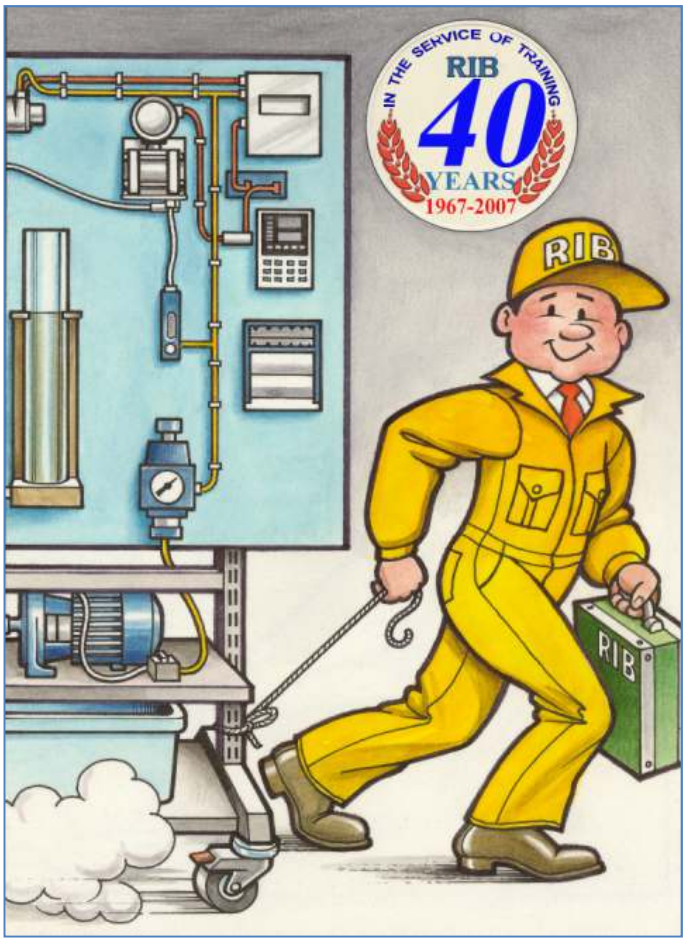
REGLERTEKNISKA INGENJÖRSBYRÅN AB

Training plans
Proposals

The training plans is created together with the process industry for all personnel groups that in some way get in contact with process control, instrumentation and measurement.

The training plans consist of a number of courses which can be combined in different ways.

The courses is described in detail in each course plan.



The training plans can be used on:

- Steel industry
- Pulp & Paper
- Mining industry
- Petrochemical industry
- Chemical industry
- Heating plants
- Power generation plants
- Bio fuel
- Food & Beverage
- Pharmaceutical
- Consultancy enterprises
- Off-shore
- etc.

Get in contact with us for an unconditioned discussion regarding your training needs. We will then make a suggestion for a training plan especially for your plant.

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Together we create the Sustainable Process Industry

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Process Control and Instrumentation Technicians and Engineers

Updating course
Course code: A509
Modules: AUT_21
Length: 2-5 days
Contents: In this course knowledge and skills that has been gained in previous courses are updated. We also add news. What has happened since the last course?

System identification and optimizing with PC based analyze software
Course code: A504
Modules: AUT_19
Length: 3-4 days
Contents: Physical system identification. System identification. data acquisitions. Sampling rate. Model validation. Control models. Simulation. PCT Optimizer Suite or Matlab simulink. Supervisory systems with dynamic feed forward

Performance Monitoring
Course code: A505
Modules: AUT_20
Length: 3-4 days
Contents: Site optimizing. Key performance index. Loop Performance Assessment. LPA-indications. Automatic configuration. Reporting and analyzing. Problem solving. PCT Optimizer Suite.

Process Control & Instrumentation - Multivariable systems, Linearization and Control theory – Step 3
Course code: A503 (A523)
Modules: AUT_14, 15, 16, 17, 18
Length: 8-11 days depending on number of participants
Contents: Cascade control - optimization. Static feed forward control. Dynamic feed forward control. Static and dynamic control blocks. Linearization's. Characterizations in controller and positioner. Parameter control. Optimization according to step response methods. Auto tune controllers. Bode diagram, margins, dead time, stability. Control equations. Performance monitoring in smart positioners. Introduction to different systems for data acquisitions, identification physical system identification and performance monitoring.

Process Control & Instrumentation - Optimum settings and total analysis of Control loops – Step 2
Course code: A502 (A522)
Modules: AUT_12, 13
Length: 7-10 days depending on number of participants
Contents: Theory with practical applications on live processes in a laboratory environment. Process and loop identification. Stability. Dependence of running conditions. System gain. PID-control. Oscillation characteristics. Methods for optimum settings. Damping. Control equations. Sampling. Interactions. Positioners. Linearization's. Valve characteristics. Gain and load dependence. Introduction to Cascade and feed forward control.
In the second Week each participant is assigned one control loop in the plant which is to be analyzed in detail regarding process type, controllability, damping, linearity, interactions, mounting of valves and transmitters etc. The control parameters is optimized. A report is presented for head of maintenance and operations with suggestions for actions.

Process Control & Instrumentation– Industrial Measurement and the Control loop – Step 1
Course code: A501 (A521)
Modules: AUT_01, 07, 08, 09
Length: 5 days
Contents: Adjustments - calibration. Signal systems. Converters. Transmitters for pressure, level, flow, temperature, pH and consistency. Control valves and positioners.
Mounting of transmitters and fittings for venting and safe operation. Control valves for different applications. Flow diagram, functional diagrams and equipment lists. International standard for diagrams. Basic PID-control. Oscillation causes – actions.

Engineers

Construction and Process Engineers

Advanced Process Control strategy - Step 3 (Also performed as open course)
Course code: K503 (K523)
Modules: Ing_03
Length: 3 days
Contents: Cascade control. Static feed forward control. Dynamic feed forward control. Static and dynamic control blocks. Smart positioners. Linearization's. Characterizations. Parameter control, gain scheduling. System identification with PC based tools. Performance monitoring.

Basic Process Control strategy - Step 2 (Also performed as open course)
Course code: K502 (K522)
Modules: Ing_02
Length: 3 days
Contents: Process control philosophy. Process and loop identification. Instability. System gain, load and dead time dependence.
P- PI- and PID- control. Interpretation of oscillations and actions. Process control quality, PV or control valve optimization. Methods for loop tuning. Un linearity's – control valve characteristics. Damping, filter constant, sampling rate.

Transmitters and final control element - Step 1 (Also performed as open course)
Course code: K501
Modules: Ing_01
Length: 2 days
Contents: Strategies for measurement and control. Measurement accuracy. Measuring methods for pressure, vacuum, level, flow, temperature, pH, conductivity, consistency, force, torque, gas analyses. Installation techniques for these transmitters. E.g. Venting, draining, purging of pipes, purging, condensate vessel, length of straight pipe, personnel security, wet and dry reference pipe etc. Control valves, control ability, limitations, control characteristics, pressure drop, cavitation.

Construction – Process control

Transmitters and Control valves (Also performed as open course)
Course code: K506 (K526)
Modules: Ing_06
Length: 1 day
Contents: Mounting and installation of transmitters and control valves, piping and process design etc.

Construction – Mechanical

Process control continued (Also performed as open course)
Course code: K505 (K525)
Modules: Ing_05
Length: 2 days
Contents: Multivariable systems. Tools for tuning of control loops. Performance monitoring and loop diagnostics.

Basic Process control (Also performed as open course)
Course code: K504 (K524)
Modules: Ing_04
Length: 3 days
Contents: Better understanding for how the control loop influence the characteristics of the process. Better communication and understanding with other personnel groups. Possibilities and limitations.

Process Engineers

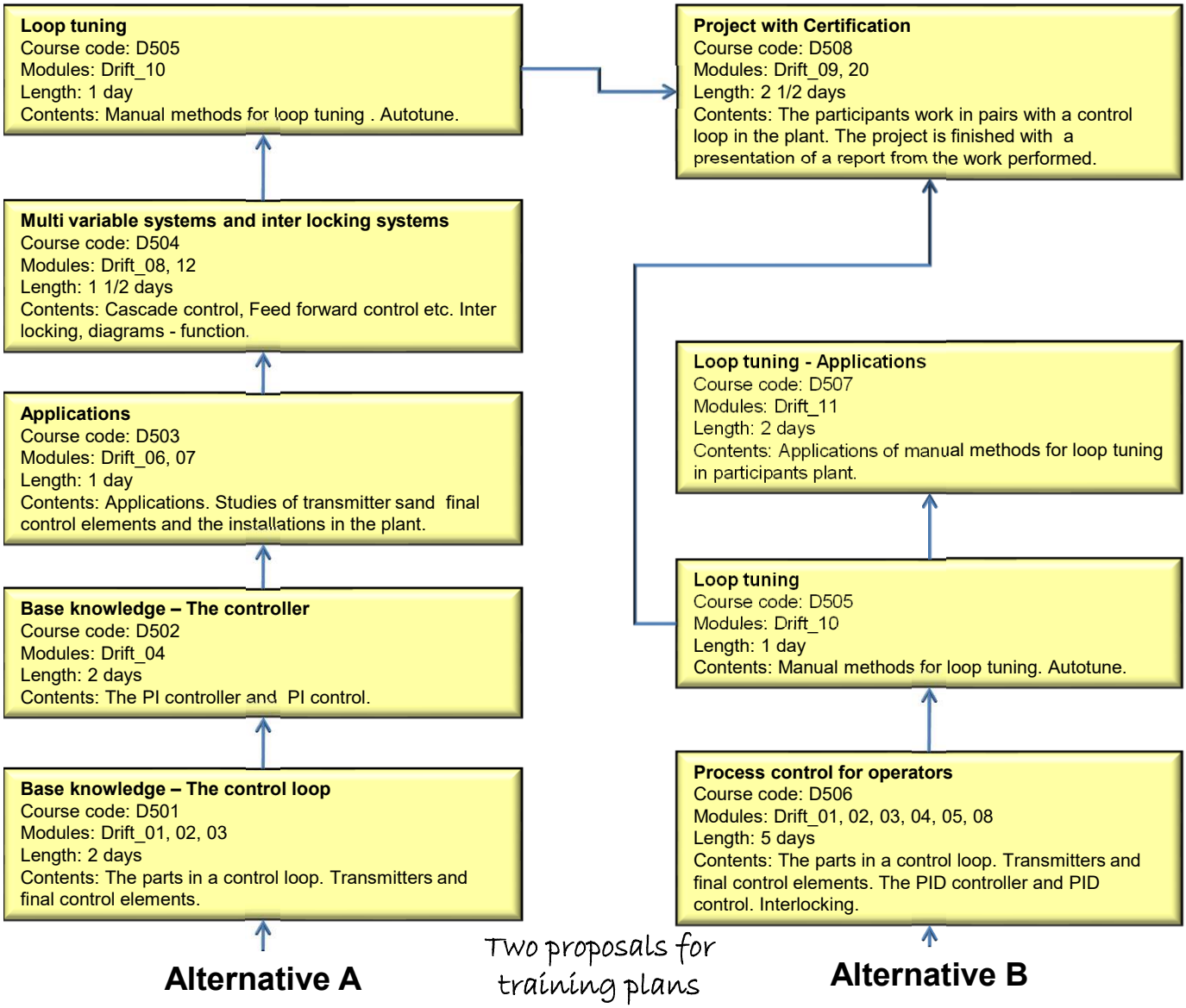
Process Control – Continued, Step 3
Course code: K508
Modules: AUT_08, 09, (11)
Length: 3-4 days
Contents: Rehearsal of step 2. The PD- and PID- controller. PID- control. Methods for tuning a control loop. Exercises with tuning on the DCS or HMI/SCADA system in the plant. Unlinearities in process and control valve. Oscillations due to different running of the plant. The control characteristics of the control valve. Cams in positioners. Cascade control . Feed forward control. Bias control.

Process Control – Basic , Step 2
Course code: K507
Modules: AUT_06, 07, (10 or 11)
Length: 3-4 days
Contents: Definitions. The control loop. Different types of processes. Flow diagrams, International standard and local standard. Configuration of PID-controllers. Graphic pictures for controller detail and object pages from the DCS or HMI/SCADA system in the plant. P- controller, P-control – control errors. PI- controller, PI-control. Disturbances. Energy and power balance. Instability. Oscillations, oscillations causes - actions. The D-part and the influence on the control. Practical exercises on a couple of control loops in the plant.

Process Control - Instrumentation, Step 1
Course code: K506
Modules: AUT_01, 02, 03, (04 or 05)
Length: 3-4 days
Contents: Definitions. Accuracy. The control loop. Signal systems.
Analogue and smart transmitters. Converters. Transmitters for pressure, level, flow, temperature, pH, consistency. Practical hand on exercises; mounting, connections, calibration. Adjustments and taking into running state of a complete control loop. More then 65% practical exercises. Installations and control loops is viewed in the plant.

Technicians

Operators
Operation personnel
Operations technicians



Production personnel

Measurement principles – Basic course
Course code: M501
Modules: Prod_01
Length: 2 days
Contents: Transmitters. Measuring different physical quantity. Examples of applications in the products or in the production plant.

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