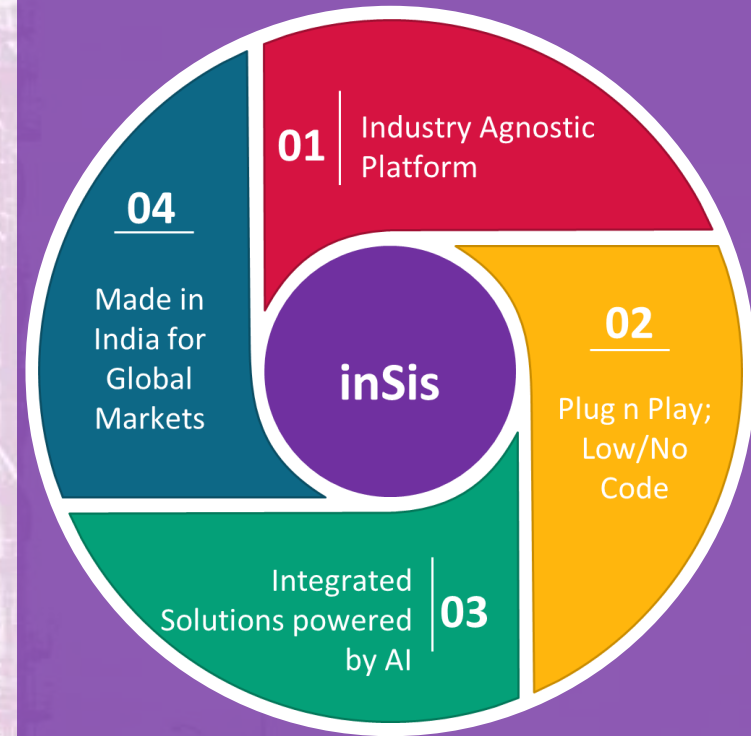




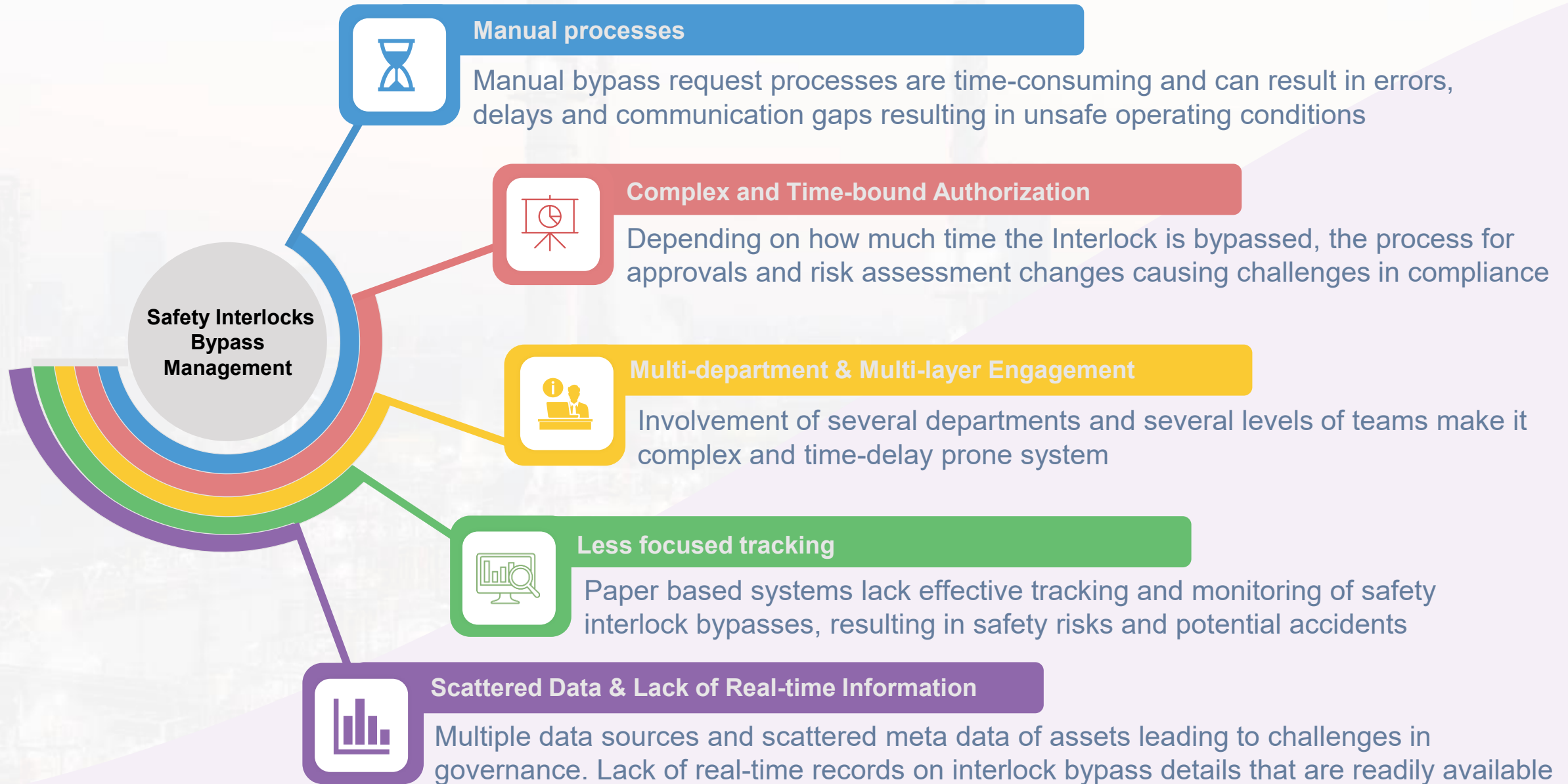
Jaaji Technologies

Sophistication with Simplicity

Safety Interlock Bypass Management System for Enhanced Operational Safety



Challenges in Safety Interlocks Bypass Management



Overall Objectives of Safety Interlock Bypass Management

Track and Trace all actions on Safety Interlock Bypasses

1

Appropriate Authorization and Workflow for all Bypass requests

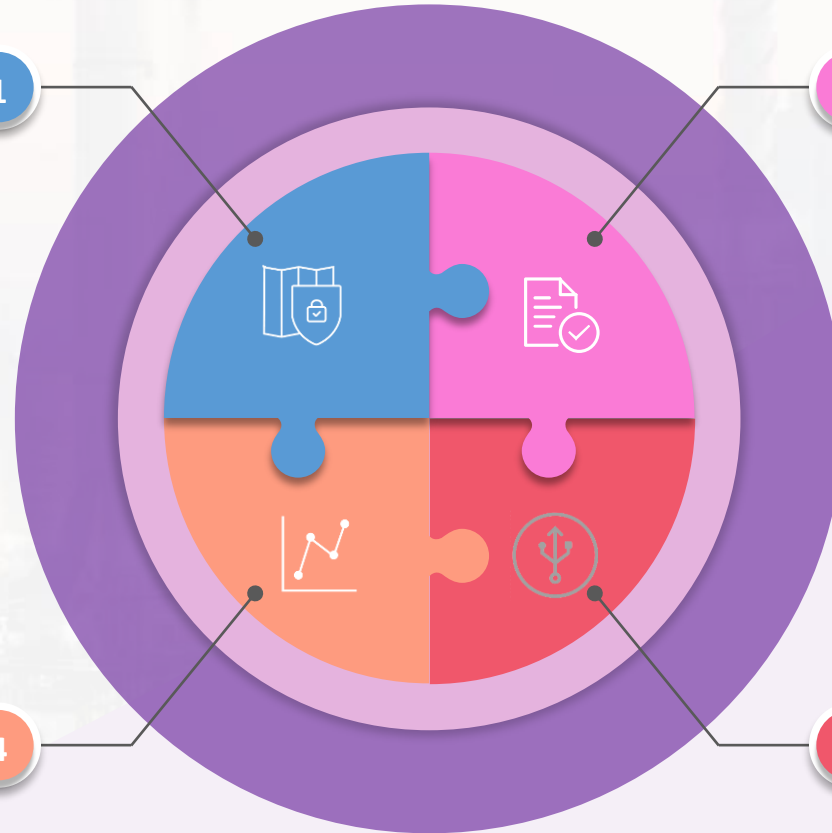
2

Digital footprint of Bypasses done for easy analysis against process and asset performance

4

Single consolidated view of real time status of Interlocks across the plant

3



Safety Interlock Bypass Management Solution - Overview

Digital footprint

keeps track of all bypasses and provides real-time data on bypass status.

Customizable system

can be tailored to meet the specific needs of a business and can adapt to changing needs over time.

Integration

can be integrated with existing safety systems, operations logbooks and equipment for seamless management of safety interlock bypasses



Automated bypass request process

allows for faster request processing and eliminates the need for paper forms or manual data entry.

Real-time Reporting

provides real-time alerts and notifications, keeping users informed of bypasses as per the authorization matrix

Access control

allows for the creation of roles and permissions to ensure that only authorized personnel can approve or perform bypasses

- ✓ Monitors changes in safety interlocks.
- ✓ Tracks initiator, reason, approval, bypass duration.
- ✓ Maintains a comprehensive change history.
- ✓ Enables Root Cause Analysis for incidents.
- ✓ Ensures accountability in interlock modifications.

Benefits

The major benefit is enhanced **Process Safety** by eliminating unsafe operating conditions with a real-time system



Real-time data

A digitized system provides real-time data on interlock status and the duration of bypass



Improved Safety

Better tracking and management of Interlocks, reducing the risk of accidents and improving safety



Better Compliance

A digitized system improves compliance of safety regulations reducing risk of fines and legal issues.



Increased efficiency

Automating the bypass request process and improves governance.



Scalability

A digitized system is scalable and can adapt to changing needs over time.

Safety Interlock Bypass Management Implementation for a Leading Refinery at Gujarat



Objective



To digitize and simplify the management of safety interlocks across all process units by enabling clear workflows, transparent approvals, and real-time tracking. This will improve plant safety, reduce manual work, and ensure better compliance with regulations.



OFFERED SOLUTIONS

inSis Safety Interlock Bypass Management (SIM), a web-based, role-based and self-service solution



CONCLUSION

Enabled a centralized and standardized interlock system with full traceability. Improved response to critical events and enhanced overall plant safety.

Features of SIM

- Digital Interlock Registry with real-time tracking
- Bypass Workflow with customizable approval steps
- Multi-level Approvals with built-in risk assessment
- Custom Authorization Matrix with email alerts
- Auto-alerts when tag conditions are met, allowing direct bypass without manual entry
- Integration with inSis Operational Logbook to record bypass events
- Email Notifications & Reminders for pending tasks. Automatic Scheduling of daily, weekly, and historical reports

Scope of Work

- 32 Units across the plant
- 16,437 Interlocks managed
- New Interlock & Bypass Creation (Manual + Bulk Load)
- Configurable Alerts & Reminders via Email
- Work Area Dashboard for tracking pending approvals
- Reports Exportable in Excel and PDF formats
- Approval Chain with Authorization Matrix per department

Benefits Achieved



✓ Digital Record of all Interlocks and Bypasses

⚡ Faster Approval and Quick Normalization cycles

🔔 Timely Alerts to prevent bypass overruns



Data-Driven Insights for proactive safety decisions



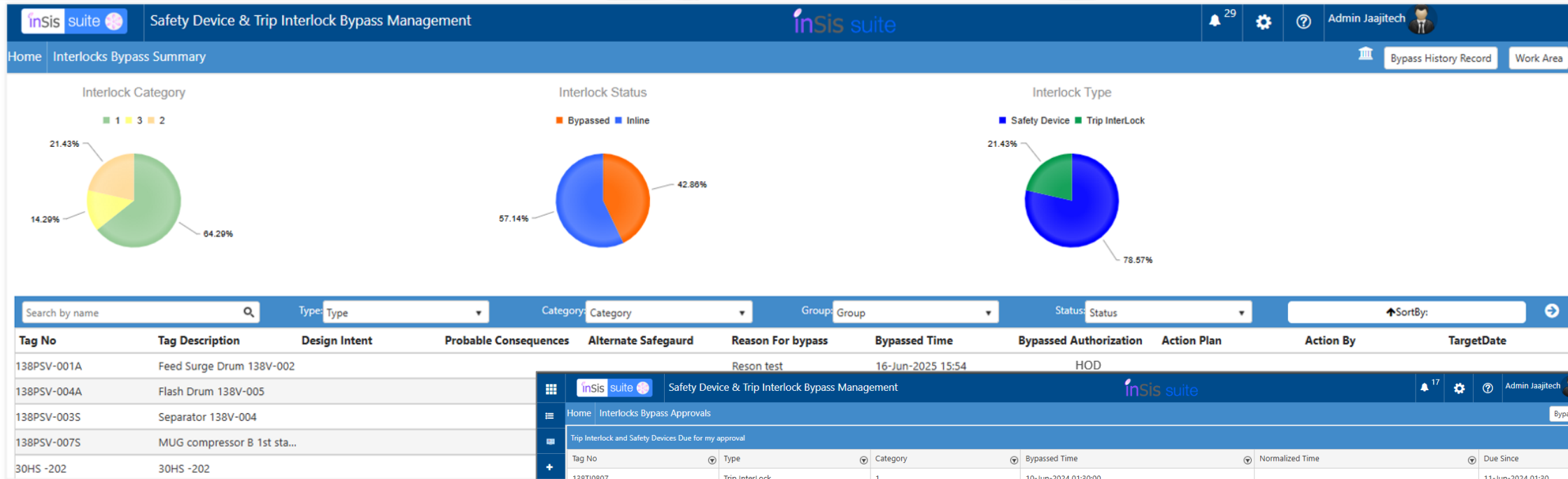
Complete Audit Trail



Centralized Monitoring across all process units

Dashboards & Work-areas

The dashboards provide the summary and overview of the Safety Devices & Interlocks status



The work area will give an overview of Interlocks approvals. Helps to track the pending status of approval of Interlocks

Tag No	Type	Category	Bypassed Time	Normalized Time	Due Since
138T10807	Trip InterLock	1	10-Jun-2024 01:30:00		11-Jun-2024 01:30
138T10807	Trip InterLock	3	20-May-2024 13:07:21	10-Jun-2024 00:00	03-Jun-2024 13:07
138PSV-003S	Safety Device	1	15-May-2024 09:24:55		16-May-2024 09:24
138PSV-007A	Safety Device	1	09-Apr-2024 14:30:00	10-Apr-2024 23:20	10-Apr-2024 14:30

Tag No	Type	Category	Bypassed Time	Normalized Time	Due Since	Pending With
138XY0645	Trip InterLock	1	17-Feb-2025 00:30:00	17-Feb-2025 12:05	17-Feb-2025 00:30	Kirit Kalaria
30HS -207	Safety Device	1	29-Dec-2024 01:50:57		29-Dec-2024 01:50	SIC USER
138PSV-007S	Safety Device	1	07-Nov-2024 15:58:17		07-Nov-2024 15:58	Vipul Bhut
30HS 201D	Safety Device	1	10-Aug-2024 00:00:00	14-Aug-2024 00:00	10-Aug-2024 00:00	SIC USER
138PSV-001S	Safety Device	1	26-Jun-2024 16:20:06	30-Oct-2024 13:44	26-Jun-2024 22:00	Assistant Area Manager

Authorization Matrix

Users can define authorization order, whether a risk assessment is required or not based on levels. Similarly, we can enable remainder email notification for risk assessment based on time defined to a particular level.

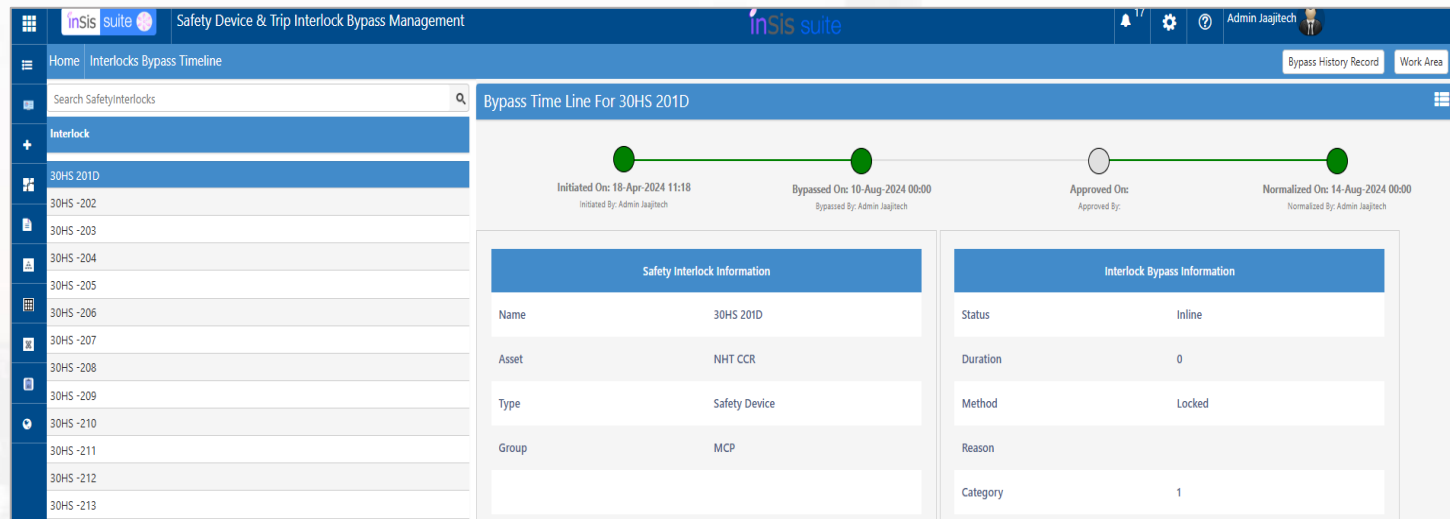
Authorization Levels Management Form:

- Authorization Level*: Shift Incharge
- Description: Lvl 1
- Authorization Order: 1.00
- Category*: 1
- Risk Assessment Form Required: NO
- IsReminder Required: NO
- Reminder Intiation Days: 0.00
- Validity: From 1.00 Shift To 1.00 Shift

Authorization Level	Description	1	2	3
Shift Incharge	Lvl 1	1 Shift	1 Shift	1 Shift
Assistant Area Manager	Lvl 2	1 Day	1 Week	2 Week
Area Manager	Lvl 3	7 Day	15 Day	1 Year
HOD	Lvl 4	1 Month	30 Day	--
HOD - Operations	Lvl 5	1 Year	1 Year	--

1 - 5 of 5 items

Bypass Timeline



The timeline of the Interlock is provided to have overall view of each interlock workflow process and current status

Integration with Logbooks – Built-in Widger for Safety interlocks

Number of interlocks bypassed can be linked directly with the inSis shift Logbook for a **safe shift handover**.

Safety Devices & Trip Interlocks Currently Bypassed			
Name	Description	BypassedTime	Reason for Bypass
10LS102X1	Old Desalter 2nd Stage UNIT-1 Oil Level Switch	13-Jan-24 10:10	Level switch malfunctioning
10TS102X1	Old Desalter 2nd Stage UNIT-1 Thermal Switch	18-Jan-24 10:57	Temperature switch malfunctioning.
10SZALL101	10F151A ID-A SPEED LL 185 RPM	17-Feb-25 09:30	Soot Blowing
10FZALL200B	10F151A ID-A OIL FLOW LL 1.0 M3/HR	17-Feb-25 09:30	Soot Blowing

Types of Alerts & Reminders

Throughout the workflow of Interlock bypass management, several alerts and reminders are sent to various levels of teams for effective engagement and on-time bypass, approval and normalisation, thus mitigating the risk of unsafe conditions

S.No	Type of Alerts	Description
1	On Bypass	When the Interlock is Bypassed
2	On Approval	When the Interlock is Approved
3	On Normalization	When the Interlock is Normalized
4	On Risk Assessment Initiation	To initiate the RA Form Creation
5	On Risk Assessment Approval	To approve the RA Form

S.No	Type of Reminders	Description
1	Approval	Bypass authorization is Pending
2	Risk Assessment Initiation	RA Form creation is Pending
3	Risk Assessment Approval	RA Form approval is Pending

Mails of Alerts & Reminders

Bypass Operation Reminder Authorization for Interlock -138PSV-001A

Mahendra Reddy G MG Mon 10/21/2024 10:07 AM

To: Mahendra Reddy G; Mahendra Reddy G
Cc: Mahendra Reddy G; Mahendra Reddy G; Mahendra Reddy G; Mahendra Reddy G; Mahendra Reddy G; +4 others

Dear Sir/Madam,

The Interlock - 138PSV-001A is Bypassed on 08/10/2024 04:42 PM

Please approve the bypass in the Portal <http://localhost/inSisSafetyInterlock>

Approval due time: 08/Oct/2024 10:00 PM

Note: This is an automatically generated report by inSis Interlock System.

inSis Suite - Process Data Analytics, Dashboards, Notifications & Asset Pe

[Reply](#) [Reply all](#) [Forward](#)

Risk AssetForm Approval required for Interlock -138PSV-001S

Mahendra Reddy G MG Thu 10/3/2024 12:24 PM

To: Chagam Prasanna
Cc: Mahendra Reddy G; Chagam Prasanna

Dear Sir/Madam,

The Interlock - 138PSV-001S is Bypassed on 9/26/2024 11:48:00 AM and not yet normalized.

Please Approve the Riskassessment form for the Interlock - 138PSV-001S on the Portal <http://localhost/inSisSafetyInterlock>

Note: This is an automatically generate report by inSis Interlock System.

inSis Suite - Process Data Analytics, Dashboards, Notifications & Asset Performance System

[Reply](#) [Reply all](#) [Forward](#)

Automated and On-demand Reports

- The reports help the number of interlocks bypassed provide crucial insights into safety performance, help identify areas for improvement, and enable proactive risk management strategies.
- The reports can be exported to Excel sheets and PDFs.
- The reports can be scheduled to respect users through email.

Types of Reports

- Currently Bypassed Report
- Daily Report/Weekly Report
- Safety Interlocks Bypass Record
- Interlock Bypass History Report

Trip Interlock/ Safety Device Bypass Record								
Tag No	Tag Description	Probable Consequence (maximum) if trip/device is not available	Alternate Safeguard/ Monitoring tag available. When to Initiate Contingency measures and how?	Bypassed on (Date & Time)	Reason for Bypass	Location and Type of Bypass (Mention: DCS/ Engineering Panel/ Field Method: locked/ value forced/MOS)	Bypassed By (Name & Sign)(Action taken by: Operations/ Maintenance Engineer)	Reviewed By Shift InCharge (Name & Sign)(1 shift)
40FZB640MS	COMBST AIR FLOW LOW LOW	Incomplete combustion and Explosive mixture in heater, due to this heater explosion may occur.	40FI-631 & 635 of 40FD-201A & B	17-Aug-2024 10:35	Due to Rain	DCS	Janakrajsinh Jhala	
40FZB640MS	COMBST AIR FLOW LOW LOW	Incomplete combustion and Explosive mixture in heater, due to this heater explosion may occur.	40FI-631 & 635 of 40FD-201A & B	17-Aug-2024 12:20	Due to Rain	DCS	Mahendrasinh Rana	
40FZB640MS	COMBST AIR FLOW LOW LOW	Incomplete combustion and Explosive mixture in heater, due to this heater explosion may occur.	40FI-631 & 635 of 40FD-201A & B	19-Aug-2024 15:00	Due to Rain	DCS	Shahnavaz Patel	
40FZB640MS	COMBST AIR FLOW LOW LOW	Incomplete combustion and Explosive mixture in heater, due to this	40FI-631 & 635 of 40FD-201A & B	24-Aug-2024 20:00	Due to Rain	DCS	Shahnavaz Patel	

A photograph of an industrial facility, likely a refinery or chemical plant, at sunset. The sky is a mix of orange, pink, and blue. Several tall, cylindrical towers are visible, some with lights on. A large purple diagonal band cuts across the right side of the image.

Thank You



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