.

Learning objectives
After attending the course the participants will have an overview of what can be achieved with an ECS/PlantGuide application. The participants will also be ready to print reports and participate in report design.

This enables the participants to create specific reports and other kind of data analysis relevant for Plant Management use.

Benefits
ECS/PlantGuide makes information available at the right time, in the right place and in the right format and for the right people.

Course Contents
The first day of this course gives an overview of the ECS/PlantGuide system application. The next days, the focus is on hands-on experience with the ECS/PlantGuide system application.

The course covers the following subjects:
- ECS/PlantGuide points
- ECS/PlantGuide Reports
- Finding or creating the points required for composing the desired report
- ECS/PlantGuide on the office network
- Configuration of site specific ECS/PlantGuide points
- Configuration of site specific ECS/PlantGuide reports
- Maintenance of the ECS/PlantGuide database
- Use of ECS/PlantGuide tools
- Design of Reports
- Collecting data from multiple plants.

The course is a combination of the courses ECS/PlantGuide Daily Use and ECS/PlantGuide Configuration.

Form
The course is a combination of theoretical classroom PC lectures and hands-on exercises.

Documentation
Each participant will receive a binder with a complete set of training materials.

Target group
The course is designed for Production or quality responsible people delivering reports and data analysis for Management.

Experience in use and configuration of ECS/ControlCenter are required.

Participants
The maximum number of participants is 12.

Duration
3 days

Planned course days
21 - 23 October 2014

Location
The course is held at FLSmidth Automation in Bethlehem USA.

Registration Fee
Tuition fee per participant is $1,850 USD. The fee includes all course materials, and lunch daily.

Note: This does not include the cost of your lodging or personal expenses.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
For registration please contact
Customer Service Center
Tel: +1 610 231 6044
Fax: +1 610 264 6045
E-mail: flsinstitute.us@flsmidth.com

Note: Please note that registration shall be made 8 weeks prior to a course start.
ECS/ACESYS Programming for Control Logix PLC

BETHLEHEM USA

General
The objective for the course is to develop skills in creating, changing and adding new ACESYS modules in ECS and PLC.

Learning objectives
After attending the course the participants will have an overview of the communication between the ECS/ControlCenter and the PLC’s and knowledge of ACESYS programming possibilities in the PLC. The participants will also get experience in selecting, adding and changing ACESYS Modules in ECS/ControlCenter and PLC.

Benefits
Adaptable Control Engineering System, ACESYS, is used for programming the PLC’s. ACESYS trained staff can maintain PLC software and make the necessary changes in the PLC for optimization or process changes.

Course Contents
This course is focusing on ACESYS for Rockwell ControlLogix PLC’s and programmed with RSlogix5000 Software.

The course covers the following topics:
- ECS and PLC structure and layout
- Departments
- Groups
- Routes
- Uni- and Birectional Motors
- MotorGates
- Valves
- Select Points
- Analog and Digital Alarms
- Positioners
- PID Controllers.

Form
The course is a combination of lectures, demonstration, hands-on exercises and discussions. Training is performed using ECS Device Simulation and Rockwell SoftLogix PLC.

Documentation
Each participant will receive a binder with a complete set of training materials.

Target group
The course is designed for engineers, who work with and program ACESYS installations. The course requires ECS maintenance skills similar to the course “ECS/ControlCenter Maintenance” and experience programming ControlLogix PLCs using RSLogix5000.

Each participant must have prior experience or training using ECS control systems and PLC programming using RSLogix5000.

Participants
The maximum number of participants is 10.

Duration
5 days

Planned course days
10 - 24 February 2014
15 - 19 September 2014

Location
The course is held at FLSmidth Automation in Bethlehem, USA.

Registration Fee
Tuition fee per participant is $3,200 USD. The fee includes all course materials, and lunch daily.

Note: This does not include the cost of your lodging or personal expenses.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
For registration please contact Customer Service Center
Tel: +1 610 231 6044
Fax: +1 610 264 6045
E-mail: fslinstitute.us@flsmidth.com

Note: Please note that registration shall be made 8 weeks prior to a course start.
ECS/ACESYS Programming for Siemens S7 PLC

BETHLEHEM USA

General
The objective for the course is to develop skills in creating, changing and adding new ACESYS modules in ECS and PLC.

Learning objectives
After attending the course the participants will have an overview of the communication between the ECS/ControlCenter and the PLC’s and knowledge of ACESYS programming possibilities in the PLC. The participants will also get experience in selecting, adding and changing ACESYS Modules in ECS/ControlCenter and PLC.

Benefits
Adaptable Control Engineering System, ACESYS, is used for programming the PLC’s. ACESYS trained staff can maintain PLC software and make the necessary changes in the PLC for optimization and process changes.

Course Contents
This course is focusing on ACESYS for Control Logix PLC’s and programmed with Siemens step 7 Software.

The course covers the following topics:
- ECS and PLC structure and layout
- Departments
- Groups
- Routes
- Uni- and Biirectional Motors
- MotorGates
- Valves
- Select Points
- Analog and Digital Alarms
- Positioners
- PID Controllers.

Form
The course is a combination of lectures, demonstration, hands-on exercises and discussions. Training is performed using Soft PLC.

Documentation
Each participant will receive a binder with a complete set of training materials.

Target group
The course is designed for engineers, who work with and program ACESYS installations. The course requires ECS maintenance skills similar to the course “ECS/ControlCenter Maintenance”.

Basic Siemens S7 PLC understanding is required.

Participants
The maximum number of participants is 10.

Duration
5 days

Planned course days
17 - 21 February 2014
22 - 26 September 2014

Location
The course is held at FLSmidth Automation in Bethlehem, USA.

Registration Fee
Tuition fee per participant is $3,200 USD.
The fee includes all course materials, and lunch daily.

Note: This does not include the cost of your lodging or personal expenses.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
For registration please contact Customer Service Center
Tel: +1 610 231 6044
Fax: +1 610 264 6045
E-mail: flsinstitute.us@flsmidth.com

Note: Please note that registration shall be made 8 weeks prior to a course start.
ECS/ProcessExpert – Kiln High Level Process Control

BETHLEHEM USA

General
This course focuses on how to reduce variability and cost of operating rotary kilns by implementing high level multivariable process control.

Learning objectives
The learning objective for this course is to develop knowledge of the configuration and use of ECS/ProcessExpert for high level control of rotary kilns.

Benefits
The overview and knowledge gained from the course will enable the implementation of high level control strategies based on the ECS/ProcessExpert Toolbox and applications.

Course Contents
- Basics of high level control system
- Main functions of ECS/ProcessExpert and user interface
- General application structure
- Monitoring and tuning options
- On/Off logic and control groups
- Advanced ECS (ECS Points and I/O)
- Control Indices
- Utility Objects
- Applied Control Technique
- Fuel Control
- Priority Strategy
- Customization.

Form
The course is a combination of theoretical classroom PC lectures and hands-on exercises.

Documentation
Each participant will receive a binder with a complete set of training materials.

Target group
The course is designed for plant engineers with practical experience from a plant. The course requires basic IT skills and advanced knowledge of the process of rotary kiln operation.

Participants
The maximum number of participants is 10.

Duration
5 days

Planned course days
10 - 14 March 2014

Location
The course is held at FLSmidth Automation in Bethlehem USA.

Registration Fee
Tuition fee per participant is $3,200 USD. The fee includes all course materials, and lunch daily.

Note: This does not include the cost of your lodging or personal expenses.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
For registration please contact Customer Service Center
Tel: +1 610 231 6044
Fax: +1 610 264 6045
E-mail: flsinstitute.us@flsmidth.com

Note: Please note that registration shall be made 8 weeks prior to a course start.
ECS/ProcessExpert
– High Level Process Control of Grinding

BETHLEHEM USA

General
Reduce variability and cost of grinding by implementing high level multivariable process control.

Learning objectives
To develop knowledge of the configuration and use of ECS/ProcessExpert for high level control of grinding circuits.

Benefits
The overview and knowledge gained from the course will enable the implementation of high level control strategies based on the ECS/ProcessExpert Toolbox and applications.

Course Contents
- Basics of high level control system
- Main functions of ECS/ProcessExpert and user interface
- General application structure
- Monitoring and tuning options
- On/Off logic and control groups
- Advanced ECS (ECS Points and I/O)
- Control Indices
- Utility Objects
- Applied Control Technique
- Feed Control
- Priority Strategy
- Customization.

Form
The course is a combination of theoretical classroom PC lectures and hands-on exercises.

Documentation
Each participant will receive a binder with a complete set of training materials.

Target group
The course is designed for plant engineers with practical experience from a plant. The course requires basic IT skills and advanced knowledge of the grinding process.

Participants
The maximum number of participants is 10.

Duration
5 days

Planned course days
6 - 10 October 2014

Location
The course is held at FLSmidth Automation in Bethlehem USA.

Registration Fee
Tuition fee per participant is $3,200 USD. The fee includes all course materials, and lunch daily.

Note: This does not include the cost of your lodging or personal expenses.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
For registration please contact
Customer Service Center
Tel: +1 610 231 6044
Fax: +1 610 264 6045
E-mail: flsinstitute.us@flsmidth.com

Note: Please note that registration shall be made 8 weeks prior to a course start.
Infrared Kiln Scanning by ECS/CemScanner

COPENHAGEN DENMARK

General
The course focuses on the ECS/CemScanner tools to supervise the kiln shell in order to avoid unforeseen kiln stops.

Learning objectives
After attending the course, participants will understand the operating principles and functions of the ECS/CemScanner system. Participants will get to know how to examine the KilnView and BrickGuide, displays for red spots, lining data, brick and coating thickness, Live Ring Migration, Fan Control and PyroScan.

Participants will understand the configuration of the ECS/CemScanner system. They will learn how to install, configure, trouble-shoot and maintain the system equipment and they will be able to modify the system configuration for varying needs.

Benefits
Supervision of the kiln lining by the ECS/CemScanner is valuable. The overview and knowledge gained from this course will improve the system operation, increase kiln lining durability and all together improve plant performance.

Course Contents
The first days training covers a description of the ECS/CemScanner system with focus on functions for daily use. The system principle as well as the different types of hardware will be introduced. The second day covers the ECS/CemScanner with focus on engineering functions for configuration and maintenance of the system.

The course is a combination of ECS/CemScanner Daily Use and ECS/CemScanner Maintenance and is based on ECS Version 8.

Form
The course is a combination of theoretical classroom PC lectures and hands-on exercises.

Documentation
Each participant will receive a binder with a complete set of training materials.

Target group
Plant engineers, operators and technicians, who need knowledge of operation, trouble-shooting and maintaining the system.

The course requires basic IT skills.

Participants
The maximum number of participants is 12.

Duration
2 days

Planned course days
6 - 7 November 2014

Location
The course is held at FLSmidth Automation in Valby, Denmark.

Registration Fee
Tuition fee per participant is EUR 1,250. The fee includes all course materials, and lunch daily.

Note: This does not include the cost of your lodging or personal expenses.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
For registration please contact Customer Service Center
E-mail: 800flsmidth@flsmidth.com
or fslinstitute@flsmidth.com

Note: Please note that registration shall be made 8 weeks prior to a course start.
QCX/Basics & Sampling Procedures

COPENHAGEN DENMARK

General
After attending the course the participants will understand the concept and applications of FLSmidth’s QCX laboratory automation product.

Learning objectives
This course will give the participants detailed knowledge of the LIMS (Laboratory Information Management System) parts of the QCX system. This includes how the software handles sample login, sample analysis, result acceptance and data storages; and how these results can be shown, used for calculations, reports, trends, export to other systems and back up. The course will be loaded with examples and exercises, which will relate the QCX system to chemical process problems, chemical process control and sampling / laboratory procedures.

Benefits
The overview and knowledge gained from the course will improve the operation of the QCX System and in this way improve laboratory practices and cement production.

Course Contents
Introduction to the QCX product suite:
- QCX concept, from Pile to Shipping
- Sampling and analyzing options.

LIMS use:
- Sample Login and Analysis
- Basis setup
- Sample Display and Sample list
- Trend
- Reports
- Dynamic data extraction from Excel.

LIMS Setup:
- Sample groups and sample point
- Equipments and programs
- Data items and formulas
- Accept limits
- Data export to PLC’s and externals systems
- Equipment communication troubleshooting
- User control.

The course is based upon the QCX Daily Use & Setup version 7 courses.

Form
Lectures, hands-on exercises, demonstrations and discussions.

Documentation
Each participant will receive a binder with a complete set of training materials.

Target group
The course is designed for Quality Managers and Laboratory responsible personnel with QCX Base Training courses or prior operation in a cement laboratory.

Participants
The maximum number of participants is 8.

Duration
3 days

Planned course days
12 - 14 November 2014

Location
The course is held at FLSmidth Automation in Valby, Denmark.

Registration Fee
Tuition fee per participant is EUR 1,850. The fee includes all course materials, and lunch daily.

Note: This does not include the cost of your lodging or personal expenses.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
For registration please contact
Customer Service Center
E-mail: 800flsmidth@flsmidth.com
or flsinstitute.us@flsmidth.com

Note: Please note that registration shall be made 8 weeks prior to a course start.
QCX/Mix Control & Optimisation of Mills

COPENHAGEN DENMARK

General
The participant will achieve in depth knowledge on the QCX/BlendExpert™ Mill application. How do the software models the process? What inputs are needed? How does it find the optimal mixing solution? What are the pitfalls concerning lab procedures and software? How can the control be evaluated and how can it be tuned?

The participants will also get to know the fundamentals of the static mixing process and being able to pinpoint the limitations by using the QCX/BlendDesigner.

Learning objectives
To give the participants a firm knowledge base on how to mix materials in the context of cement plant process: On the pile for smoothing variation from query, in the raw mill for making chemical steady kiln feed and in the cement mills making different types of cement.

To be familiar with the QCX/BlendExpert™ Mill application to analyze its behavior and have the understanding to make setting changes to improve control and evaluate if the changes have the wanted effect. Participants will gain experience using the QCX/BlendDesigner for calculating and optimizing blends.

Benefits
The overview and knowledge gained from the course will help to optimize laboratory practices. Having the skills to analyze and tune the behaviour of your QCX/BlendExpert™ Mill. Investment will be returned in lower derivation on the chemical control of the Kiln Feed.

Course Contents
The course focuses on understanding the need for QCX Mix Control in relation to the production process and how your QCX Mix Control can improve and control the process in accordance with international standards. Further the course deals with the theory and practice of chemical control of raw mill or cement mill production. The course focuses on the principles of the QCX/BlendExpert™-Mill software, on basis of both laboratory X-Ray and On-line analysis of laboratory data for automatically control of the raw and/or cement mill production for optimum process operation.

Finally we go through the principles of the QCX/blendDesigner software, which is used for examining and estimation the impacts of changing input parameters to the production process.

The course is a combination of QCX/BlendExpert, QCX/BlendExpert Mill and QCX/BlendExpert On-line Analazis. If you need a QCX Pile course, please have a look at our web-site, www.flsmidth.com.

The course is based on QCX version 7.

Form
Lectures, hands-on exercises, demonstrations and discussions.

Documentation
Each participant will receive a binder with a complete set of training materials.
General
The objective of this course is to provide in-depth knowledge of QCX/RoboLab™ system to ensure correct use of it for quality control operation.

Learning objectives
The participants will be able to use the QCX/RoboLab™ for daily operation, do basic trouble-shooting as well as gain overview of the software configuration.

Benefits
The overview and knowledge gained from the course will improve the operation of the QCX/RoboLab™ system and in this way improve the laboratory practices, the production and ensure consistent quality output.

Course Contents
The course covers the following subjects:
- Cell configuration
- Master recipes and recipes
- Sample arrival from QCX/AutoSampling™
- Sample structure for QCX/AutoSampling™ samples
- Sample login from conveyor or other manual entry equipment
- Sample structure for manual entry samples.

The course is based on QCX version 7.

Form
Lectures, hands-on exercises, demonstrations and discussion.

Documentation
Each participant will receive a binder with a complete set of training materials.

Target group
The course is designed for Quality Managers and Laboratory responsible personnel with prior QCX Base Training courses or knowledge on daily operation in a cement laboratory.

Experience in QCX system set-up and daily use is required.

Participants
The maximum number of participants is 10.

Duration
2 days

Planned course days
27 - 28 November 2014

Location
The course is held at FLSmidth Automation in Valby, Denmark.

Registration Fee
Tuition fee per participant is EUR 1,250. The fee includes all course materials, and lunch daily.

Note: This does not include the cost of your lodging or personal expenses.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
For registration please contact Customer Service Center
E-mail: 800flsmidth@flsmidth.com or flsinstitute@flsmidth.com
General
Cement Plant ABC – An introduction to Cement

COPENHAGEN DENMARK

General
Many people are working in the cement industry without ever being involved in the actual manufacture of cement. In order to be able to support the production people, it is important that they know what goes on at a cement plant.

Learning objectives
The purpose of the course is to give non-engineers an overall knowledge of the operations of a cement plant. This includes getting acquainted with the vocabulary used in the cement industry.

Benefits
The participants will be able to better support the operational side of the cement plant by learning to speak the same language as the production people. This will eliminate misunderstandings and confusions in daily work and optimize cooperation between the departments. The ultimate result may very well be increased profitability of the cement plant.

Course contents
- What is cement? How is it made?
- The raw materials, basic chemistry
- Raw material crushing process
- Stores with and without pre-homogenisation
- Production of raw meal
- Homogenisation of raw meal
- The kiln feed system
- The processes in the kiln
- The elements in the pyro system (preheater, calciner, kiln)
- Clinker cooling
- Combustion incl. fuel types, burners, flame formation
- Cement grinding incl. cement types, cement quality
- Coal grinding.

Form
The course is theoretical classroom tuition. Furthermore, the knowledge gained at the course is measured by tests.

Documentation
Each participant will receive a complete set of training materials.

Target group
The course is designed for participants with no or little knowledge of chemistry and engineering in general. The participants will typically be staff from the accounting, purchasing, human resources, marketing, sales or other supporting departments.

Participants
The maximum number of participants is 15.

Location
The course is held at FLSmidth in Valby, Copenhagen, Denmark.

Duration
3 days

Planned Course days
12 - 14 March 2014

Registration fee
Tuition fee per participant is EUR 1,950. Cost of board, lodging or personal expenses are not covered.

Cancellation
0-30 days before = 100% of fee
31-60 days before = 50% of fee
61 days before = 0% of fee

Registration
Please contact:
Ms. Pernille Beck
Tel: +45 36 18 17 27
Fax: +45 36 18 28 04
E-mail: flsinstitute@flsmidth.com
Customized
Customized training

General
FLSmith offers customized training courses designed from the ground up to meet the needs of your cement plant in all its uniqueness. This is the best way of ensuring that you get maximum value out of your investment in training.

Our customized training programs are flexible solutions designed to address the specific challenges facing the staff at your plant. We take into account the actual processes and machinery in use, pinpoint the areas of development and structure each program with topics relevant to your organization.

We develop customized training programs to help increase awareness and understanding of:
- Mechanical and electrical maintenance practices
- Proper operating procedures
- Maintenance and operational safety
- Training need analysis by testing of personnel.

Customized training
When FLSmidth prepares a customized training course, we ensure that all key aspects of the course are tailored to your individual needs. These aspects include:

- **Scope**: You decide what topics and issues are to be covered, as well as the duration of the course.
- **Theory**: We provide the exact amount and type of theoretical background needed to make the most of the practical training.
- **Practical training**: This is tailored precisely to your own plant and the scope of the training course.
- **Case studies**: These are carefully selected to ensure that they apply to your operations.
- **Materials**: We provide expertly developed training materials that reinforce your learning.

- **Language**: We can offer training in your native language, either by our instructors speaking the local language or with an interpreter. The training material can also be translated into the language requested.

- **Working culture**: We consider more than just the equipment, also tailoring our training to the way you operate your plant.

This amounts to a training course that is truly customized, meeting our needs exactly.

Value for money
Customized training is often the best solution for plants acquiring new equipment or facing specific challenges with existing lines. Focusing exclusively on the topics agreed between you and FLSmidth, every minute of a customized training course helps you meet the challenges you face. This ensures unparalleled value for money and a very fast return on investment.

Customer satisfaction
FLSmidth conducts customer satisfaction evaluations. And we continue to refine our ability to measure the effect of our training through assessment tools that provide “before-and-after” evaluation. We aim for, and frequently exceed, a 30 per cent jump in knowledge in our participants. Customer satisfaction is very high – Many companies are so impressed with the benefit that they incorporate customized training as a regular part of their operations.

Training materials
Customized training materials are based on the technical documentation specific to your plant. These include flow sheets, FLSmidth instructions and sub-suppliers’ user manuals. In addition, FLSmidth’s own training material, group work and exercises, audio-visual aids and computer-based training will also be used when needed.

Participants
The number of participants will be agreed upon with the customer.

Duration
To be agreed upon with the customer.

Location
FLSmidth headquarters or on-site abroad.

Registration
Feel free to contact us by e-mail, fax or telephone. Contact information available on the back page.
Registration
General Information

Application procedure
Please follow the guidelines listed below for the training you are interested in attending. Remember to specify which seminar you are planning to attend on the application.

- Fill in the application form or register on-line on www.flsmidth.com

Upon receipt of the application form, a registration package including detailed information on the seminar and an invoice will be forwarded to you.

Please e-mail or fax the application form to:

FLSmidth
Vigerslev Allé 77
2500 Valby, Denmark
Attn: Ms. Pernille Beck
Tel: +45 36 18 17 27
Fax: +45 36 18 28 04
E-mail: flsinstitute@flsmidth.com

or if applying for the USA seminars:

FLSmidth
2040 Avenue C
Bethlehem, PA 18017-2188, USA
Attn: Ms. Lynn Petrak
Tel: +1 610 264 6017
Fax: +1 610 264 6031
E-mail: flsinstitute_Bethlehem@flsmidth.com

For training in India, please contact:

FLSmidth
FLSmidth House
34 Egatoor, Kelambakkam
(Old Mahabalipuram Road - Chennai)
Tamil Nadu - 603 103, India
Attn: Mr. M. Shyamsundar
Tel: +91-44-47481000
Fax: + 91-44-27470301
E-mail: flsinstitute.in@flsmidth.com

Language
All seminars and training courses will be conducted in English except if otherwise stated under the descriptions.

Accommodation
For further information please refer to the individual seminar or training course description.

Payment
An invoice will be forwarded to you as soon as we have received the registration to a seminar or training course.

Registration is not considered final until payment is received.

Cancellation Policy
There will be an administrative charge in case of absence or cancellation. The cancellation fees are as follows:
- 0-30 days before seminar start = 100% of fee
- 31-60 days before seminar start = 50% of fee
- 61 days before seminar start = 0% of fee

Absence or cancellation due to missing visa will not be the responsibility of FLSmidth and will be subject to normal cancellation rules of the international seminars and courses.

FLSmidth reserves the right to cancel seminars and training courses if there are not enough applicants to meet the objectives of a given seminar or training course. In case of cancellation, notification will be sent direct to all applicants.

For online registration go to: www.flsmidth.com

Seminars and courses are differentiated by the breadth and depth of their content, as well as by teaching materials and instruction format. For more information and advice about exactly which seminars and courses are best for your needs, please e-mail or telephone FLSmidth.
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<td>03.02 - 07.02</td>
<td>ECS/ControlCenter – Daily Use, Mimics and Maintenance, USA</td>
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<td>10.02 - 14.02</td>
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<td>ECS/ProcessExpert – High Level Process Control of Grinding, USA</td>
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<td>ECS/PlantGuide Report Handling, USA</td>
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<td>27.10 - 30.10</td>
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<td>Kiln Process and Operation, Denmark</td>
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<td>November</td>
<td>06.11 - 07.11</td>
<td>Infrared kiln scanning by ECS/CemScanner, Denmark</td>
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<td>12.11 - 14.11</td>
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<td>18.11 - 21.11</td>
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<tr>
<td>December</td>
<td>01.12 - 05.12</td>
<td>Vertical Raw Mill Simulation Course, Denmark</td>
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PLANNED INDIVIDUALLY
- OK Cement Mill Operation and Optimisation
- Customized training