

# Health & Safety 360°: Permitting To Cumulative Risk

April 10, 2024



# Speaker Introduction



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# RiskPoynt and Barrier Management

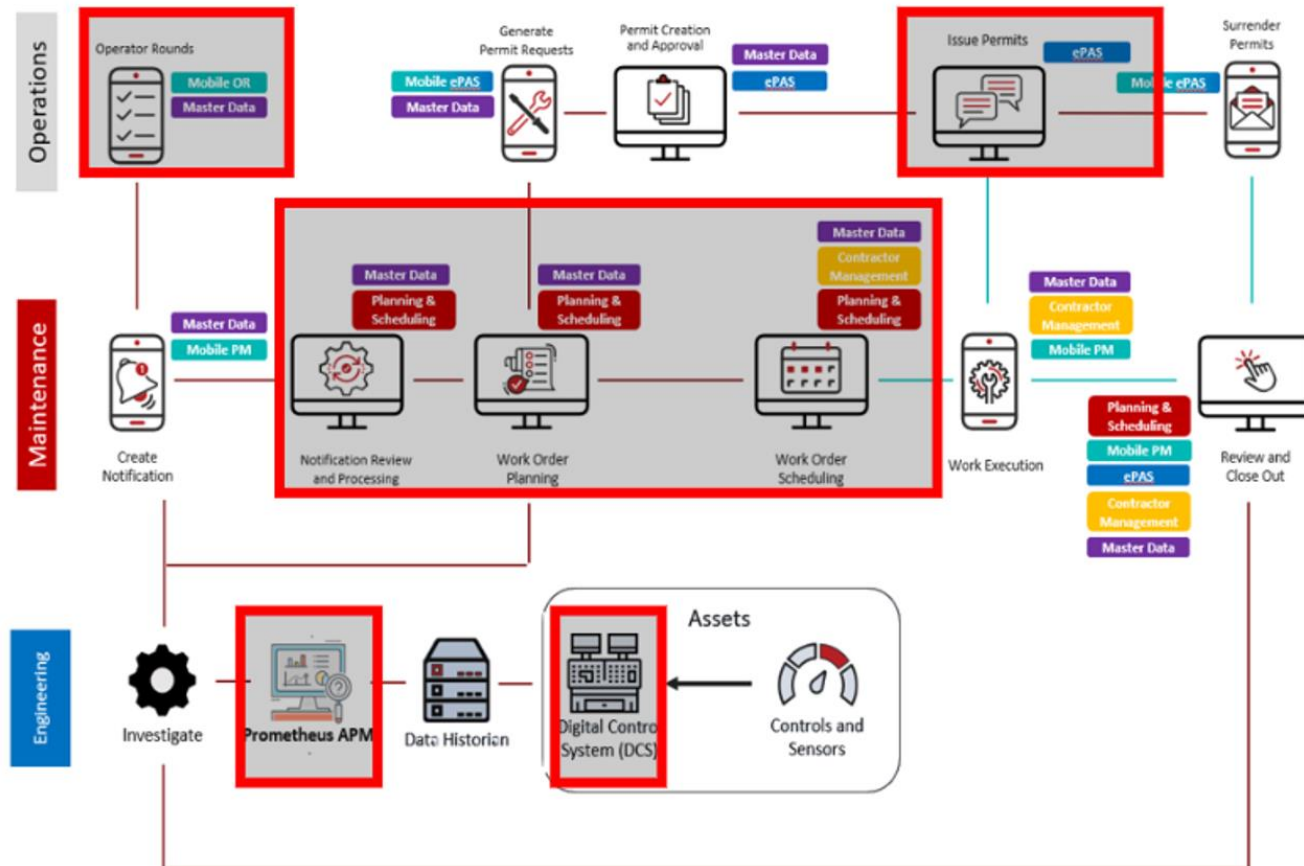


# Health & Safety 360°

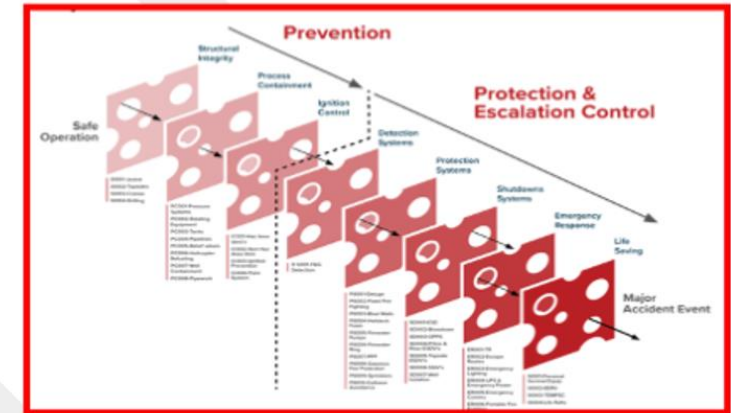
- Integrated barrier management within ePAS gives permitting users visibility into overall cumulative risk of a permit-related area
- 360° visibility on SIMOPS (Simultaneous Operation) and MOPO (Manual of Permitted Operations) clashes by including permit analysis within barrier management
- Coupled integration with SAP ensures integration with ePAS and RiskPoynt is seamless



# Barrier Management Inside the Platform



SHIFT FOCUS

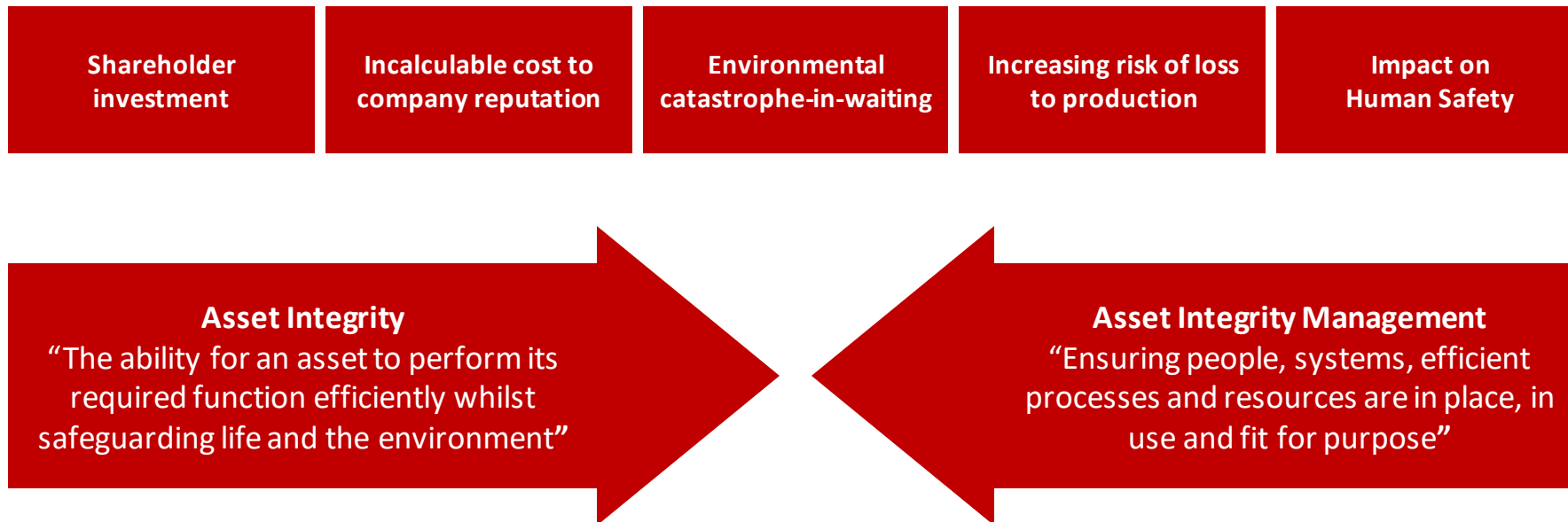


Barrier Management



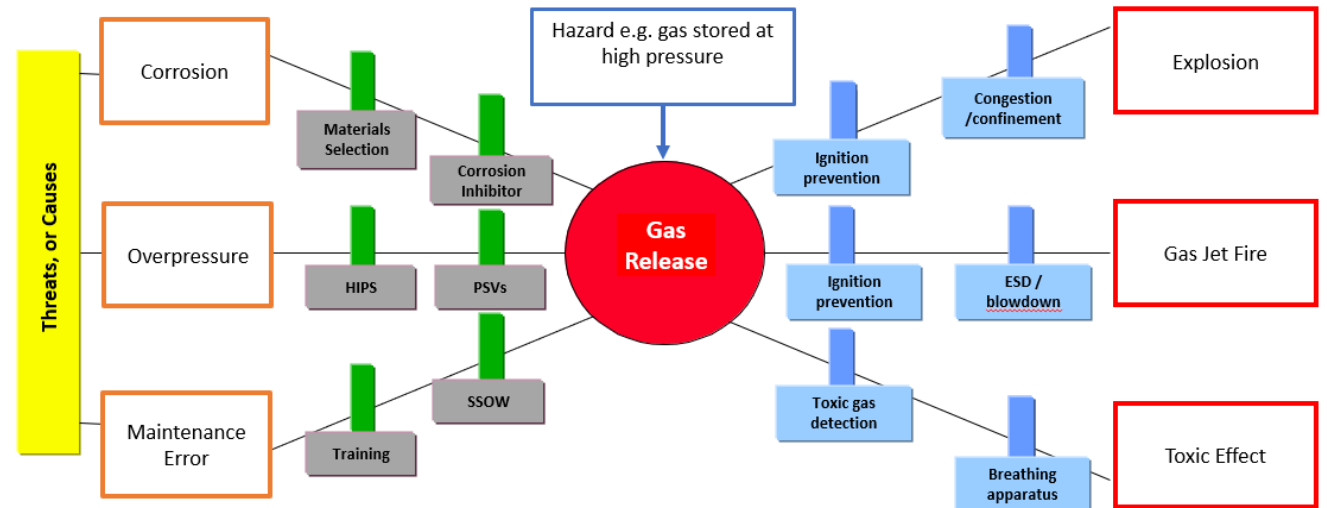
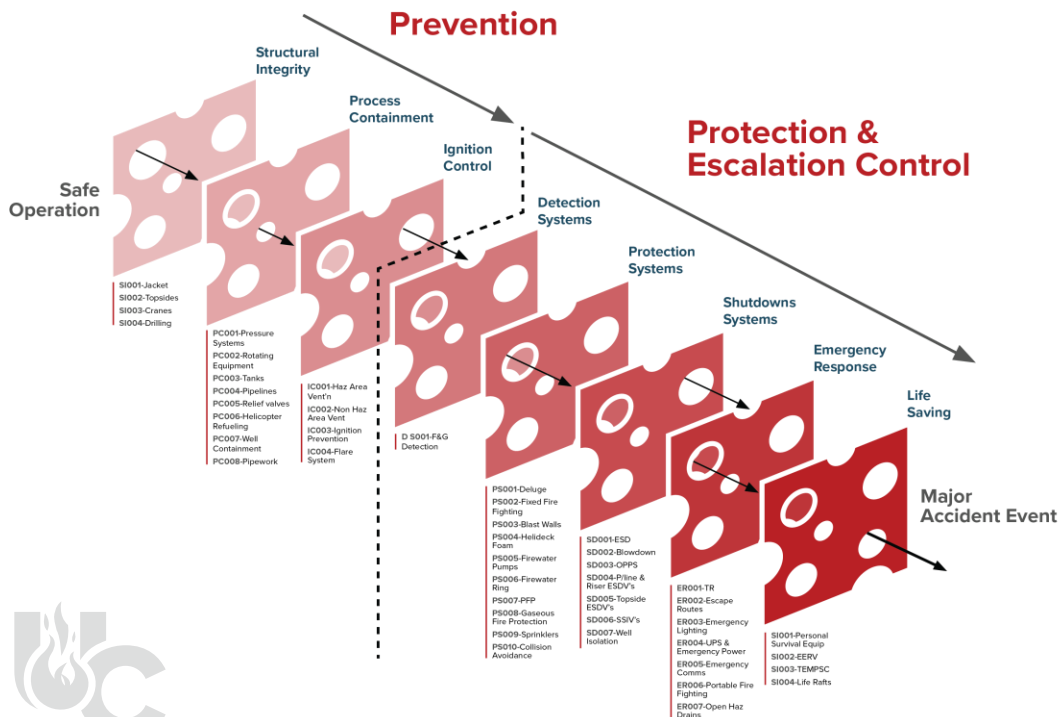
# Barrier Management

- Ask – “What a critical asset failure could do today?”
- Barrier Management enables any company to demonstrate control and drive efficiencies in their operations
- Visualise risk cumulatively - merge multiple aspects of the operation into a single visualisation



# What Is a Barrier?

- Barriers are protective and are categorized in 2 groups. Prevention barriers are to the left and escalation and protection are to the right. A barrier's function is independent of each other, but a lineup of degraded barriers means an increase in major accident hazard (MAH) potential.

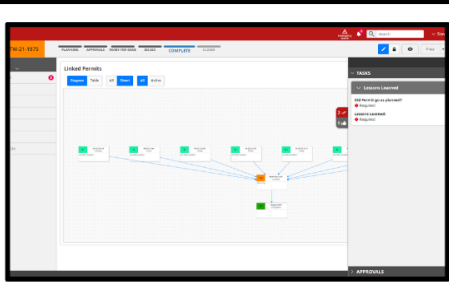


# ePAS – Permit Administration



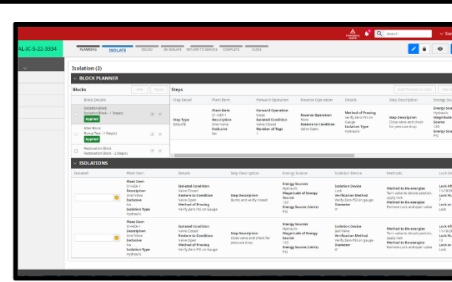


# Electronic Permit Administration System



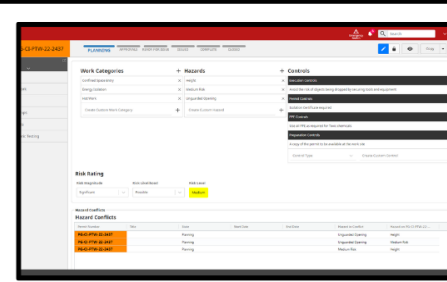
## Electronic Permit to Work

*Streamlined web-based electronic permitting interface*



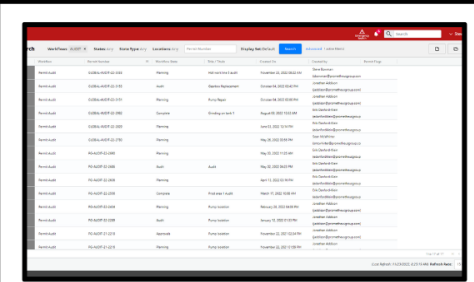
## Isolation Management

*Increase efficiency of permit and isolation management processes*



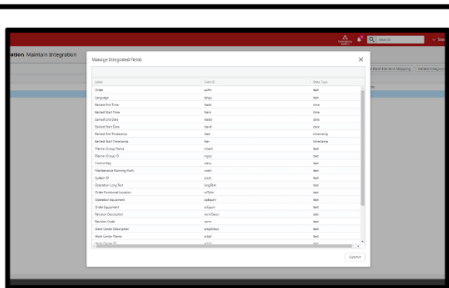
## Risk Assessment (HIRA)

*Standardize hazard identification and risk assessment*



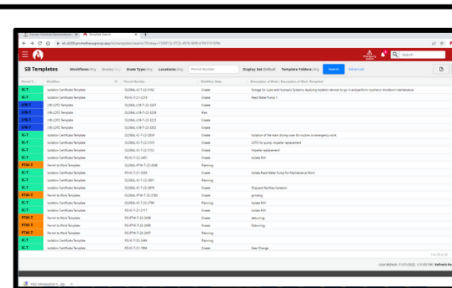
## Audits

*Maintain compliance for organization logs and records in an easily accessible system*



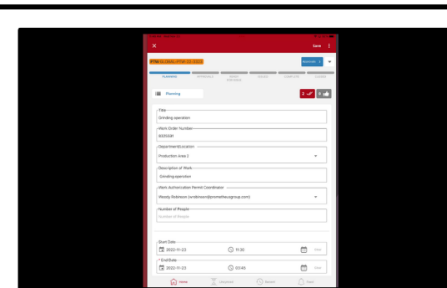
## CMMS Integration

*Integrate workflows with your CMMS to connect permits to associated work orders*



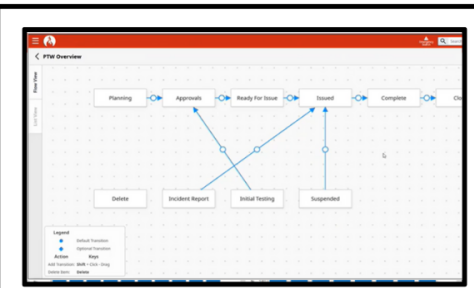
## Templates

*Increase the efficiency of your permitting and safety processes with templates*



## Mobile Permitting

*Perform your permitting processes on a mobile device, online or offline*



## Configurable Workflows

*Set up safety workflows based on your unique safety processes*



# ePAS Business Objectives

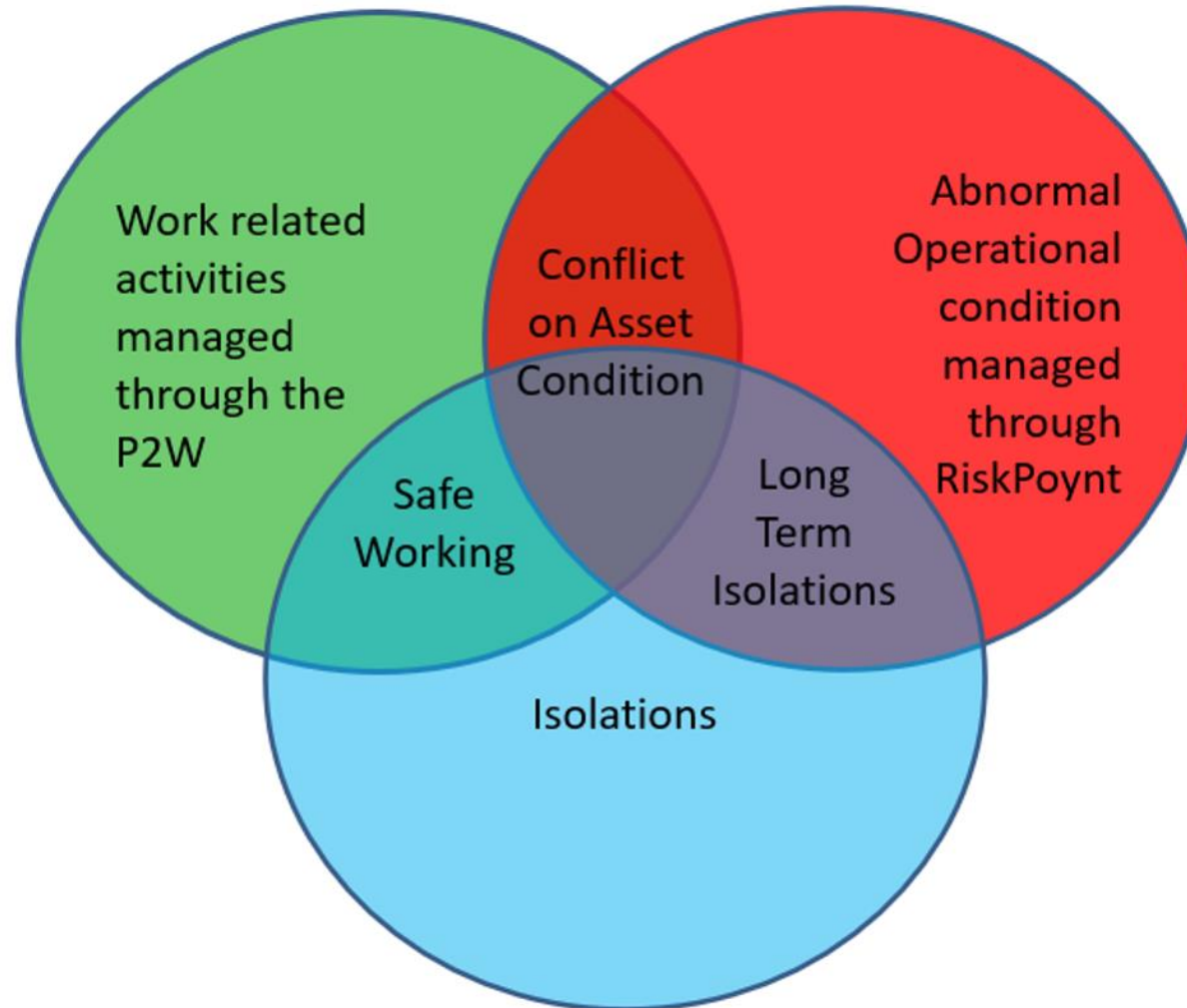
- **Improve safety** – reduce incidents, increase compliance, and create consistency
- **Improve efficiency** – integration with maintenance, PG solutions, and guided workflows route to appropriate users and groups for key discussions
- **Digital transformation** – get rid of paper-based processes and integrate with other systems
- **Standardization** – standardize processes without forcing term and role commonality across all sites/regions



# RiskPoynt and ePAS Synergy



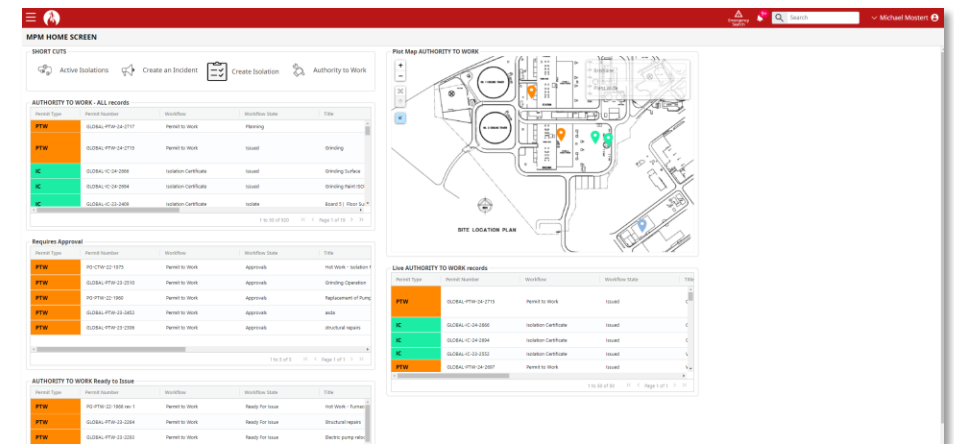
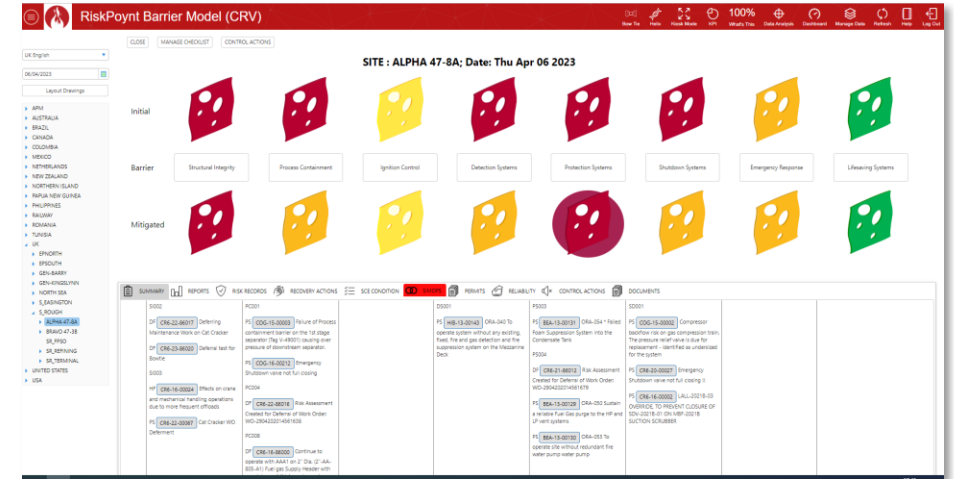
# Barrier Management & Permit to Work



# What Is the Advantage?

- The powerful synergy of an ePAS sign-off link to Barrier Management enables Installation Managers, Area Authorities and performing authorities to easily and readily check the current cumulative risk of the planned area of work and the overall asset at the following key points:

- At daily planning meeting (Permit Authorization)
  - Permit Authorization by the Installation Manager
- At permit issuer
  - Permit issued by the area authority
  - Permit acceptance by the performing authority
- At shift handover
  - Oncoming shift checks the current status of safety barriers prior to accepting the transfer of Authority



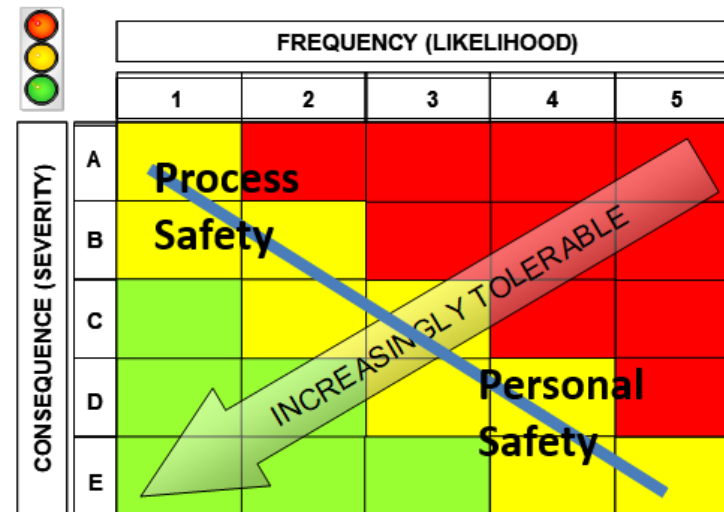
# Current State of Play

- Limited consideration of plant status outside of the permitting operation
- Permit coordinator needs to manually check other systems for asset status and operational conditions
- No evidence of stored against the permit process that barrier condition has been acknowledged during permit planning
- No foresight to adjust permit schedule based on barrier conditions into the future



# What Does a 360-View Look Like?

- Relevant barrier condition to the location of the permit reported inside the Permit process
- Improved planning with look-ahead functions to view barrier condition 7 days in advance for opportunities to reduce MOPO clashes



# Integrated View

*The Link between RiskPoynt Barrier Management and ePAS.*

- SIMOPS check against degraded operational barriers (safe-guards)
- Live validation of mitigation strategy – for example isolation of equipment that is actively relied on as part of a hazard mitigation.
- Visualize overall cumulative risk with permitting and isolation activities.

The screenshot displays the 'Barrier Management' software interface. At the top, it shows 'Areas for ALPHA 47-8A: : ALL: PRODUCTION DECK'. Below this, there are several 3D models of the production deck, including a 'Planting Map' and a 'Structural Integrity' view. A table below the models lists permits with columns for Area, Conflict, Permit Type, Permit Status, Permit No., Permit Description, Conflict Type, Permit From, and Permit To. The table contains several rows of permit data, including entries for 'PRODUCTION DECK - MGC MODULE' and 'PRODUCTION DECK - BSC MODULE'.

Area	Conflict	Permit Type	Permit Status	Permit No.	Permit Description	Conflict Type	Permit From	Permit To
PRODUCTION DECK - MGC MODULE	Electrical	LIVE	00-5511448	OPS-Submarine Power Repair UPS-7560	1 SIMOPS Conflict	28/05/2023 20:16:00	30/05/2023 08:00:00	
PRODUCTION DECK - BSC MODULE	Breaking Containment	LIVE	00-5541320	Sole-PTS BOC B Compressor Charging and Changing screens on Lube oil	1 SIMOPS Conflict	30/05/2023 06:00:00	30/05/2023 08:00:00	
PRODUCTION DECK - VFU MODULE	Hot Work	Suspended	00-5532387	DOOD Hot Work Installation on Heat Trace Piping, Fuel Gas Skid, and Barriers Platform Wide	4 SIMOPS Conflict	28/05/2023 21:30:00	11/06/2023 21:30:00	
PRODUCTION DECK - SEPARATOR MODULE	Hot Work	Suspended	00-5532387	DOOD Hot Work Installation on Heat Trace Piping, Fuel Gas Skid, and Barriers Platform Wide	4 SIMOPS Conflict	28/05/2023 21:30:00	11/06/2023 21:30:00	
PRODUCTION DECK - BSC MODULE	Hot Work	Suspended	00-5532387	DOOD Hot Work Installation on Heat Trace Piping, Fuel Gas Skid, and Barriers Platform Wide	4 SIMOPS Conflict	28/05/2023 21:30:00	11/06/2023 21:30:00	
PRODUCTION DECK - SEPARATOR MODULE	Hot Work	Suspended	00-5532387	DOOD Hot Work Installation on Heat Trace Piping, Fuel Gas Skid, and Barriers Platform Wide	4 SIMOPS Conflict	28/05/2023 21:30:00	11/06/2023 21:30:00	
PRODUCTION DECK - WELLSKIP MODULE	Hot Work	Suspended	00-5537623	SI2 Tailing Oil and Gas Isolates from sample points for Allocation purposes	4 SIMOPS Conflict	21/05/2023 18:00:00	04/06/2023 18:30:00	
PRODUCTION DECK - WELLSKIP MODULE	Hot Work	Suspended	00-5537623	SI2 Tailing Oil and Gas Isolates from sample points for Allocation purposes	4 SIMOPS Conflict	27/05/2023 22:46:00	10/06/2023 22:46:00	

The screenshot displays the 'ePAS' software interface, showing a table of work items. The table has columns for Work Item No., Status, State Type, Location, Permit Number, Display Set Default, Search, and Advanced. The table contains several rows of work item data, including entries for 'Hot work grinding on top floor', 'General Isolation of Gas Heat', and 'Hot Work Grinding on Top Floor'.

Work Item No.	Status	State Type	Location	Permit Number	Display Set Default	Search	Advanced
0296-PT10-0219	Needs to close	Permitting	Hot work grinding on top floor	September 27, 2023 14:08		Hot Work Isolation (SimOps) [A]	[-] [0]
0296-PT10-0219	Needs to close	Closed	Hot work grinding on top floor	September 27, 2023 12:17		Hot Work Isolation (SimOps) [A]	[-] [0]
0296-PT10-0219	Needs to close	Isolation Certificate	General Isolation of Gas Heat	September 27, 2023 12:06		Hot Work Isolation (SimOps) [A]	[-] [0]
0296-PT10-0219	Needs to close	Isolation Certificate	Hot Work	September 27, 2023 12:06		Hot Work Isolation (SimOps) [A]	[-] [0]
0296-PT10-0219	Needs to close	Isolation Certificate	Hot Work	September 27, 2023 12:06		Hot Work Isolation (SimOps) [A]	[-] [0]
0296-PT10-0219	Needs to close	Isolation Certificate	Hot Work	September 27, 2023 12:06		Hot Work Isolation (SimOps) [A]	[-] [0]
0296-PT10-0219	Needs to close	Isolation Certificate	Hot Work	September 27, 2023 12:06		Hot Work Isolation (SimOps) [A]	[-] [0]
0296-PT10-0219	Needs to close	Isolation Certificate	Hot Work	September 27, 2023 12:06		Hot Work Isolation (SimOps) [A]	[-] [0]
0296-PT10-0219	Needs to close	Isolation Certificate	Hot Work	September 27, 2023 12:06		Hot Work Isolation (SimOps) [A]	[-] [0]
0296-PT10-0219	Needs to close	Isolation Certificate	Hot Work	September 27, 2023 12:06		Hot Work Isolation (SimOps) [A]	[-] [0]





# Integrated View

- Increase area risk when SIMOPS clashes active

**SITE : CHEMPLANT; Date: 27-10-2023**

Current Risk: [Green] [Red] [Red] [Yellow] [Red] [Red] [Yellow] [Yellow]

Barrier: Structural Integrity, Process Containment, Ignition Control, Detection System, Protection System, Shutdown System, Emergency Response, Life Saving System

Mitigated Risk: [Green] [Red] [Red] [Yellow] [Yellow] [Yellow] [Yellow]

Area	Conflict	Permit Type	Permit Status	Permit No	Permit Description	Alert Notification	Permit From	Permit To
	[Yellow]				HIGH RISK PERMITS	HIGH RISK Permits in Area   <math>42</math> Authorized Permits <math>1</math> Threshold Permits		
	[Yellow]	Breaking Containment			SAME TYPE PERMIT CONFLICT	Same Type in Area 1 Authorized Permits Breaking Containment 1 Threshold Permits		
	[Yellow]	Radiation			SAME TYPE PERMIT CONFLICT	Same Type in Area 20 Authorized Permits Radiation 1 Threshold Permits		
	[Yellow]	Hot Work			SAME TYPE PERMIT CONFLICT	Same Type in Area 1 Authorized Permits Hot Work 1 Threshold Permits		
	[Yellow]	Cold Work			SAME TYPE PERMIT CONFLICT	Same Type in Area 20 Authorized Permits Cold Work 1 Threshold Permits		
Refinery East	[Yellow]	Breaking Containment	LIVE	PTW-204	SIMOPS 10	20 Cleashing Permits	14-10-2023 14:00:54	22-11-2023 18:59:54

**Areas for CHEMPLANT : ALL : Refinery East**

Current Risk: [Green] [Green] [Green] [Green] [Green] [Yellow]

Barrier: Structural Integrity, Process Containment, Ignition Control, Detection System, Protection System, Shutdown System

Map: Facility layout with color-coded risk areas. A red dashed box highlights a specific area on the map.



# Integrated View

- Isolations are linked directly to mitigation strategies and then validated

The screenshot displays a software interface for managing safety incidents. The top section, titled 'ORA - TMS-24-00101', shows a workflow from REQUEST to CLOSED. Below this, a 'Hazard' table lists details for 'TMS-24-00101 Hazard', including Initial and Residual risk levels (SV, LH, Risk) and a PEAR value.

The lower section, titled 'Control', shows a table of isolation points. A red box highlights the 'Get Isolation Tags For Permit' button. A red arrow points from this button to a callout box. The callout box shows a 'Plant' dropdown menu with 'C12 DRAIN-010' selected, an 'ISOL' button with a notification icon, and a 'People' dropdown menu with 'Technician' selected.

Initial		Residual			PEAR
SV	LH	Risk	SV	LH	Risk
RB	D	16	RB	B	8

Isolated (0/0)	High Risk Blind	Isolation Point Description	Isolation Type	Isolation Position	Line Size	Energy Source	Normal Position
No Rows To Show							



# Integrated View

- Permit and Isolation Data visibility within the Barrier Management Solution

## SCE Condition

Conflicting Permits (P)	Conflicting Permits (A)
0	0
0	0
0	0
1	2
0	0
1	2
0	0

- Approved permits
- Permits pending approval
- Status color according to Performance Standard

## SIMOPS



Permit Type	Permit Status	Permit No.	Permit Description	Area Identification	Permit From
Conflicting permit			SAVE FIVE REBAPT COLLECT	Same Type in Area 3 Authorized Permits Conf not open permit 1 Theoretical Permit	
Hot work permit			SAVE FIVE REBAPT COLLECT	Same Type in Area 3 Authorized Permits Conf not open permit 1 Theoretical Permit	
Hot work permit			SAVE FIVE REBAPT COLLECT	Same Type in Area 3 Authorized Permits Conf not open permit 1 Theoretical Permit	
Conflicting permit	LIVE	PH-001	REBAPT - CAN MARIPOSA - LINE 9	Building Heating Permit of Same Type in Area 1 Heating Permits not open permit 1 Theoretical Permit	28/02/2024 10:00:00
Conflicting permit	LIVE	PH-002	REBAPT - CAN MARIPOSA - LINE 9	Building Heating Permit of Same Type in Area 1 Heating Permits not open permit 1 Theoretical Permit	28/02/2024 10:00:00

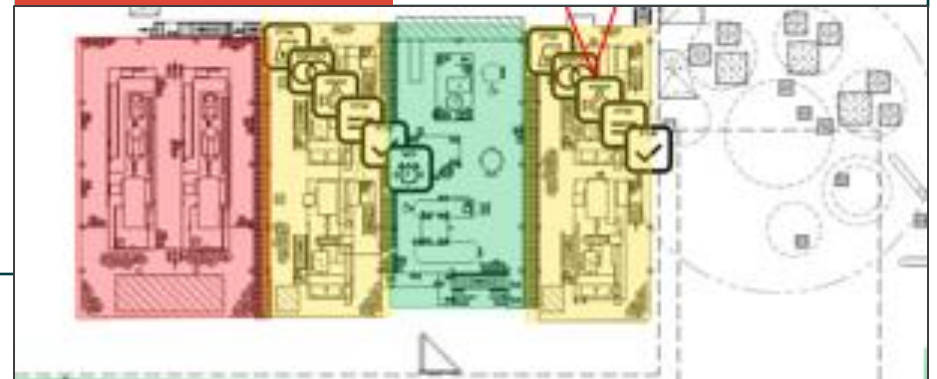
- Tab color according to status
- Reason for permit conflict with end date
- Pending permit approvals included
- Start date of conflict

## Permits

### Hyperlink to permit in Permit Vision

Conflict	Priority Area Code	Additional Area Code	Permit Number	Title	Type of Permit	Status	Start Date	End Date
	GA CELLAR DECK	GA CELLAR DECK	PH-001	REBAPT - CAN MARIPOSA - LINE 9	CONFINED SPACE	LIVE	28/02/2024 10:00:00	28/02/2024 10:00:00
	GA CELLAR DECK	GA CELLAR DECK	PH-002	REBAPT - CAN MARIPOSA - LINE 9	CONFINED SPACE	LIVE	28/02/2024 10:00:00	28/02/2024 10:00:00
	GA CELLAR DECK	GA CELLAR DECK	PH-001	REBAPT - CAN MARIPOSA - LINE 9	CONFINED SPACE	LIVE	28/02/2024 10:00:00	28/02/2024 10:00:00
	GA CELLAR DECK	GA CELLAR DECK	PH-002	REBAPT - HOT ESCAPE ROUTE 1	HOT WORK	LIVE	28/02/2024 10:00:00	28/02/2024 10:00:00
				REBAPT - C/F GA AUTOMATIC FLAMMABLE GAS DETECTOR 1	HOT WORK	LIVE	28/02/2024 10:00:00	28/02/2024 10:00:00
				REBAPT - HOT ESCAPE ROUTE 2	HOT WORK	UNAUTHORIZED	28/02/2024 10:00:00	28/02/2024 10:00:00
				REBAPT - HOT ESCAPE ROUTE 4	HOT WORK	LIVE	28/02/2024 10:00:00	28/02/2024 10:00:00

### Area Layout

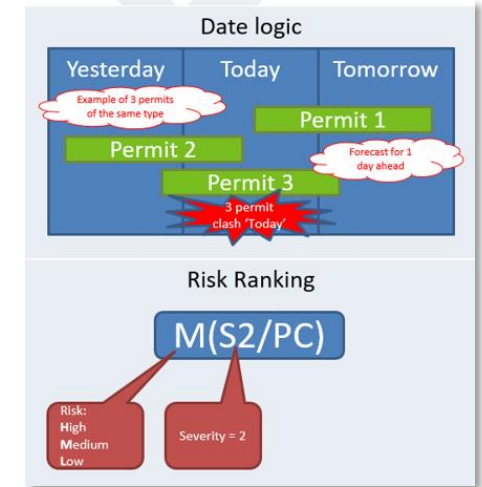


# Integrated View

- SIMOPS and MOPO clashes visible to the permit officer.

Permit Type1	Permit Type2	Conflict Criteria		
		Red Condition	Amber Condition	Alert notification
Breaking containment	Hot work (High risk)	Hot work with risk severity 3 & above	Hot work with medium risk severity of 1 & 2	Potential Conflict. Consult MOPO Matrix.*
Breaking containment	Electrical (Energized)	Electrical Energized high-risk severity 3 & above		Potential Conflict. Consult MOPO Matrix.*
Breaking containment	Confined space	Any Breaking Containment and Confined Space activities within the same area	n/a	Potential Conflict. Consult MOPO Matrix.*
Breaking containment	Well Services	*Perdido never had conflicting areas between breaking containment and well services. Need to be validated with other type of assets	n/a	
Confined space	Electrical (Energized)	Confined space Risk severity 3 & above	n/a	Potential Conflict. Consult MOPO Matrix.*

PS Code	Permit Type	Severity	Outcome RAG	PS Code	Permit Type	Severity	Outcome RAG
DS001	Cold Work	3 & Above	AMBER	PC004	Confined Space Entry	All Severity	
DS001	Breaking Containment	All Severity	RED	PC004	Breaking Containment	All Severity	
DS001	Radiation	All Severity	RED	PC004	Hot Work	3 & Above	
DS001	Confined Space Entry	All Severity	RED	PC005	Confined Space Entry	All Severity	
DS001	Lifting and Hoisting	All Severity	GREEN	PC005	Breaking Containment	All Severity	
DS001	Drilling Well Services	All Severity	GREEN	PC005	Hot Work	3 & Above	
DS001	Electrical	All Severity	RED	PC006	Confined Space Entry	All Severity	
DS001	Instruments and Control	All Severity	RED	PC006	Breaking Containment	All Severity	
DS001	Mechanical	All Severity		PC006	Hot Work	3 & Above	
DS001	Working at Height	All Severity		PC007	Breaking Containment	All Severity	
DS001	Confined Space Entry	All Severity		PC007	Hot Work	3 & Above	
ER001	Breaking Containment	All Severity	AMBER	SD1-10	Breaking Containment	All Severity	



PTW GLOBAL-PTW-23-2495

PLANNING APPROVALS READY FOR ISSUE ISSUED COMPLETE CLOSED

Brisbane Change Location

Planning 0

Plant & Work 1

HIRA 0

Relationships 1

Documents 0

Initial Atmospheric Testing 0

Approvals

PPE to be worn appropriate to the task and potential substances involved.

Respiratory protection to be worn

Types PPE Suit

Preparation Controls

Barriers and signs to be erected

Decontamination / disposal area to be set up

Ensure activity is clear of ventilation intakes

If required, extraction system to be provided to remove smoke/fumes.

Lead abatement hygiene area.

System to be depressurised / de-energised

Hazard Conflicts

Permit Number	Title	State	Start Date	End Date	Hazard in Conflict	Hazard on GLOBAL-PTW-2
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# Workflow Example – Day in the Life

## Prometheus ePAS Workflow

Maintenance

Maintenance Technician



Request Permit  
from Work Order



Accept Permit



Perform Work



Surrender Permit

Operations



Approve permit requests and  
create isolation certificate



Isolate equipment



Issue permit



Accept surrender



De-isolate equipment



Closeout



# Receive Request for Work (Maintenance)

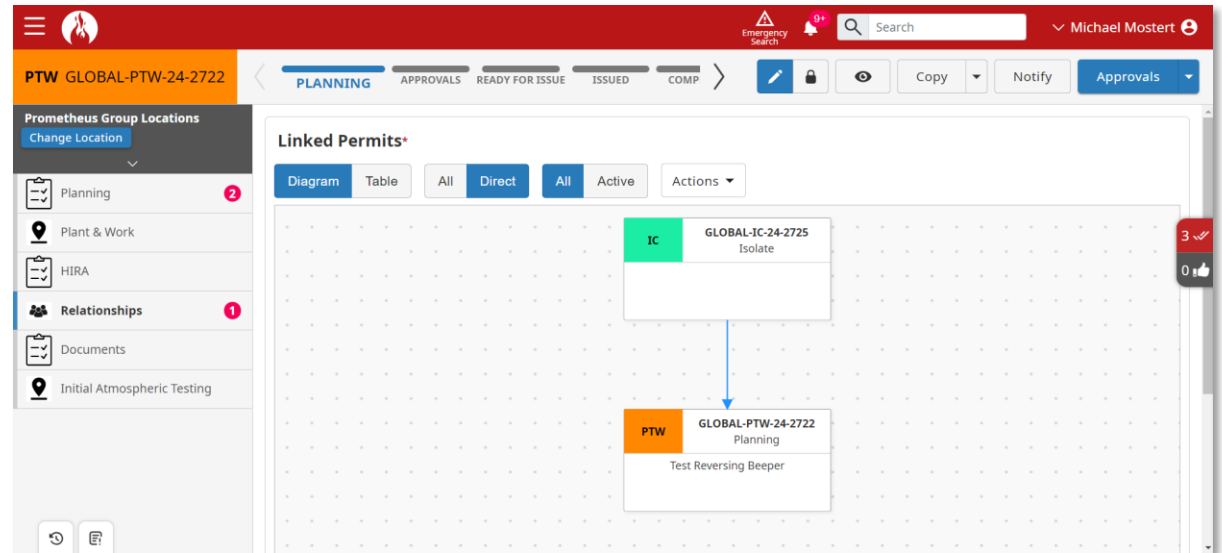
- The requirement for one or more permit(s) arises
  - Maintenance has a work request (PM, corrective, etc.) with controlled elements
  - Operations identifies that a permit is required for non-maintenance work
- Initiate process from work order or ePAS directly (Both can be done through a mobile device)

The screenshot displays a web application interface for work order management. The top navigation bar is red and contains a search bar, a user profile for Michael Mostert, and an emergency search icon. Below the navigation bar, a breadcrumb trail shows the current status: PLANNING > APPROVALS > READY FOR ISSUE > ISSUED > COMP. The main content area is divided into a left sidebar and a main form. The sidebar, titled 'Prometheus Group Locations', includes a 'Change Location' button and a list of categories: Planning (with a red notification badge '2'), Plant & Work, HIRA, Relationships (with a red notification badge '2'), Documents, and Initial Atmospheric Testing. The main form contains several input fields: 'Title \*' with the value 'Test Reversing Beeper', 'Work Order Number' with '7055289-30', 'Department/Location \*' with a dropdown menu showing 'Boiler Room', 'Start Date \*' with 'November 1, 2028 11:00 AM', 'End Date \*' with 'November 1, 2028 12:00 PM', and 'Outage Event'. A 'Description of Work \*' field is also present but empty. The interface includes various utility icons like a pencil, lock, eye, and copy, as well as a 'Notify' button and an 'Approvals' dropdown menu.



# Plan

- Commence planning object (permit to work, isolation certificate, risk assessment, confined space etc.) using configurable templates or from scratch
- Outline hazards and controls and other requirements



# Site Review

- Compare job site to permit
  - Have we addressed all hazards involved?
- Add additional/missing hazards
- Collaboration and feedback
- Photos

The screenshot displays a software interface for HIRA (Hazard Identification and Risk Assessment). The interface is divided into several sections:

- Header:** Includes a search bar, user profile (Michael Mostert), and navigation tabs: PLANNING, APPROVALS, READY FOR ISSUE, ISSUED, COMP.
- Left Sidebar:** Shows navigation options: Planning (2), Plant & Work, HIRA (selected), Relationships (1), Documents, and Initial Atmospheric Testing.
- Main Content Area:** Titled "HIRA", it features three columns: Work Categories, Hazards, and Controls.

Work Categories	Hazards	Controls
Working in confined spaces - level 1	Bad Visibility / Lighting	Execution Controls
	Electrical Cable Failure	Chemicals - Have all relevant MSDS been referenced and made available at the worksite?
Create Custom Work Category	General Hazards	Continuous monitoring for hydrocarbon gas to be carried out
	Lack of Oxygen	Continuous monitoring for oxygen content to be carried out
	Noise	Continuous monitoring for toxic gas to be carried out.
	Pinch point or trapping Hazards	Good housekeeping practice to be maintained (eg. tools to be kept tidy, swarf and debris to be removed on completion of work)
	Poor Lighting	Hatch / grating removal period kept to a minimum
	Rotating Machinery / Tools	No one is positioned under a suspended load
	Slipping Hazard	Spills of oil and other fluids to be cleared up immediately
	Static spark	On duty personnel functions (Checklist)
	Toxic Gas Fumes	All access and escape routes are identified and kept clear at all times
	Unguarded Opening	





# Approve

- Dynamic levels of approvals based on risk, area, work type, asset criticality, and more
- Sign off by appropriate parties
- Approved does *not mean* issued

The screenshot displays a software interface for PTW (Permit to Work) management. The main header shows 'PTW GLOBAL-PTW-24-2722' and a navigation bar with tabs: 'PLANNING', 'APPROVALS' (selected), 'READY FOR ISSUE', 'ISSUED', and 'COMPLETE'. A notification banner at the top indicates 'Contractor Documentation Supplied'. The left sidebar lists 'Prometheus Group Locations' with options: Planning, Plant & Work, HIRA, Relationships, and Documents. The main form area contains fields for: Title (Test Reversing Beeper), Work Order Number (7055289-30), Department/Location (Boller Room), and Description of Work (description of work). On the right, there are fields for Start Date (November 1, 2028), End Date (November 1, 2028), Priority (Select...), Applicant, and Permit Coordinator. A 'Permit to Work Approval' modal is open, showing a 'Declaration' field with the text: 'This permit has all the relevant hazards identified with the correct control elements applied'. Below this are fields for 'Reason' and 'Approver' (Michael Mostert). At the bottom of the modal are 'Reject' and 'Approve' buttons.



# Verify & Issue Permit

- Work cannot commence until permit is issued
- Confirm worker identity and qualifications
- Confirm Barrier Condition and acknowledge formally
- Permit recipient is approved to work; permit is issued

The screenshot displays a web application interface for permit management. The browser address bar shows the URL: e5-config20.na2.pgdev.io/e5/permits/view/28ab64a9-53c5-4c3b-ab63-e3b0539c316. The application header includes the text "[CONFIG20 | Internal Demo - NA]" and a search bar. The main content area is titled "PTW GLOBAL-PTW-24-3433" and features a navigation menu with tabs: "PLANNING", "APPROVALS", "READY FOR ISSUE", "ISSUED", "COMPLETE", and "CLOSED". The "PLANNING" tab is active. On the left, a sidebar menu lists various categories: "TMSR" (with a "Change Location" button), "Planning", "Plant & Work", "HIRA", "Relationships", "Documents", "Initial Atmospheric Testing", and "Risk Barriers". The "Risk Barriers" section is expanded, showing a "Risk Barrier Summary" for "Process Containment". This summary includes a large red circle icon and a list of system status indicators with corresponding colored dots (green, yellow, red). The indicators are: SI - Structural Integrity (green), PC - Process Containment (yellow), IC - Ignition Control (green), DS - Detection Systems (green), PS - Protection Systems (green), SD - Shutdown Systems (yellow), ER - Emergency Response (green), and LS - Lifesaving Systems (green). To the right of these indicators, detailed text provides specific metrics for each system, such as "The SCE score is Green" or "The number of Corrective records is 5". A small red notification badge with the number "8" and a checkmark is visible in the top right corner of the application window.



# Confirm Barrier Condition

- Review the Barrier Condition based on work area
  - ePAS will use the location information to match the CRV status
  - The time is considered to review SIMOPS and MOPO clashes
- Using the selected Equipment
  - Simulate the equipment degrading based on the permit workflow (Example – bypass)
  - Check Bow Ties for the area validating the equipment forms part of a safe-guard. If degrading the equipment increases a threat or consequence report back to the user
  - Check if the equipment is used on a risk assessment control mitigation
  - Check the existing status of the equipment

The screenshot displays the TMSR (Task Management System) interface. At the top, it shows the user [CONFIG20 | Internal Demo - NA] and the permit ID PTW GLOBAL-PTW-24-3438. The interface is divided into a left sidebar and a main content area. The sidebar lists various project stages: Planning, Plant & Work, HIRA, Relationships, Documents, Initial Atmospheric Testing, and Risk Barriers (which is currently selected). The main content area displays the 'Risk Barrier Summary' for the selected permit. This summary includes a circular progress indicator and a list of risk barriers with their corresponding status indicators (green for 'Good', yellow for 'Warning', and red for 'Critical').

Risk Barrier	Status
SI - Structural Integrity	Good (Green)
PC - Process Containment	Warning (Yellow)
IC - Ignition Control	Warning (Yellow)
DS - Detection Systems	Critical (Red)
PS - Protection Systems	Good (Green)
SD - Shutdown Systems	Good (Green)
ER - Emergency Response	Good (Green)
LS - Lifesaving Systems	Good (Green)



# Demonstration



# ePas and Barrier Management

- Companies that use Barrier Management:
  - Lower likelihood of MAH events occurring
  - Align to international standards (IOGP)
  - Use facts to decide prioritization changes, targeting work on equipment that keeps the operator safe
  - Broaden communication on operational risks so all personnel are aware of the condition of the facility
  - Promote and foster a culture of safe operations and inclusion – everyone has a part to play in safety
  - Measurable success in barrier condition over time
- **Safer operations improve production**



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  - GOM
  - TMS**
    - TMSR

CLOSE

## Regional Level Display Containing All Sites



TMSR



Initial Mitigated

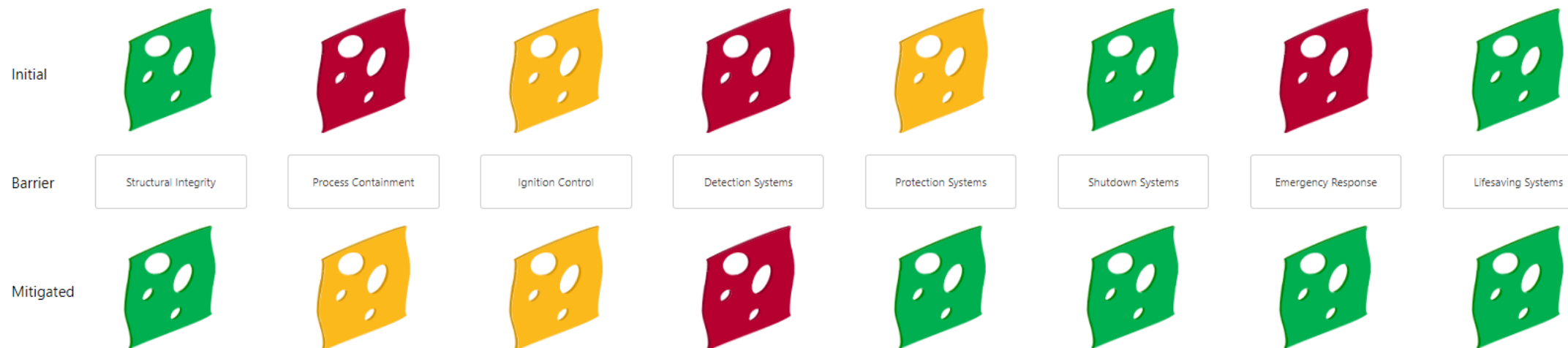
	Initial	Mitigated
Structural Integrity	Green	Green
Process Containment	Red	Yellow
Ignition Control	Yellow	Yellow
Detection Systems	Red	Red
Protection Systems	Yellow	Green
Shutdown Systems	Green	Green
Emergency Response	Red	Green
Lifesaving Systems	Green	Green

CLOSE    MANAGE CHECKLIST    CONTROL ACTIONS

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SITE : TMSR; Date: 09-04-2024



SUMMARY	REPORTS	RISK RECORDS	RECOVERY ACTIONS	CONSOLIDATED SCE VIEW	SCE CONDITION	BARRIER MATRIX	SIMOPS	PERMITS	MOC	PASSING VALVES	RELIABILITY	CONTROL ACTIONS	DOCUMENTS
<p>STATUS OF SCENARIOS    INHIBIT/OVERRIDE</p>													
<p>PC003</p> <p>IH <a href="#">TMS-24-00262</a> ENTER REASON FOR INHIBIT/OVERRIDE - Created by PG_USER at 06/02/2024 04:35:18 UTC</p> <p>PC004</p> <p>HF <a href="#">TMS-24-00121</a> PC004 Human factors - Process containment</p> <p>IH <a href="#">TMS-24-00241</a> PC004 CRUDE OIL TANK 1 long-term inhibit (date of expiry 29.1.2024)</p> <p>IH <a href="#">TMS-24-00242</a> PC004 CRUDE OIL TANK 2 - short-term inhibit testing (date of expiry 29.1.2024)</p>		<p>PS <a href="#">TMS-24-00081</a> IC002 - test for checklist</p>		<p>DS001</p> <p>PS <a href="#">TMS-24-00102</a> FLOW RATE SENSOR 1 malfunction</p> <p>DS003</p> <p>IH <a href="#">TMS-24-00181</a> FLOW RATE SENSOR 2 - Long-term inhibit testing</p> <p>PS <a href="#">TMS-24-00381</a> RP-785 Common elements testing</p> <p>RA <a href="#">TMS-23-00025</a> DS003 and Gas detector risk assessment</p> <p>RA <a href="#">TMS-23-00021</a> Flow rate sensor inspection</p>		<p>RP415</p> <p>PS <a href="#">TMS-24-00402</a> RP-415 Risk Assessment #2 for active impairment</p> <p>The SCE score is Green</p>		<p>SD004</p> <p>IH <a href="#">TMS-24-00243</a> SD004 ISOLATION VALVE 1 - Long-term inhibit testing expiring (open date 7.1.2024)</p> <p>RA <a href="#">TMS-24-00101</a> Testing for Control Actions and Shift Awareness</p> <p>RA <a href="#">TMS-24-00321</a> ISOLATION VALVE 1 RA - RED</p> <p>The SCE score is Green</p> <p>The number of Corrective records is 4</p> <p>The number of Preventative records is 2</p> <p>The number of INHIBITS records is 1</p>		<p>ER002</p> <p>HF <a href="#">TMS-24-00061</a> Annual safety training refresh</p> <p>ER006</p> <p>RA <a href="#">TMS-24-00041</a> Emergency power generator maintenance</p> <p>The SCE score is Green</p> <p>The number of HF records is 1</p>			

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CLOSE

### Bowtie Summary View: TMSR; Date: 09-04-2024

Show Residual

**Gas Leak**

0 Red Threat Lines 0 Previous

0 Amber Threat lines 0 Previous

0 Red Cons Lines 0 Previous

0 Amber Cons Lines 0 Previous

**Testing for Metrics**

0 Red Threat Lines 0 Previous

0 Amber Threat lines 0 Previous

0 Red Cons Lines 0 Previous

0 Amber Cons Lines 0 Previous

**TESTING FOR RP-415: New bow tie rules processing**

0 Red Threat Lines 0 Previous

0 Amber Threat lines 0 Previous

0 Red Cons Lines 0 Previous

0 Amber Cons Lines 0 Previous

**TESTING FOR RP-604: 20 Threats**

0 Red Threat Lines 0 Previous

0 Amber Threat lines 0 Previous

0 Red Cons Lines 0 Previous

0 Amber Cons Lines 0 Previous

**TESTING FOR RP-604: 30 Threats**

0 Red Threat Lines 0 Previous

0 Amber Threat lines 0 Previous

0 Red Cons Lines 0 Previous

0 Amber Cons Lines 0 Previous

**TESTING FOR RP-604: 40 Threats**

0 Red Threat Lines 0 Previous

0 Amber Threat lines 0 Previous

0 Red Cons Lines 0 Previous

0 Amber Cons Lines 0 Previous

**TESTING FOR RP-604: 50 Threats**

0 Red Threat Lines 0 Previous

0 Amber Threat lines 0 Previous

0 Red Cons Lines 0 Previous

0 Amber Cons Lines 0 Previous

**TESTING FOR RP-604: 64 Threats**

0 Red Threat Lines 0 Previous

0 Amber Threat lines 0 Previous

0 Red Cons Lines 0 Previous

0 Amber Cons Lines 0 Previous

**RP-604 Testing bow tie with 63 threats and 10 consequences**

0 Red Threat Lines 0 Previous

0 Amber Threat lines 0 Previous

0 Red Cons Lines 0 Previous

0 Amber Cons Lines 0 Previous

**RP-604 Testing bow tie with 10 threats and 10 threats each**

0 Red Threat Lines 0 Previous

0 Amber Threat lines 0 Previous

0 Red Cons Lines 0 Previous

0 Amber Cons Lines 0 Previous

**RP-710 testing alt+enter in bow tie fields**

0 Red Threat Lines 0 Previous

0 Amber Threat lines 0 Previous

0 Red Cons Lines 0 Previous

0 Amber Cons Lines 0 Previous

**RP-710 testing alt+enter in bow tie fields [NEW]**

0 Red Threat Lines 0 Previous

0 Amber Threat lines 0 Previous

0 Red Cons Lines 0 Previous

0 Amber Cons Lines 0 Previous

Top event: Explosion

TOP EVENT - Testing

RP-785 TEST BOW TIE 1

RP-785 TEST BOW TIE 2

SUMMARY 
 REPORTS 
 RISK RECORDS 
 RECOVERY ACTIONS 
 CONSOLIDATED SCE VIEW 
 SCE CONDITION 
 BARRIER MATRIX 
 SIMOPS 
 PERMITS 
 MOC 
 PASSING VALVES 
 RELIABILITY 
 CONTROL ACTIONS 
 DOCUMENTS

STATUS OF SCENARIOS 
 INHIBIT/OVERRIDE

PERFORMANCE STANDARD	TA Owner	PM	CM	Deviation	INHIBITS	PI or DCS	OVERRIDE	HF	Conflicting Permits (A)	Conflicting Permits (P)	Passing Valves (Weighted Count)	Passing Valves (Distinct Count)	WO_11	WO_12	WO_17	COMP_11	ALARM_01	ALARM_02	Total	
PC003 Rotating Equipment	TEST - Rotating Mechanical	0 0	0 0	0 0	1 0	1 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	2 0
PC006 Pipelines and Flowlines	TEST - Pipelines	0 0	5 0	0 0	2 0	2 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	9 0
DS001 Fire and Gas Detection Systems	TEST - Control and Automation	1 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	1 0
DS003 Sensors	TEST - Control and Automation	0 0	8 0	0 0	5 0	2 0	0 0	0 0	0 0	1 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	16 0
SD004 Pipeline Emergency Shutdown Valves	TEST - Control and Automation	2 0	4 0	0 0	1 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	7 0
<b>Total</b>	TEST -	3 0	17 0	0 0	9 0	5 0	0 0	0 0	0 0	1 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	35 0



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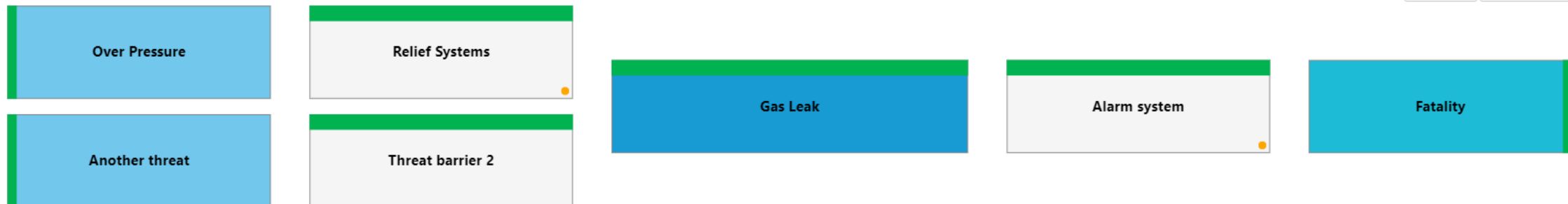
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SITE : TMSR; Date: 09-04-2024  
GAS LEAK

Show Residual Filters

Zoom to fit Expand/Collapse



SUMMARY 
 REPORTS 
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 RECOVERY ACTIONS 
 CONSOLIDATED SCE VIEW 
  **SCE CONDITION**
 BARRIER MATRIX 
 SIMOPS 
 PERMITS 
 MOC 
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 RELIABILITY 
 CONTROL ACTIONS 
 DOCUMENTS

STATUS OF SCENARIOS 
 INHIBIT/OVERRIDE

PERFORMANCE STANDARD	TA Owner	PM	CM	Deviation	INHIBITS	PI or DCS	OVERRIDE	HF	Conflicting Permits (A)	Conflicting Permits (P)	Passing Valves (Weighted Count)	Passing Valves (Distinct Count)	WO_11	WO_12	WO_17	COMP_11	ALARM_01	ALARM_02	Total
PC003 Rotating Equipment	TEST - Rotating Mechanical	0 0	0 0	0 0	1 0	1 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	2 0
PC006 Pipelines and Flowlines	TEST - Pipelines	0 0	5 0	0 0	2 0	2 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	5 0
DS001 Fire and Gas Detection Systems	TEST - Control and Automation	1 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	1 0
DS003 Sensors	TEST - Control and Automation	0	8	0	5	2	0	0	0	1	0	0	0	0	0	0	0	0	16

CLOSE

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### Gas Leak

#### Over Pressure

#### Relief Systems

Inspection and maintenance of ventilation fan Relief Systems

#### Initiating Event

Normal Risk

Abnormal Risk

Mitigated Risk

SCE Status Explanation

Export to Excel

Drag a column header and drop it here to group by that column

Equipment No	Changed	Equipment Name	PS Code	Explanation	Emergency	MOC Emergency	PM	CM	Deferment	WO_17	PI or DCS	INHIBITS	ALARM_01
VENTILATION FAN 2		FAN 2	IC002	Risk Assessments (RA) Count = 1	0	0	0	0	0	0	0	0	null
CP-B-E2	✱	Tempature Control Valve	PC006		0	0	0	0	0	0	0	0	null
FLOW RATE SENSOR 1	✱	SENSOR 1	DS003	INHIBITS = 1 Risk Assessments (RA) Count = 7	0	0	0	0	0	0	0	1	null
FLOW RATE SENSOR 2	✱	SENSOR 2	DS003	INHIBITS = 1	0	0	0	0	0	0	0	1	null

20 items per page

1 - 4 of 4 items

PC003 Rotating Equipment	TEST - Rotating Mechanical	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
PC006 Pipelines and Flowlines	TEST - Pipelines	0	5	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3
DS001 Fire and Gas Detection Systems	TEST - Control and Automation	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
DS003 Sensors	TEST - Control and Automation	0	8	0	5	2	0	0	0	1	0	0	0	0	0	0	0	0	0	16

- TMSR [Change Location](#)
- Planning
- Plant & Work
- HIRA
- Relationships
- Documents
- Initial Atmospheric Testing
- Risk Barriers**

### Risk Barrier Summary



- SI - Structural Integrity ●●
- PC - Process Containment ● ●
- IC - Ignition Control ●●
- DS - Detection Systems ●●
- PS - Protection Systems ● ●
- SD - Shutdown Systems ●●
- ER - Emergency Response ● ●
- LS - Lifesaving Systems ●●

**\*\*Warning\*\*** Degrading CP\_B\_E2 will effect Bow Tie Gas Leak, Threat Over Pressure, Barrier Relief Systems.

Process Containment  
 PS Details TMS-23-00001  
 CORROSION  
 PEAR RA-BHF Details TMS-24-00121  
 PC004 Human factors - Process containment  
 PEAR RD-B  
 The SCE score is Green  
 The number of Corrective records is 5  
 The number of HF Count records is 3  
 The number of HF records is 1  
 The number of INHIBITS records is 3

Ignition Control  
 PS Details TMS-24-00081  
 IC002 - test for checklist  
 PEAR RD-B

Detection Systems  
 PS Details TMS-24-00102  
 FLOW RATE SENSOR 1 malfunction  
 PEAR RB-B  
 The SCE score is Green  
 The number of Corrective records is 8  
 The number of Preventative records is 1  
 The number of HF Count records is 2  
 The number of P2W Pending records is AMBER  
 The number of INHIBITS records is 5

Protection Systems  
 PS Details TMS-24-00402  
 RP-415 Risk Assessment #2 for active impairment  
 PEAR RC-B  
 The SCE score is Green

Shutdown Systems  
  
 The SCE score is Green  
 The number of Corrective records is 4  
 The number of Preventative records is 2  
 The number of INHIBITS records is 1

Emergency Response  
 HF Details TMS-24-00061

Thank You!

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Questions?



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**CONFERENCE**  
EUROPE

Michael Mostert - Developer & EHS Functional Consultant