

SAP Work Permit Management

Permit-to-Work Process in the Oil&Gas Industry



Stavanger, Sep 15th/16th 2015

Michael Lesk

Permit applies for date _____ Time from _____ To: _____ Work order no. _____																																	
1 The permit is renewed: (all items have been re-evaluated) Date: _____ Time from: _____ To: _____ Sign: _____ Date: _____ Time from: _____ To: _____ Sign: _____																																	
2 Installation: _____	Area: _____ Equipment: _____																																
3 Description of work: _____																																	
4 Need for entry permit <input type="checkbox"/> Yes <input type="checkbox"/> No Chemicals used in equipment: _____																																	
5 Safety check, operation responsible <table border="0"> <tr> <td>CO₂- / foam equipment to be closed <input type="checkbox"/></td> <td>Sign: _____</td> <td>Ventilation <input type="checkbox"/></td> <td>Sign: _____</td> </tr> <tr> <td>Pressure release <input type="checkbox"/></td> <td>_____</td> <td>Mechanical is secured <input type="checkbox"/></td> <td>_____</td> </tr> <tr> <td>Draining <input type="checkbox"/></td> <td>_____</td> <td>Radioactive isotopes <input type="checkbox"/></td> <td>_____</td> </tr> <tr> <td>Isolated with: Closed valves <input type="checkbox"/></td> <td>_____</td> <td>Fire detection system disconnected <input type="checkbox"/></td> <td>_____</td> </tr> <tr> <td>Locked valves <input type="checkbox"/></td> <td>_____</td> <td>Machinery secured from start-up <input type="checkbox"/></td> <td>_____</td> </tr> <tr> <td>Disconnecting <input type="checkbox"/></td> <td>_____</td> <td>Electrical power disconnected <input type="checkbox"/></td> <td>_____</td> </tr> <tr> <td>Blinds <input type="checkbox"/></td> <td>_____</td> <td>Checked by attempted start <input type="checkbox"/></td> <td>_____</td> </tr> <tr> <td></td> <td></td> <td>Need to point out cables, water, ventilation, sanitary etc. in the ground <input type="checkbox"/></td> <td></td> </tr> </table>		CO ₂ - / foam equipment to be closed <input type="checkbox"/>	Sign: _____	Ventilation <input type="checkbox"/>	Sign: _____	Pressure release <input type="checkbox"/>	_____	Mechanical is secured <input type="checkbox"/>	_____	Draining <input type="checkbox"/>	_____	Radioactive isotopes <input type="checkbox"/>	_____	Isolated with: Closed valves <input type="checkbox"/>	_____	Fire detection system disconnected <input type="checkbox"/>	_____	Locked valves <input type="checkbox"/>	_____	Machinery secured from start-up <input type="checkbox"/>	_____	Disconnecting <input type="checkbox"/>	_____	Electrical power disconnected <input type="checkbox"/>	_____	Blinds <input type="checkbox"/>	_____	Checked by attempted start <input type="checkbox"/>	_____			Need to point out cables, water, ventilation, sanitary etc. in the ground <input type="checkbox"/>	
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7 Specific instructions/information regarding work at height/ digging/ ex. zone etc. _____																																	
8 Energy control/lock out – Responsible sign: _____																																	
9 Control room / Operator in area is informed about work start-up Yes <input type="checkbox"/> No <input type="checkbox"/> sign _____																																	
10 Executing unit: _____ Work permit reviewed together with the operation unit. Defined safety actions completed.																																	
11 Comp./Installation: _____ tit _____ full name _____ sign _____ Operation responsible (Work permit granted) _____ Appointed responsible work executor: _____ Special sign: <input type="checkbox"/> EI resp. Sign: _____ Sign: _____ Name _____ <input type="checkbox"/> Crane resp. Sign: _____ _____ <input type="checkbox"/> Built/egg resp. Sign: _____																																	
12 Gas test <input type="checkbox"/> Yes <input type="checkbox"/> No _____ Responsible sign: _____ <table border="1"> <thead> <tr> <th></th> <th>Time</th> <th>Res.</th> <th>Gas</th> <th>Sign</th> <th>Time</th> <th>Res.</th> <th>Gas</th> <th>Sign</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Time	Res.	Gas	Sign	Time	Res.	Gas	Sign																							
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13 Installation that has been locked out is returned to normal operation _____ Sign _____ Work finished, checked and the workplace is cleaned up _____ Time _____ date _____ Sign: _____ Executing unit / Appointed responsible work executor _____ Work checked and equipment ready for operation _____ Time _____ date _____ Sign: _____ Operation responsible _____																																	

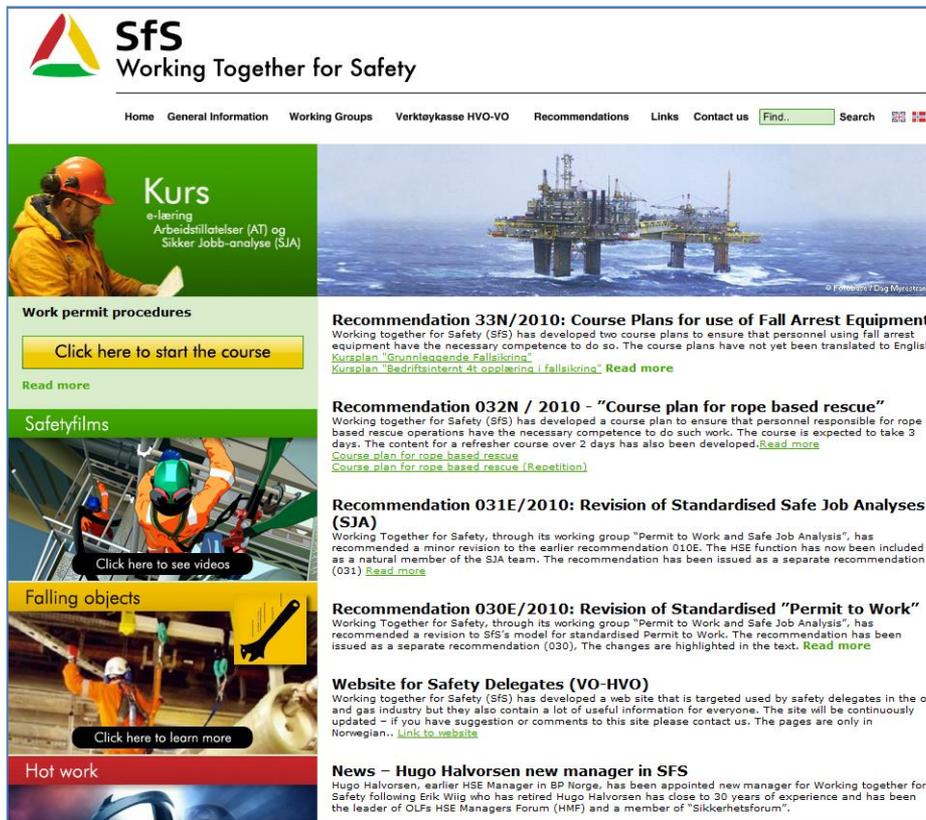




- **Typical High-Level Requirements for a PTW System**
- Basics on SAP WPM
- How to model an Oil&Gas PTW System in SAP WPM?
- Oil&Gas Safety Cockpit
- Related Topics
- Q&A



- NOG (formerly OLF) Guidelines
- Customer Input during SAP WPM Focus Group 2009-2011
- Further Feedback from SAP Oil&Gas Customers and Prospects



SFS
Working Together for Safety

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Kurs
e-læring
Arbeidsfyllatøser (AT) og
Sikker Jobb-analyse (SJA)

Work permit procedures
[Click here to start the course](#)
[Read more](#)

Safetyfilms
[Click here to see videos](#)

Falling objects
[Click here to learn more](#)

Hot work

Recommendation 33N/2010: Course Plans for use of Fall Arrest Equipment
Working together for Safety (SFS) has developed two course plans to ensure that personnel using fall arrest equipment have the necessary competence to do so. The course plans have not yet been translated to English. [Kursplan "Grunnleggende Fallsikring"](#), [Kursplan "Bedriftsinternt 4t opplæring i Fallsikring"](#). [Read more](#)

Recommendation 032N / 2010 - "Course plan for rope based rescue"
Working together for Safety (SFS) has developed a course plan to ensure that personnel responsible for rope based rescue operations have the necessary competence to do such work. The course is expected to take 3 days. The content for a refresher course over 2 days has also been developed. [Read more](#)
[Course plan for rope based rescue](#)
[Course plan for rope based rescue \(Repetition\)](#)

Recommendation 031E/2010: Revision of Standardised Safe Job Analyses (SJA)
Working Together for Safety, through its working group "Permit to Work and Safe Job Analysis", has recommended a minor revision to the earlier recommendation 010E. The HSE function has now been included as a natural member of the SJA team. The recommendation has been issued as a separate recommendation (031). [Read more](#)

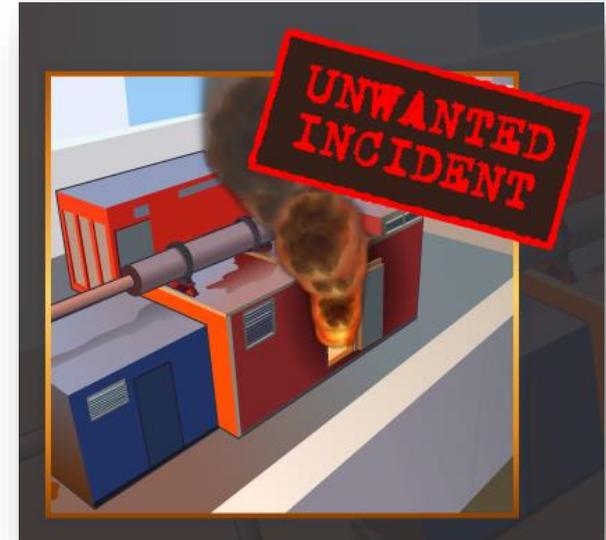
Recommendation 030E/2010: Revision of Standardised "Permit to Work"
Working together for Safety, through its working group "Permit to Work and Safe Job Analysis", has recommended a revision to SFS's model for standardised Permit to Work. The recommendation has been issued as a separate recommendation (030). The changes are highlighted in the text. [Read more](#)

Website for Safety Delegates (VO-HVO)
Working together for Safety (SFS) has developed a web site that is targeted used by safety delegates in the oil and gas industry but they also contain a lot of useful information for everyone. The site will be continuously updated - if you have suggestion or comments to this site please contact us. The pages are only in Norwegian.. [Link to website](#)

News – Hugo Halvorsen new manager in SFS
Hugo Halvorsen, earlier HSE Manager in BP Norge, has been appointed new manager for Working together for Safety following Erik Wiig who has retired. Hugo Halvorsen has close to 30 years of experience and has been the leader of OLFs HSE Managers Forum (HMF) and a member of "Sikkerhetsforum".



- The main objective of a PTW system is to ensure that all aspects related to elements of risk in work activities are taken into consideration in the planning, approval, preparation, execution and completion of work.
- By using work permits (WPs), you can make sure that safety measures for carrying out certain work are complied with, and that such measures are retained until they are not requested anymore.



- Work permits of level 1 are used for work that involves high risks and hazards. This work requires a comprehensive safety and approval process. It includes hot work, work in an area with special entry restrictions, and so on.
- Level 1 work permits are usually valid for only one working shift. An extension of the work permit is only possible under certain restrictions, e.g. for a max. of 4 hours; afterwards, the work permit can no longer be extended. If the work is not yet completed at this point in time, a new work permit has to be created for the next day.



- Work permits of level 2 are used for all work with lower risks/hazards.
- This work shall also be completed within a predefined time period, although the time period is defined more generously (for example: 14 days).



Typical PTW Process – Work Permit Level 2

13:00

17:00
Coordination Meeting

07:00

19:00

Senior approver

Advisor – HSE function (only offshore)

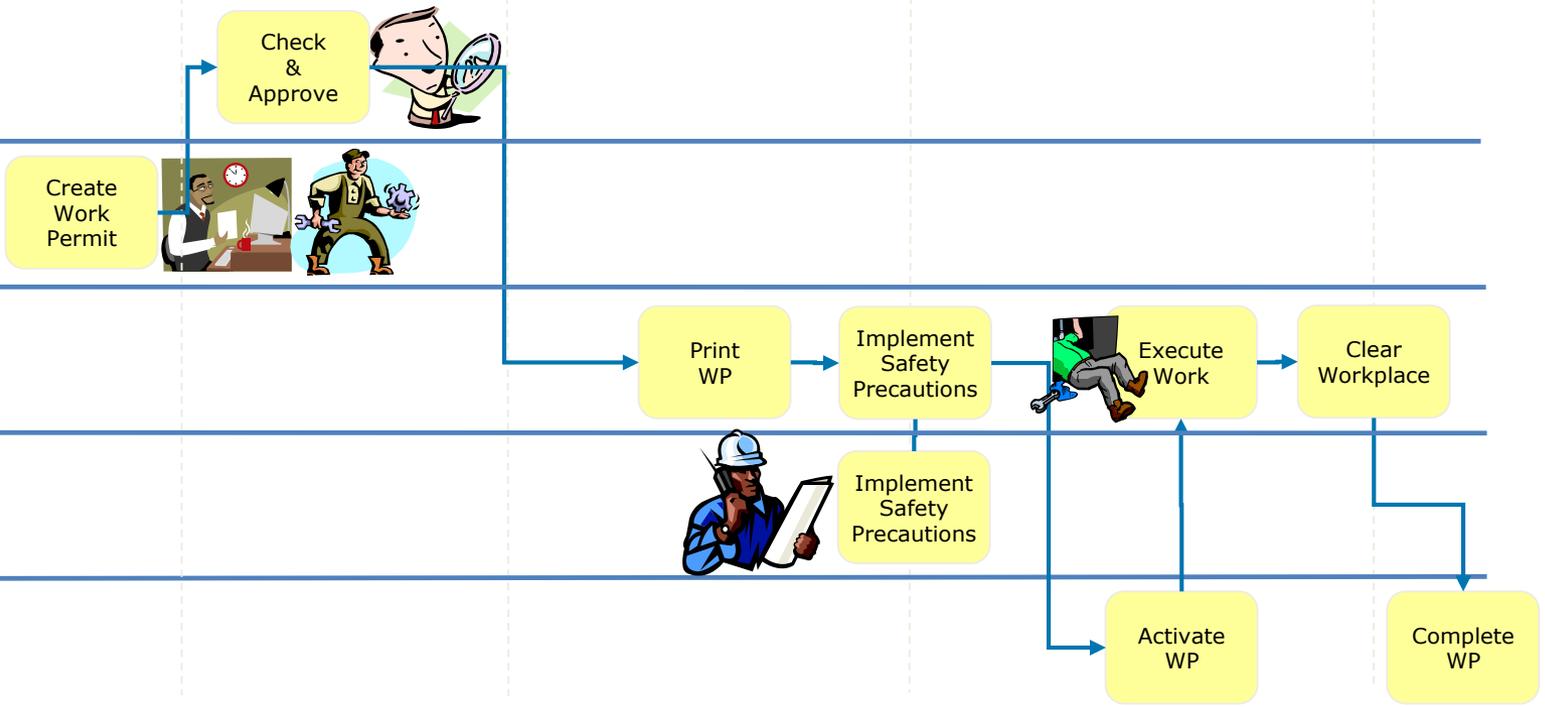
Approver – area operation supervisor

Applicant

Executor – skilled worker

Area technician

CCR technician



Roles in the Work Process for Work Permits



Applicant



CCR Technician

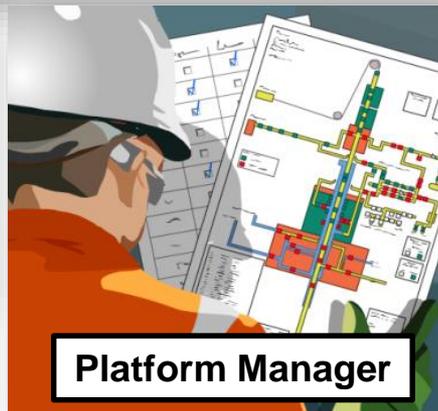
Operations Supervisor



Area Technician



Skilled Worker



Platform Manager



HSE Function

- Integration into SAP EAM System / Work Order Processing
- Usage of SAP Master Data (Functional Location / Equipment)
- Support of industry-specific Safety Procedure Standards
- Process Configuration of Different Work Permits
- Integration of Lockout/Tagout Process
- Conflict Verification during Lockout/Tagout
- Integration of Job Safety Analysis
- Dedicated Safety Approval Processes
- Traffic Light Indicators for Safety Situation
- Flexible Authorization Control
- Library of Approved Templates for Work Permits + Safety Certificates





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- Work clearance module created in R/2 as **utility customer project** (begin of the 1990s)
- WCM Focus Group (SAP + customers) worked together on an enhanced WCM system as part of an **R/3 industry solution** (1996-1999)
- Due to strong demands across industries, SAP WCM was integrated in **R/3 standard** (2000)
- WCM Focus Group revival in 2005 with yearly WCM Info Days as **co-innovation platform for further enhancements** (e.g. Mobile WCM, BAdIs, Flexible UI)
- Dedicated WPM Focus Group (SAP + Statoil / ConocoPhillips) established in 2009 as **co-innovation platform for a WPM system** for all asset-intensive industries (particularly Oil&Gas)
- First **delivery of WPM system** as part of SAP WCM in 2011
- First **delivery of Web-UI-based WPM system** (“EAM Worker Safety”) in 2012

Target Industries: Asset-Intensive Industries

- Project with SAP-WCM customers to develop a standard permit to work solution meeting requirements of the Oil & Gas industry.



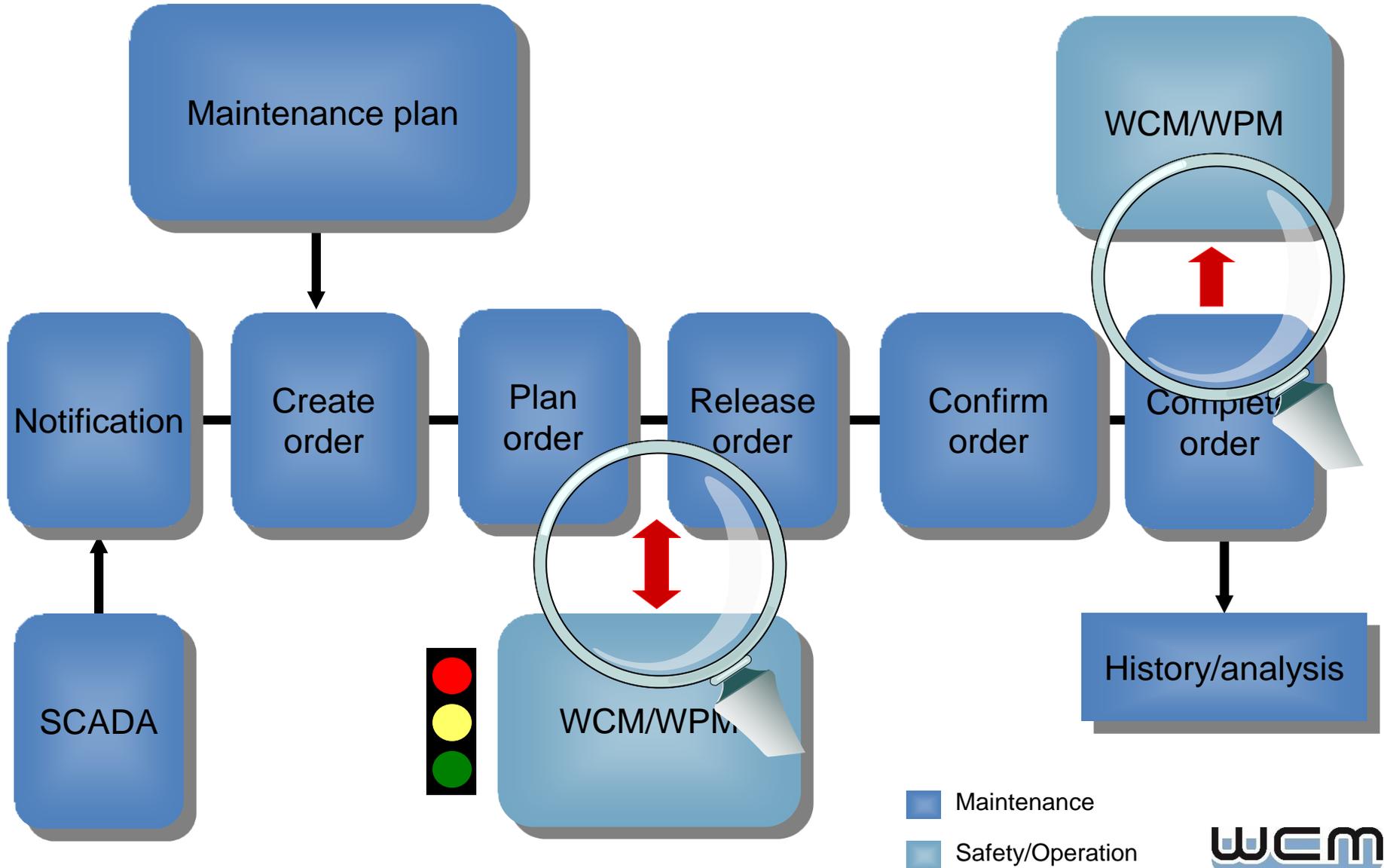
- Target industries addressed by the final SAP-WCM standard solution:

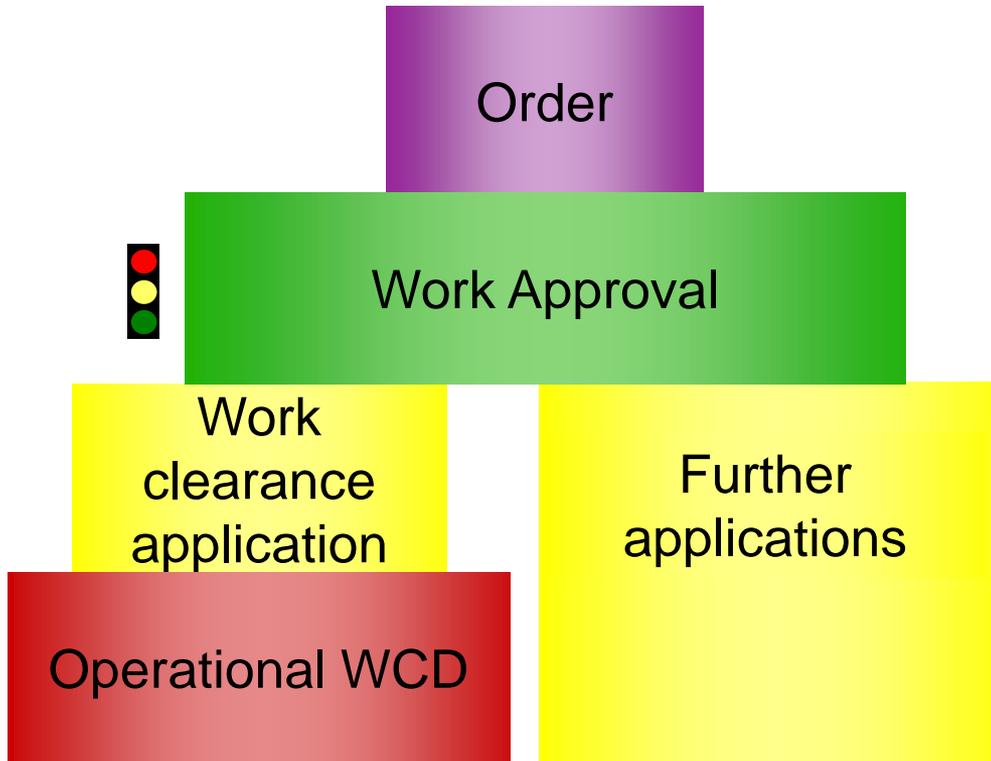
- **Oil & Gas** industry, **Utility** industries, **Chemical** industry, **Mill & Mining** industry.
- Other **asset intensive industries** having respective requirements concerning working with WPs.

- Existing functionality in SAP-WCM was enhanced, so that all target industries can configure their individual work processes for work permits in WCM customizing.

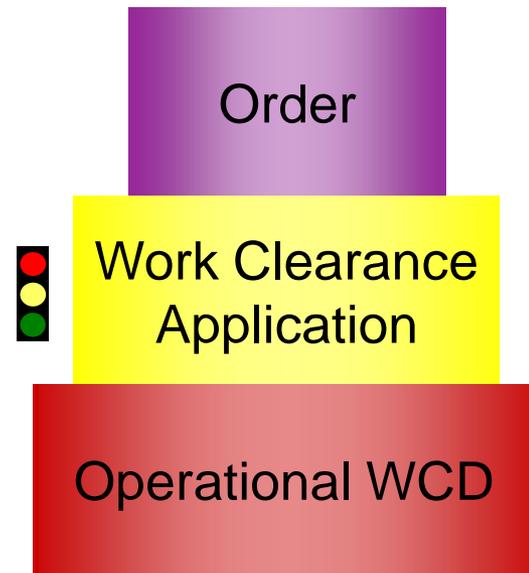
Process and system changes pose significant challenges to organizations, especially those that are widespread and currently utilize different methodologies.







Enhanced model (4 layers)



Standard model (3 layers)

- The SAP WPM system is obtained by dedicated configuration settings in SAP's Work Clearance Management (SAP-WCM) component.
- A major difference between a classic WCM system and a WPM system is the **integration between WCM safety applications and EAM maintenance orders**: In classic WCM, a safety application assigned to an order (e.g. a work clearance application) was always valid for the whole duration of the related safety-relevant maintenance work.
 - The sequential assignment of several safety applications (each of them e.g. valid on a daily basis only, with possibly different safety specifications) to the maintenance order was not supported.
 - Similar restrictions applied (at least in the WCM standard model) if safety applications were to be separated according to a dedicated job (e.g. radiation permit, hot work permit) or based on general risk evaluations (e.g. high risk, normal risk).

- Such scenarios are exactly where the new process of Working with Work Permits comes into play.
 - WPM supports the direct **assignment of several safety applications (work permits) to the order**, separated according to validity, dedicated job criteria or general risk evaluations.
 - The support of such scenarios is representing a decisive factor for the transition process of SAP-WCM from a rather Utilities-driven component to a generalized work permit system which is meant to be broadly applicable across industries.
- Another important business feature supported in WPM is that **every work permit can be assigned to different types of safety certificates** (no more only Operational WCDs like in classic WCM, but all kind of certificates ensuring job safety in a specified context).

Work Order



Work Permits



Safety Certificates



PERMIT TO WORK
ISSUED FOR
SWANBANK POWER
B Station
Issued: 30.04.2003 16:56:35

Plant Covered: SB1ERB31AP001 B1 A FUEL OIL PUMP
TAILED DESCRIPTION
Work to be Done: DISCONNECT MOTOR

2 Isolation: This plant has been isolated in Accordance with the following Isolation List:
Issued: 30.04.2003 16:56:35

WCD No Short Text
20001101 DISCONNECT MOTOR

3 Issue of Permit To Work:
Work to be Done: DISCONNECT MOTOR

I understand the duties of PTW Officer:
PTW Officer: Print Name: _____
I understand the duties of DIC Work:
OIC Name: Operator Hartfiel KW

Transfer of Permit To Work:
I hereby transfer this Permit To Work under the conditions stated:

Isolated Space Closed up:
I understand the duties of DIC Work, and accept this PTW isolated under the conditions stated:
OIC Name: Operator Hartfiel KW

Transfer of Permit To Work:
I hereby transfer this Permit To Work under the conditions stated:

Isolated Space Closed up:
I understand the duties of DIC Work, and accept this PTW isolated under the conditions stated:
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Transfer of Permit To Work:
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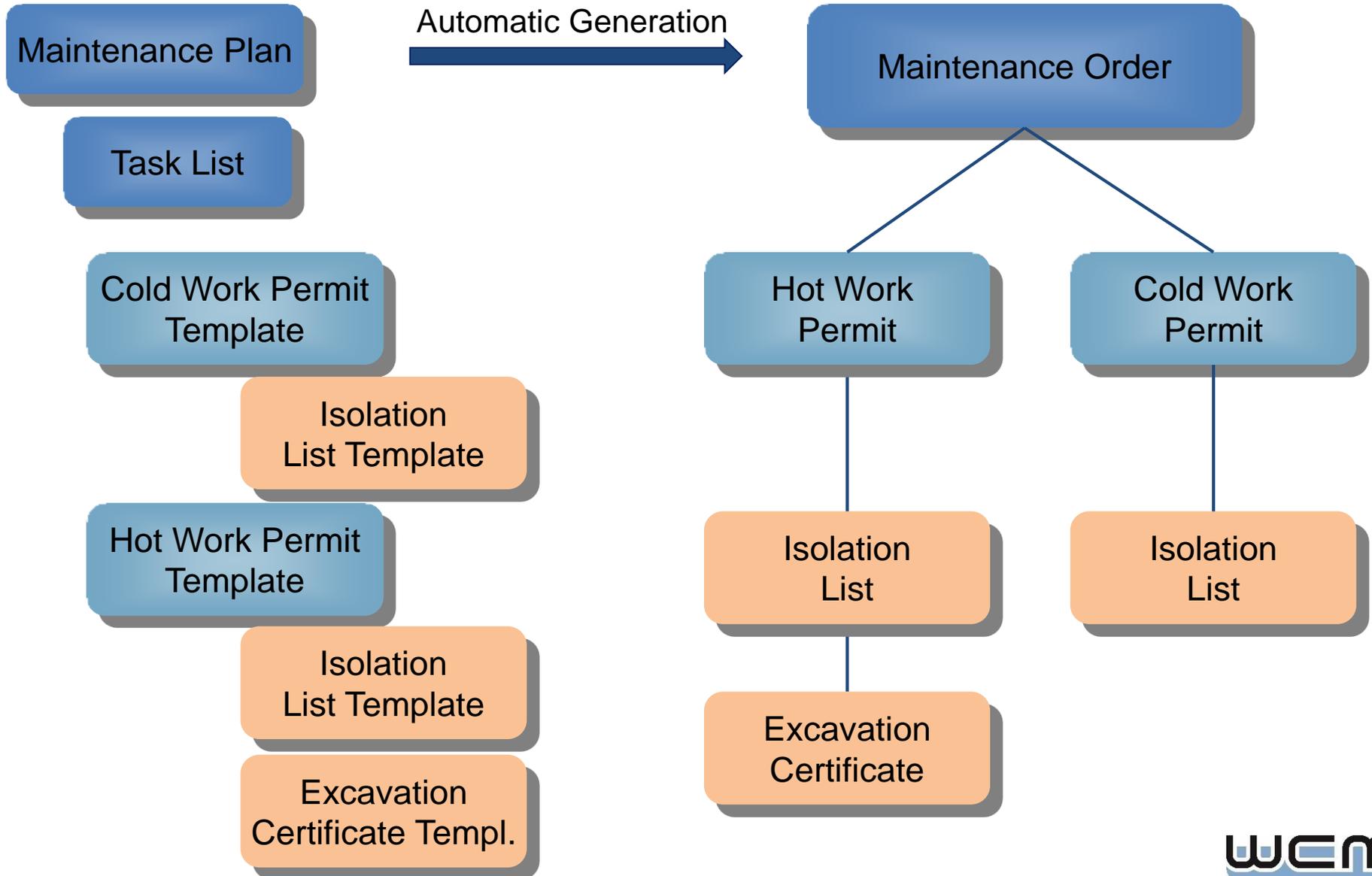


- Risk-related WPs
 - Work Permit Level 1
 - Work Permit Level 2
- WPs related to dedicated jobs
 - Hot Work Permit
 - Cold Work Permit
- ...

- Isolation Lists
 - Electrical Isolation List
 - Valve & Blind List
- General Job Safety Certificates
 - Excavation Certificate
 - Diving Certificate
- ...

All individually configurable in SAP-WCM Customizing...







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- All **industry-specific work permits** (WP level 1, WP level 2, both onshore and offshore) can be individually configured as work permits in SAP WPM.
- The requirement for **different WP approval processes** can be represented easily by different approval hierarchies in SAP WPM, depending on the plant / functional location (→ onshore or offshore) as well as on the WP level (→ 1 or 2).
- All **industry-specific isolation lists** (electrical isolation list, full V&B list, simplified V&B list, heat trace log) can be individually configured as safety certificates in SAP WPM.
- The requirement for **different isolation approval processes** can be represented easily by different approval hierarchies in SAP WPM, depending on isolation list type (e.g. full V&B list vs. simplified V&B list).
- The **roles** involved in the different approval processes can be represented easily as partners in SAP WPM, with appropriate **authorizations** for the underlying SAP users.
- **Industry-specific job safety analyses** can be individually configured as safety certificate in SAP WPM.
- A dedicated **risk assessment process** as part of a JSA can be implemented by means of the SAP EHSM system.
- The requirement for **individual layout and I/O fields** of all types of WPs and safety certificates can be individually configured as different view profiles in SAP; customer-specific I/O fields can be added by screen BADIs wherever required.

Oil&Gas WP Level 2 Onshore with Lockout/Tagout

Sample demo process (shown by dedicated "Oil&Gas Safety Cockpit")



WP Appliance:

Maintenance planner applies for a **L2-WP** for his maintenance order



WP Review (Operations):

Op. supervisor enhances the WP, particularly by a small **electrical isolation list**; finally, he **approves** both the isolation list and the WP
NB: Operations may also set up and execute a **SJA**



Printout Preparation:

At the end of the daily WP meeting, all approved **WPs** will be **printed**, as well as **tagging lists** and **tags**

General information on the safety process could be provided in the Safety Cockpit as well,

e.g.:

- Link to company-specific process flow + related documentation (Intranet)
- Link to general safety process guidelines (Internet), e.g. from Norwegian Oil & Gas Association



Untagging List Execution:

Op. worker **executes untagging** operations and **removes tags**; afterwards, the CCR operator **confirms** the untagging operations in the system and **closes the isolation list**



Repair Work Execution:

Maint. worker **performs repair work**; after work completion + review with area technician, the WP is returned to the CCR operator who **closes the WP** in the system and **prints** the applicable **untagging lists**.



WP Safety Execution:

Maint. worker **executes WP** safety precautions in cooperation with area technician; afterwards, the CCR operator **releases** the WP in the system



Tagging List Execution:

Op. worker **executes tagging** operations and **hangs tags**; afterwards, the CCR operator **confirms** the tagging operations in the system

Oil&Gas WP Level 1 Offshore with Lockout/Tagout

Sample demo process (shown by dedicated "Oil&Gas Safety Cockpit")



WP Appliance:
Maintenance planner applies for a **L1-WP** for his maintenance order



WP Review (Operations):
Op. supervisor enhances the WP, particularly by a simplified **V&B list**; finally, he **approves** both the V&B list and the WP
NB: Operations may also set up and execute a **SJA**



WP Review (HSE):
HSE function reviews the WP and enhances it if necessary; finally, he **approves** the WP



WP Review (Senior):
In a daily WP meeting, all L1-WPs for the next day are reviewed; finally, the senior approver issues the **final approval** for the L1-WPs



Printout Preparation:
At the end of the meeting, all approved **WPs** will be **printed**, as well as **tagging lists** and **tags**

General information on the safety process could be provided in the Safety Cockpit as well, e.g.:

- Link to company-specific process flow + related documentation (Intranet)
- Link to general safety process guidelines (Internet), e.g. from Norwegian Oil & Gas Association



Untagging List Execution:
Op. worker **executes untagging** operations and **removes tags**; afterwards, the CCR operator **confirms** the untagging operations in the system. After **successful test** by operations, he **closes the V&B list**



Repair Work Execution:
Maint. worker **performs repair work**; after work completion + review with area technician, the WP is returned to the CCR operator who **triggers the WP test cycle** and **prints** the applicable **untagging lists** for testing



WP Safety Execution:
Maint. worker **executes WP safety** precautions in cooperation with area technician; afterwards, the CCR operator **releases** the WP in the system



Tagging List Execution:
Op. worker **executes tagging** operations and **hangs tags**; afterwards, the CCR operator **confirms** the tagging operations in the system

- Fully in the SAP backend system:
 - Very simple:
 - User Favorites using SAP-WCM transactions
 - Implementation:
 - Customer-specific SAP backend cockpit reusing SAP-WCM transactions / APIs
- Other Frontend UIs:
 - Quite simple:
 - Customer-specific SAP Screen Personas UI (similar to SAP GuiXT) reusing SAP-WCM transactions in the backend system in a customer-tailored way
 - Implementation:
 - Customer-specific NWBC Web Dynpro UI reusing SAP-WCM APIs in the backend
 - NB: Dedicated EAM/WPM process (order ↔ work permits ↔ safety certificates) already supported by SAP standard as NWBC Web UI scenario („Worker Safety“)
 - Customer-specific SAP Fiori UI / Apps reusing SAP-WCM APIs in the backend
 - NB: Support of WCM Fiori Apps also in the SAP standard pipeline (first to come: Mobile Lockout/Tagout)



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Sample for a Simple Oil&Gas Safety Cockpit

Central point-of entry built with SAP Screen Personas



SAFETY COCKPIT

Oil & Gas

APPLY

REVIEW

PREPARE

EXECUTE

EXTEND / CLOSE

OTHER FUNCTIONS

DOCUMENTS

DASHBOARD



Preliminary Remarks on the Built Sample Cockpit



- Cockpit provides a logical process flow for the typical PTW process
 - Some steps could be summarized if requested. For example, the cockpit provides dedicated approval steps for each person involved in the WP approval process
 - Operation Supervisor
 - HSE Function (offshore WPs)
 - Senior Approver (WPs Level 1)
 - Some steps could be partially or fully automated if requested, e.g. the WP print after a WP has been fully approved
- The demo processes shown with the sample cockpit are just configured examples; SAP-WCM configuration supports adaptation wherever required
- No-user specific hiding of functions that are not applicable to him
 - Authorization checks during function processing instead

Demo – WP L2 Onshore with Lockout/Tagout

WP Appliance by Maintenance Planner – Edit Order from Worklist



List Edit Goto Order Environment Settings System Help

Change PM Orders: List of Orders

S	Order	Description	Functional Location	Bsc start	Basic fin.	System status	WPs	Phase
	821580	Repair AAZ	AAZ	12.09.2015	12.09.2015	WCM CRTD MANC NMAT PRC		
	821581	Repair BBZ II	BBWS01	13.09.2015	13.09.2015	WCM EXEC LRRA REL NMAT PRC		
	821582	Repair Pump For Cooling, Unit 3	AAZ	13.09.2015	13.09.2015	WCM CRTD MANC NMAT PRC		

Order Edit Goto Extras Environment System Help

Change Maintenance Order 821582: Central Header

Order: PM01 821582 Clean Pump For Cooling, Unit 3

Sys.Status: WCM EXEC CRTD MANC NMAT PRC

Work Permits Work completed

HeaderData Operations Components Costs Partner Object

Person responsible
PlannerGrp: / 3200
Mn.wk.ctr: MECHANIK / 3200 Mechanical mainte...
Person Res...

Dates
Bsc start: 13.09.2015 Priority:
Basic fin.: 13.09.2015 Revision:

Reference object
Func. Loc.: AAZ Pump for Cooling, Unit3
Equipment:
Assembly:
UII:

First operation
Operation: Repair Pump For Cooling, Unit 3 Cckey: Calculate work
WkCtr/Plnt: MECHANIK / 3200 Ctrl key: PM01 Acty Type: 1410
Work durtn: # Number: 1 Oprtn dur.: #
Person. no:

No Work Permits Assigned Yet

Selection

Desc.WCMO
WP Level 1
WP Level 2



Demo – WP L2 Onshore with Lockout/Tagout WP Appliance by Maintenance Planner – Create + Save WP L2



Create WP Level 2

Save icon (1) | Undo (2) | Redo | Cancel | Print | Refresh | Help | Settings

Create WP Level 2 2

Safety Certificates | PPE

Work Permit: Clean Pump For Cooling, Unit 3 | 002 | Phase: Planning Phase

Work description | Safety precautions | Approval process | Area Overview

Applicant

Partner: C5114682 | Michael Lesk

Safety Validity

Status	CRTE				
Valid from	15.09.2015	08:00:00	Valid to	29.09.2015	08:00:00

Safety Organization

Planner group: / 3200
Work Center: MECHANIK / 3200 | Mechanical maintenance

Work Level 2

Cleaning Work 1
 Demolition Work
 Restructuring Work
 Painting Work

Work Level 2 (cont.)

Replacing Lamps
 Ventilation
 Water Supply
 Checking

Work Description

Work Order

Order: 821582 | Repair Pump For Cooling, Unit 3
Status: WCM CRTD MANC NMAT PRC

Installation Data

Functional loc.: AAZ | Pump for Cooling, Unit3
Equipment:

Location Data

MaintPlant: 3200 | Atlanta
Location: 1 | Production Area 3200/01
Plant section:



Demo – WP L2 Onshore with Lockout/Tagout

WP Review by Op. Supervisor – Need for creating EI. Isolation List



Work Permit Edit Goto Extras Settings System Help

Op. Supervisor - Change Orders with Work Permits

Order	WorkPe...	Short Text	Functional Location	Valid from	Valid from	Valid to	Valid to	Ext..	Phase	System status	Approvals	Assg...	Catal..	Docu...	Partn...
821582	21100	Clean Pump For Cooling, U...	AAZ	15.09.2015	08:00:00	29.09.2015	08:00:00	0	CRTE		OO				

WP Level 2 Edit Goto Extras System Help

Change WP Level 2

Safety Certificates

Work Permit: 21100 Clean Pump For Cooling, Unit 3

Work description: Safety precautions

Precautions (General)

- Depressurization
- Job Safety Analysis
- Lockout/ Tagout

Precautions (Area Technician)

- Draining/Emptying
- Cng/HC Freeing
- Regular Inspection

Safety Certificates

Table with 2 columns: Certif., Short Text

Usage of WCM Object (5) 6 Entries found

Usage	Short Text
001	Electrical Isolation List
002	Valve & Blind List
003	Heat Trace Log
0MB	Isolation List (Mobile)
0S2	Valve & Blind List (Simplified)
SJA	Safety Job Analysis

WC Document: WCDT01AA0001

Short Text: Fibre Glass Helmet, Helmet with Light, Safety Helmet with Ra..., Safety Helmet Withou..., Breathing Apparatus, Pollution Mask

LT Checkbox

No Safety Certificates Assigned Yet

Creation based on Approved Isolation List Template



Demo – WP L2 Onshore with Lockout/Tagout

WP Review by Op. Supervisor – Create + Approve El. Isolation List



Create Electrical Isolation List: Header

Certificate: 1 EIL: AA Pump for Cooling, Unit 3 001 Phase: Planning Phase

Safety Validity: Status: CRTE, Valid from: 04.09.2015 00:00:00, Valid to: 09.09.2016 00:00:00

Safety Organization: Planner group: EH / 3200 Eric Hansen, Work Center: WCM3200 / 3200 Safety Department

Installation Data: Functional loc.: AAZ, Equipment: Pump for Cooling, Unit3

Location Data: MaintPlant: 3200 Atlanta, Location: 1, Production Area 3200/01, Plant section:

Remarks (Isolation):

1. Electrical isolations on the motor and its parts must ALWAYS be carried out by authorized personnel and in accordance to the local codes.
2. Any work on the pump should be carried out by at least 2 people.
3. When approaching the pump always be properly dressed and/or wear safety equipment (hard hat, safety glasses, safety shoes etc).

Linked Documents:

Ty.	Document	DPT	Vr	Description
0001	P-1000	001	00	Assembly drawing for pump

Work Permits:

WorkPermit	Short Text	Approvals	Functional Location	Equipment	Valid	Valid from	Valid to	System status	User Status
21100	Clean Pump For Cooling, Unit 3	OO	AAZ		▲	15.09.2015	29.09.2015	CRTE	

Electrical Isolation List

Create Electrical Isolation List: Maintenance Screen

Certificate: EIL: AA Pump for Cooling, Unit 3 1 / 1

Status: CRTE

1	2	It...	IC	Technical Object	Short Text	OG	Tag. Cond.	TT	TS	Untag.Cond.	UT	US	BIT	Ph	Lock	TR	PF	Tag	LT	DL	Tagging Comment
		10	F	AAZP	Power	E	OFF	X	1	ON	X	3				✓	E001				
		20	F	AAZFC	Fuel Gas Compressor	E	GROUNDED	X	2	UNGROUNDED	X	2				✓	E001				
		30	F	AAZSI	Sea Water Injection	E	GROUNDED	X	3	UNGROUNDED	X	1				✓	E001				



Demo – WP L2 Onshore with Lockout/Tagout

WP Review by Op. Supervisor – Approve WP



Change WP Level 2

Change WP Level 2

Work Permit: 21100, Clean Pump For Cooling, Unit 3, 002, Phase: Planning Phase

Safety precautions | Approval process | Area Overview

Precautions (General)

- Depressurization
- Job Safety Analysis
- Lockout/Tagout

Precautions (Area Technician)

- Draining/Emptying
- Cng/HC Freeing
- Regular Inspection

Safety Certificates

Certif.	Short Text	Approvals	Functional Location	Equipm
10001200	EIL: AA Pump for Cooling, U...	•••	AAZ	
Electrical Isolation List Just Created				

Linked Documents

Ty.	Document	DPT	Vr	Description

Precautions (Skilled Worker)

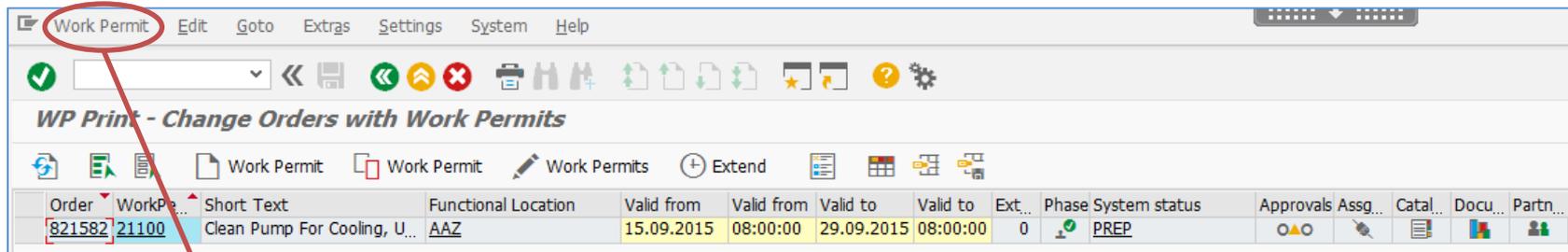
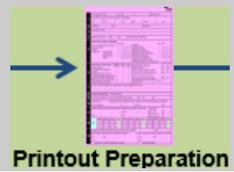
- Barriers/Signs
- On-Site Instruction
- Protective Equipment

PPE

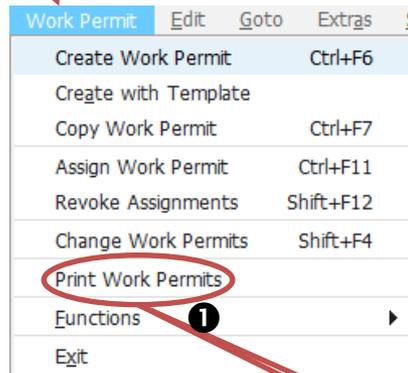
Sort field	Co...	Short text	Code	Description	Short Text	LT	Checkbox
	ZSO...	Statoil Saf...	01	Ear Protector		<input type="checkbox"/>	
	ZSO...	Statoil Saf...	03	Safety Goggle & Eye S...		<input type="checkbox"/>	
	ZSO...	Statoil Saf...	06	Fibre Glass Helmet		<input type="checkbox"/>	
	ZSO...	Statoil Saf...	07	Helmet with Light		<input type="checkbox"/>	
	ZSO...	Statoil Saf...	10	Safety Helmet with Ra...		<input type="checkbox"/>	
	ZSO...	Statoil Saf...	11	Safety Helmet Withou...		<input type="checkbox"/>	
	ZSO...	Statoil Saf...	12	Breathing Apparatus		<input type="checkbox"/>	
	ZSO...	Statoil Saf...	15	Pollution Mask		<input type="checkbox"/>	

Demo – WP L2 Onshore with Lockout/Tagout

Printout Preparation - WP Print

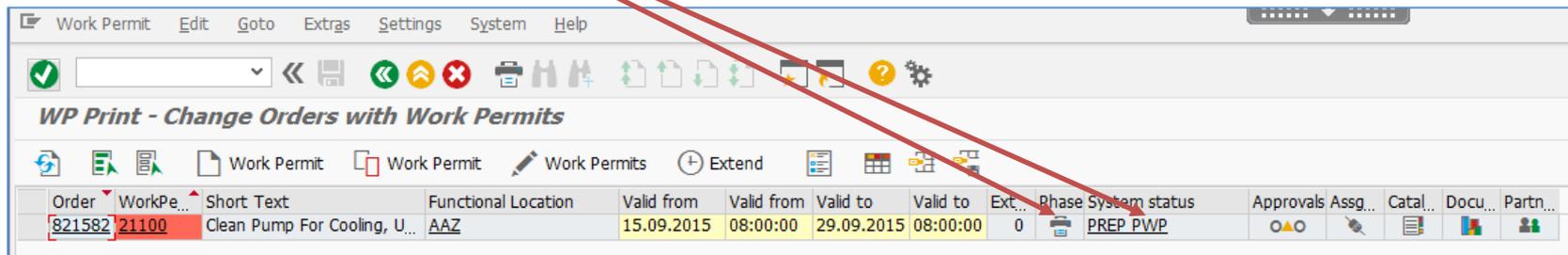


Order	WorkPe...	Short Text	Functional Location	Valid from	Valid from	Valid to	Valid to	Ext...	Phase	System status	Approvals	Assg...	Catal...	Docu...	Partn...
821582	21100	Clean Pump For Cooling, U...	AAZ	15.09.2015	08:00:00	29.09.2015	08:00:00	0	PREP	PREP					



- Work Permit
- Edit
- Goto
- Extras
- Settings
- System
- Help
- Create Work Permit (Ctrl+F6)
- Create with Template
- Copy Work Permit (Ctrl+F7)
- Assign Work Permit (Ctrl+F11)
- Revoke Assignments (Shift+F12)
- Change Work Permits (Shift+F4)
- Print Work Permits**
- Functions (1)
- Exit

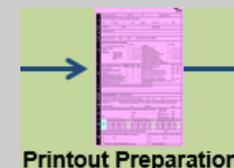
WP Print is often a mass function, could even be triggered automatically



Order	WorkPe...	Short Text	Functional Location	Valid from	Valid from	Valid to	Valid to	Ext...	Phase	System status	Approvals	Assg...	Catal...	Docu...	Partn...
821582	21100	Clean Pump For Cooling, U...	AAZ	15.09.2015	08:00:00	29.09.2015	08:00:00	0	PREP	PREP PWP					

Demo – WP L2 Onshore with Lockout/Tagout

Printout Preparation – Tagging List / Tag Print



Safety Certificate Edit Goto Settings System Help

Tagging List Print - Change Safety Certificates

Safety Certificates

Certificate	Usg.	Short Text	Functional Location	Valid from	Valid to	System status	Approvals	Maint.Scr.	SwitchSc...	Ass...	Docu...	Partn...
10001200	001	EIL: AA Pump for Cooling, Unit...	AAZ	14.09.2015	09.09.2016	PREP ITG						

Electrical Isolation List Edit Goto Extras Switch System Help

Change Electrical Isolation List: Switching Screen

Tag

Certificate: 10001200
Status: PREP ITG

CONF	ITG	PIAG	ETG	BUG	EUG	PROT
0	3	0	0	0	0	0

Print

- Operational List
 - Tagging List
 - Untagging List
- Copies
 - 3 ITG
- Preprint Tag

1	2	It...	IC	Technical Object	Short Text	OG	Tag. Cond.	TS	Untag.Cond.	US	System status	BIT	Ph	Lock	TR	PF	Tag	LT	DL	Tagging Comment
		10	F	AAZP	Power	E	OFF	1	ON	3	ITG						E001			
		20	F	AAZFC	Fuel Gas Compressor	E	GROUND	2	UNGROUND	2	ITG						E001			
		30	F	AAZSI	Sea Water Injection	E	GROUND	3	UNGROUND	1	ITG						E001			

Demo – WP L2 Onshore with Lockout/Tagout Safety Execution – Tagging List Confirmation (after its Execution)



Safety Certificate Edit Goto Settings System Help

Tagging List Confirmation - Change Safety Certificates

Safety Certificates

Certificate	Usg.	Short Text	Functional Location	Valid from	Valid to	System status	Approvals	Maint.Scr.	SwitchSc...	Ass...	Docu...	Partn...
10001200	001	EIL: AA Pump for Cooling, Unit...	AAZ	14.09.2015	09.09.2016	PREP PROC PTAG	○▲○	🔧	🔗	🔍	📊	👤

Electrical Isolation List Edit Goto Extras Switch System Help

Change Electrical Isolation List: Switching Screen

Tagged

Certificate: 10001200 EIL: AA Pump for Cooling, Unit 3 1 / 1

Status: PREP PROC PTAG

CONF	ITG	PTAG	EIG	BUG	EUG	PROT
0	0	3	0	0	0	0

1	2	It...	IC	Technical Object	Short Text	OG	Tag. Cond.	TS	Untag.Cond.	US	System status	BIT	Ph	Lock	TR	PF	Tag	LT	DL	Tagging Comment
	10	F	AAZP	Power	E	OFF	1	ON	3	PTAG				☑	E001	10001081				
	20	F	AAZFC	Fuel Gas Compressor	E	GROUNDED	2	UNGROUNDED	2	PTAG				☑	E001	10001082				
	30	F	AAZSI	Sea Water Injection	E	GROUNDED	3	UNGROUNDED	1	PTAG				☑	E001	10001083				

Demo – WP L2 Onshore with Lockout/Tagout Safety Execution – WP Safety Confirmation (after its Execution)



Work Permit Edit Goto Extras Settings System Help

WP Safety Confirmation - Change Orders with Work Permits

Work Permit Work Permit Work Permits Extend

Order	WorkPe...	Short Text	Functional Location	Valid from	Valid from	Valid to	Valid to	Ext...	Phase System status	Approvals	Assg...	Catal...	Docu...	Partn...
821582	21100	Clean Pump For Cooling, U...	AAZ	15.09.2015	08:00:00	29.09.2015	08:00:00	0	PREP PWP					

Approvals - WP Level 2

Permit	Short Text	Cat	Pr	LT	PI	Approv. by	Ent. by
OPER_SUPER	Area / Operation Supervisor	9					CS11461
APPROVED	Pre-Approved						CS11461
TAGGED	Tagged/Released	1					CS11461
RELEASED	Released by CCR Operator	0					

Issue Revoke

Work Permit Edit Goto Extras Settings System Help

WP Safety Confirmation - Change Orders with Work Permits

Work Permit Work Permit Work Permits Extend

Order	WorkPe...	Short Text	Functional Location	Valid from	Valid from	Valid to	Valid to	Ext...	Phase System status	Approvals	Assg...	Catal...	Docu...	Partn...
821582	21100	Clean Pump For Cooling, U...	AAZ	15.09.2015	08:00:00	29.09.2015	08:00:00	0	PREP PWP					

Demo – WP L2 Onshore with Lockout/Tagout Closure – Close WP (after Repair Work Execution)



Work Permit | Edit | Goto | Extras | Settings | System | Help

WP Closure - Change Orders with Work Permits

Order	WorkPe...	Short Text	Functional Location	Valid from	Valid from	Valid to	Valid to	Ext...	Phase System status	Approvals Assg...	Catal...	Docu...	Partn...
821582	21100	Clean Pump For Cooling, U...	AAZ	15.09.2015	08:00:00	29.09.2015	08:00:00	0	PREP PWP	OO			

Work Permit | Edit | Goto | Extras | Settings | System | Help

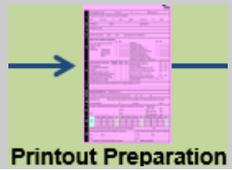
- Create Work Permit Ctrl+F6
- Create with Template
- Copy Work Permit Ctrl+F7
- Assign Work Permit Ctrl+F11
- Revoke Assignments Shift+F12
- Change Work Permits Shift+F4
- Print Work Permits
- Functions
 - Set Prepared
 - Revoke Prepared
 - Close
 - Reje...
 - Deactivate
 - Activate
 - Set Deletion Flag
 - Remove Deletion Flag
- Exit

Work Permit | Edit | Goto | Extras | Settings | System | Help

WP Closure - Change Orders with Work Permits

Order	WorkPe...	Short Text	Functional Location	Valid from	Valid from	Valid to	Valid to	Ext...	Phase System status	Approvals Assg...	Catal...	Docu...	Partn...
821582	21100	Clean Pump For Cooling, U...	AAZ	15.09.2015	08:00:00	29.09.2015	08:00:00	0	PREP PWP CLSD	OO			

Demo – WP L2 Onshore with Lockout/Tagout Closure – Untagging List Print



Safety Certificate Edit Goto Settings System Help

Untagging List Print - Change Safety Certificates

Safety Certificates

Certificate	Usg.	Short Text	Functional Location	Valid from	Valid to	System status	Approvals	Maint.Scr.	SwitchSc...	Ass...	Docu...	Partn...
10001200	001	EIL: AA Pump for Cooling, Unit...	AAZ	14.09.2015	09.09.2016	PREP PROC UNT ETG	OO					

Electrical Isolation List Edit Goto Extras Switch System Help

Change Electrical Isolation List: Switching Screen

Untag

Certificate: 10001200
 Status: PREP PROC UNT ETG

CONF	ITG	PTAG	ETG	BUG	EUG	PROT
0	0	0	3	0	0	0

Print

- Operational List
- Copies
- Preprint Tag
- Tagging List
- Untagging List

1	2	It...	IC	Technical Object	Short Text	OG	Tag. Cond.	TS	Untag.Cond.	US	System status	BIT	Ph	Lock	TR	PF	Tag	LT	DL	Tagging Comment
		10	F	AAZP	Power	E	OFF	1	ON	3	ETG				✓	E001	10001081			
		20	F	AAZFC	Fuel Gas Compressor	E	GROUND	2	UNGROUND	2	ETG				✓	E001	10001082			
		30	F	AAZSI	Sea Water Injection	E	GROUND	3	UNGROUND	1	ETG				✓	E001	10001083			

Demo – WP L2 Onshore with Lockout/Tagout Closure – Untagging List Confirmation (after its Execution)



Safety Certificate Edit Goto Settings System Help

Untagging List Confirmation - Change Safety Certificates

Safety Certificates

Certificate	Usg.	Short Text	Functional Location	Valid from	Valid to	System status	Approvals	Maint.Scr.	Switch.Sc...	Ass...	Docu...	Partn...
10001200	001	EIL: AA Pump for Cooling, Unit...	AAZ	14.09.2015	09.09.2016	PREP PROC UNT BUG	▲△○	🔧	⚙️	🔍	📄	👤

Electrical Isolation List Edit Goto Extras Switch System Help

Change Electrical Isolation List: Switching Screen

Untagged

Certificate: 10001200 | : AA Pump for Cooling, Unit 3

Status: PREP PROC UNT BUG

CONP	ITG	PTAG	ETG	BUG	EUG	PROT
0	0	0	0	3	0	0

1	2	It...	IC	Technical O	Untag.Cond.	US	System status	BIT	Ph	Lock	TR	PF	Tag	LT	DL	Tagging Comment
		≠10	F	AAZP	ON	3	BUG				✓	E001	10001081			
		≠20	F	AAZFC	UNGROUND	2	BUG				✓	E001	10001082			
		≠30	F	AAZSI	UNGROUND	1	BUG				✓	E001	10001083			

Electrical Isolation List Edit Goto Extras Switch System

- Other Electrical Isolation List
- Create
- Create with Template
- Change
- Display
- List Editing
- Save Ctrl+S
- Print
- Functions
 - Set Prepared
 - Revoke Prepared
 - Close
 - Reject
 - Deactivate
 - Activate
 - Set Deletion Flag
 - Remove Deletion Flag
- Exit

Benefits of the SAP WPM System

BENEFITS



- Full Integration into SAP EAM Maintenance Work Order Cycle
- Support of Industry-specific Standard Safety Procedures
- Assignment of Different Work Permits to the Same Order
- Powerful List Processing Combining Orders + Work Permits
- Working with Different Levels of Work Permits
- Integration of Different Lockout/Tagout Processes (Paper-based or Mobile)
- Integration of Job Safety Analysis
- Flexible Screen Layout for Work Permits + Safety Certificates
- Dedicated Safety Approval Process
- Library of Approved Templates for Work Permits + Safety Certificates



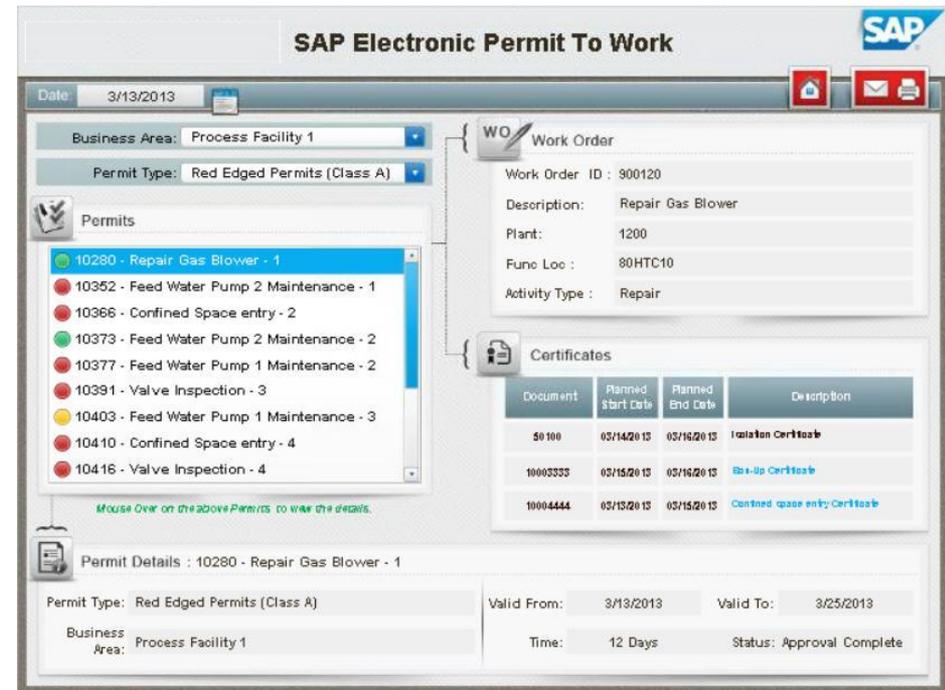
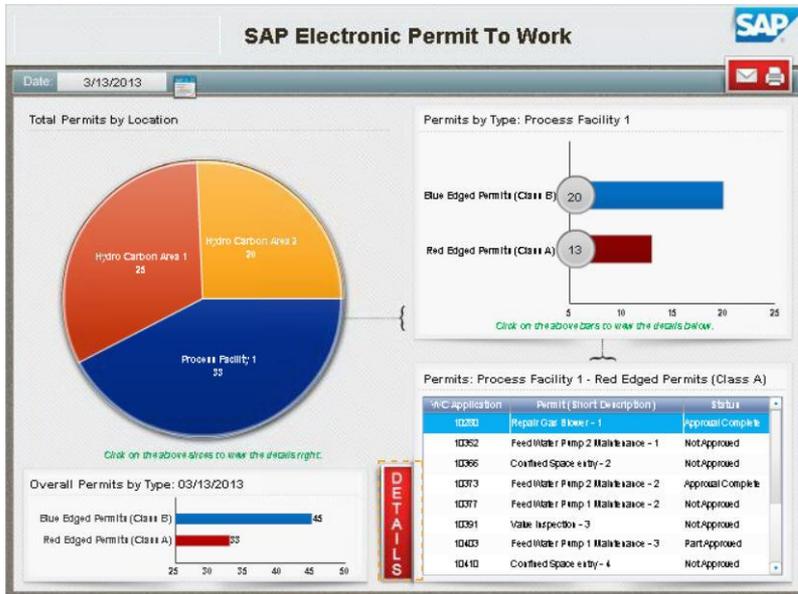
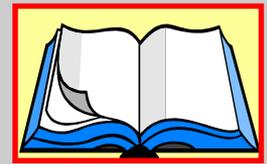


- Typical High-Level Requirements for a PTW System
- Basics on SAP WPM
- How to model an Oil&Gas PTW System in SAP WPM?
- Oil&Gas Safety Cockpit
- **Related Topics**
- Q&A



Related Topics – Work Permit Dashboards

Example 1 – Management View

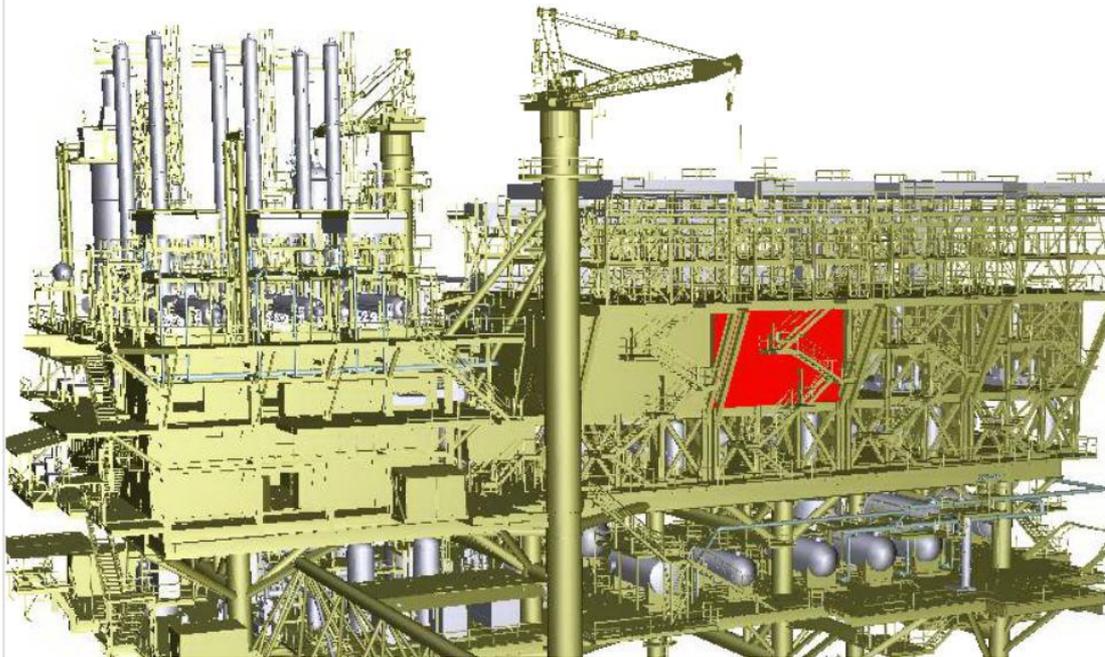
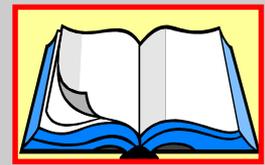


Analytical Visualization (SAP Business Objects)

- Visualization Part requires Custom Development
- Evaluation of Standard Operational WCM Data

Related Topics – Work Permit Dashboards

Example 2 – Maintenance/Operation View



Technical Visualization (SAP Visual Enterprise)

- Visualization Part requires Custom Development
- Evaluation of Standard Operational WCM Data

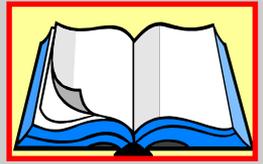
Hot Permit Cold Permit Open Flame

Permits By Area

- AP-10 Pumps Station
- AP-20 Pumps Station
- AT-01 Tanks Location

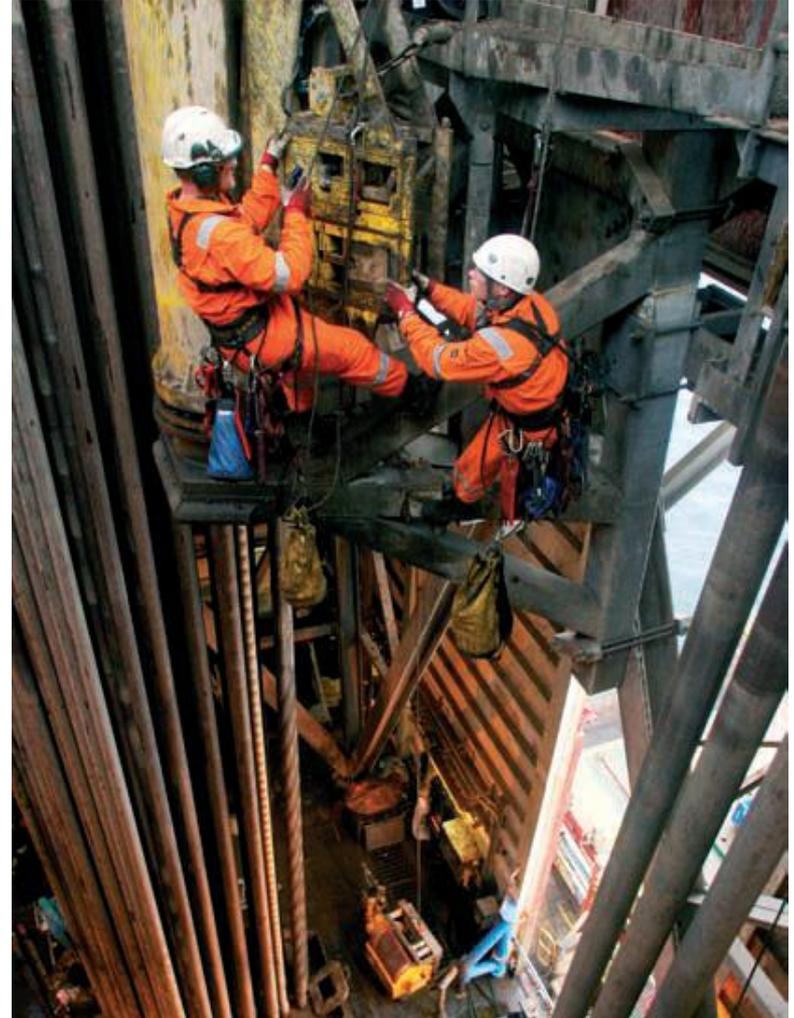
Work Permits

Type	Permit No.	Permit Description



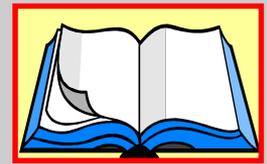
Purpose of EAM Worker Safety Integration

- It is straightforward that Work Permit Management represents a crucial part of Worker Safety.
- Therefore, it was a basic requirement to integrate Work Permit Management with the Web Dynpro-based SAP EAM Worker Safety solution for handling safety-critical maintenance processes.



Related Topics – Worker Safety

EAM Worker Safety – List of Orders and assigned Work Permits



Order and Notification List

Order and Notification List # Default (250) Order List - Default (0) Notification List - Default (0) Order and Operation List - Default (0)

[Change Query](#) [Define New Query](#) [Personalize](#)

View: Ord/Ntf View Set Order and Notification Status Set Order Status Set Notification Status Assign Order Print Object Add to Favorites Print Version Export Refresh

Ord/Ntf.	Type	Description	Ass. Order/Ntf.	Priority Descr.	Tech. Object	Start Date	End Date	System Status	WkCtr Descr.	WP Phase	Work Permit
4020330	PM01	Overhaul Feedwater Pump System	10033267		80LAC20	15.07.2015	15.07.2015	WCM EXEC CRTD MANC NMAT NTUP PRC	Work Center with person assigned		
4020333	PM01	Repair Opening Valve of Feedwater Pump	10033302	2-High	80LAC20AA004	21.07.2015	21.07.2015	WCM EXEC CRTD MANC NMAT NTUP PRC	Work Center with person assigned		
4020335	PM01	Clean Opening Valve of Feedwater Pump	10033304	2-High	80LAC20AA004	22.07.2015	22.07.2015	WCM EXEC CRTD MANC NMAT NTUP PRC	Work Center with person assigned		
4020336	PM01	Repair Opening Valve of Feedwater Pump	10033305	2-High	80LAC20AA004	22.07.2015	22.07.2015	WCM EXEC CRTD MANC NMAT NTUP PRC	Work Center with person assigned		11000
4020337	PM01	Clean Opening Valve of Feedwater Pump	10033306	2-High	80LAC20AA004	22.07.2015	22.07.2015	WCM EXEC CRTD MANC NMAT NTUP PRC	Work Center with person assigned		
4020338	PM01	Reduce Pressure on Opening Valve	10033307	2-High	80LAC20AA004	22.07.2015	22.07.2015	WCM EXEC CRTD MANC NMAT NTUP PRC	Work Center with person assigned		
4020339	PM01	Check High Pressure Valve	10033308		DEMO-VALVE	22.07.2015	22.07.2015	WCM EXEC CRTD MANC NMAT NTUP PRC	Mechanical		
4020341	PM01	Stress Test Opening Valve	10033276	2-High	80LAC20AA004	16.07.2015	16.07.2015	WCM EXEC CRTD MANC NMAT NTUP PRC	Work Center with person assigned		
4020342	PM01	Repair Opening Valve of Feedwater Pump	10033277	2-High	80LAC20AA004	16.07.2015	16.07.2015	WCM EXEC LRRR REL NMAT PRC	Work Center with person assigned		
4020347	PM01	Repair Side Panel	10033295	3-Medium	MCK-SIDEPANEL	21.07.2015	21.07.2015	WCM EXEC CRTD MANC NMAT NTUP PRC	Work Center with person assigned		

Last Refresh 29.09.2015 16:38:31 CET Refresh

Details for order 4020336

General Data Location Data Organization Data Work Permits

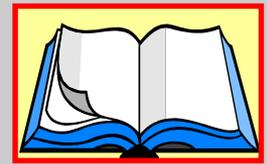
Work Permits

Request New Copy Work Permit Print Work Permits Extend Validity Close

Work Permit	Description	Type Description	Valid From (Date)	Valid From (Time)	Valid To (Date)	Valid To (Time)	Phase	Approval Status
11000	Safety for Cold Work on Opening Valve	Cold Work Permit	29.09.2016	08:00:00	29.09.2016	20:00:00		

Related Topics – Worker Safety

EAM Worker Safety – WP Detail incl. Assigned Safety Certificates



Change Cold WP: 11000

Save Check Status Information Set Prepared Reject

Work Permit 11000 Planning plant Plant 0001 Usage Cold Work Permit System Status CRTE Approval Status ● 0 Document(s)

General Data

Work Permit: Safety for Cold Work on Opening Valve

Long Text:

General Precautions:

1. Ensure that the equipment to be worked on is appropriately prepared (i.e., locked out, drained, steamed, blinded, etc.), and if being worked on while still operating, what additional precautions are necessary.
2. Ensure that all personnel who may be impacted by the work are aware that the work is commencing.

Validity

Valid From: 29.09.2016 Valid-From Time: 08:00:00

Valid To: 29.09.2016 Valid-To Time: 20:00:00

Reference Object

Technical Object: 80LAC20AA004 Valve before Feedwater Pump

Type of Technical Object: Functional Location

Work (Group 1)

Hot Work A:

Hot Work B:

Pressure Testing:

Work (Group 2)

Nightwork:

Work at Height:

Overhead Work:

Requirements (Technician)

On-Site Instruction:

Safety Staff:

Requirements (Skilled Worker)

Barriers/Signs:

PA Announcements:

Approvals Documents Partner Safety Certificates

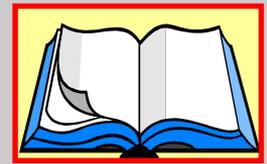
Safety Certificates

Certificate Display Certificate Remove Certificate ↻

Certificate	Certificate Type	Description	System Status	Approval Status
11628	Iso. & De-Iso. CERT	Mechanical Isolation of Opening Valve	PREP ITG	●

Related Topics – Worker Safety

EAM Worker Safety – Safety Certificate Detail



Change Iso. & De-Iso. CERT: 11628

Save Check Status Information Set Prepared Reject

Certificate 11628 Planning plant Plant 0001 Usage Isolation & De-Isolation Certificate System Status CHNG ITG Approval Status 0 Document(s)

General Data

Safety Certificate:

Long Text:

Validity

Valid From: Valid-From Time:

Valid To: Valid-To Time:

Reference Object

Technical Object: [Valve before Feedwater Pump](#)

Type of Technical Object: Functional Location

Approvals Documents Partner **Items**

Items

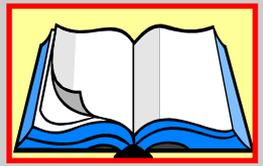
Item Category Remove Item Tagging Tagged Untagging Untagged

Item	Item Category	Technical Object	Short Text	System Status	Operational Group	Tagging Condition	Tagging Type	Tag Required	Print Format for Tag	Tag	Untagging Condition	Untagging Type
000010	Functional location	80LAC20	Feedwater Pump Syst...	ITG	M	BLOCKED	X	<input checked="" type="checkbox"/>	M001		UNBLOCKED	X
000000	Functional location							<input type="checkbox"/>				
000000	Functional location							<input type="checkbox"/>				
000000	Functional location							<input type="checkbox"/>				
000000	Functional location							<input type="checkbox"/>				



Related Topics – Mobile WCM System

Motivation for a Mobile Lockout/Tagout System



- Time saving:

You no longer have to print out and distribute the operational lists. This means that your employees no longer have to collect operational lists for processing or return them after processing.



- Higher safety:

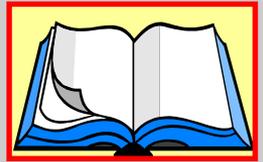
You only need to confirm ONCE on the mobile device that the activities have been performed. This prevents errors that could arise from transcribing operation lists.

The use of bar codes or RFIDs ensures that switching is only possible for the selected object.



- Manage your operational list history:

You don't have to archive your operational lists anymore in paper form, keeping them for several years.



- SAP is working on a new Mobile WCM solution, replacing Mobile Infrastructure + Mobile UI of the existing one
 - Like for the existing Mobile WCM, the new solution shall assist mobile lockout/tagout at first, i.e. the replacement of operational list printouts for tagging and untagging by mobile communication
 - Further mobile WCM scenarios (e.g. for work permits) might be supported in a second step
- The basic lockout/tagout process design of the existing solution doesn't need to be changed
 - From the backend system, the mobile user uploads the switching items to be processed by him on his mobile device
 - The user must confirm on the mobile device:
 - the execution of the activity on site or the rejection of the activity (switching items only)
 - the completion of the item (afterwards, it disappears from his mobile device)



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