Safety First!

Prevent Your Technicians from Working in Dangerous Situations

Pieter van Daal / SAP Netherlands
London / 30.09.2011

Just some figures

Safety and health at work

International Labour Organization

Every day 6,300 people die as a result of occupational accidents or work-related diseases - more than 2.3 million deaths per year. Ove 337 million accidents occur on the job annually; many of these resulting in extended absences from work. The human cost of this daily adversity is vast and the economic burden of poor occupational safety and health practices (lost working time and interruption of production, medical expenses and workers' compensation) is estimated a 4 per cent of global Gross Domestic Product each year.

The safety and health conditions at work are very different between countries, economic sectors and social groups. Deaths and injuries take a particularly heavy toll in developing countries, where a large part of the population is engaged in hazardous activities, such as agriculture, fishing and mining. Throughout the world, the poorest and least protected - often women, children and migrants - are among the most affected.

GDP UK 2009 acc. Eurostat: € 1700 Billion → **€ 62.5 Billion**

Maintenance-related: 10-15% (estimation) → **€ 6.2 – 9.4 Billion**

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Objective

Explain how a safe working environment for your maintenance technicians can be influenced and how SAP will enable you to create that environment.

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Agenda

- The framework to achieve a ‘zero risk exposure’ situation executing maintenance activities
- The SAP ‘Worker Safety’ concept
- The details of SAP’s ‘Worker Safety’ solution
- Summary

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The framework to achieve a ‘zero risk exposure’ situation executing maintenance activities

Is a ‘zero risk exposure’ situation executing maintenance activities a realistic goal?

Is it possible to win a leg with 9 darts?

Raymond van Barneveld at the World Championship 2009

Is it possible to score a hole in 1?

Dustin Johnson at The British Open 2011

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A coherent approach to target a ‘zero risk exposure’ situation executing maintenance activities

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Example of ‘bureaucratic’ Safety Management

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The human factor: Being aware that ‘hands-free’ is the safest way to use a cellphone in your car.....

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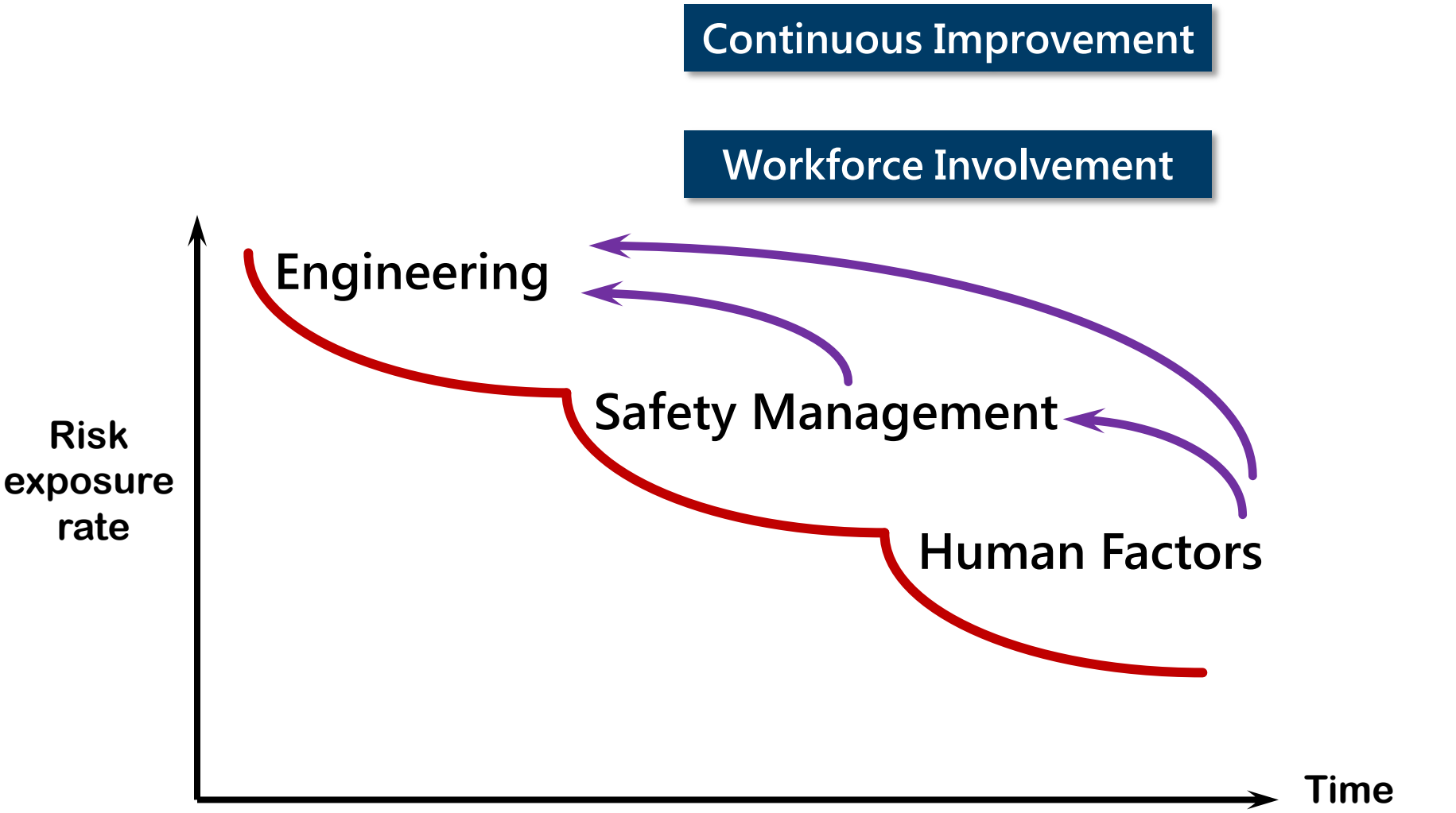
A ‘zero risk exposure’ situation can only be achieved by being aware that ‘ensuring a safe work environment’ should be considered as a process



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Human factors are the weakest link in the Safety Improvement Process

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Although we are aware that we are working in an unsafe way, we are working in...

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Active participation of your workforce in the safety Improvement Process is *just* a matter of 'culture'

DUPONT
The miracles of science™

With in-depth expertise in employee, contractor and process safety management, our safety consultants can transform workplace culture, develop employee skills, help reduce incidents and improve performance. We work with a wide range of companies in such industries as energy, aerospace, transportation, manufacturing, oil & gas and more.

In addition to our rich experience in high-risk processes, behavioral safety and risk management consulting, we offer an extensive library of safety training resources. Our method includes assessing and measuring workplace safety, developing an action plan, and following up as needed to sustain the results and improve safety culture.

Employee Safety Management
Providing excellence in safety management through integrated safety management systems, operational discipline, leadership development, and employee behavior.
» Learn More

Process Safety & Operations Risk Management
Helping prevent process-related injuries and incidents through integrated process safety management (PSM) systems, operational discipline and PSM performance management systems.
» Learn More

Contractor Safety Management
Minimizing contractor-related injuries and incidents through contractor safety best practices, contractor management processes, performance assessments and resource training.
» Learn More

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The SAP ‘Worker Safety’ concept

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Safety Plan as the relevant part of the EAM work order

Dec 2, 2010 Job Card POLEDNA Copy H Page 1

Order	4006942	Order Type	PM01	Maintenance order	
Description	Repair broken cover				
Start date	Dec 2, 2010			End date	Dec 2, 2010
Priority					
Status	REL NMAT PRC TTJL				
Funct. location					
Equipment	10037809	Gas Tank			
Assembly					
Location				Room	
PM planner grp				PM plant	0001
Main work center	MECHANIK 0001	Plant Maintenance Mechanik			
Maintenance plan				Maint. plan item	
Revision number					

Safety Plan

Relevant Risks

Explosion Falling from Hights

Planned Safety Measures

General Safety Measures

- Welding Permit

Operations and Safety Measures

Check pressure and temperature

- Gas Detector GS13-5
- Fire Extinguisher FE87-987
- Safety belt 4711

Remove cover

- Safety belt 4711

Check and repair cover

No safety-relevant information available

Install cover

- Fire Extinguisher FE87-987
- Safety belt 4711

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Safety Measure List supports the creation of the Safety Plan in the EAM work order

Change Safety Measure List

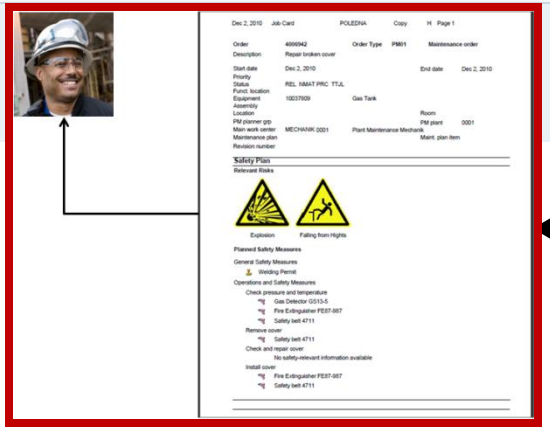
Save | Read Only

Documents | Permits | Task Lists | Materials | Equipment PRTs | Other PRTs

Documents in Safety Measure List

Document Options | Add Documents | Remove Documents | Filter

Document	Type	Part	Version	Description	PRT	Safety Relevance
10000000276	DRW	000	00	WZA dok. testowy - nr 2	☑	Sign
10000000277	DRW	000	00	WZA dok. testowy - nr 3	☑	Sign
10000000278	DRW	000	00	REMOTELY CHANGED	☑	Inform
10000000282	DRF	000	00	Test document for WC_LVL	☑	Inform
10000000283	DRW	000	00	Test document DRW for WC_LCL	☐	Inform
10000000320	DRF	000	00	Test for worker safety measure list	☑	Inform
10000000321	DRW	000	00	Test for WS measure list - #2 DRW	☐	Sign
10000000322	DRF	000	00	Test for WS measure list - #2 DRF	☑	Sign
10000000323	DRW	000	00	Test for WS measure list - #4 DRW	☐	Inform
10000000334	DRW	000	00	safety measure list doc test1	☐	Inform
10000000335	OHD	000	00	safety measure list doc test2	☑	Inform
10000000337	DRW	000	00	test doc Plinio	☑	Inform
AAA_EAMS_DOC_1	DRW	000	00	AAA_EAMS_DOC_1	☑	Inform
AAA_EAMS_DOC_1	DRW	000	01	AAA_EAMS_DOC_1	☑	Inform
AAA_EAMS_DOC_1	DRW	000	02	AAA_EAMS_DOC_1	☑	Inform
AAA_EAMS_DOC_2	DRW	000	00	AAA_EAMS_DOC_2	☐	Inform



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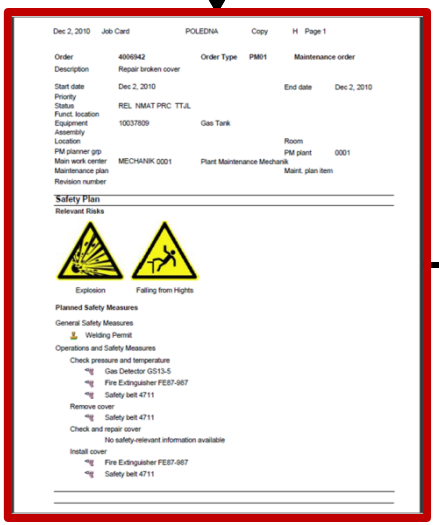
Work Permit or Lockout/Tagout as Safety Plan items



Dec 2, 2010 Job Card POLEDNA Copy H Page 1

Order 4006942 Order Type PM01 Maintenance order
Description Repair broken cover

Start date Dec 2, 2010 End date Dec 2, 2010
Priority
Status REL NMAT PRC TTJL
Funct. location
Equipment 10037809 Gas Tank
Assembly
Location Room
PM planner grp PM plant 0001
Main work center MECHANIK 0001 Plant Maintenance Mechanik
Maintenance plan Maint. plan item
Revision number

Safety Plan

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- Safety belt 4711

Remove cover
- Safety belt 4711

Check and repair cover
- No safety-relevant information available

Install cover
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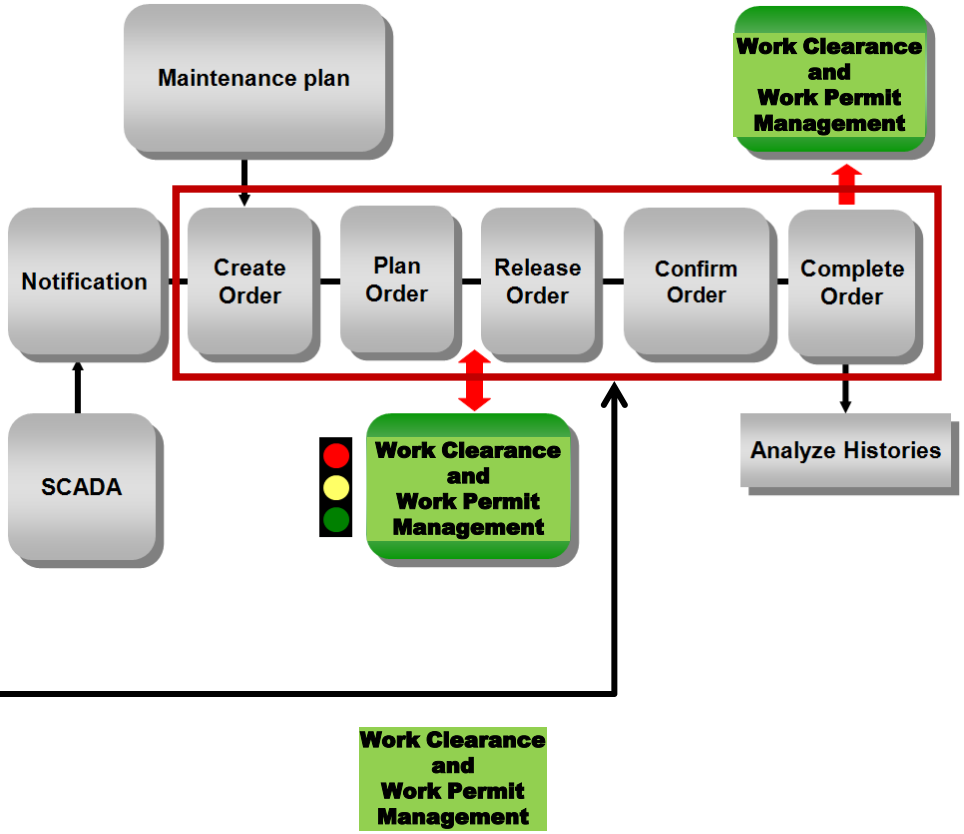
- Safety belt 4711



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An EAM work order refers to a technical object (structure)

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A Safety Plan is a response to a conscious risk

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- Safety belt 4711

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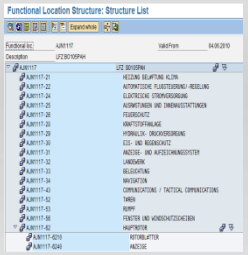
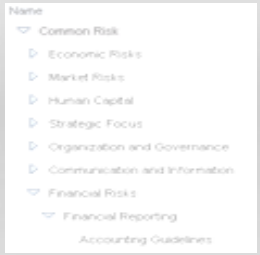
Summary of the concept

Risk Management*)

Assign Risks to Maintenance Objects

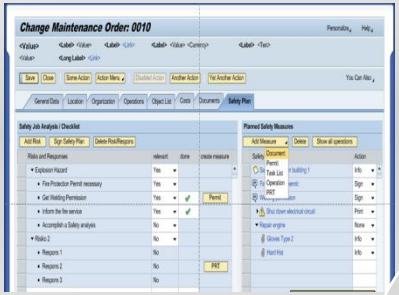


Create Risks and Responses

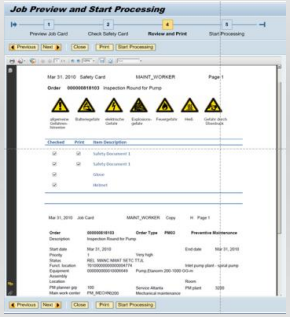


EAM Worker Safety

Safety Plan in EAM

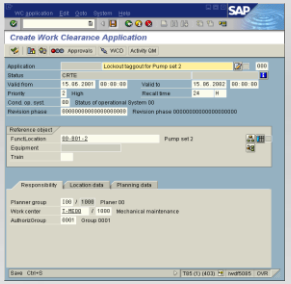


Worker Safety in Job Execution



Work Clearance Management*)

Work Clearance Management



*) = optional

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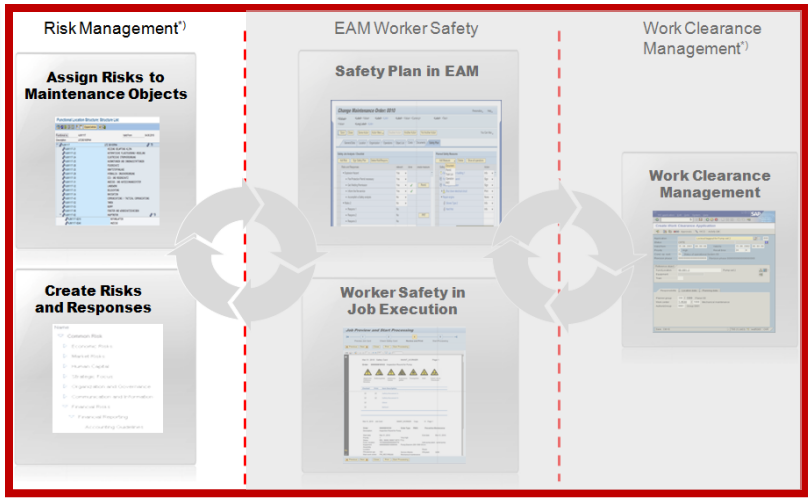
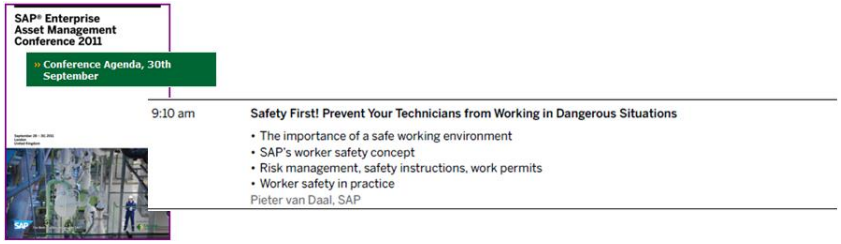
Realization of the concept by SAP

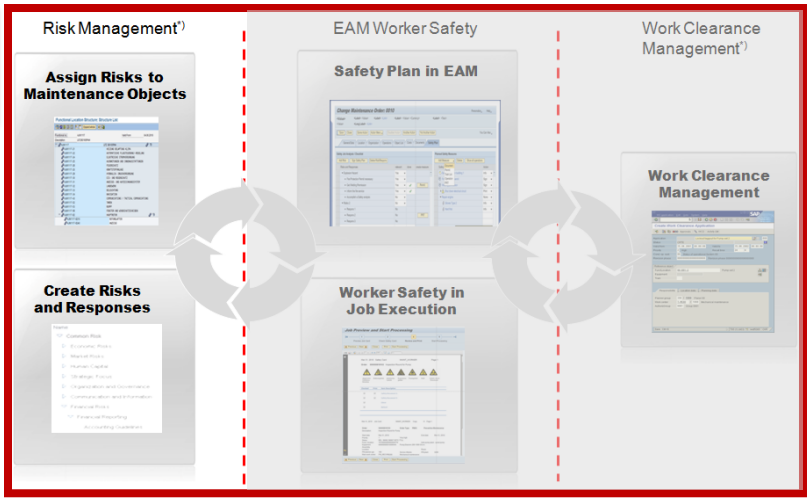
1



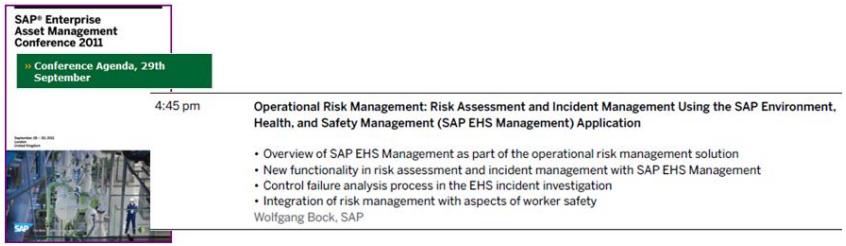
Risk Assessments Process executed in SAP Governance, Risk, and Compliance (SAP GRC)



2



Risk Assessments Process executed in SAP Environment, Health and Safety Management (SAP EHSM)



!!! ATTENTION: At the end of this presentation more details are provided how these '2 worlds' come together !!!

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The details of SAP's 'Worker Safety' solution

- EAM Worker Safety
- EAM Worker Safety combined with Work Clearance Management
- EAM Worker Safety combined with GRC Risk Management
- EAM Worker Safety combined with Work Clearance Management and GRC Risk Management

The details of SAP's 'Worker Safety' solution

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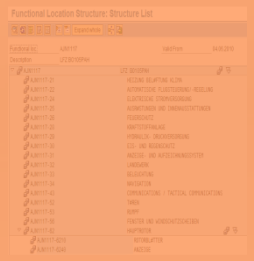
EAM Worker Safety

Risk Management*)

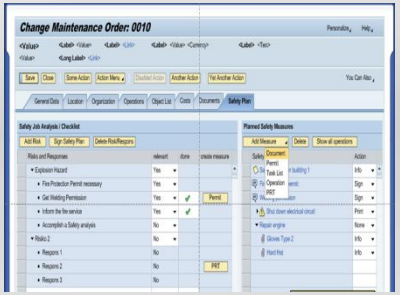
Assign Risks to Maintenance Objects



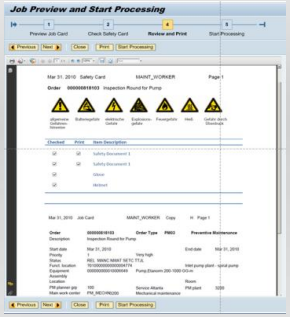
Create Risks and Responses

EAM Worker Safety

Safety Plan in EAM

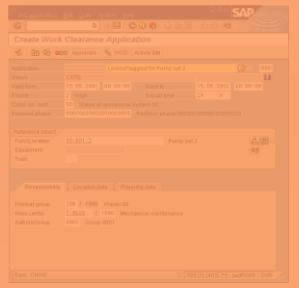


Worker Safety in Job Execution



Work Clearance Management*)

Work Clearance Management



*) = optional

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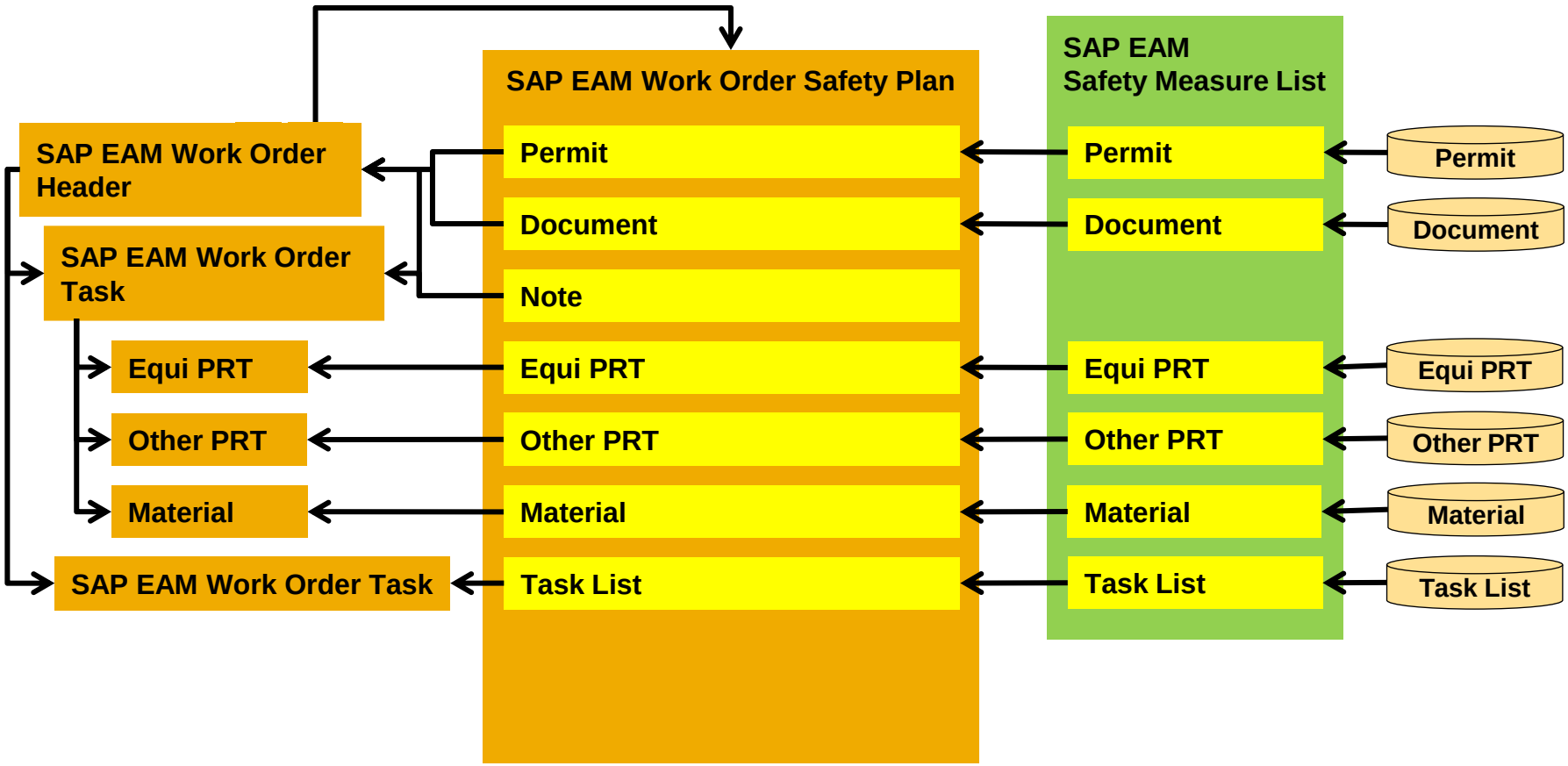
EAM Worker Safety: Basic Architecture



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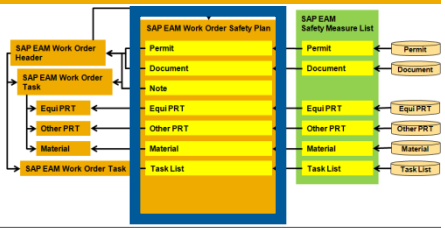
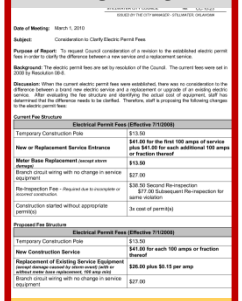
Just an example



Replace halogen bulbs in ceiling

Permit



Switched off electrical circuit

Equi PRT

Platform

Task List

Task List

0010 Agree with Facilities Dept on Dates/Times

0020 Check Emergency Lights

Preparatory work

Document

Work safe with halogen

Note

Attention Memo

Other PRT

Set of Pilons Barrier Tape

Material

Special gloves

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SAP EAM Safety Measure List

Documents | Permits | Task Lists | Materials | Equipment PRTs | Other PRTs

Documents in Safety Measure List

Document Options ▾ | Add Documents | Remove Documents

Document	Type	Part	Version	Description
PVD_EAMWS_AT_1	DRW	000	00	PvD:s Worker Safety Document 1
PVD_EAMWS_AT_3	DRW	000	00	Work safe with halogen
PVD_EAMWS_AT_5	DRW	000	00	PvD's Worker Safety Document 5
PVD_EAMWS_AT_6_PRT	DRW	000	00	PvD's Worker Safety Document 6 as PRT
PVD_EAMWS_AT_7	DRW	000	00	PvD's Worker Safety Document 5

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SAP EAM Safety Measure List

Documents | **Permits** | Task Lists | Materials | Equipment PRTs | Other PRTs

Permits in Safety Measure List

Permit Options | Add Permits | Remove Permits

Permit	Description
ZPVD-1	Switched off Electr. Circuit
ZPVD-10	PvD Worker Safety Test 10
ZPVD-3	PvD Worker Safety Test 3
ZPVD-5	PvD Worker Safety Test 5
ZPVD-6	PvD Worker Safety Test 6
ZPVD-7	PvD Worker Safety Test 7
ZPVD-8	PvD Worker Safety Test 8

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SAP EAM Safety Measure List

Documents | Permits | **Task Lists** | Materials | Equipment PRTs | Other PRTs

Task Lists in Safety Measure List

Task List Options ◢ Add Task Lists Remove Task Lists

Type	Group	Counter	Description
General Maintenance Task List	PVD	1	Gen TaskList PVD
General Maintenance Task List	PVD	3	Gen TaskList PVD 3
General Maintenance Task List	PVD	4	Preparatory work

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SAP EAM Safety Measure List

Documents | Permits | Task Lists | **Materials** | Equipment PRTs | Other PRTs

Materials in Safety Measure List

Material Options ▾ | Add Materials | Remove Materials

Material	Material Description
PVD-1	PVD Material - 1
PVD-2	PvD Testmaterial 2
PVD-4	Special gloves

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SAP EAM Safety Measure List

Documents | Permits | Task Lists | Materials | **Equipment PRTs** | Other PRTs

Equipment PRTs in Safety Measure List

Equipment Options | Add Equipment | Remove Equipment

Equipment	Equipment Description
10000368	Platform

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SAP EAM Safety Measure List

Documents | Permits | Task Lists | Materials | Equipment PRTs | **Other PRTs**

Other Production Resources/Tools (PRTs) in Safety Measure List

Other PRT Options ▾ | Add Other PRTs | Remove Other PRTs

Production Resource/Tool	Description
PVD-O-1	Set of Pilons
PVD-O-2	Barrier Tape

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SAP EAM Work Order Safety Plan

Create Maintenance order: %00000000001

Save | Check Entries | Status Information | Set System Status | Additional Functions | You can also

Order %00000000001 **Order Type** PM01, Maintenance order **Technical Object** PVD-6 **Priority** 2-High **System Status** CRTD MANC NTUP

General Data | Location Data | Organization Data | Operation Data | Object List | Costs | Documents | Permits | Safety Plan

Long Text: Demo Safety First presentation

General Data

Description: PvD Demo Safety First
Required Start: 28.07.2011 09:00:00
Technical Object: PVD-6 Pieter van Daal's Testequipment EhP6-1
Material:
Assembly:
Assigned Notification: Assign Notification

Priority: 2-High
Required End: 29.07.2011 17:00:00
Technical Object Type: Equipment
Serial Number:
System Condition:
Task List: Assign Task List

Responsibilities

Work Center: * PVD_MECH PvD Mechanical Technicians
Planning Plant: 0001 Werk 0001
Planner Group: PVD Pieter van Daal

Work Center Plant: 0001 Werk 0001
Person Responsible:

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SAP EAM Work Order Safety Plan

Create Maintenance order: %00000000001

Save | Check Entries | Status Information | Set System Status | Additional Functions | You can also

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General Data | Location Data | Organization Data | Operation Data | Object List | Costs | Documents | Permits | Safety Plan

Long Text: Demo Safety First presentation

General Data

Description: PvD Demo Safety First
Priority: 2-High
Required Start: 28.07.2011 09:00:00
Required End: 29.07.2011 17:00:00
Technical Object: PVD-6 Pieter van Daal's Testequipment EhP6-1
Technical Object Type: Equipment

Create Maintenance order: %00000000001

Save | Check Entries | Status Information | Set System Status | Additional Functions | You can also

Order %00000000001 **Description** PvD Demo Safety First **Order Type** PM01, Maintenance order **Technical Object** PVD-6 **Priority** 2-High **System Status** CRTD MANC NTUP

General Data | Location Data | Organization Data | Operation Data | Object List | Costs | Documents | Permits | Safety Plan

Overview of Operations

Remove Operation

Op...	Description	Work Center	Plant	Contr...	Status	Person ...	Person Resp...	Work	Unit	Ca...	Duration	Unit	Ac...	Mater...	Purch...	Purch...	Cost Ele...	Price	Cu...	Op...	Unit
0010	PvD Demo Safety First	PVD_MECH	0001	PM01	CRTD			4,0	H	1	4,0	H	PVD_					0,00		1,000	
0020								0,0		0	0,0							0,00		0,000	
0030								0,0		0	0,0							0,00		0,000	
0040								0,0		0	0,0							0,00		0,000	
0050								0,0		0	0,0							0,00		0,000	

Details for operation 0010 - PvD Demo Safety First

Operation Details | Materials | Suboperations | Relationships | Production Resources/Tools | External Data | Limits | Service Packages

Long Text:

LAB PREVIEW

SAP EAM Work Order Safety Plan

Create Maintenance order: %00000000001

Save | Check Entries Status Information Set System Status Additional Functions You can also

Order %00000000001 **Description** PvD Demo Work Order **Order Type** PM01, Maintenance order **Technical Object** PVD-6 **Priority** 2-High **System Status** CRTD MANC NTUP

General Data | Location Data | Organization Data | Operation Data | Object List | Costs | Documents | Permits | **Safety Plan**

Planned Safety Measures

Add Safety Measure | Remove

Safety Measures	Object ID	Type	Action
General Safety Measures			
Operations and Safety Measures			
PvD Demo Work Order	0010	Operation	
No safety-relevant information available			

Relevant Risks

Add Risk Remove

Risks and Safety Measures	Action
The system cannot determine any risks	

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SAP EAM Work Order Safety Plan

Create Maintenance order: %00000000001

Save | Check Entries Status Information Set System Status Additional Functions You can also

Order %00000000001 **Description** PvD Demo Work Order **Order Type** PM01, Maintenance order **Technical Object** PVD-6 **Priority** 2-High **System Status** LRRA CRTD MANC

General Data | Location Data | Organization Data | Operation Data | Object List | Costs | Documents | Permits | **Safety Plan**

Planned Safety Measures

Add Safety Measure Remove

Safety Measures	Object ID	Type	Action
General Safety Measures			
Work safe with halogen	PVD_EAMWS_AT_3/DRW/000/00	Document	Sign
Switched off Electr. Circuit	ZPVD-1	Permit	
Preparatory work	A/PVD/4	Task List	Inform
Attention: Holiday Season	01	Safety Note	
Operations and Safety Measures			
Agree with Facilities Dept on Date/Time	0010	Operation	
Platform	10000368	PRT	Inform
Set of Pilons	PVD-O-1	PRT	Sign
Barrier Tape	PVD-O-2	PRT	Inform
Special gloves	PVD-4	Material	Inform
Check Emergency Lights	0020	Operation	
No safety-relevant information available			

Relevant Risks

Add Risk Remove

Risks and Safety Measures	Action
The system cannot determine any risks	

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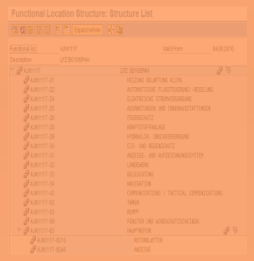
The details of SAP's 'Worker Safety' solution

- EAM Worker Safety
- EAM Worker Safety combined with Work Clearance Management
- EAM Worker Safety combined with GRC Risk Management
- EAM Worker Safety combined with Work Clearance Management and GRC Risk Management

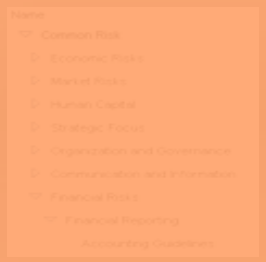
EAM Worker Safety

Risk Management*)

Assign Risks to Maintenance Objects

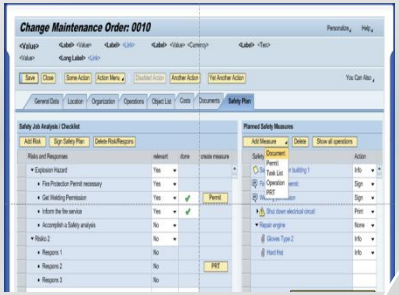


Create Risks and Responses

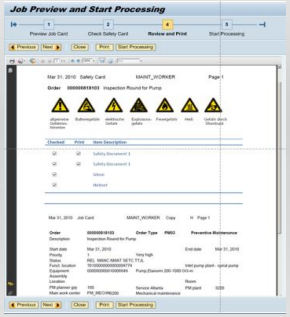


EAM Worker Safety

Safety Plan in EAM

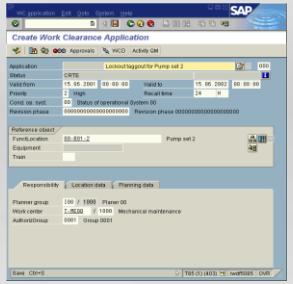


Worker Safety in Job Execution



Work Clearance Management*)

Work Clearance Management



*) = optional

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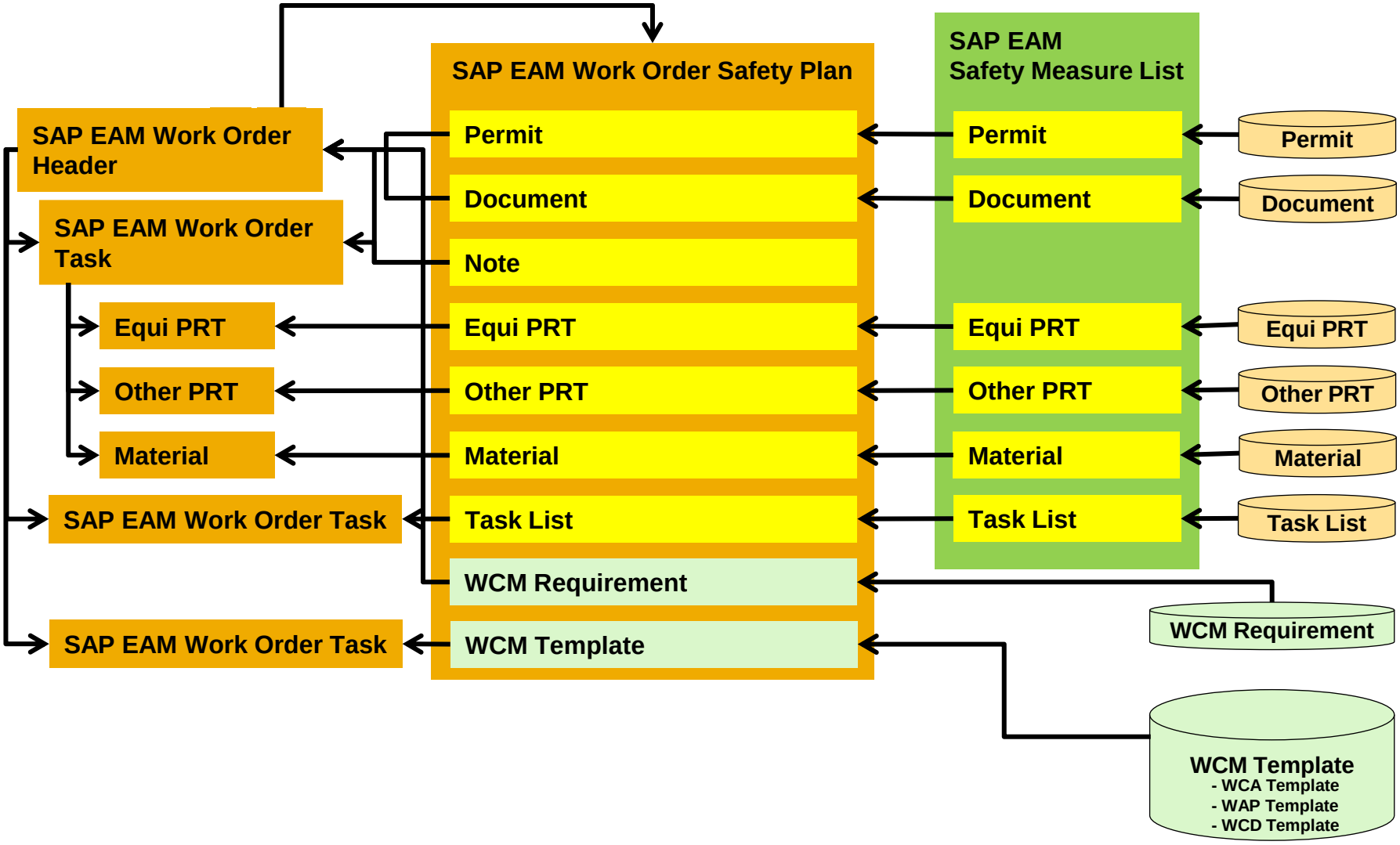
Worker Safety: Basic Architecture extended with Work Clearance Management



Work AProval (WAP) Templates/Work Clearance Document (WCD) Templates → Functional Locations/Equipments

Functional Location Structure: Structure List

Expand whole

Functional Loc. PVD1 Valid From 28.07.2011

Description Pieter van Daal's Functional Location

PVD1	Pieter van Daal's Functional Location
PVD-1	Pieter van Daal's Testequipment EhP6-1
PVD-2	Pieter van Daal's Testequipment EhP6-2
PVD1-001	Second level FL Pieter van Daal

List Editing - Display Work Approvals

System Status

- Created
- Prepared
- Work permit printed
- Closed
- Change mode
- Object Deactivated
- Rejected
- Deletion Flag

General Data | Reference Object | Responsibilities | Documents | Administration Data | Planning

Functional Location PVD1

Equipment to

Train to

Object List

Functional Location to

Equipment to

List Editing - Display Work Approvals

Work Approvals

WAP / Func. Loc. / System status	Short Text / Equipment / UsrStatus	Long Text / ObjList / Assgmt	Valid from / Assgmt	Valid to / Template
100000006300	WCTA PvD 1		22.02.2011	22.02.2012
PVD1				
PREP				
100000006303			22.02.2011	22.02.2011
PVD1				
CHNG				
100000006304	PvD Test		22.02.2011	23.02.2011
PVD1				
CHNG				
100000006700	PvD Customizing with GRC		25.02.2011	01.03.2011
PVD1				
PREP				
100000008700	Test		27.06.2011	27.06.2011
PVD1				
PREP				
100000008701	Test			
PVD1				
PREP				

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Work AProval (WAP) Templates/Work Clearance Document (WCD) Templates → Functional Locations/Equipments

Functional Location Structure: Structure List

Expand whole

Functional Loc.	PVD1	Valid From	28.07.2011
Description	Pieter van Daal's Functional Location		

PVD1	Pieter van Daal's Functional Location
PVD-1	Pieter van Daal's Testequipment EhP6-1
PVD-2	Pieter van Daal's Testequipment EhP6-2
PVD1-001	Second level FL Pieter van Daal

List Editing - Display WCD Templates

Items

System Status

- Created
- Prepared
- Closed
- Change mode
- Object Deactivated
- Rejected
- Deletion Flag

General Data | Reference Object | Responsibilities | Documents | Administration Data

Functional Location	PVD1		
Equipment		to	
Train		to	

Object List

Functional Location		to	
Equipment		to	

List Editing - Display WCD Templates

WCD Templates

WCD	Short Text	Long Text	Valid from	Valid to	MaintScrn
Func. Loc.	Equipment	ObjList	Usg.		
System status	UsrStatus	Template			
400000001700	WCT1 PvD 1		22.02.2011	22.02.2012	
PVD1		001			
PREP					

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EAM Work Order Safety Measures referring to Work Clearance Management Items (Requirements/Templates)

Create Maintenance order: %00000000001

Save | Check Entries | Status Information | Set System Status | Additional Functions | You can also

Order %00000000001 **Description** PvD Work Order Worker Safety <--> WCM **Order Type** PM01, Maintenance order **Technical Object** PVD-2 **Priority** 2-High **System Status** LRRA CRTD NTUP

General Data | Location Data | Organization Data | Operation Data | Object List | Costs | Documents | Permits | Safety Plan

Long Text: PvD Demo Work Order to show the integration between Worker Safety and Work Clearance Management

General Data

Description: PvD Work Order Worker Safety <--> WCM
Required Start: 28.07.2011 16:00:00
Technical Object: PVD-2 Pieter van Daal's Testequipment EhP6-2
Material:
Assembly:
Assigned Notification: Assign Notification

Priority: 2-High
Required End: 28.07.2011 19:00:00
Technical Object Type: Equipment
Serial Number:
System Condition: not in operation
Task List: Assign Task List

Responsibilities

Work Center: * PVD_MECH PvD Mechanical Technicians
Planning Plant: 0001 Werk 0001
Planner Group: PVD Pieter van Daal

Work Center Plant: 0001 Werk 0001
Person Responsible:

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EAM Work Order Safety Measures referring to Work Clearance Management Items (Requirements/Templates)

Create Maintenance order: %00000000001

Save | Check Entries | Status Information | Set System Status | Additional Functions | You can also

Order %00000000001 **Description** PvD Work Order Worker Safety <--> WCM **Order Type** PM01, Maintenance order **Technical Object** PVD-2 **Priority** 2-High **System Status** LRRA CRTD MANC NTUP

General Data | Location Data | Organization Data | **Operation Data** | Object List | Costs | Documents | Permits | Safety Plan

Overview of Operations

Remove Operation

Op...	Description	Work Center	Plant	Contr...	Status	Person ...	Person Resp...	Work	Unit	Ca...	Duration	Unit	Ac...	Mater...	Purch...	Purch...	Cost Ele...	Price	Cu...	Op...	Unit
0010	Repair Equipment	PVD_MECH	0001	PM01	CRTD			2,0	H	1	2,0	H	PVD_					0,00		1,000	
0020								0,0		0	0,0							0,00		0,000	
0030								0,0		0	0,0							0,00		0,000	
0040								0,0		0	0,0							0,00		0,000	
0050								0,0		0	0,0							0,00		0,000	

Details for operation 0010 - Repair Equipment

Operation Details | Materials | Suboperations | Relationships | Production Resources/Tools | External Data | Limits | Service Packages

Long Text:

Operation/Activity: 0010
System Condition:
Calculation Key: 1 Calculate duration
Work/Unit: 2,0 H
Assembly:

Operation Description: Repair Equipment
Activity Type: PVD_MA PvD Maint Act
Required Capacities: 1
Duration/Unit: 2,0 H
Work Percentage: 0 %

Planned Times

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EAM Work Order Safety Measures referring to Work Clearance Management Items (Requirements/Templates)

Create Maintenance order: %00000000001

Save | Check Entries | Status Information | Set System Status | Additional Functions | You can also

Order %00000000001 **Description** PvD Work Order Worker Safety <--> WCM **Order Type** PM01, Maintenance order **Technical Object** PVD-2 **Priority** 2-High **System Status** LRRA CRTD MANC NTUP

General Data | Location Data | Organization Data | Operation Data | Object List | Costs | Documents | Permits | **Safety Plan**

Planned Safety Measures

Add Safety Measure | Remove

Safety Measures	Object ID	Type	Action
General Safety Measures			
Operations and Safety Measures			
Repair Equipment	0010	Operation	
No safety-relevant information available			

Relevant Risks

Add Risk | Remove

Risks and Safety Measures	Action
The system cannot determine any risks	

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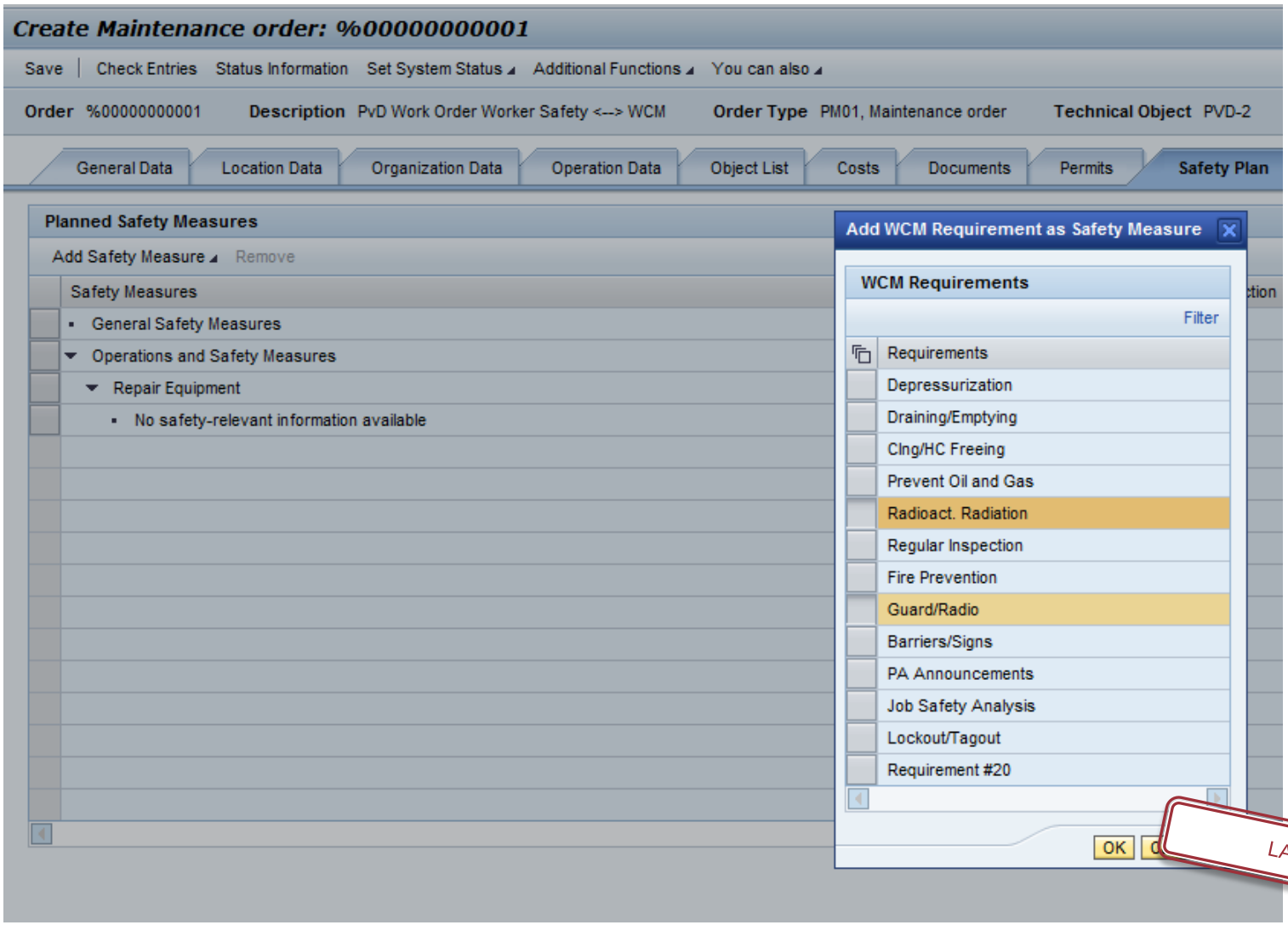
EAM Work Order Safety Measures referring to Work Clearance Management Items (Requirements/Templates)



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EAM Work Order Safety Measures referring to Work Clearance Management Items (Requirements/Templates)

Create Maintenance order: %00000000001

Save | Check Entries | Status Information | Set System Status | Additional Functions | You can also

Order %00000000001 **Description** PvD Work Order Worker Safety <--> WCM **Order Type** PM01, Maintenance order **Technical Object** PVD-2 **Priority** 2-High **System Status** LRRA CRTD MANC NTUP

General Data | Location Data | Organization Data | Operation Data | Object List | Costs | Documents | Permits | **Safety Plan**

Planned Safety Measures

Add Safety Measure | Remove

Safety Measures	Object ID	Type	Action
General Safety Measures			
Radioact. Radiation		WCM Requirement	
Guard/Radio		WCM Requirement	
Operations and Safety Measures			
Repair Equipment	0010	Operation	
No safety-relevant information available			

Relevant Risks

Add Risk | Remove

Risks and Safety Measures	Action
The system cannot determine any risks	

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EAM Work Order Safety Measures referring to Work Clearance Management Items (Requirements/Templates)

Create Maintenance order: %00000000001

Save | Check Entries | Status Information | Set System Status | Additional Functions | You can also

Order %00000000001 **Description** PvD Work Order Worker Safety <--> WCM **Order Type** PM01, Maintenance order **Technical Object** PVD-2 **Priority** 2-High **System St**

General Data | Location Data | Organization Data

Planned Safety Measures

Add Safety Measure | Remove

Safety Measures
- General Safety Measures
  - Radioact. Radiation
  - Guard/Radio
- Operations and Safety Measures
  - Repair Equipment
    - No safety-relevant information available

Add WCM Template as Safety Measure

WCM Template

Filter

ID	Description	Type	Technical Object	Technical Object Description
100000006300	WCTA PvD 1	Work Approval	PVD1	Pieter van Daal's Functional Location
100000006303		Work Approval	PVD1	Pieter van Daal's Functional Location
100000006304	PvD Test	Work Approval	PVD1	Pieter van Daal's Functional Location
100000006700	PvD Customizing with GRC	Work Approval	PVD1	Pieter van Daal's Functional Location
100000008700	Test	Work Approval	PVD1	Pieter van Daal's Functional Location
100000008701	Test	Work Approval	PVD1	Pieter van Daal's Functional Location
400000001700	WCT1 PvD 1	WCD Template	PVD1	Pieter van Daal's Functional Location

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EAM Work Order Safety Measures referring to Work Clearance Management Items (Requirements/Templates)

Create Maintenance order: %00000000001

Save | Check Entries Status Information Set System Status Additional Functions You can also

Order %00000000001 **Description** PvD Work Order Worker Safety <--> WCM **Order Type** PM01, Maintenance order **Technical Object** PVD-2 **Priority** 2-High **System Status** WCM LRRA CRTD MANC NTUP

General Data | Location Data | Organization Data | Operation Data | Object List | Costs | Documents | Permits | **Safety Plan**

Planned Safety Measures

Add Safety Measure Remove

Safety Measures	Object ID	Type	Action
General Safety Measures			
Radioact. Radiation		WCM Requirement	
Guard/Radio		WCM Requirement	
WCT1 PvD 1	400000001700	WCD Template	
Operations and Safety Measures			
Repair Equipment	0010	Operation	
No safety-relevant information available			
Operation 0020	0020	Operation	
No safety-relevant information available			

Relevant Risks

Add Risk Remove

Risks and Safety Measures	Action
The system cannot determine any risks	

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EAM Work Order Safety Measures referring to Work Clearance Management Items (Requirements/Templates)

Create Maintenance order: %00000000001

Save | Check Entries | Status Information | Set System Status | Additional Functions | You can also

Order %00000000001 **Description** PvD Work Order Worker Safety <--> WCM **Order Type** PM01, Maintenance order **Technical Object** PVD-2 **Priority** 2-High

General Data | Location Data | Organization Data | **Operation Data** | Object List | Costs | Documents | Permits | Safety Plan

Overview of Operations

Remove Operation

Op...	Description	Work Center	Plant	Contr...	Status	Person ...	Person Resp...	Work	Unit	Ca...	Duration	Unit	Ac...	Mater...
0010	Repair Equipment	PVD_MECH	0001	PM01	CRTD			2,0	H	1	2,0	H	PVD_	
0020		PVD_MECH	0001	WCM	CRTD			0,0	H	0	0,0	H	PVD_	
0030								0,0		0	0,0			
0040								0,0		0	0,0			
0050								0,0		0	0,0			

Details for operation 0010 - Repair Equipment

Operation Details | Materials | Suboperations | Relationships | Production Resources/Tools | External Data | Limits | Service Packages

Long Text:

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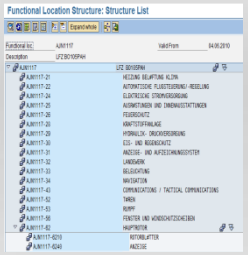
The details of SAP's 'Worker Safety' solution

- EAM Worker Safety
- EAM Worker Safety combined with Work Clearance Management
- EAM Worker Safety combined with GRC Risk Management
- EAM Worker Safety combined with Work Clearance Management and GRC Risk Management

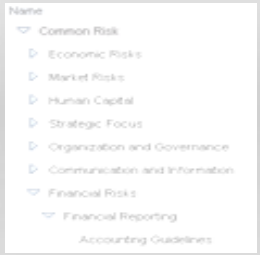
EAM Worker Safety

Risk Management*)

Assign Risks to Maintenance Objects

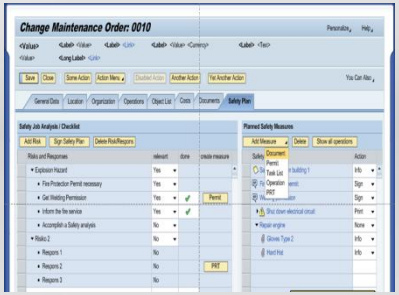


Create Risks and Responses

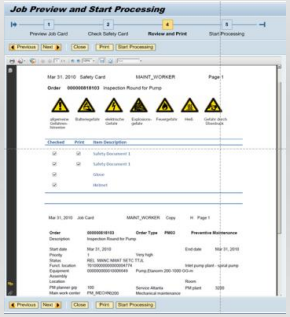


EAM Worker Safety

Safety Plan in EAM

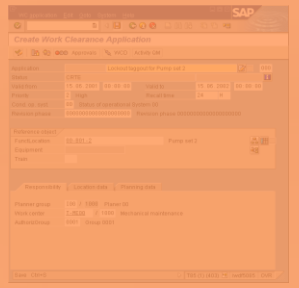


Worker Safety in Job Execution



Work Clearance Management*)

Work Clearance Management



*) = optional

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Worker Safety: Basic Architecture extended with Risk Management

SAP EAM Reference Object

SAP EAM Work Order Header

SAP EAM Work Order Task

Equi PRT

Other PRT

Material

SAP EAM Work Order Task

SAP EAM Work Order Safety Plan

Permit

Document

Note

Equi PRT

Other PRT

Material

Task List

SAP EAM Safety Measure List

Permit

Document

Equi PRT

Other PRT

Material

Task List

Permit

Document

Equi PRT

Other PRT

Material

Task List

Context

- Functional Location
- Equipment
- Technical Object Type
- Characteristic
- Task List

Risk

Response

Context

GRC Risk Management: Risks

Risk and Opportunity Management

New Worklist | Change Worklist

Risks (1254) | Opportunities (0) | Proposed Risks (0)

View: * [Standard View] | Display As: Table | Create | Delete | Print Version | Export | Refresh

Risk / Opportunity	Organizational Unit	Activity / Subprocess	Category
Risk*			
Risk_CO_Emission	SAP AG		Chemical Hazards
Risk 3 SW	AP1		Asset Operations
Risk 2 SW	AP1		Asset Operations
Risk2_Explosion_Test	SAP AG		Fire and Explosion Hazards
Risk1_Acid _Test	SAP AG		Chemical Hazards
Risk3_Gas_Test	SAP AG		Fire and Explosion Hazards
Risk4_Rotation_Test	SAP AG		Mechanical / Equipment Hazards

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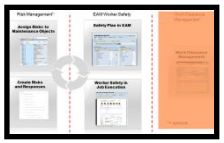
GRC Risk Management: Risks



Risk: Risk1_Acid _Test

Organization Unit SAP AG

Save | Cancel | Switch to Graphical View | Print Fact Sheet

General | Roles | Key Risk Indicators | Analysis | Response Plans | Risk Incidents | Influenced Risks | Underlying Risks | Surveys | Attachments and Links | Issues | Context | Policies

General Information

Name: * Risk1_Acid _Test

Organization Unit: * SAP AG

Secondary Org. Unit:

Activity:

Risk Category: * Chemical Hazards

Status: Active

Distribution Method:

Risk Used As Scenario Loss:

Description | Notes

Risk for testing

Validity Dates

Valid From: * 20.01.2011

Valid To: * 31.12.9999

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GRC Risk Management: Risks

Risk: Risk1_Acid _Test

Organization Unit SAP AG
Risk Category Chemical Hazards

Created By Edda-Leonore Seitz
Created On 09.02.2011

Save | Cancel | Switch to Graphical View | Print Fact Sheet

General | Roles | Key Risk Indicators | Analysis | Response Plans | Risk Incidents | Influenced Risks | Underlying Risks | Surveys | Attachments and Links | Issues | Context | Policies

Context Attributes

View: [Standard View] | Print Version | Export | Add | Remove | Filter Settings

Dimension ID	Context Value	Context Value Text
PM: Equipment in Q63	000000000010000321	Gas detector 2 (chemical, biological)
PM: Equipment in Q63	HOEFT-004	hoeft-001 prt
PM: Equipment in Q63	T10-EQ1-1	Case
PM: Equipment in Q63	T10-EQ1-2	Stator Level
PM: Equipment in Q63	TGRC-EQ1-1-1	TGRC-EQ1-1 for test (char. values)
PM: Functional Location in Q63	HOFT-010	hoeft- without rm
PM: Functional Location in Q63	PVD1	Pieter van Daal's Functional Location
PM: Functional Location in Q63	TL	Thiemos technischer Platz
PM: Tasklist in Q63	A/608/1	A/608/1

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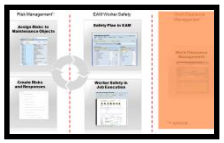
GRC Risk Management: Responses



Risk: Risk1_Acid _Test

Organization Unit SAP AG

Save | Cancel | Switch to Graphical View | Print Fact Sheet

General | Roles | Key Risk Indicators | Analys | Response Plans | Risk Incidents | Influenced Risks | Underlying Risks | Surveys | Attachments and Links

Responses

Print Version | Export | Create | Assign | Open | Remove

Type	Name	Owner	Organizational Unit	Status
Mitigate	Acid Protection	Edda-Leonore Seitz	SAP AG	Active

Mitigation

Analysis Date: 20.01.2011

Probability Reduction: 0 %

Impact	Impact Category	Score Reduction
damage	Damage to equipment	0

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GRC Risk Management: Responses

Response:Acid Protection

Response: Acid Protection

Created by Edda-Leonore Seitz **Created On** 20.01.2011

Save Cancel

General | Affected Risks | Context | Attachments and Links | Notes | Issues

General Information

Name: * Acid Protection

Description:

Organization Unit: * SAP AG

Owner: * Edda-Leonore Seitz

Type: * Mitigate

Purpose: Prevent

Share Response: Not Shared

Status: Active

Automation

Automation:

Automation Status:

Notification

Due Date:

On Due Date: sent out 0 days before due date

Additional details

myFile2:

myFile1:

Response Details

Steps/Actions:

Distribution Method: None

Start Date: 01.01.2011

Finish Date: 31.12.9999

Completeness: 0 % Calculate Completeness

Cost: 0,00 EUR

Response Effectiveness

Effective From: 20.01.2011

Effective To: 31.12.9999

Current Effectiveness:

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GRC Risk Management: Responses

Response:Acid Protection

Response: Acid Protection

Created by Edda-Leonore Seitz **Created On** 20.01.2011

Save | Cancel

General | Affected Risks | Context | Attachments and Links | Notes | Issues

Context Attributes

View: [Standard View] | Print Version | Export | Add | Remove | Filter Settings

PM: Safety Tasklist in Q63	A/333/1	A320 - Check Low Pressure Compressor

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GRC responses: Example Task List

Display General Maintenance Task List: A/333/1

Edit | Additional Functions | You can also

Task List A/333/1 **Description** A320 - Check Low Pressure Compressor **Group** 333 **Counter** 1

General Data | **Operation Data** | Maintenance Packages | Documents | Permits | Safety Plan

Overview of Operations

Op...	Description	Work Center	Plant	Contr...	Work	Unit	Ca...	Duration	Unit	Ac...	Materi...	Purch...	Purch...	Cost Ele...	Price	Cu...	Op...	Unit
0010	Preparations	AAA_TH1	0001	PM01	5,0	HR	0	5,0	HR						0,00	EUR	0,000	
0020	Exchange spare parts	AAA_TH1	0001	PM01	4,0	HR	0	4,0	HR						0,00	EUR	0,000	
0030	Check Engine	AAA_TH1	0001	PM01	10,0	HR	0	10,0	HR						0,00	EUR	0,000	

Details for operation 0010 - Preparations

Operation Details | **Materials** | Suboperations | Production Resources/Tools | External Data | Service Packages | Limits

Overview of Materials

Display Material

Material	Description	Quantity	Unit	Item Category	Purchase Requisition	Backflush	Safety ...
T12_MAT1	Low Pressure Compressor	1,000	EA	L			Inform
ABG_EAMS_HALB01	ABG: EAMS material 01	1,000	EA	L			Not Saf...

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GRC responses: Example Task List

Display General Maintenance Task List: A/333/1

Edit | Additional Functions | You can also

Task List A/333/1 Description A320 - Check Low Pressure Compressor Group 333 Counter 1

General Data | Operation Data | Maintenance Packages | Documents | Permits | Safety Plan

Overview of Operations

Op...	Description	Work Center	Plant	Contr...	Work	Unit	Ca...	Duration	Unit	Ac...	Materi...	Purch...	Purch...	Cost Ele...	Price	Cu...	Op...	Unit
0010	Preparations	AAA_TH1	0001	PM01	5,0	HR	0	5,0	HR						0,00	EUR	0,000	
0020	Exchange spare parts	AAA_TH1	0001	PM01	4,0	HR	0	4,0	HR						0,00	EUR	0,000	
0030	Check Engine	AAA_TH1	0001	PM01	10,0	HR	0	10,0	HR						0,00	EUR	0,000	

Details for operation 0010 - Preparations

Operation Details | Materials | Suboperations | Production Resources/Tools | External Data | Service Packages | Limits

Overview of Materials

Display Material

Material	Description	Quantity	Unit	Item Category	Purchase Requisition	Backflush	Safety ...
T12_MAT1	Low Pressure Compressor	1,000	EA	L			Inform
ABG_EAMS_HALB01	ABG: EAMS material 01	1,000	EA	L			Not Saf...

Attention: Both materials are defined as ‘safety materials’ in Safety Measure List

Change Safety Measure List

Save | Read Only

Documents | Permits | Task Lists | Materials | Equipment PRTs | Other PRTs

Materials in Safety Measure List

Material Options | Add Materials | Remove Materials

Material	Material Description	Material Category	Material Category Description		
T12_MAT1	Low Pressure Compressor	FERT	Finished Product	☐	Inform
T12_MAT2	Main Landing Gearbox	FERT	Finished Product	☐	Inform

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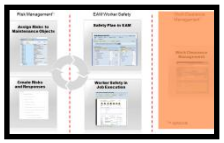
Safety Plan in EAM Order based on GRC Content



Create Order

Continue

Order Type: * Maintenance order

Priority: 2-High

Technical Object: PVD1

Assembly:

Planning Plant:

Business Area:

Select Equipment or Functional Location

The system has found a piece of equipment and a functional location with the same ID. Select the object you want to use.

Technical Object Type	Technical Object ID	Technical Object Description
Functional Location	PVD1	Pieter van Daal's Functional Location
Equipment	PVD1	Equi Pieter van Daal PVD1

OK Cancel

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Safety Plan in EAM Order based on GRC Content

Create Maintenance order: %00000000001

Save | Check Entries | Status Information | Set System Status | Additional Functions | You can also

Order %00000000001 **Order Type** PM01, Maintenance order **Technical Object** PVD1 **Priority** 2-High **System Status** CRTD MANC NTUP

General Data | Location Data | Organization Data | Operation Data | Object List | Costs | Documents | Permits | Safety Plan

Long Text: PvD Work Order to demonstrate Work Order Safety integration with GRC

General Data

Description: PvD Demo Order Worker Safety <--> GRC
Required Start: 28.07.2011 13:58:40
Technical Object: PVD1 Pieter van Daal's Functional Location
Material:
Assembly:
Assigned Notification: Assign Notification

Priority: 2-High
Required End: 28.07.2011 13:58:40
Technical Object Type: Functional Location
Serial Number:
System Condition:
Task List: Assign Task List

Responsibilities

Work Center: * PVD_MECH PvD Mechanical Technicians
Planning Plant: 0001 Werk 0001
Planner Group: PVD Pieter van Daal

Work Center Plant: 0001 Werk 0001
Person Responsible:

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Safety Plan in EAM Order based on GRC Content

Create Maintenance order: %00000000001

Save | Check Entries | Status Information | Set System Status | Additional Functions | You can also

Safety measures have been automatically applied in the order

Order %00000000001 **Description** PvD Demo Order Worker Safety <--> GRC **Order Type** PM01, Maintenance order **Technical Object** PVD1 **Priority** 2-High **System Status** LRRA CRTD MANC NTUP

General Data | Location Data | Organization Data | Operation Data | Object List | Costs | Documents | Permits | Safety Plan

Planned Safety Measures

Add Safety Measure | Remove

Safety Measures	Object ID	Type	Action
General Safety Measures			
MP Safety Plan 02	MP_SAFETY_PLAN_02/DRW/000/00	Document	Inform
Firesafety - test Jürgen	FIRE_1	Permit	
A320 - Check Low Pressure Compressor	A/333/1	Task List	Inform
Operations and Safety Measures			
Preparations	0010	Operation	
Low Pressure Compressor	T12_MAT1	Material	Inform
Exchange spare parts	0020	Operation	
Main Landing Gearbox	T12_MAT2	Material	Inform
Air Brakes on left middle wing	AAF_MAT6_1	Material	Sign
Check Engine	0030	Operation	
No safety-relevant information available			

Relevant Risks

Risks and Safety Measures	Action
Risk1_Acid _Test	
Acid Protection	Apply
A320 - Check Low Pressure Compressor	Applied

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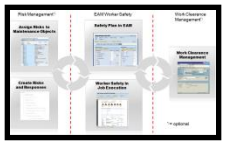
The details of SAP's 'Worker Safety' solution

- EAM Worker Safety
- EAM Worker Safety combined with Work Clearance Management
- EAM Worker Safety combined with GRC Risk Management
- EAM Worker Safety combined with Work Clearance Management and GRC Risk Management

Worker Safety: Complete Overview Architecture



SAP EAM Reference Object

SAP EAM Work Order Header

SAP EAM Work Order Task

Equi PRT

Other PRT

Material

SAP EAM Work Order Task

SAP EAM Work Order Task

SAP EAM Work Order Safety Plan

Permit

Document

Note

Equi PRT

Other PRT

Material

Task List

WCM Requirement

WCM Template

SAP EAM Safety Measure List

Permit

Document

Equi PRT

Other PRT

Material

Task List

Permit

Document

Equi PRT

Other PRT

Material

Task List

WCM Requirement

WCM Template
- WCA Template
- WAP Template
- WCD Template

Context
- Functional Location
- Equipment
- Technical Object Type
- Characteristic
- Task List

Risk

Response

Context

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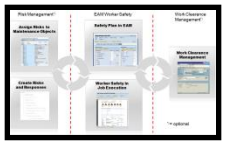
SAP Products



SAP EAM Reference Object

SAP EAM Work Order Header

SAP EAM Work Order Task

Equi PRT

Other PRT

Material

SAP EAM Work Order Task

SAP EAM Work Order Task

SAP EAM Work Order Safety Plan

Permit

Document

Material

Task List

WCM Requirement

WCM Template

SAP ERP Enterprise Asset Management

SAP EAM Safety Measure List

Permit

Document

Equi PRT

Other PRT

Material

Task List

Permit

Document

Equi PRT

Other PRT

Material

Task List

Context
- Functional Location
- Equipment
- Technical Object Type
- Characteristic
- Task List

SAP Governance, Risk, and Compliance

ontext

SAP Work Clearance Management

- WAP Template
- WCD Template

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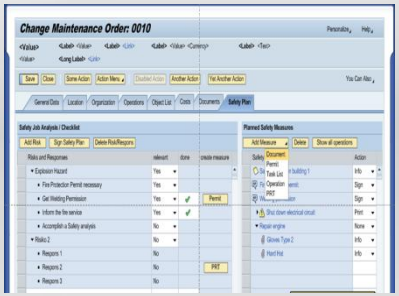
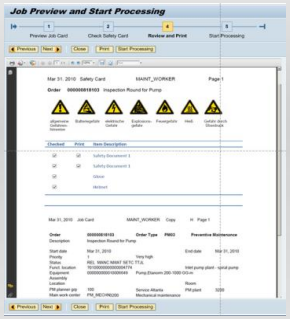
SAP Multiresource Scheduling (SAP MRS) as extension of the ‘SAP Worker Safety’ concept

EAM Work Order

Safety Plan in EAM

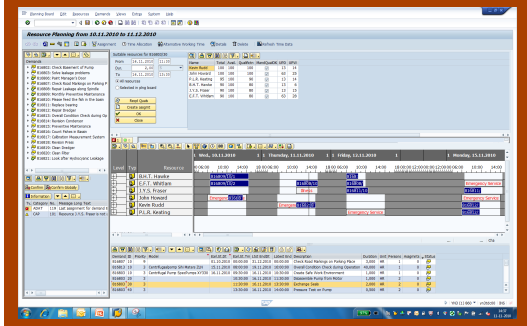


Worker Safety in Job Execution



Requirements Profile (for Task)

SAP Multiresource Scheduling



SAP ERP Human Capital Management

Availability
Qualification Profile

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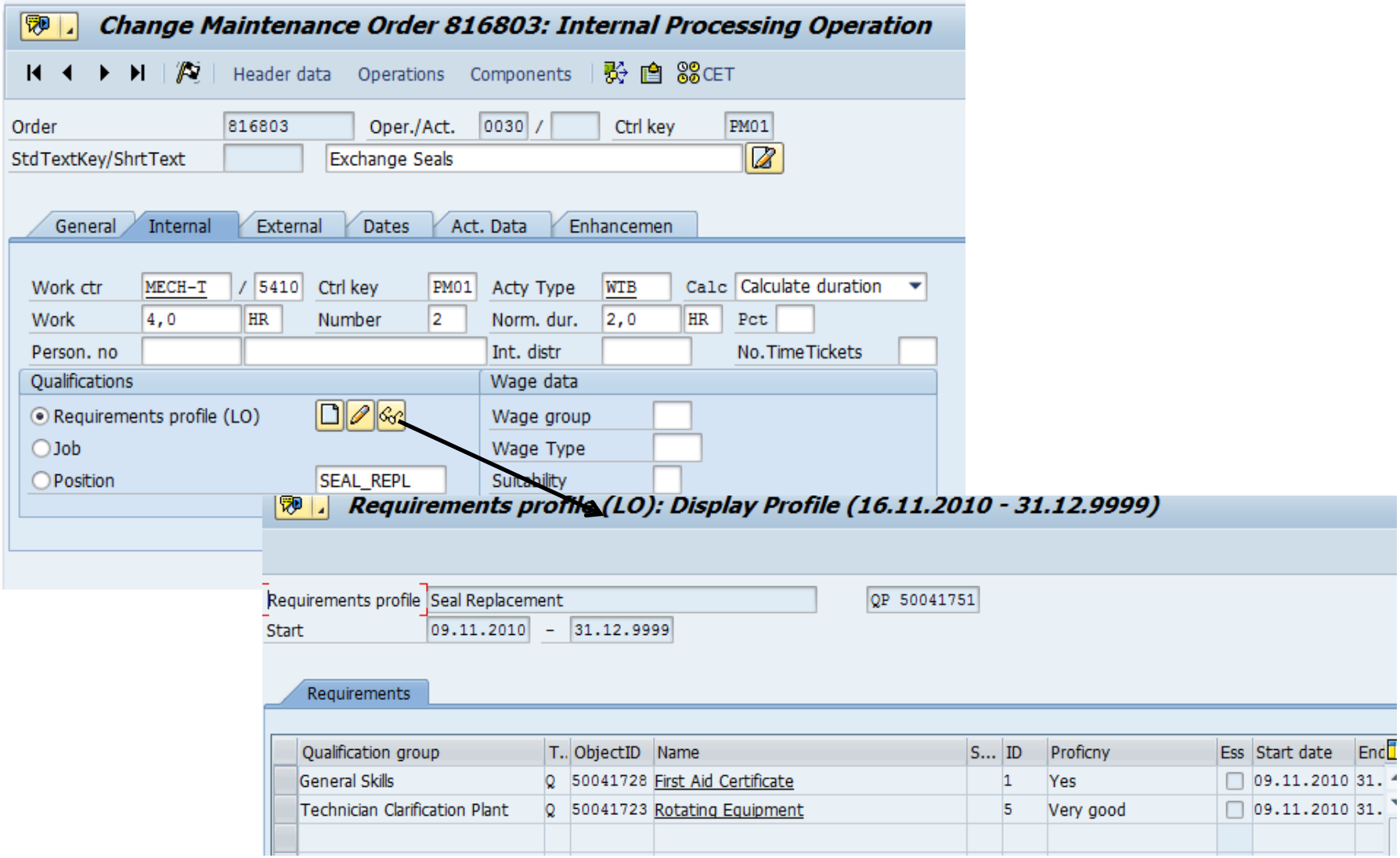
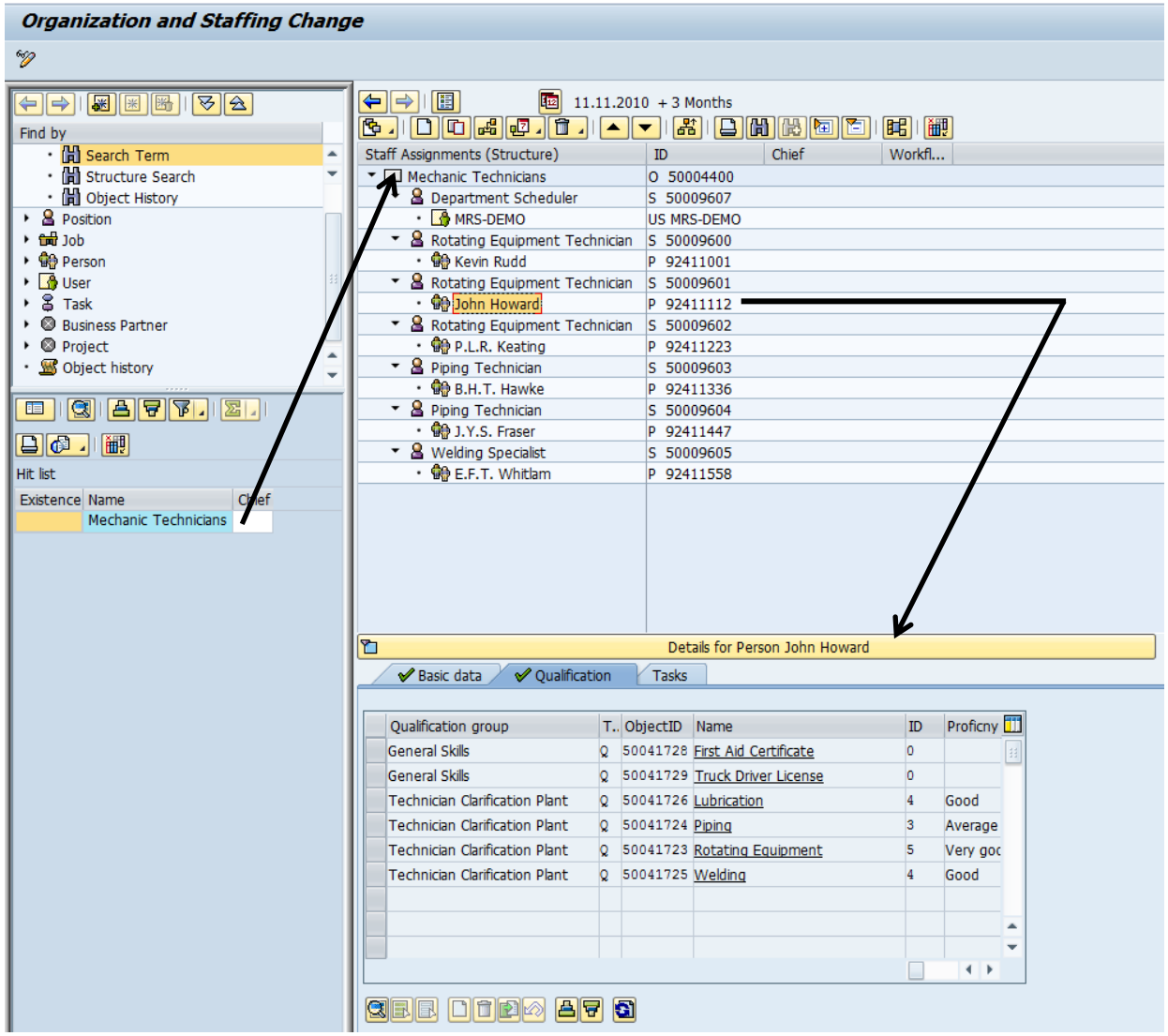
SAP Multiresource Scheduling supporting the assignment of the right person to the right job (1)



SAP Multiresource Scheduling supporting the assignment of the right person to the right job (2)



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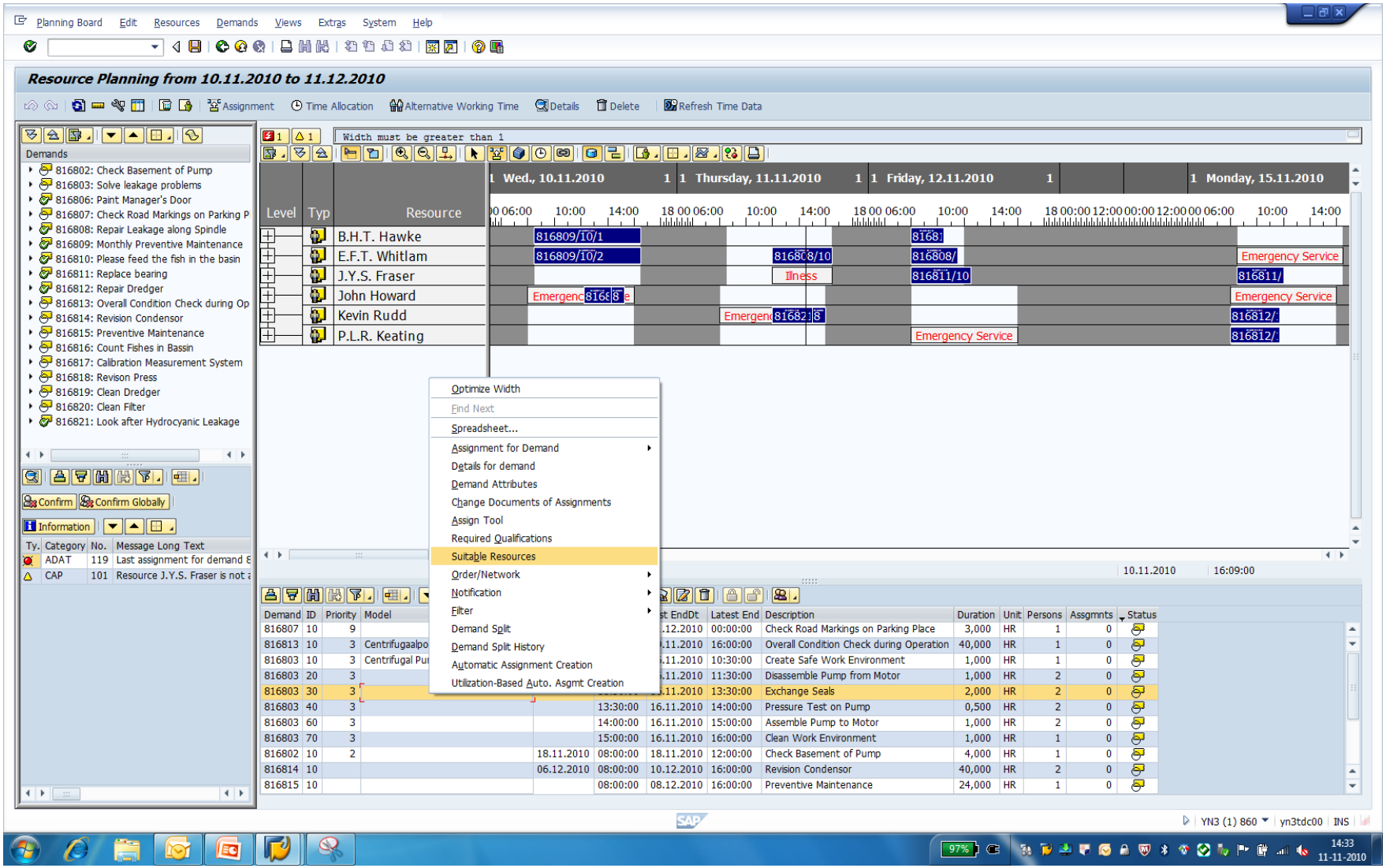
SAP Multiresource Scheduling supporting the assignment of the right person to the right job (3)



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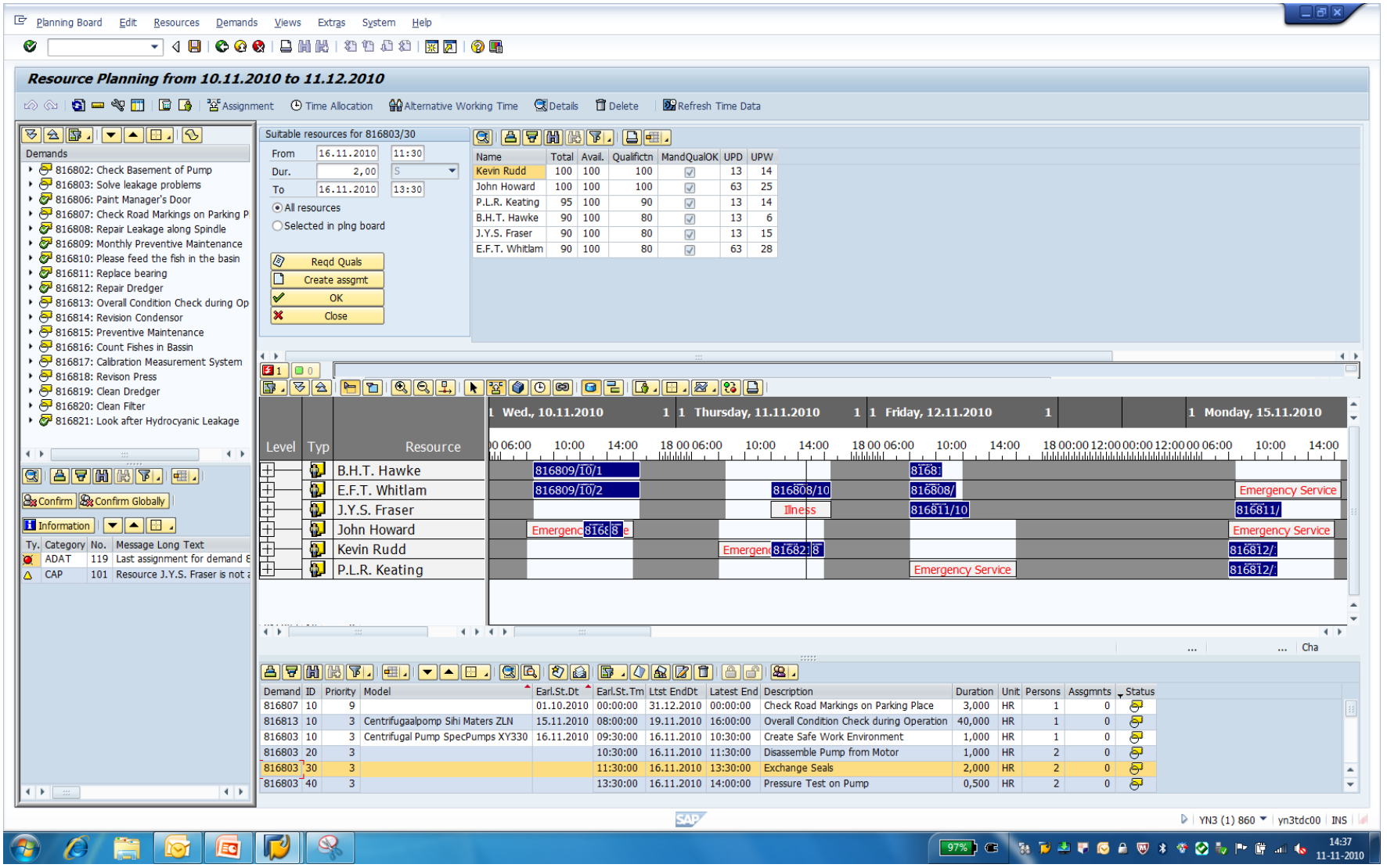
SAP Multiresource Scheduling supporting the assignment of the right person to the right job (4)



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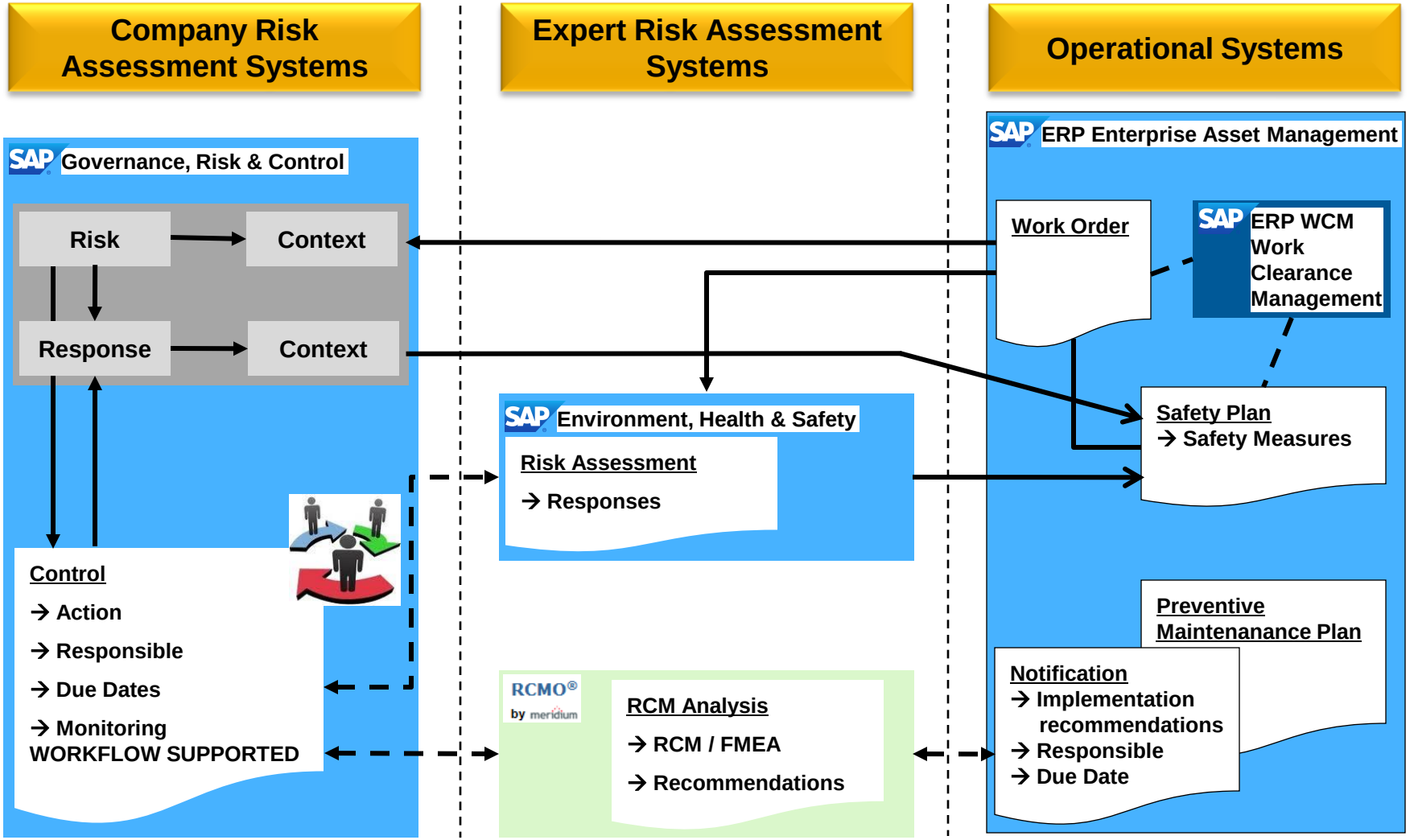
SAP Governance, Risk, and Compliance in relation to SAP Environment, Health and Safety and SAP EAM / WCM



!!! ATTENTION: Only 1 Risk Management solution can be linked to SAP EAM to propose the Work Order Safety Plan !!!

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Summary

Conclusions

- The economic burden of poor occupational safety and health practices is high.
- A ‘zero risk exposure’ situation executing maintenance activities should be targeted by each company.
- The ‘zero risk exposure’ target can only be met by implementing a coherent safety management process concentrating on the ability to recognize risks, to analyze consequences, to set priorities for mitigating actions and to control and check that those mitigating actions are implemented.
- A safety management process can only be implemented succesfully if in parallel a ‘safety culture’ is implemented: All employees should be ‘infected’ by the ‘safety gene’!
- The ‘Worker Safety’ functionality SAP will deliver as part of SAP ERP 6.0 EhP 6 supports the process targeting ‘zero *maintenance-related’* accidents/incidents can be met.

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April 28th: Workers' Memorial Day
'Remember the dead. Fight for the living!'

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May we, as SAP invite you to join us on our...

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Questions

Thank You!

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