

The Siemens logo is displayed in a teal, sans-serif font in the top right corner of the slide. The background of the entire slide is a low-angle photograph of a complex metal lattice tower, likely a high-voltage power line tower, against a clear blue sky. The tower's structure is composed of numerous intersecting steel beams, some of which are painted red, creating a geometric pattern that draws the eye upwards.

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# **Optimized Work Clearance Management as a part of Energy Management Suite**

**Best practice for process optimization and user friendly integration**

WCM-Info day, Munich, 2009-10-13  
Stefan Mehr,  
Siemens IT Dienstleistung und Beratung GmbH

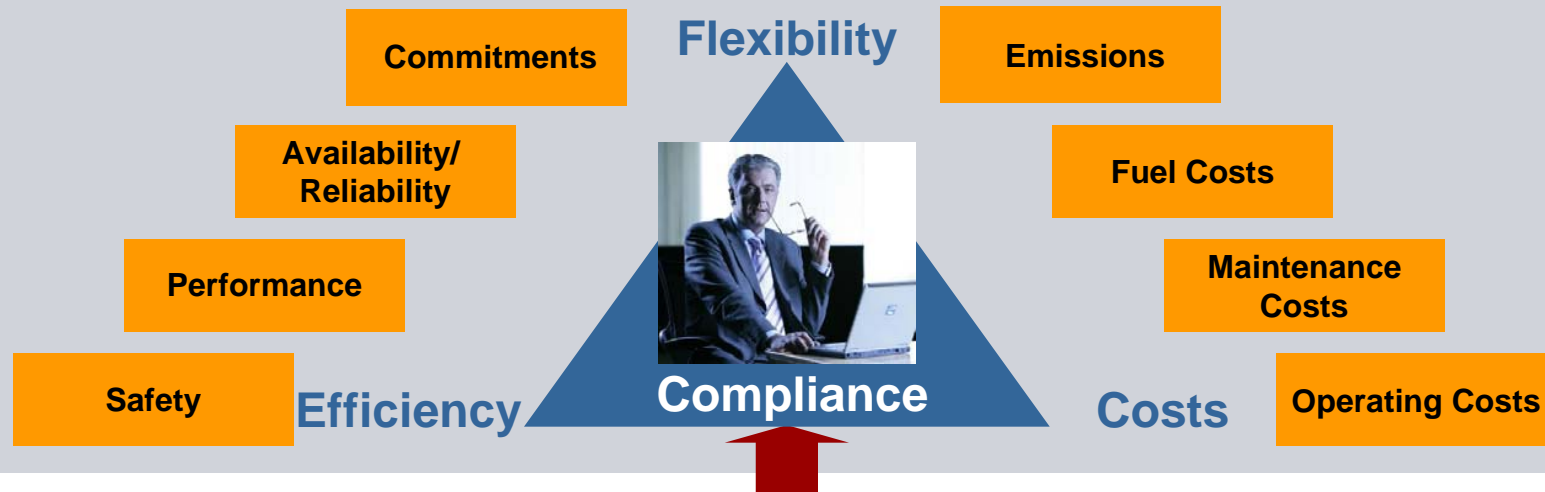
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## The Business Challenge

Situation

Solutions

Benefits



### Market Constraints and Challenges

- Generation companies are facing increased complexity of legal, social and environmental requirements
- The volatility of deregulated markets offer great opportunities for the leaders in operations excellence
- Aging and reduced workforce have to maintain more complex systems
- Decision making is increasingly interdisciplinary



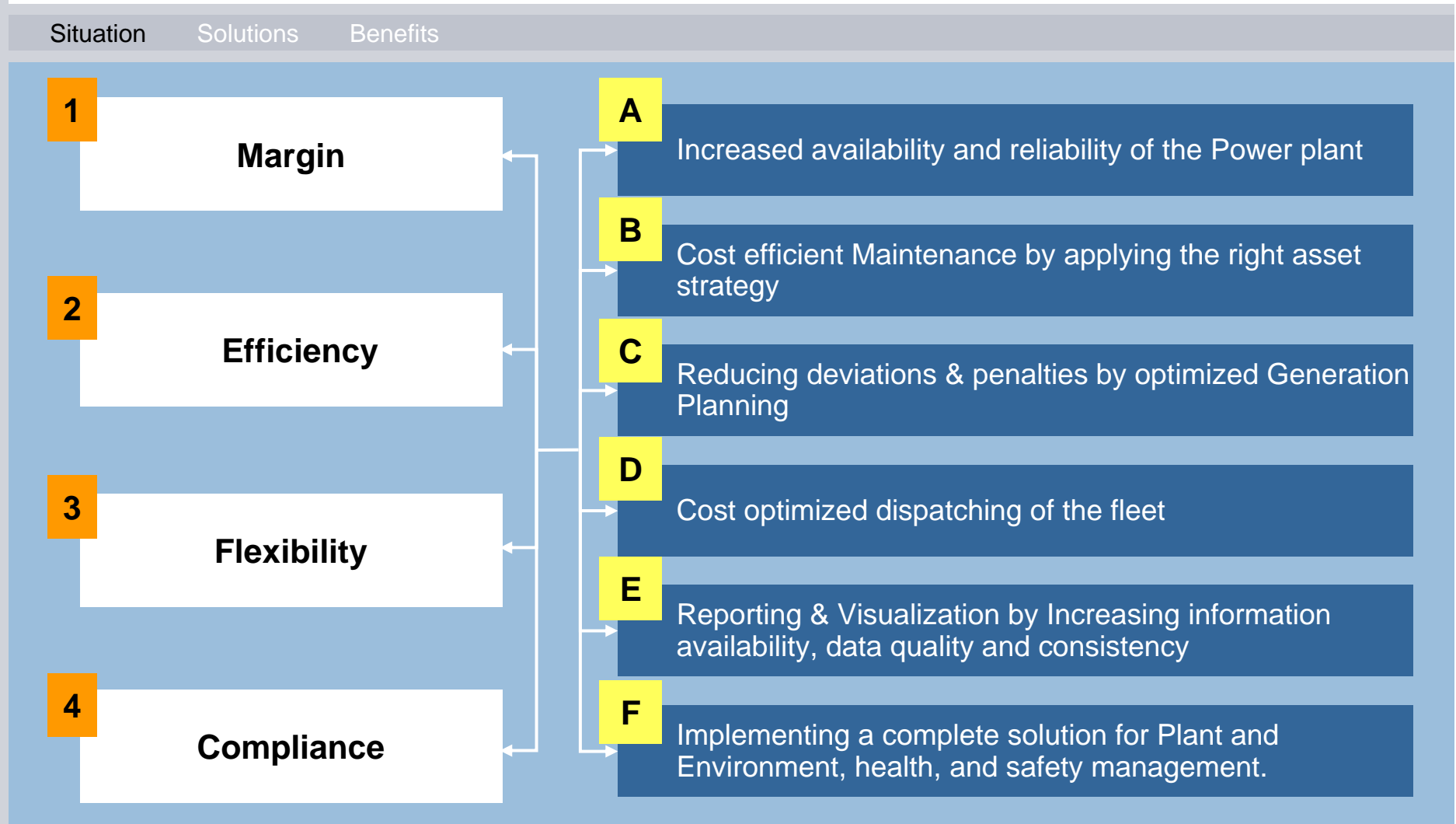
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# Reaching Strategic Goals in clearly defined Improvement Areas

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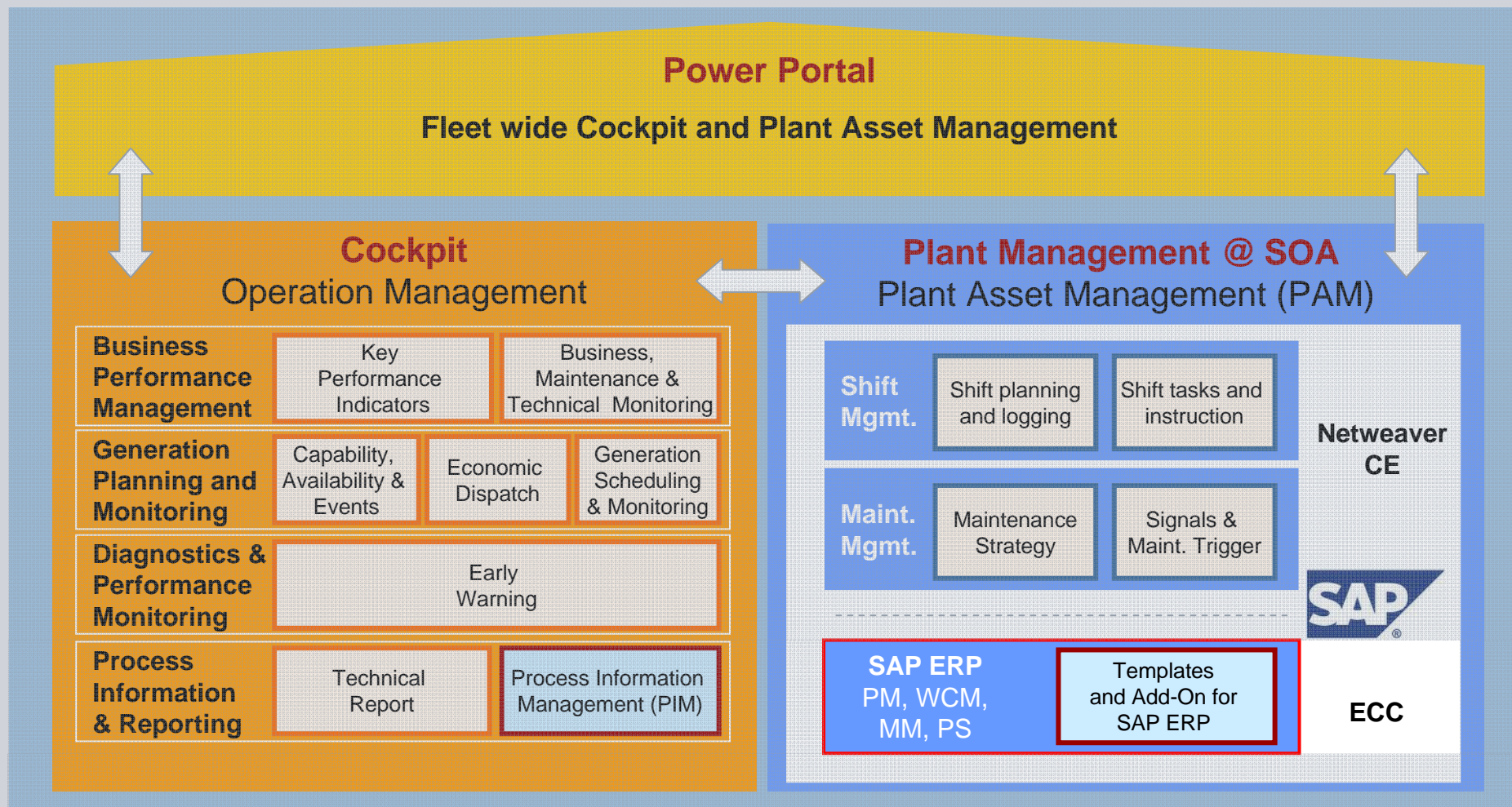


# Energy Management Suite

## Solutions based on Siemens Modules and SAP Software

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Situation      Solutions      Benefits



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# Maintenance needs efficient IT to fulfill complex requirements

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**Competition**

**Operating  
expenditures**

**Capital  
expenditures**



**Maintenance Management**

**Legal  
Requirements**

**Reliability**

**Infrastructure**

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# IT- based Comprehensive Total Solution

Situation	Solutions		Benefits							
Maintenance Strategy	Fault Clearance		Preventive Maintenance		Condition Based Maintenance		Reliability Centered Maintenance		Risk Based Maintenance	
Master Data Management	Technical Objects	Equipment	Measuring Point	Measuring record	Material Master Data	Bill of Material	Process Plans and Instructions	Maintenance Plans	Work Center	Documents
Line Management	Line capability to create technical objects			Define Lines			Line Alignment			
Shift-/Logbook	Open Shift Log		Register Shift Event		Qualify Shift Event		Close Shift Log			
Alert processing	Register Alert			Process Alert			Quit Alert			
Order processing	Validate Alerts	Create and Plan Work Orders	Release Work Orders	Process Work Order	Status Report	Close Work Order	Supporting Processes for Work Order Processing			
Work Clearance Processing	Management of Work Clearance Document Templates				Operational Cycle					
Supporting processes	Procurement	Inventory Management	Invoice Verification		External Charging		Budget		Mobile Scenarios	
Horizontal issues	Reporting and Analysis		Documentation and Management of Archive		Management of Interfaces			Management of Permits		

## Major Tasks for Work Clearance Management?

Situation      Solutions      Benefits

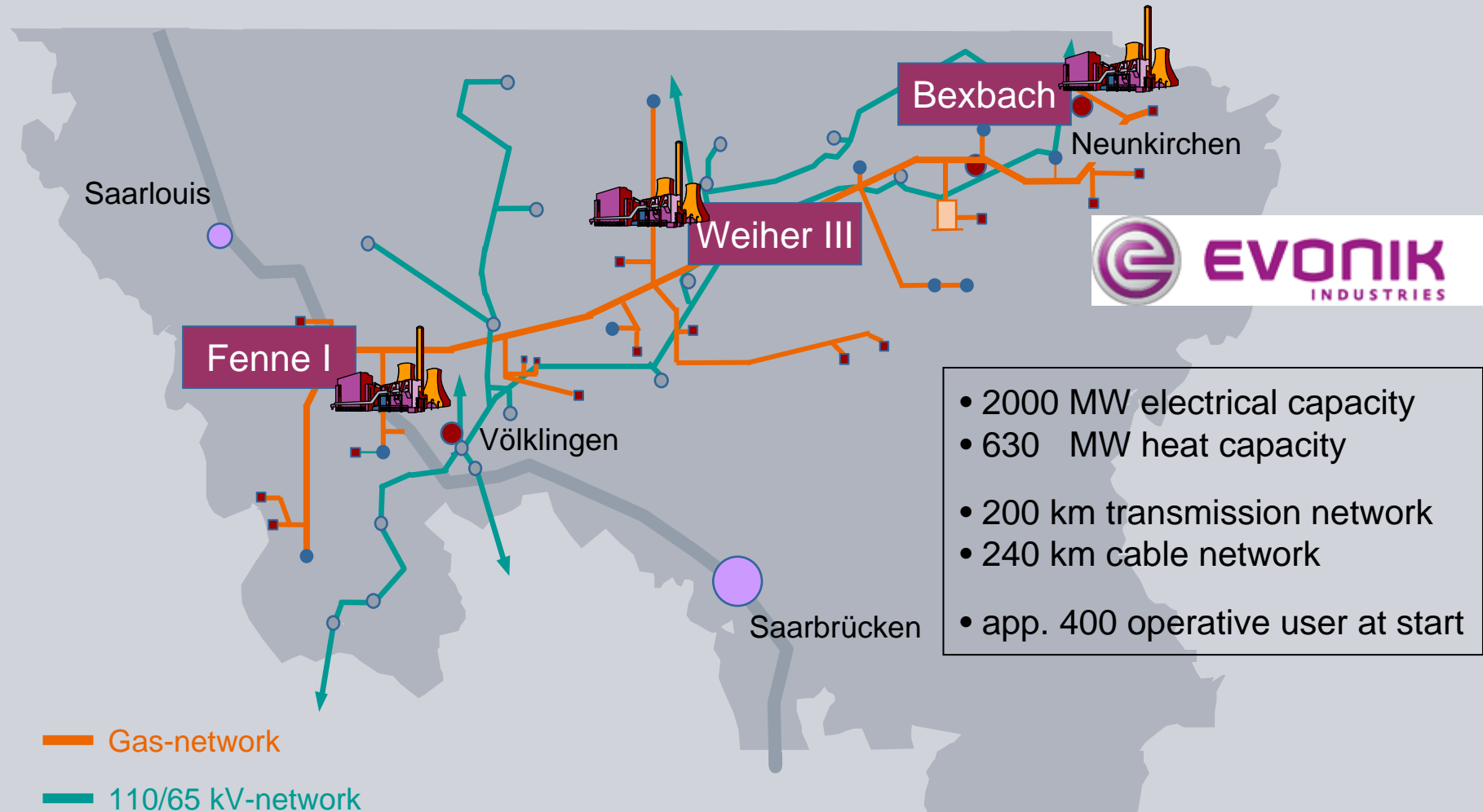
- support operational safety to avoid unexpected outages
- ensure a safe working environment for maintenance personnel
- seamless integration of work clearance into maintenance process
- workflow according to requirements of operational an occupational safety
- providing additional permits
  - hot work
  - environment
  - radiation safety
  - etc.



# Implementation of SAP WCM Rel. 4.6b in 2002 for EVONIK Power Saar

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Situation Solutions Benefits



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# Redesign of SAP WCM ECC 6.0 in 2009 for VSE AG - Ensdorf Powerplant

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Situation

Solutions

Benefits



- 430 MW electrical capacity
- 51 GWh heat (2008)
- 1050 km transmission network
- app. 50 operative user (PM)

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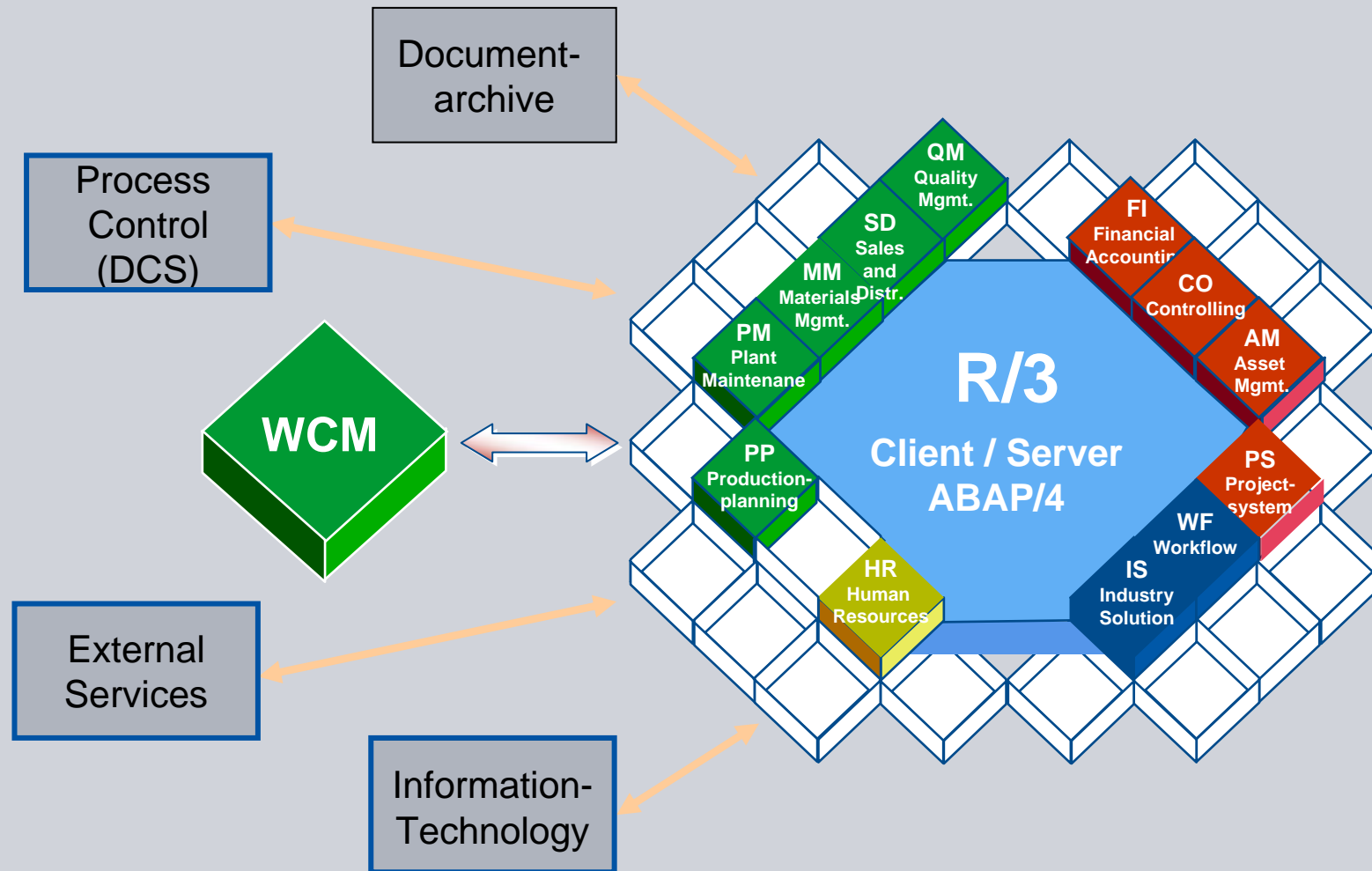
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# How to implement SAP WCM?

## SAP Landscape and IT environment

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# What to consider for implementation of SAP WCM?

## Reference objects

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Situation

Solutions

Benefits

- Master Data
  - Functional Locations
  - Equipments
  - Bill of Material
  - Task Lists

- Documents
- Maintenance Planning
- Notifications
- Work Orders
- Status Information

Relationship to HR, PS, MM, CO, SD



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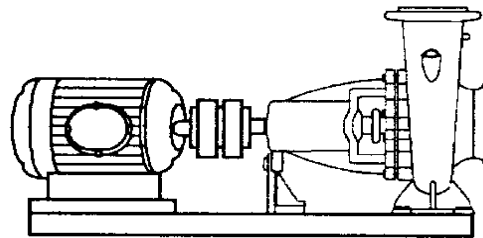


# Level of Master data functional locations for machinery

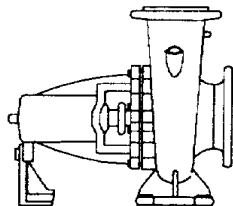
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Situation Solutions Benefits

## Master Data



Steam Economizer Condenser Pump 1 - **HLC51AP001**



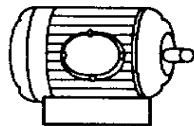
Pump

**F-02HLC51AP001-JP01**



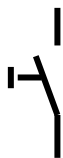
Coupling

**F-02HLC51AP001 -MX01**



Motor

**F-02HLC51AP001 -EM01**



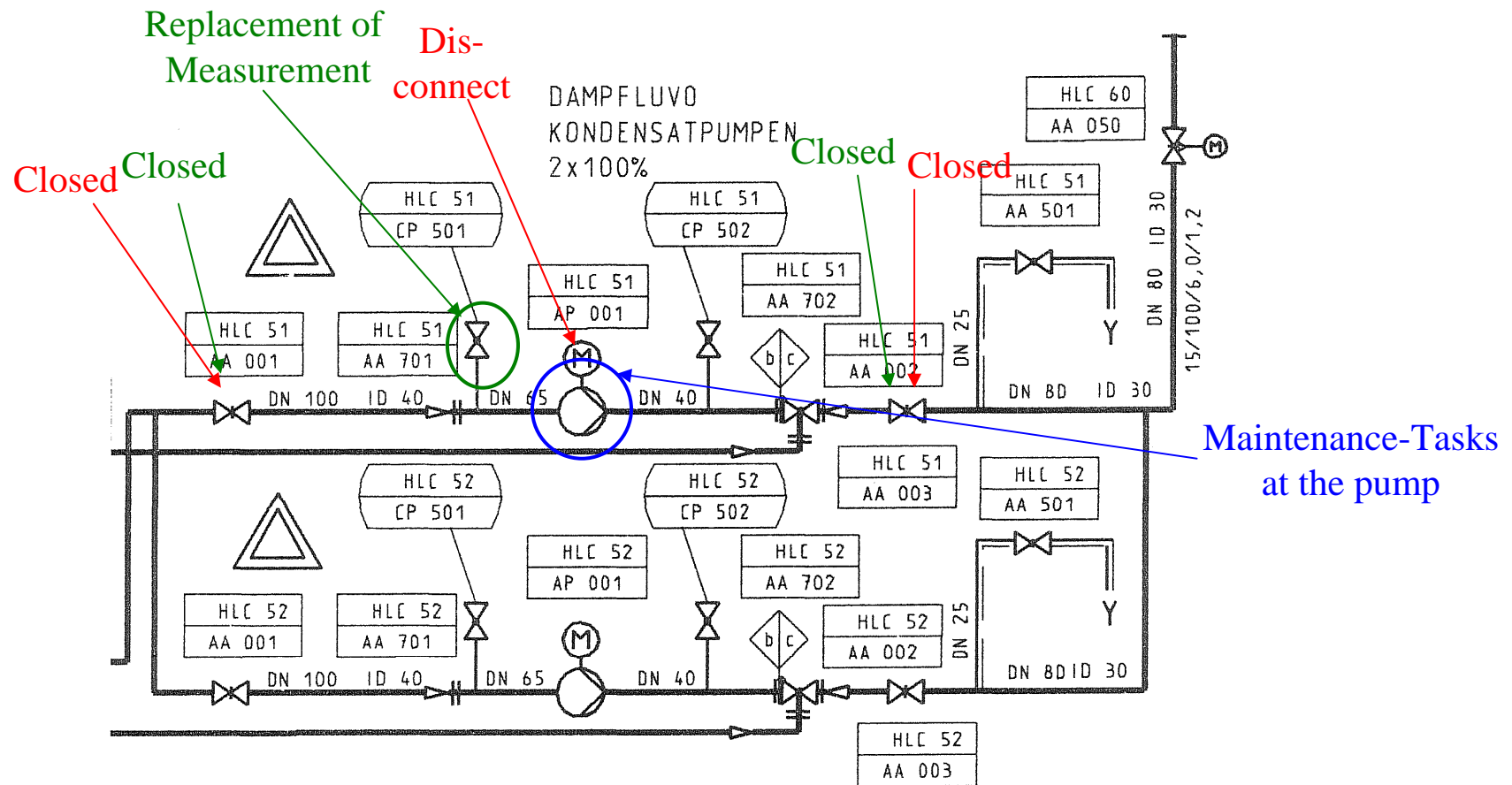
Contact Breaker **F-02HLC51AP001 -LU01**

# Schematic circuit diagram

## Practical Example

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Situation Solutions Benefits



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# Customer Requirements for Implementation of SAP Work Clearance Management



Situation

Solutions

Benefits

- Involve responsible safety engineer for personnel and plant
- Seamless integration into Plant Maintenance in SAP ERP
- Consider data security and compliance to regulations
- Ensure user acceptance due to user friendly interfaces and minimize number of transactions

Objective: activity related work clearance

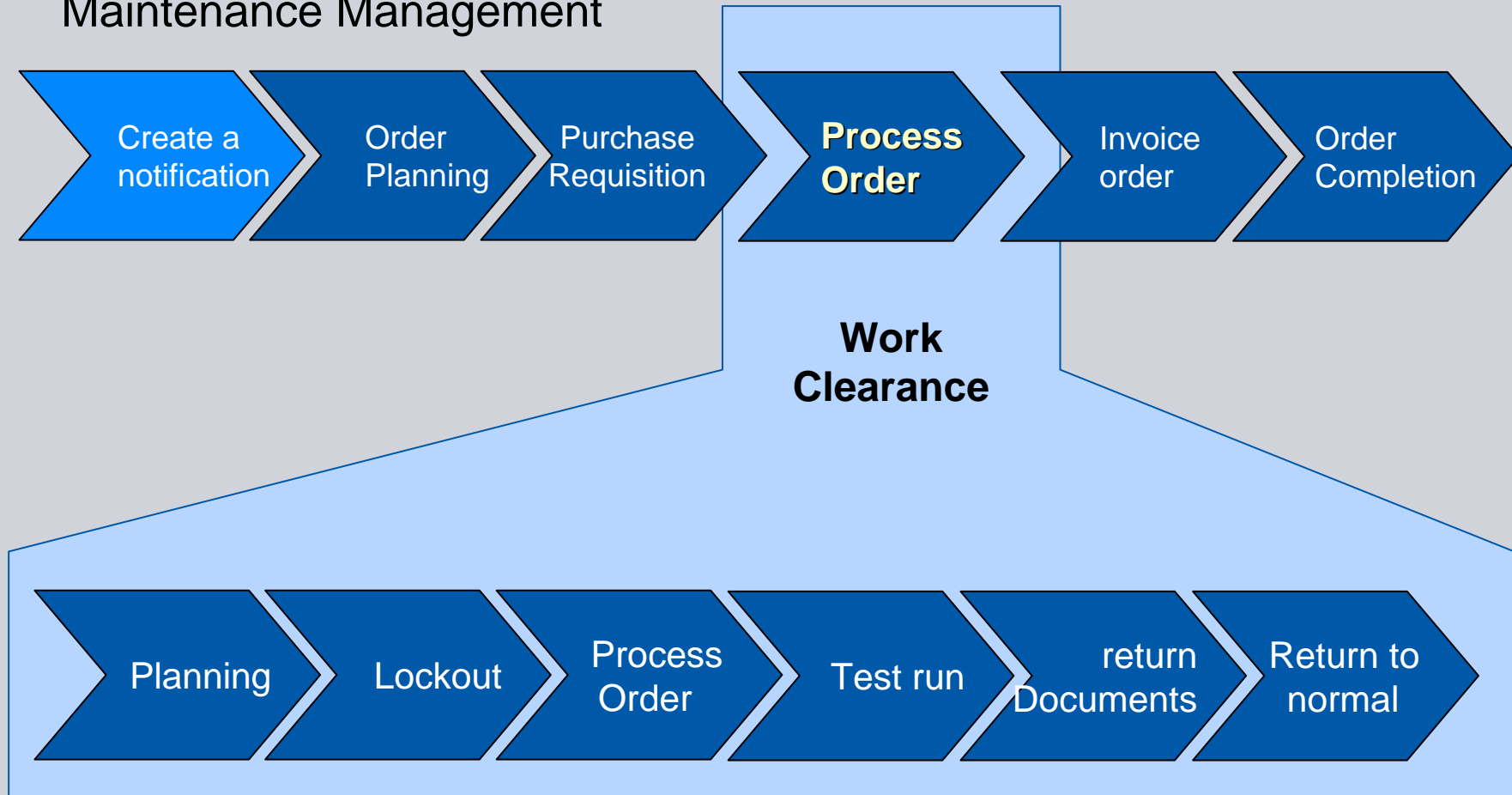


# Integration of Work Clearance Process into Maintenance planning and execution

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Situation    Solutions    Benefits

## Maintenance Management



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# Improvement areas for user friendly WCM Processing



Situation	Solutions	Benefits
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Bundling of work clearance tasks

→ Minimized down time, higher availability, reduced costs

Processing of complete process within one system

→ Support of overlapping planning and tasks

Transparency with respect to necessary work clearance and resulting downtime

→ Highest possible safety for personnel and plant

→ Legal certainty through continuous documentation

Compact user interface increases safety and reduces implementation time

# Work Clearance Planning and Execution Model, Documents and Activities

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Situation

Solutions

Benefits

**Order**

**Work Clearance  
Application**

**Operative Lists**

## Standard Model

- Work Permit for work order items
- additional Documents
  - hot work
  - environment
  - radiation

## Activities

Create WCA

Create/copy WCD

Do the planning (WCD)

Add additional documents

Prepare WCA and WCD

provide additional information for el. components

Tagging

Print out tags (and tagging list)

Do documentation (switch screen)

Print out work permits (for each relevant work order item)

Take back work permits

Finish the work order

Go back to normal

Print lists

Do documentation (switch screen)

Close WCD / WCA

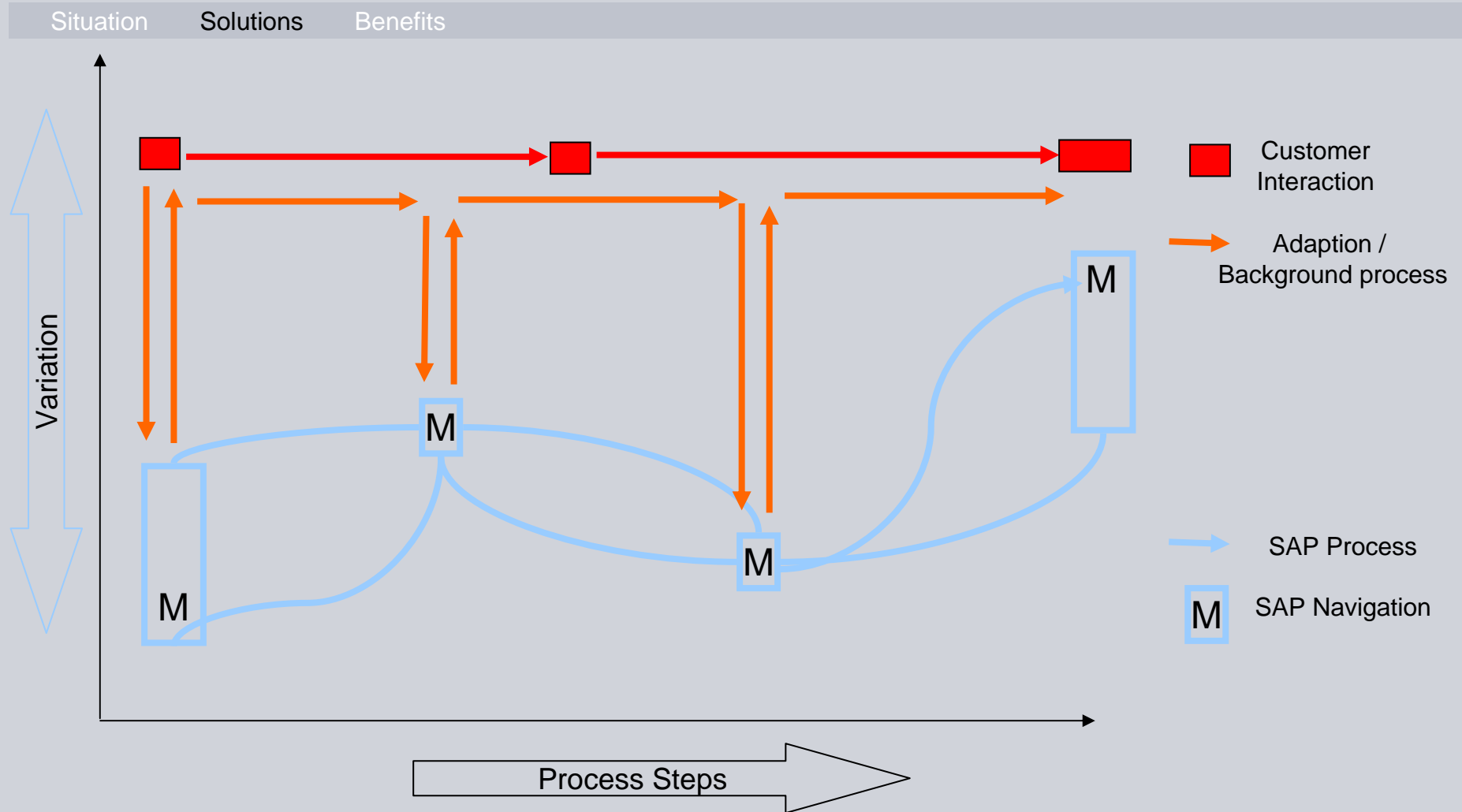
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# Process modeling sum up transactions according the real work flow

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# The Siemens Solution

## compact user interface to minimize number of transactions



Situation Solutions Benefits

- Example use case GuiXT: Work Clearance Cockpit (WCM)
  - Streamlining of the application from necessary 27 to 3 Transactions

### operative Freischaltliste ändern: Schaltvorgang

Freischaltliste: 920000607 Kühlwasserpumpe freischalten 1 / 1

Status: VOBT NFS

NFS SFS IFS SNM INM

1 0 0 0 0

KONF INAK

0 0

Test

STNM ITNM

0 0

FS drucken

AE drucken

WX drucken

Alles Normali.

NM drucken

Testlauf setzen

TM drucken

Testlauf löschen

AE rückmelden

Rückmeld Auftrag

Technisches Objekt

Kurztext

Systemstatus

10 F B-02

Block 2

NFS

SG FS-Zustand FST RF.FS

Kommentar

Anwenderstatus

M ZU FS 0

Ph FZ FSZD NormZustand NmT RF.NM

LT DV FS-Zettel

AUF FS 0

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# Siemens WCM Cockpit



Complete WCM process in a compact and user friendly interface

Situation Solutions Benefits



## Standard Model

- Work Permit for work order items
- additional Documents
  - hot work
  - environment
  - radiation

Activities	Cockpit
Create WCA	✓
Create/copy WCD	✓
Do the planning (WCD)	✓
add additional documents	✓
Prepare WCA and WCD	✓
provide additional information for el. components	✓
Tagging	✓
Print out tags (and tagging list)	✓
do documentation (switch screen)	✓
print out work permits (for each relevant work order item)	✓
take back work permits	✓
finish the work order	✓
go back to normal	✓
print lists	✓
do documentation (switch screen)	✓
close WCD / WCA	✓

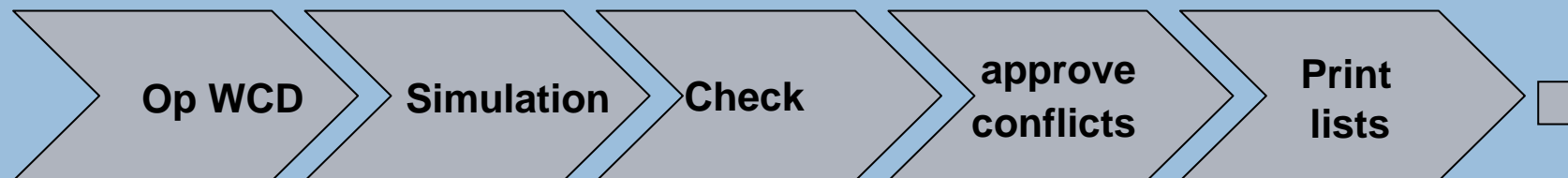


# Sum up transactions to a minimum

## Example: return to normal

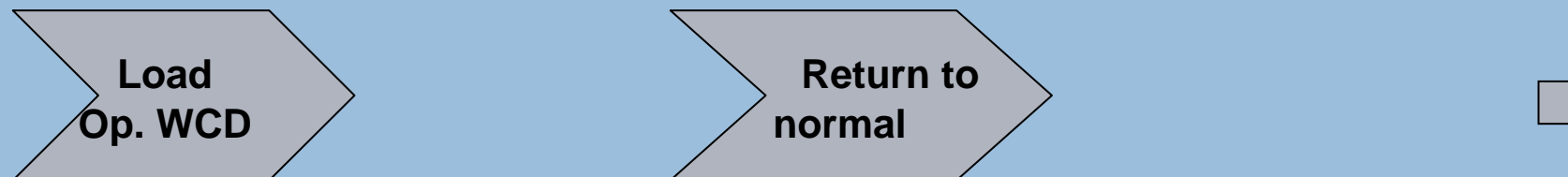
Situation Solutions Benefits

Standard process:



- Note relevant positions (from simulation)
- Switch Screen: compare results of simulation
- Mark conflicting positions
- Correct normalized status
- Save and change screen: go to switch screen
- If needed renewed simulation
- Switch positions
- Initiate print of lists

new process:



# Beyond the SAP Standards

## Results of utilizing Siemens expertise in IT and Energy



Situation      Solutions      Benefits

- Automation of Processes through
  - Workflow - Techniques
  - ABAP – background programs
  - User controlled scripts
- Adaption and enhancement of forms
- Additional interlocking
- Simplification of issuing work permits
- Coupling of maintenance tasks with work clearance tasks
- High user acceptance through adaptation of dialogs and user interface to process
- Reduction of complexity through bundling of information, and decision points („work clearance cockpit“)

# Siemens Solution - WCM Cockpit

## Streamlined WCM Processes and high user acceptance



Situation    Solutions    Benefits

### Advantage of *Siemens - Solution*

- Covers the Power Plant specific processes
- Enhanced forms and documentation with version management
- External companies and task oriented work clearance management
- high automation with supporting processes (background programs)
- simplified handling (3 instead of 27 Transactions!)
- release-insensibility
- WCM for work order items



## Contact



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**Q&A**

**Thank you for your  
attention.**

**Are there any  
questions?**

