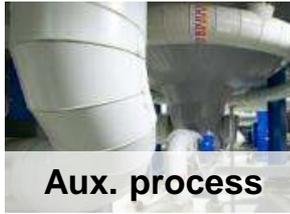


Performance Improvement and sustainability through Advance Process Controls and Remote Monitoring

Green and Clean Best Practices and
Technologies in Paper Manufacturing

Technologies for a sustainable tomorrow



Aux. process

Fiberline

Recovery line

Drying line

Mill management

Mill Information Management

Process optimization

Advanced Process Controls

Analyzers and Quality Optimization Technologies

- Brightness
- Conductivity
- Kappa
- Residuals

- Freeness
- Fibres properties
- External fibrillation

- Green and white liquor properties
- Reduction degree
- Conductivity

- Dirt count
- Web cameras
- Scanners
- Fiber quality

Asset management tool

Loop monitoring - Machine condition monitoring - Field condition monitoring

Process control

DCS

Drive controls

Field instruments, devices

Consistency, Flow, Temperature, Pressure.....

APC solutions

Key benefits

- Better fuel and chemical management
- Improved quality of final product
- Less process variations and smooth operation of the process
- Less environmental chemical load and hence lower pollution
- Well utilization of installed assets and increased production and profitability

Industrial IT

Key benefits

- Rapid response on needed situations
- Complete process analysis and expert advice on routine basis
- Healthy utilization of installed assets
- No waiting for experts' visit when needed situation arises
- Full time monitoring of system performance and loop performance and improvement solutions

Advanced Controls for the Entire Process

Debarking Optimizer

Less wood losses, 0,5 – 2 %-units

Continuous Cooking Optimizer

Kappa variation decrease 20 – 50 %
Production increase of same fibre 0,5 - 3 %

Batch Cooking Optimizer

Kappa variation decrease 10 – 50%
Production increase of same wood 0,5 - 5 %

Washing Line Optimizer

Washing loss decrease 3 - 10 %
Dry solids content increase 0,3 - 1 % to evaporation

Oxygen Stage Optimizer

Kappa variation decrease 10 – 50 %
Bleaching chemicals savings 3 – 5 %

Bleaching Optimizer

Final Brightness at desired level
Final Brightness variation decrease 10 – 50 %
Bleaching chemicals savings 5 – 15 %

Causticizing Optimizer

Increased production rate 1 – 3 %

Lime Kiln Optimizer

Decreased energy consumption 3 – 7%

Evaporation Optimizer

Increased burning liquor
Dry solids 1 - 3%

Recovery Boiler Optimizer

Increased production rate 1 – 3 %
Increased electric production 1 – 4%

RCF Optimizer

Reduced bleaching chemicals 10-40%
Improved plant yield 1-3%

TMP/BCTMP Optimizer

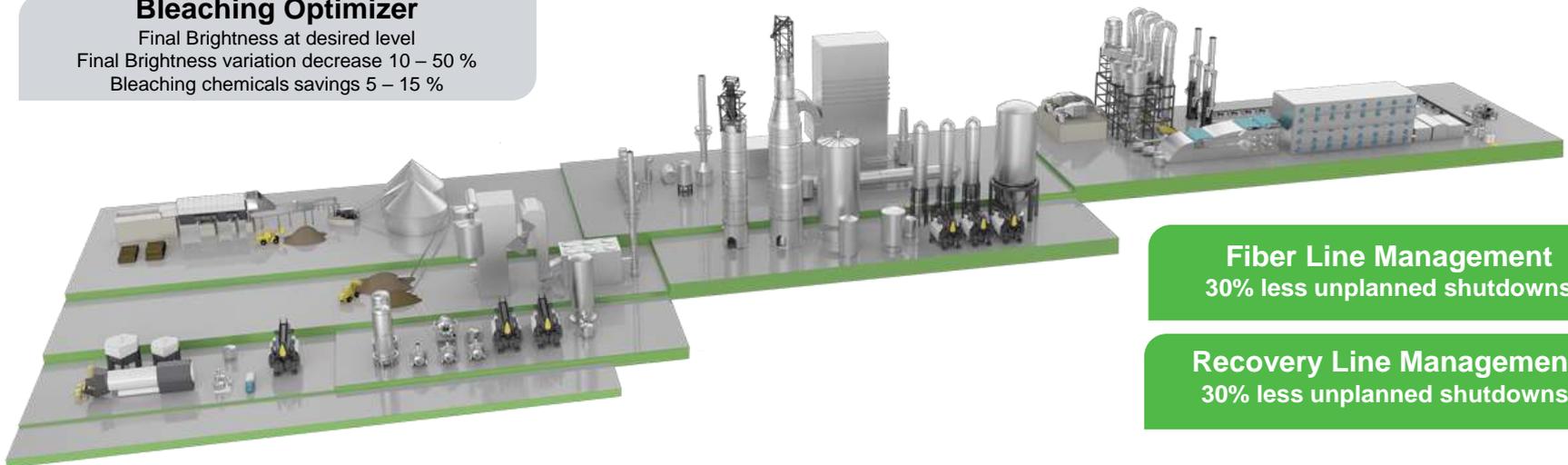
Reduced specific energy 3-10%
Increased production 3-7%

Brightness Optimizer

Chemical Reduction 10-30%

Pulp to Paper and Blending Optimizer

Paper strength variability reduction up to 35%

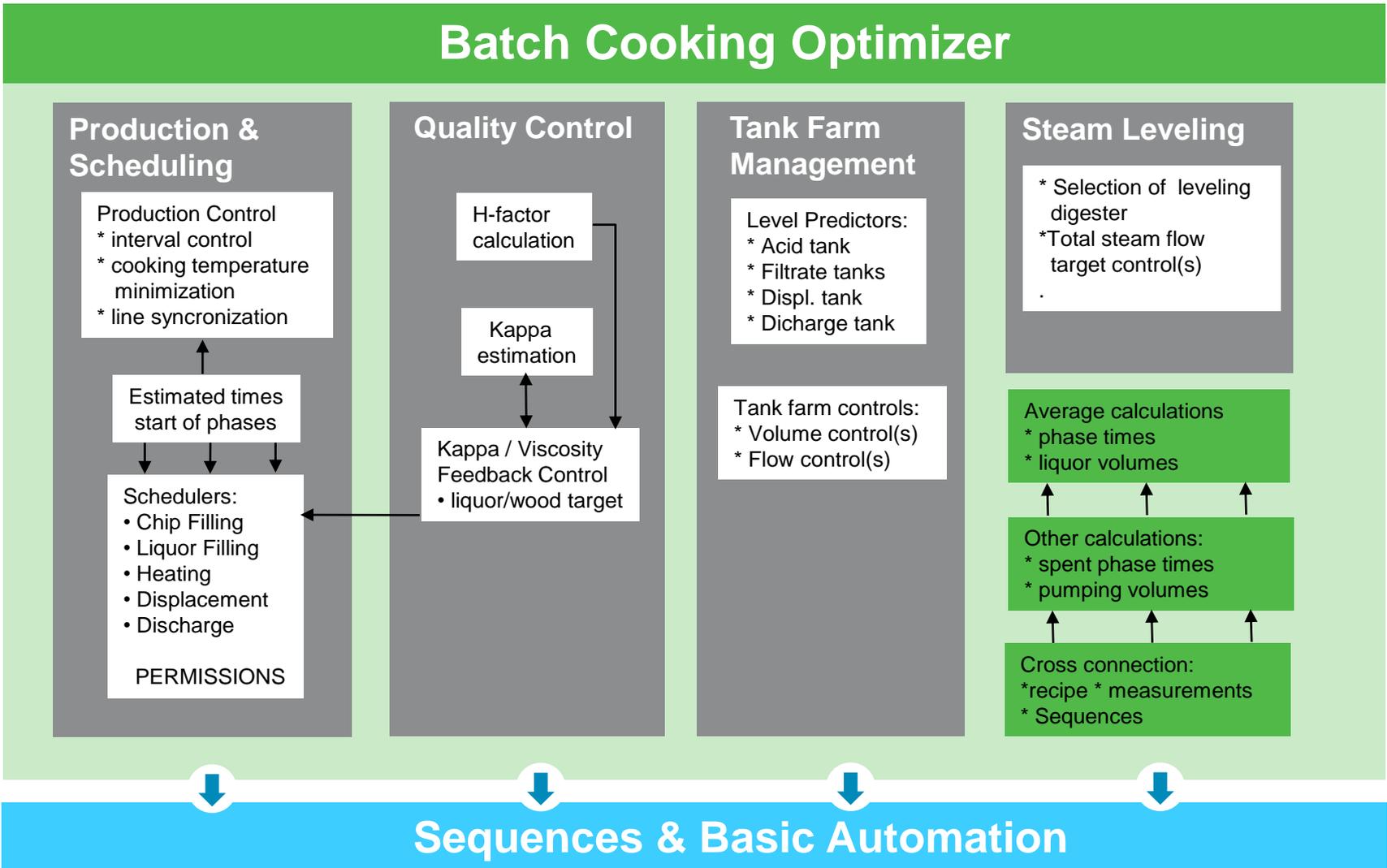


Fiber Line Management
30% less unplanned shutdowns

Recovery Line Management
30% less unplanned shutdowns

Batch Cooking Optimizer

Solution components



Bleaching Optimizer

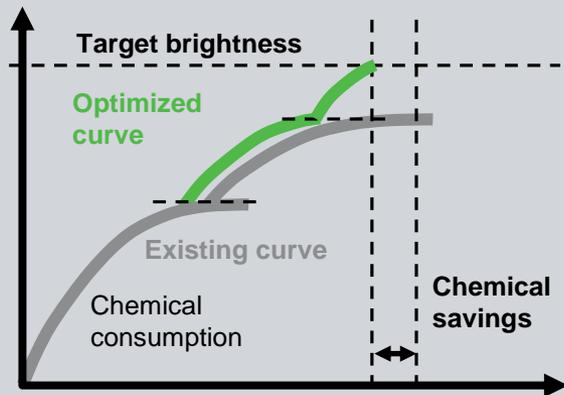
- Stabilizing controls
- Kappa and brightness control
- pH control
- Change management

Final brightness variation (std) decrease

Final brightness at desired level

Bleaching chemical savings

ISO brightness



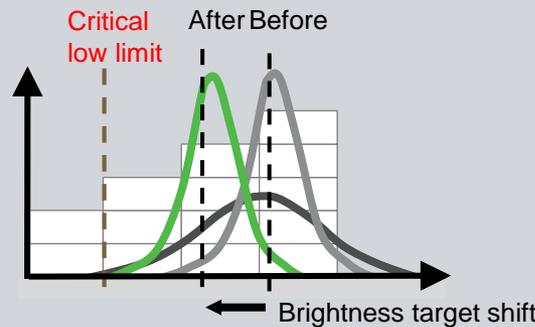
- Reduced final brightness variability
 - Exact and frequent kappa / brightness
 - Advanced model-based control strategy

Chemical optimization between stages

Stabilization of bleaching conditions by pH control

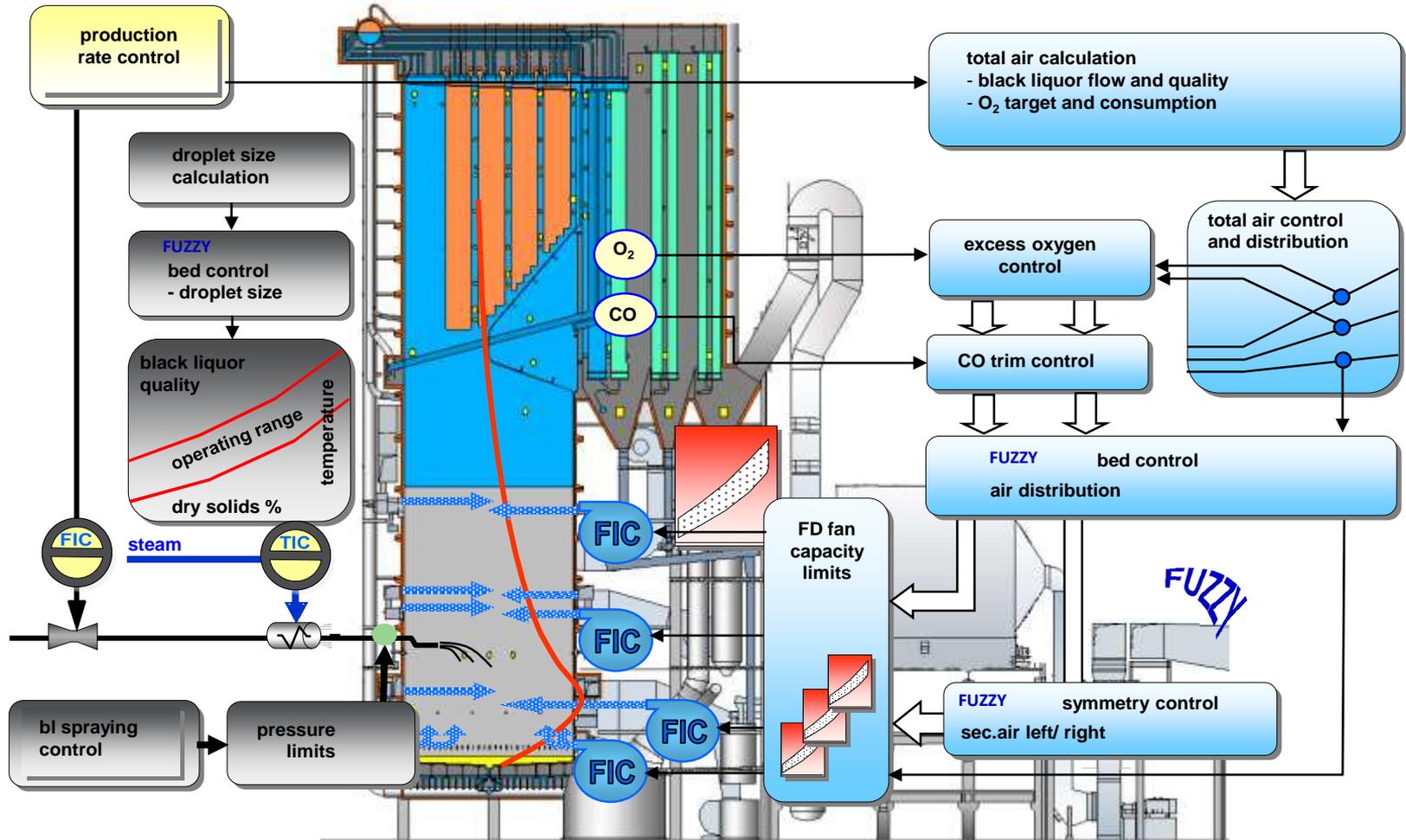
Brightness target shift to optimum

Prevention of control saturation
Optimal conditions for bleachability development

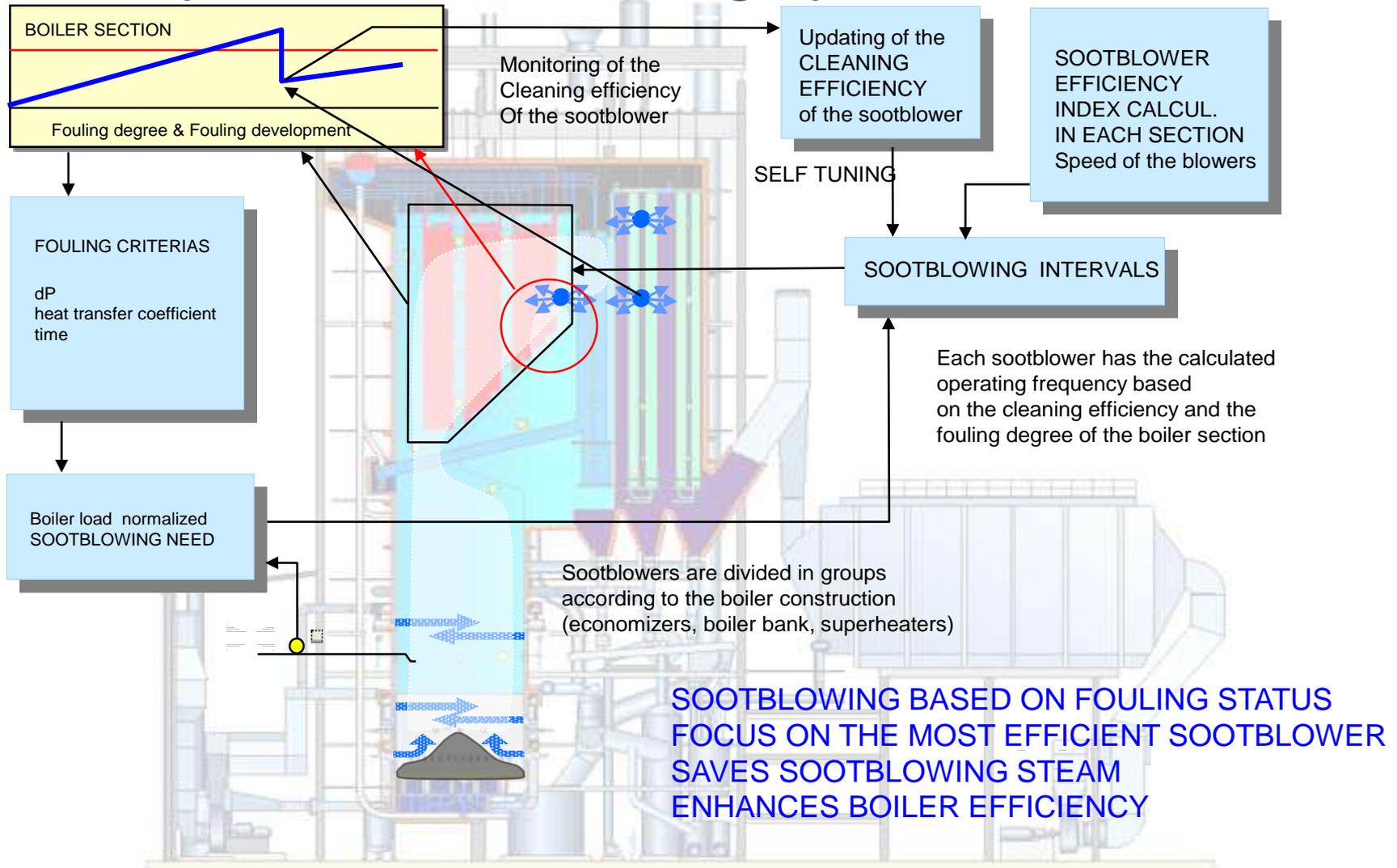


Bleaching chemical savings

Recovery Boiler Optimizer



Recovery Boiler sootblowing system



Implementation Methodology

- Study (audit) is done to assess:
 - current performance level
 - bottlenecks (Process/ Automation)
 - achievable performance improvement potential
- Audit focuses on Performance of Process & controls
- Duration of audit
 - Depends on area to be covered and targets to be achieved.

Performance Study

Metsco provides state-of-the-art process control applications for Power Plants. Benefits of advanced control applications, as well as the best way to realize them, vary from one plant to another.

Metsco DNA Process Performance Study (DNA Performance Study) is needed to assess the achievable process performance improvement potential that can also be translated into concrete savings and/or gains.

Findings and suggestions of the DNA Performance Study can be used for ROI analysis of any investment into Advanced Control Applications and also to set a baseline against which performance improvement warranty of such applications can be set.

Overview

The main emphasis of the DNA Performance Study is the evaluation of process control improvements' potential. Moreover, the study also addresses and diagnoses problems with the process itself and can help to identify critical process improvement needs.

Scope

DNA Performance Study includes:

- Start-up and basic data meeting
- Task definition
- Focused plant audit (discussions, data acquisition, observations)
- Focused data analysis (performance indicators, interactions, diagnosis)
- Conclusions and definition of further actions
- Report: findings, explanations and recommendations including commercial justification based on criteria set jointly with the customer.

For more information, contact your local Metsco office, www.metsco.com/automation

Specifications for equipment are subject to change without notice. Product names are trademarks or registered trademarks of their respective owners.

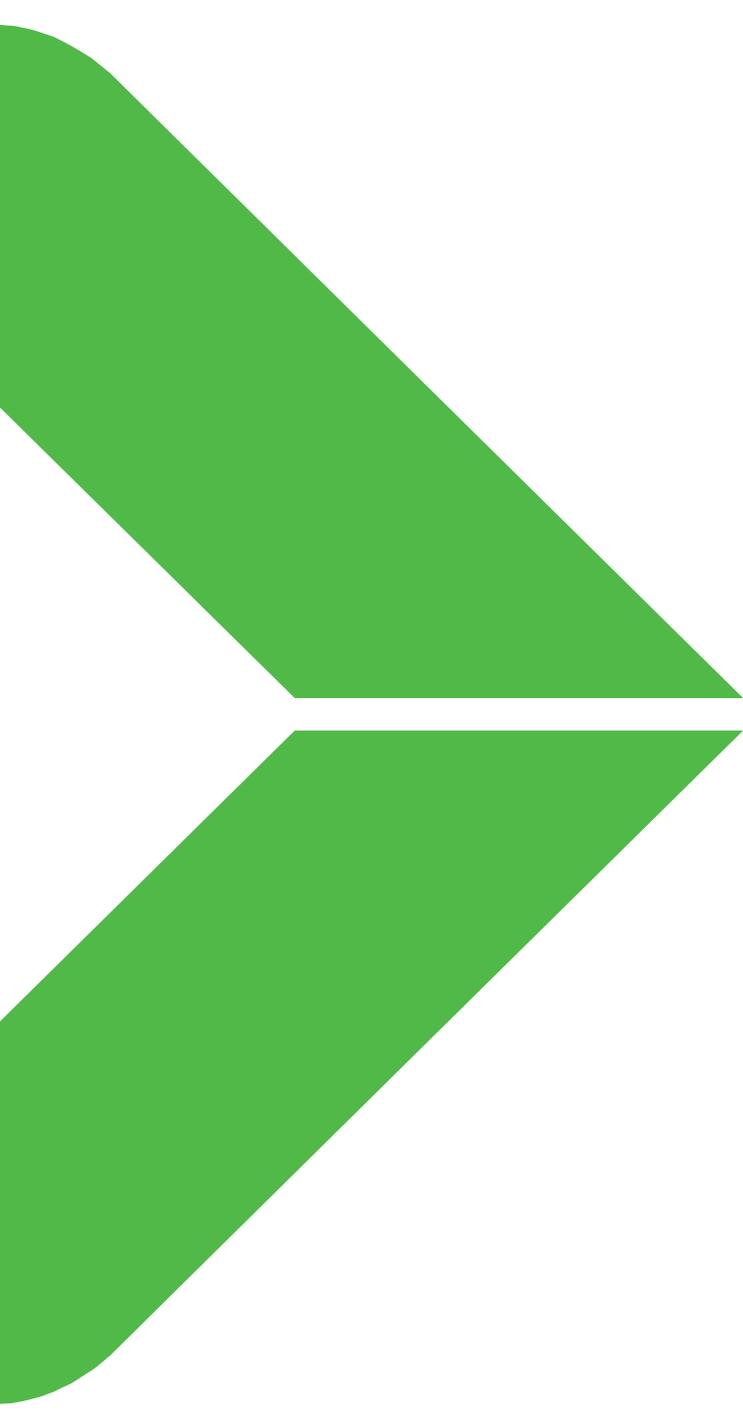


- Correct evaluation and report of process performance
- Performance indicators fully explained
- Identifies process equipment causing process variances
- Online consultation during plant audit
- Clear basic definitions for further actions
- Identifies improvement needs to basic controls and indicates benefits achievable by advanced controls
- Improves decision making and provides information for internal reporting and investment proposals.

DNA Performance Studies have been used both for traditional and advanced control improvements. In a study addressing problems with traditional control variables decreased 20 - 33 %. Other studies have identified achievable benefits of advanced control applications and set baselines for evaluation of gained performance improvements. A list of relevant references is available.

DNA Performance Study is available for any power generation plant, station or utility.





Industrial IT

Remote Connection
Solutions

Remote Maintenance Services

What information is available?

- Advance Process Controls monitoring
 - Equipment healthiness
 - Loop performances monitoring and fine tuning
 - Optimizing the advance control to current process situations
- Automation monitoring (Equipment healthiness)
 - Process Monitoring
 - Quality Monitoring
 - Control loops
 - CD Profilers
 - Automation networks
 - Information systems
- Asset monitoring
 - Field devices (instruments, valves, motors, etc.)



Process Monitoring Background

The process itself is the best reference on how it can perform

Basis

A few reasons (20%)
are the cause for
80 % of the significant
upsets in the process

Our mission

Locate and eliminate the most
significant reasons for the process
upset.

Significant savings based on experts'
experience.

That's the 80-20 Rule!

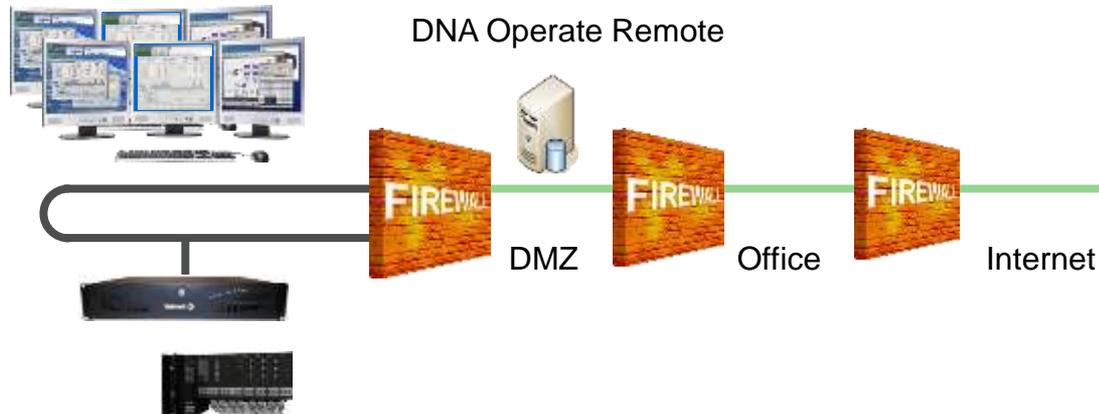
Remote Monitoring Services- Benefits

- Maintain and Improve the existing advanced controls
 - Locating and eliminating the causes of process disturbances
- Eliminating Process Disturbances mean
 - Less process upsets which cause excess raw material / chemical consumption and unplanned shutdowns
 - Less variability in final quality
 - Higher energy efficiency
 - Decreased unplanned shutdowns
- RMS Enhances Process Troubleshooting Capabilities
 - Real time data to maintenance, engineering, and operations in the mill
 - Remote interpretation of results and process analysis assistance by Valmet

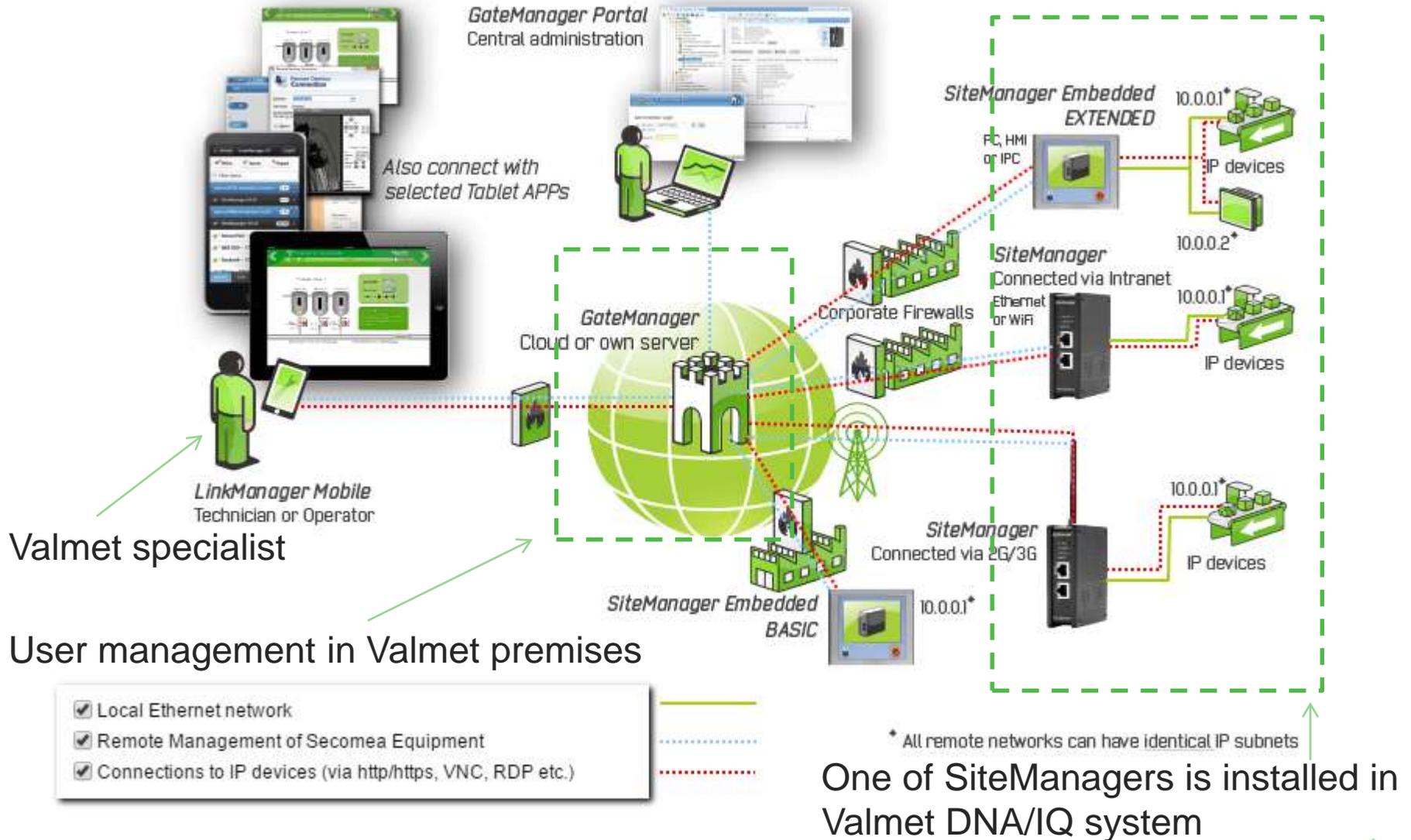
Remote Connections

Secure Connection Solutions

- Remote Operation Environment
 - DNA Operate Remote display server
 - Remote troubleshooting
 - Remote system operations after authorization by the mill
 - Data gathering and analysis

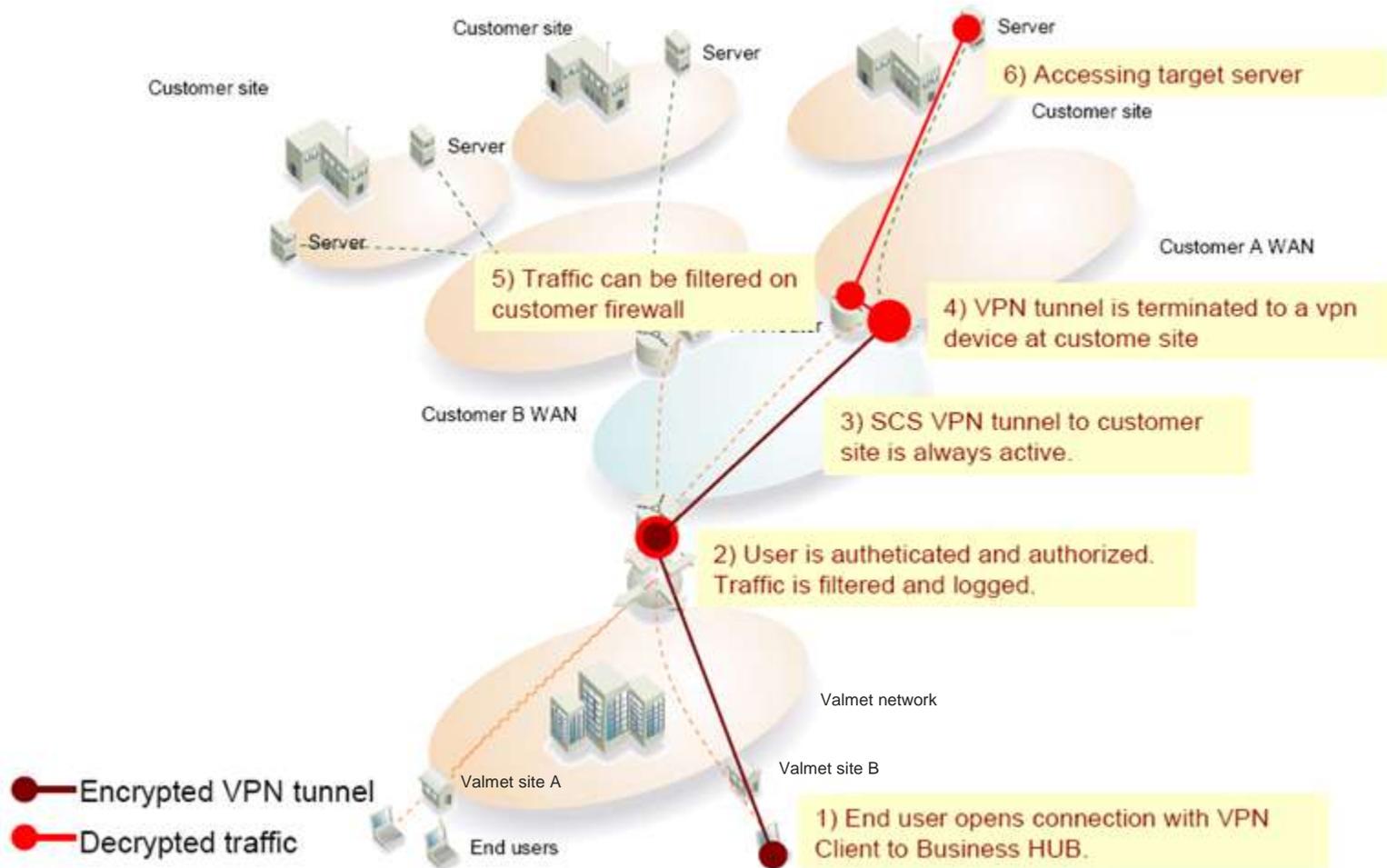


Remote Solution Architecture (Secomea)



Valmet Secure Connection Solution (SCS)

Conventional remote connection
Operational principles overview



Remote Monitoring Services

Project Steps

- Establish full process data collection
- Configure desired automated data handling
 - Calculations to remove data from shut down periods
 - Variability calculations for key variables for performance monitoring
- Set up automated reporting and trending tools
- Performance should be reviewed several days per week by
 - Mill personnel
 - Valmet Automation Experts
- Findings are reported to the mill
- Provide suggestions for corrective action
- Follow-up completed in the next analysis
- Monthly reporting of the issues and actions, Bi-Annual Mill Review

Remote Monitoring Services

Summary

Benefits

- Improved Process Stability
- Less upsets, breakdowns and quality problems
- More Uptime with better equipment efficiency
- Rapid response on needed situations and faster problem diagnostics and solution identification

Main Features

- Continuous process data collection
- Daily performance monitoring
- Daily process upset info with suggestions for corrective actions
- Extensive monthly report
- Bi-Annual follow-up meeting at the customer site

