SAP EHS Solution Overview

EHS Solution Management
Q2 2021

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SAP Strategy for Sustainability

A blueprint to integrate sustainability data into business processes
across all value chains to drive performance, new products & new markets

Complete the transition to a high-performance Sustainable Intelligent Enterprise by combining operational data mapping with holistic sustainability reporting

Steering to Zero with a **Sustainability Performance Management**

Zero Emissions with
Climate Action

Generate cost savings by transitioning from “Low to No” carbon across your entire network.

Zero Waste with
Circular Economy

Contribute to a zero-waste world by incorporating resilience and circularity into your supply chains.

Zero Inequality with
Social Responsibility

Ensure zero incidents, accidents and harm to communities, people and the environment.

Industry Innovation

Generate additional value by incorporating industry-specific solutions from across our Partner Ecosystem and Industry Cloud

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SAP Sustainability Solutions

Solution Scope

HOLISTIC STEERING AND REPORTING

- SAP Sustainability Control Tower
- SAP Ariba - EcoVadis Supplier Sustainability Rating
- SAP Spend Analytics and Category Intelligence
- SAP Environment Management (EHS)
- SAP S/4HANA for Product Compliance
- SAP Health and Safety Management (EHS)

Industry Innovation

- SAP Profitability and Performance Management by msg

ZERO EMISSIONS with Climate Action

- SAP Environment Management (EHS)
- SAP Product Footprint Management
- SAP Business Ecology Management for Small and Midsize Businesses
- SAP E-Mobility
- SAP Product Carbon Footprint Analytics (SAC)
- SAP Transportation Management
- SAP Concur
- SAP Treasury and Risk Management
- SAP Logistics Business Network Material Traceability

ZERO WASTE with Circular Economy

- SAP Responsible Design and Production
- SAP S/4HANA for Product Compliance
- SAP Environment Management (EHS Waste Mgmt)
- GreenToken by SAP
- SAP Rural Sourcing Management
- SAP Logistics Business Network Material Traceability
- Product Lifecycle Management
- Integrated Business Planning

ZERO INEQUALITY Social Responsibility

- SAP Health and Safety Management (EHS)
- SAP Occupational Health (EHS)
- SAP Incident Management (EHS)
- SAP Business Integrity Screening
- SAP S/4HANA for Product Compliance
- SAP Concur (Duty of Care)
- SAP Ariba (Supplier Diversity)
- SAP Fieldglass (Contingent Workforce Diversity)
- SAP SuccessFactors
- Qualtrics Employee XM

INDUSTRY INNOVATION

- Bearing Point LogEC (Logistics Emissions Calculator)
- SAP Traders & Schedulers Workbench
- SAP Cloud for Energy
- SAP Digital Vehicle Hub (SAP AIN)
- SAP Direct Distribution
- SAP Multichannel Order Management
- SAP S/4HANA for Waste & Recycling by Prologa
- SAP Returnable Packaging Management
- SAP Intelligent Returns Management
- SAP Outcome-based Business Insights
- SAP Replenishment Planning
- SAP Work Clearance Management (EHS)
- SAP Management of Change (EHS)

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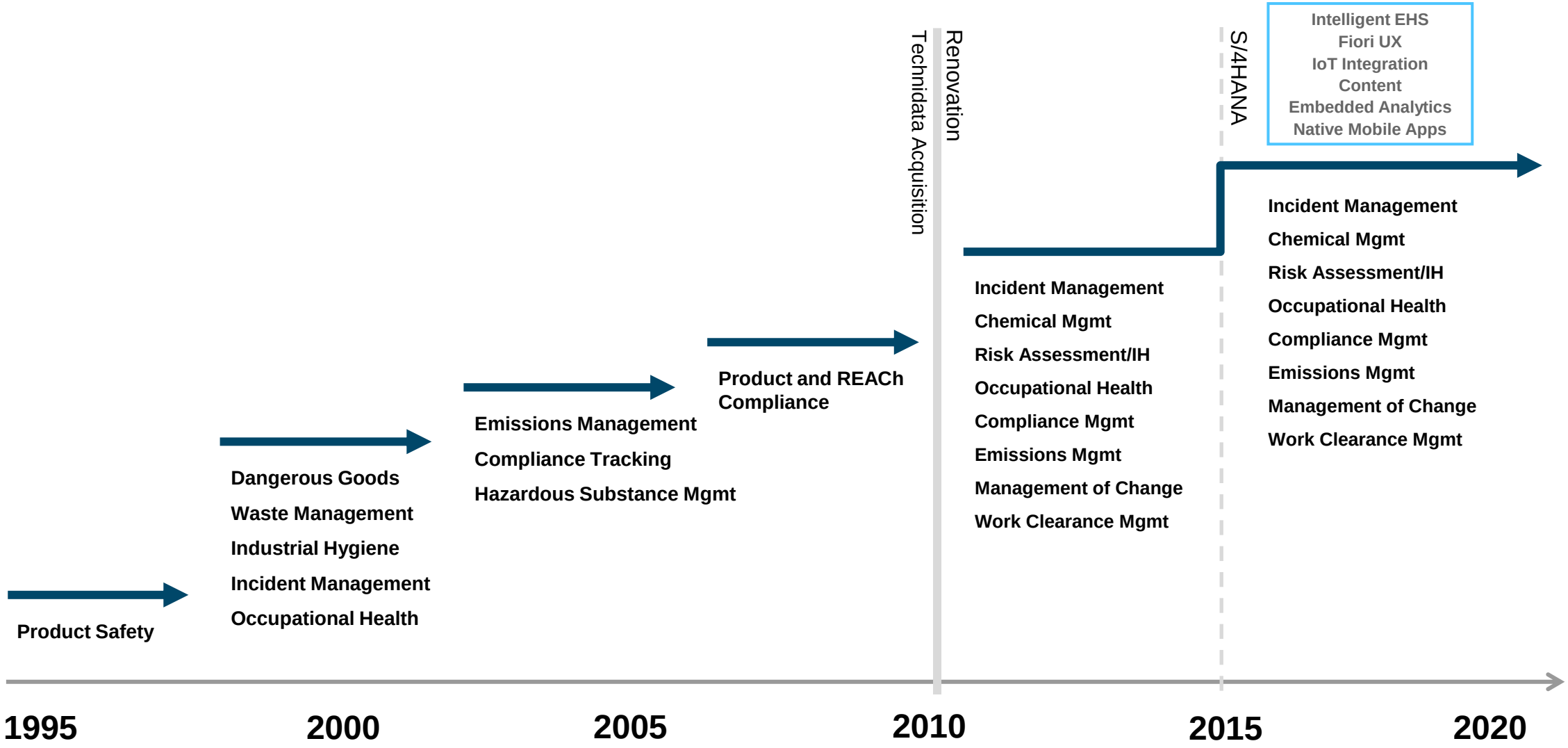
SAP Commitment to Environment Health and Safety

25 year record of investment, innovation and market leadership in delivering SAP Sustainability solutions



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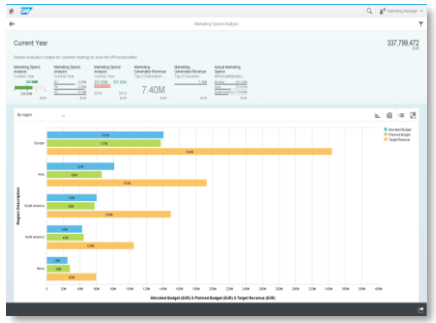
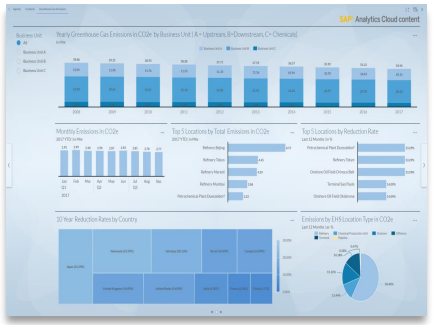
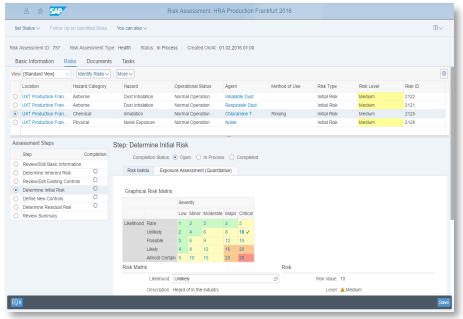
SAP EHS – Design Philosophy

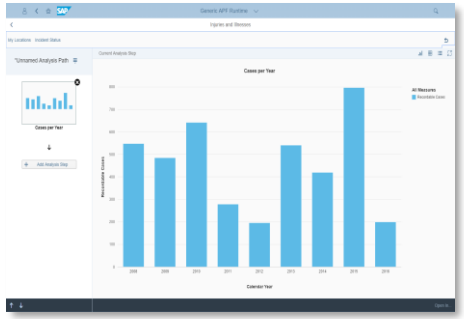
Corporate



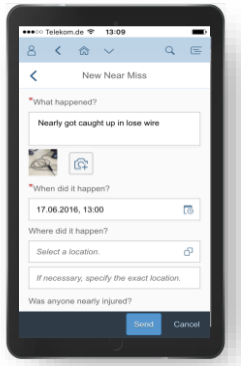


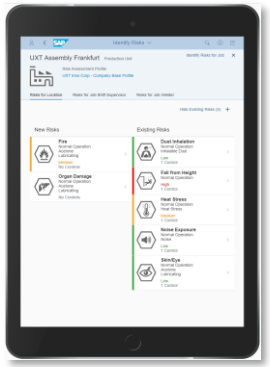
EHS Practitioner





Field Operations





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SAP EHS Solution Portfolio

EHS Incident Management

- Incident Management
- Near Misses
- Safety Observations

EHS Health and Safety

- Chemical Approval
- Chemical Management
- Operational Risk Assessment
- Industrial Hygiene and Sampling
- Occupational Health*
- EHS Audit Management**

EHS Environment Management

- Regulatory and Permit Compliance
- Emissions Management

Management of Change

- Management of Change

Maintenance Safety

- Permit to Work
- Work Clearance/LOTO

Supporting applications

- Asset Management
- Human Resources
- Contractor Management
- Implementation Add-ons

Real Time EHS Reporting and Analytics

Action Tracking and Task Management

Intelligent EHS Technologies for Awareness, Automation, Ubiquity

***OH licensed separately**

****Audit is complimentary with S/4HANA Enterprise**

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SAP EHS Solution Portfolio – Value Drivers

EHS Incident Management

- *Reduce Incident Rates*
- *Proactive Safety Culture*
- *Proactive Safety Culture*

EHS Health and Safety

- *Control of Chemicals Onsite*
- *Real Time Chemical Inventory*
- *Reduced Operational Risk*
- *Minimize Workplace Exposures*
- *Protocol-driven Medical Services*
- *Integrated CAPA Tracking*

EHS Environment Management

- *Ensure Compliance*
- *Minimize Emissions*

Management of Change

- *Reduced risk from changes*

Maintenance Safety

- *Better Control of work*
- *Prevent Safety Violations*

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The Fiori Launchpad – Role-based entry screen for all users

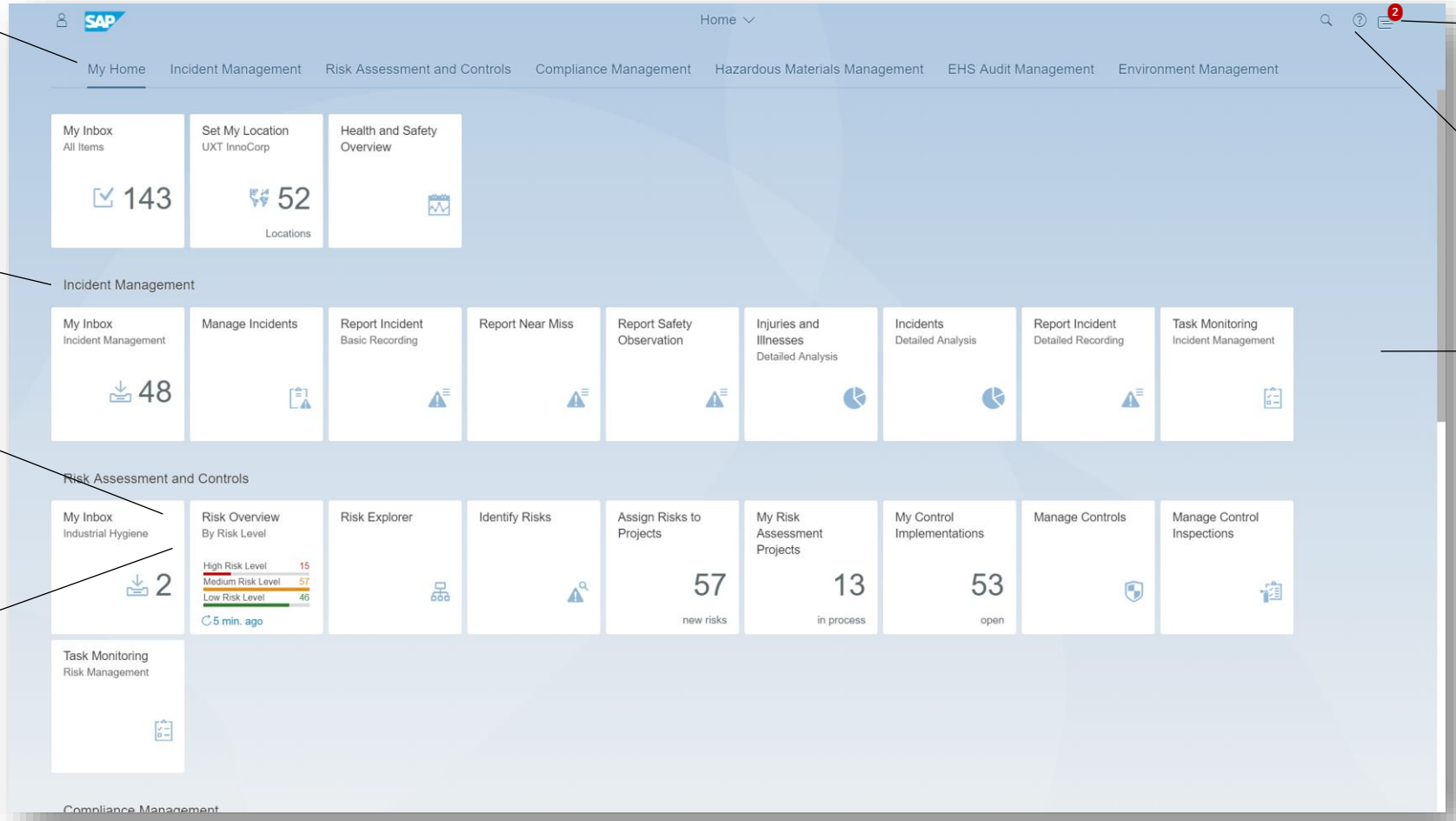
Anchor navigation allows direct access to groups

Group tiles for personalized content organization

Dynamic charts to provide high level, real-time overview

Color coding alerts user for any overdue, new or immediate actions

[Fiori Launchpad User Guide]



News and feeds to enhance collaboration

Search across and within apps to get immediate answers

Edit mode for instant personalization of groups and tiles

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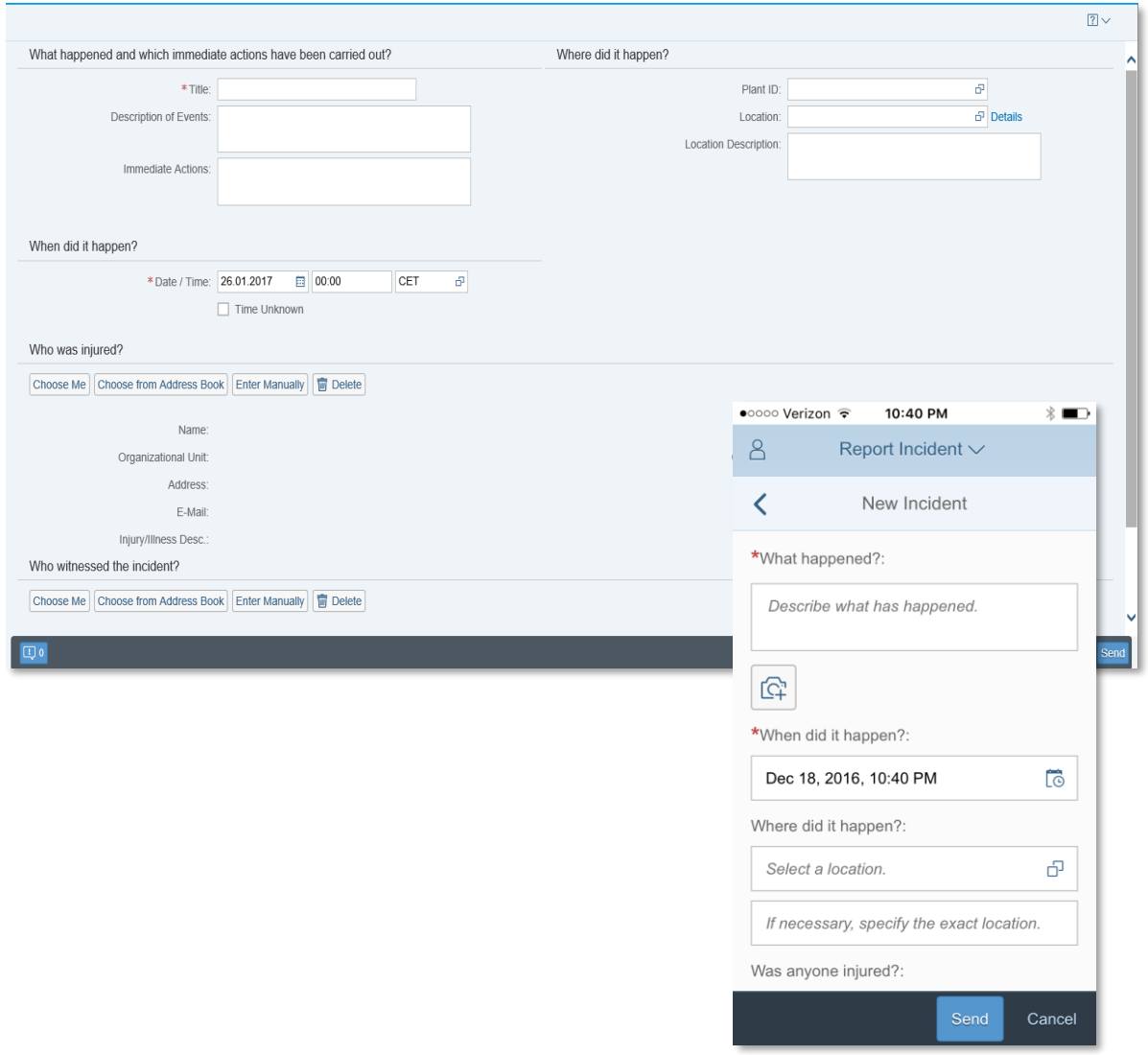
EHS Incident Management / Safety Observations



Objective

Provide a centralized solution to track all types of incidents, drive a consistent process for incident entry, investigation, and corrective actions.

Capabilities

- **Multiple options for incident data entry, including mobile and offline entry**
- **Data structure, user interface, and security model specific to incident type, near miss, safety observations**
- **Direct integration to ERP and HR processes**
- **Workflow-driven initial notifications, investigation steps, and corrective actions**
- **Real-time analytical reports and dashboard views**
- **Real-time incident rate calculations**

Benefit

- **Learn from analyzing a central database of all types of events to reduce incident rates and severity**
- **Increased visibility and automation of tasks and corrective actions**
- **Reduced time for processing incidents and regulatory reporting**
- **Valuable process integration within EHS and other SAP applications**

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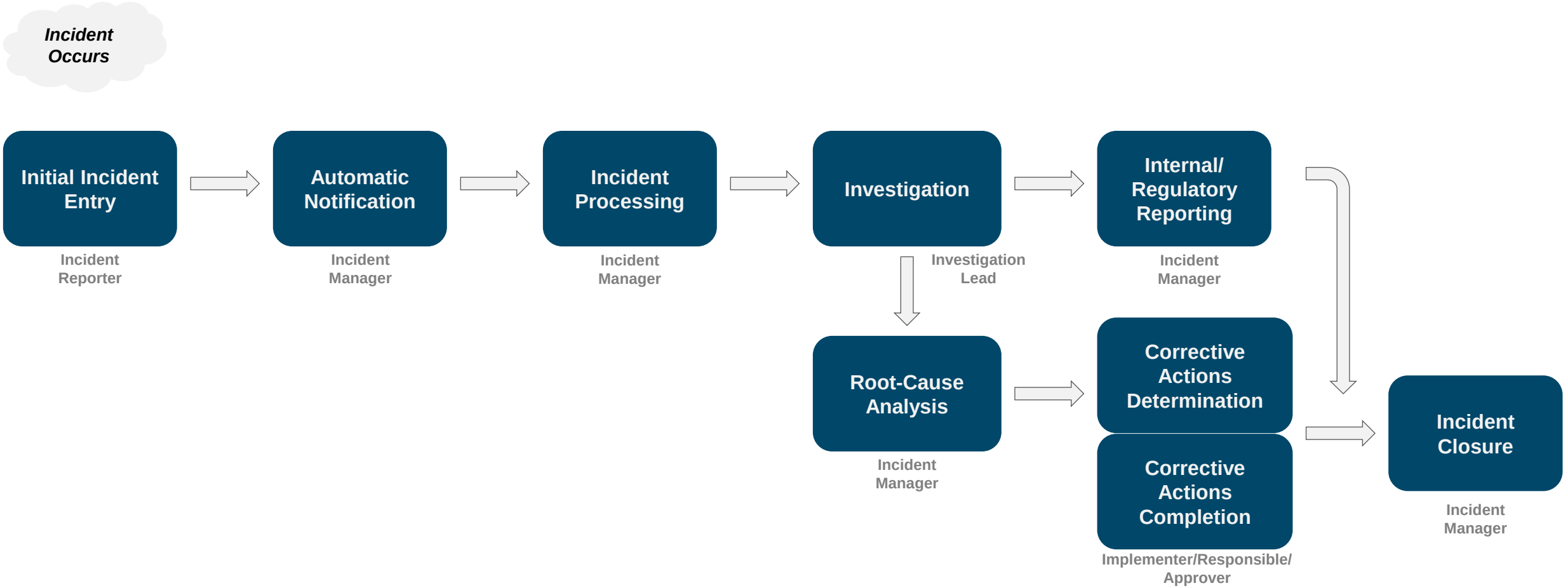
EHS Incident Management

Business Process



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EHS Incident Management

Functional Components

Incident Recording

- Incident Entry
- Near Miss Entry
- Safety Observation Entry
- Mobile App
- Offline Adobe Forms

Incident Processing

- Basic Incident Information
- Involved People
- Damaged Assets
- Notice of Violation
- Environmental Spills
- Injury Info
- Risk Assessment
- Investigation
- Absences and Restricted Duty
- Document Attachments
- Root Cause
- Influencing factors
- Financial Transactions
- Corrective Actions/ Tasks
- Treatment Info

Incident Outputs

- Regulatory Forms (eg. OSHA 300)
- Investigation Summary form
- Incident Dashboards
- Analytical, ad-hoc tabular reporting
- Data export to MS Excel, email
- Real time incident rate calculations

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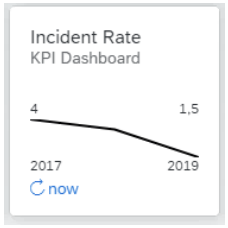
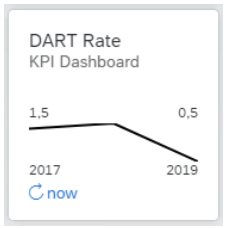
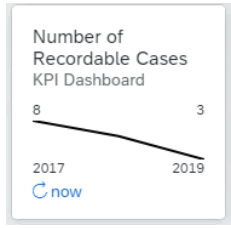
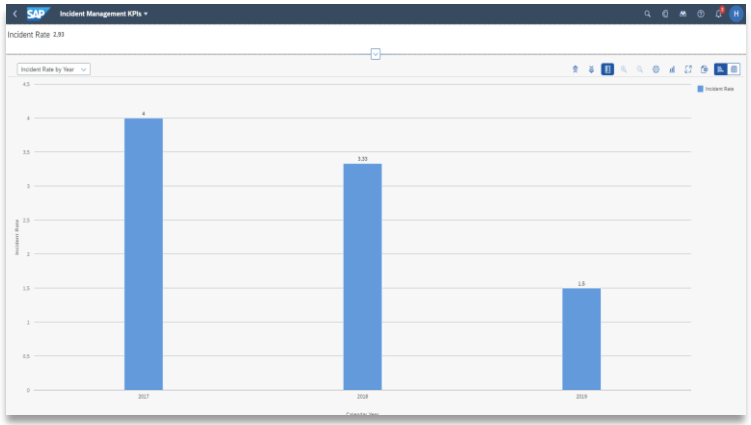
Key Feature – Real time incident rate calculation

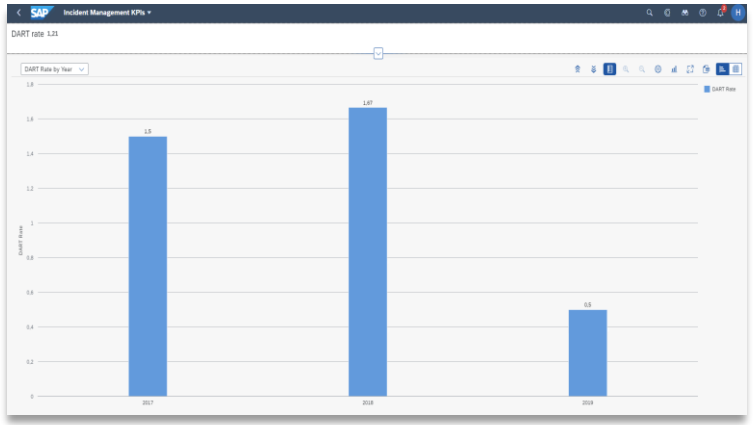
Pre-built analytical views that continuously calculate incident rate and other metrics as relevant data is being entered, such as incident records and hours worked. Live tiles provide an updated trendline right on the user Launchpad without having to click open the report

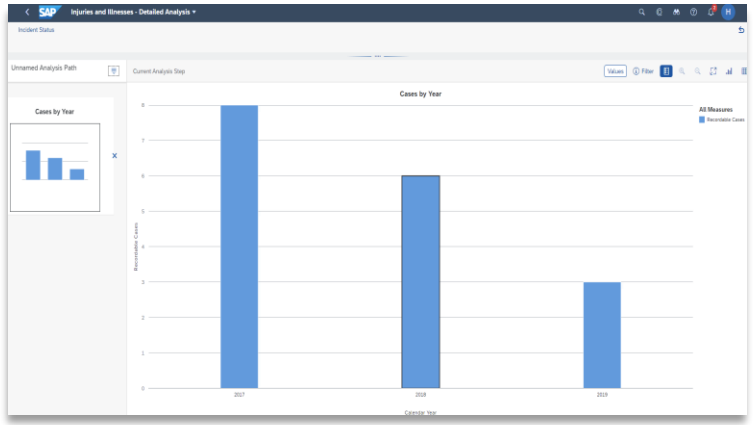












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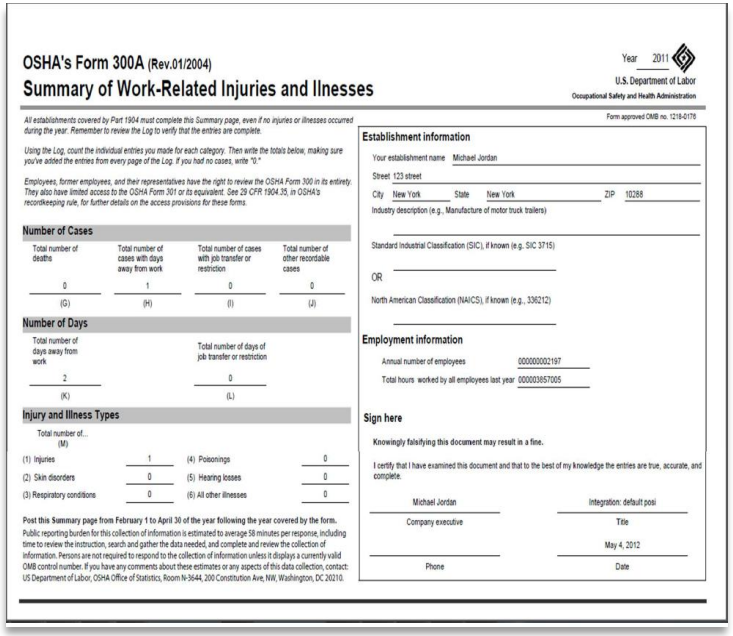
EHS Incident Management

Outputs

Forms



OSHA's Form 300A (Rev.01/2004)

Summary of Work-Related Injuries and Illnesses

Year 2011

U.S. Department of Labor

Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	1	0	0
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
2	0
(K)	(L)

Injury and Illness Types

Total number of... (M)			
(1) Injuries	1	(4) Poisonings	0
(2) Skin disorders	0	(5) Hearing losses	0
(3) Respiratory conditions	0	(6) All other illnesses	0

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210.

Establishment information

Your establishment name Michael Jordan

Street 123 street

City New York State New York ZIP 10288

Industry description (e.g., Manufacture of motor truck trailers)

Standard Industrial Classification (SIC), if known (e.g. SIC 3715)

OR

North American Classification (NAICS), if known (e.g., 336212)

Employment information

Annual number of employees 000000002197

Total hours worked by all employees last year 000003857005

Sign here

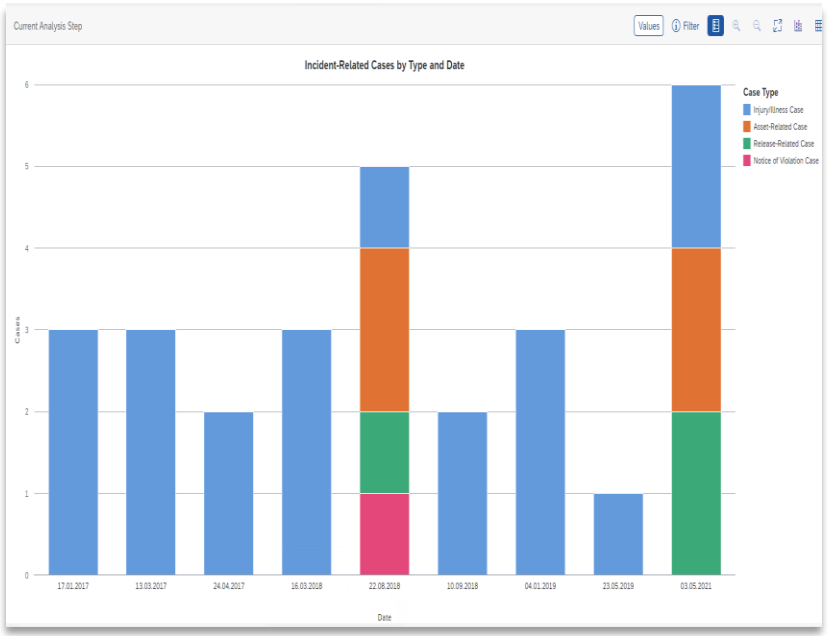
Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Michael Jordan	Integration: default posi
Company executive	Title
	May 4, 2012
Phone	Date

Dashboards

Drill Down Reporting



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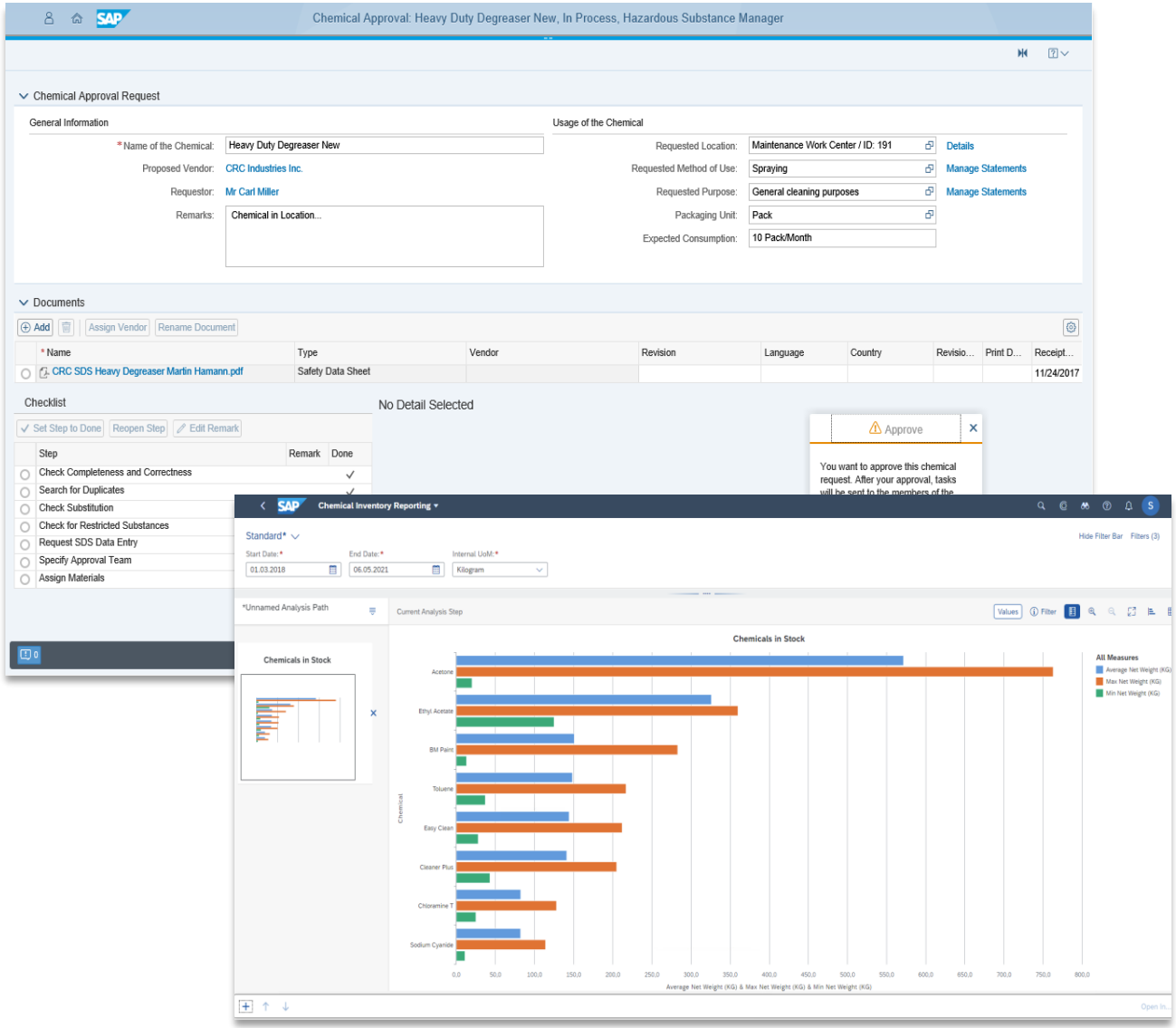
Chemical Management



Objective

Establishing an integrated health and safety process for managing chemicals to ensure safety and compliance in regards to chemicals in the workplace.

Capabilities

- **Configurable approval process for chemicals to build a company wide inventory**
- **Centralized and configurable repository for onsite chemical data**
- **Ability to leverage chemical data in exposure and health risk assessments, Industrial Hygiene sampling projects, and air pollutant emissions calculations.**
- **Integration to SAP Materials Management and Inventory to allow for real-time inventory reporting. In addition, there is support for the SARA 312 regulatory report.**

Benefit

- **Proactively minimize potential chemicals hazards**
- **Holistically leverage chemical data within health and safety management**
- **Embedding chemical workplace compliance into the standard risk assessment process**

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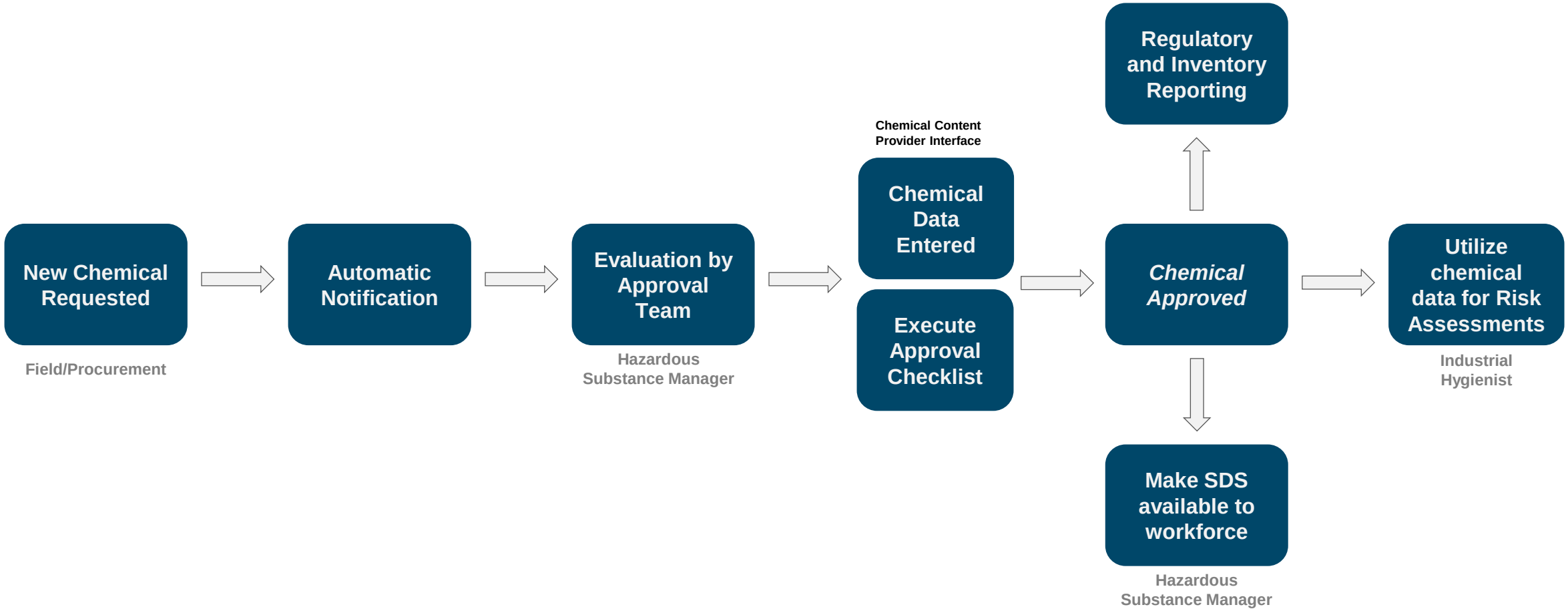
Chemical Management

Business Process – New Chemical



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Chemical Management

Functional Components

Chemical Approval Request

- Request Chemical Approval Screen
- SDS Attachment
- Material Assignment
- Relevant Locations

Chemical Data Management

- Chemical Identifiers
- GHS Classification
- SDS attachments
- Hazard Classifications
- Hazardous Ingredients
- Firefighting Measures
- Hazard Symbols
- Phys/Chem. Properties
- Workplace OELs
- First Aid Measures
- Personal Protective Equipment
- Location and Material Master Assignments

Outputs

- Safety Instruction for Chemicals
- Chemical Search Hitlists
- Real time Inventory Reporting (including SARA 312)
- Analytical, ad-hoc reporting
- Data export to MS Excel, email

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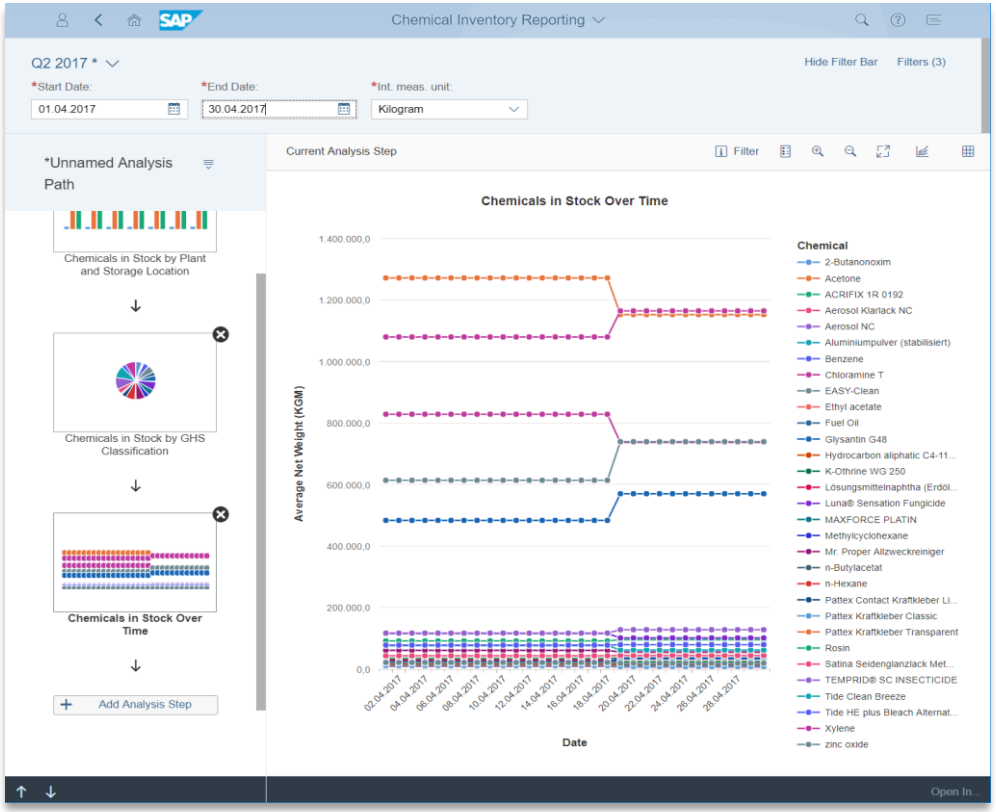
Key Feature – Real time chemical inventory tracking

Leveraging direct integration to SAP Materials Management and Inventory storage location data, SAP EHS provides a flexible, real-time view of onsite chemical storage. This also supports generation of the SARA 312 report for US customers.

- Integration to SAP MM and IM
- Drill-down reporting view of chemicals and amounts
- SARA 312 reporting



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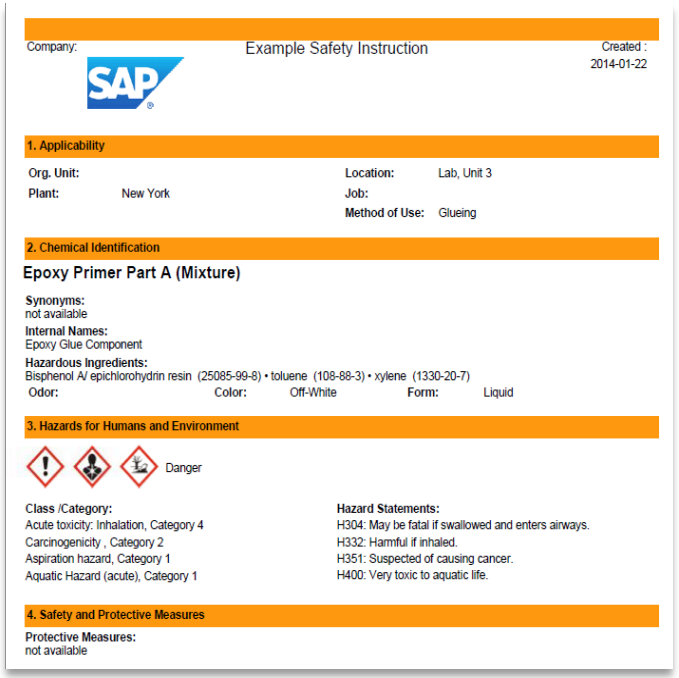
Managing Chemicals for Health and Safety

Outputs

Forms



Company:

Example Safety Instruction

Created : 2014-01-22

1. Applicability

Org. Unit: **Location:** Lab, Unit 3

Plant: New York **Job:**

Method of Use: Glueing

2. Chemical Identification

Epoxy Primer Part A (Mixture)

Synonyms:
not available

Internal Names:
Epoxy Glue Component

Hazardous Ingredients:
Bisphenol A/ epichlorohydrin resin (25085-99-8) • toluene (108-88-3) • xylene (1330-20-7)

Odor: **Color:** Off-White **Form:** Liquid

3. Hazards for Humans and Environment

Danger

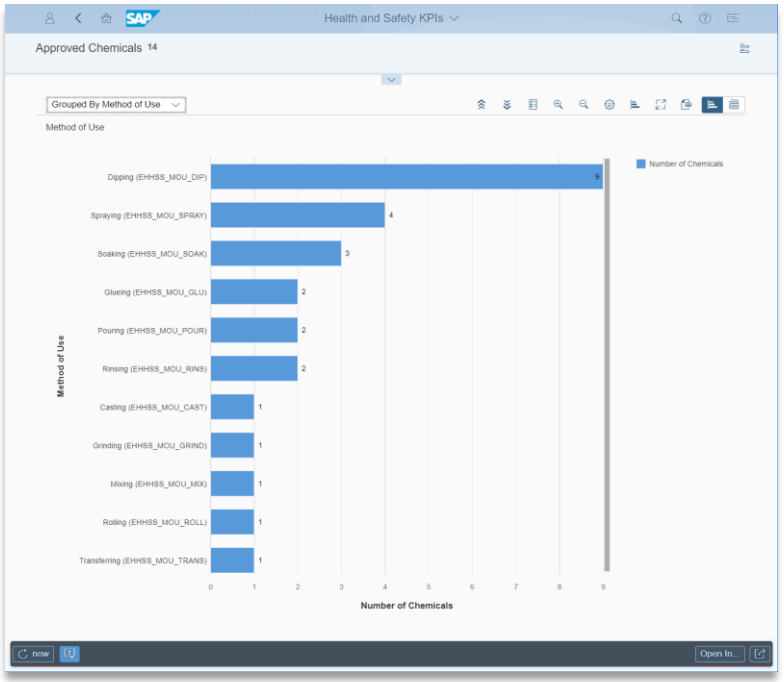
Class /Category:
Acute toxicity: Inhalation, Category 4
Carcinogenicity , Category 2
Aspiration hazard, Category 1
Aquatic Hazard (acute), Category 1

Hazard Statements:
H304: May be fatal if swallowed and enters airways.
H332: Harmful if inhaled.
H351: Suspected of causing cancer.
H400: Very toxic to aquatic life.

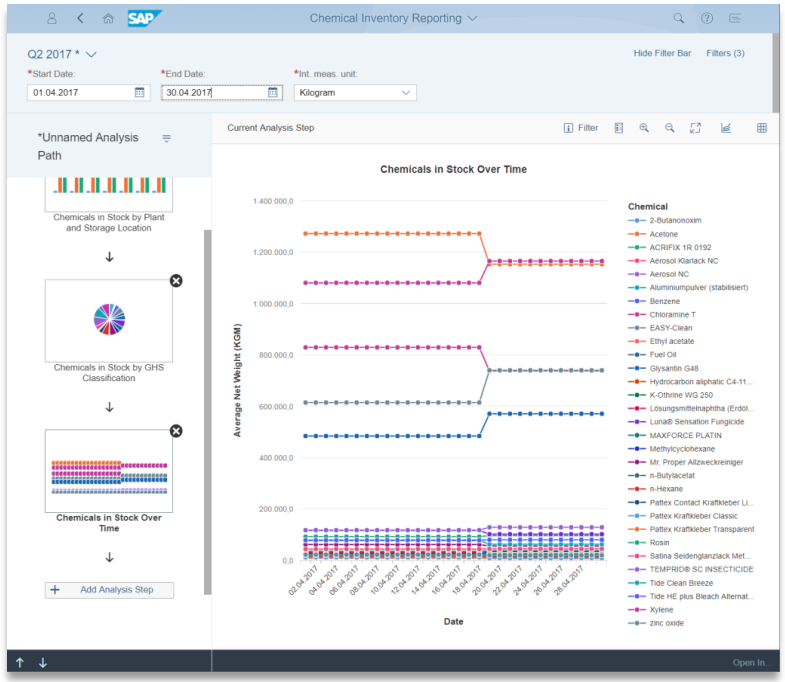
4. Safety and Protective Measures

Protective Measures:
not available

Dashboards



Drill Down Reporting



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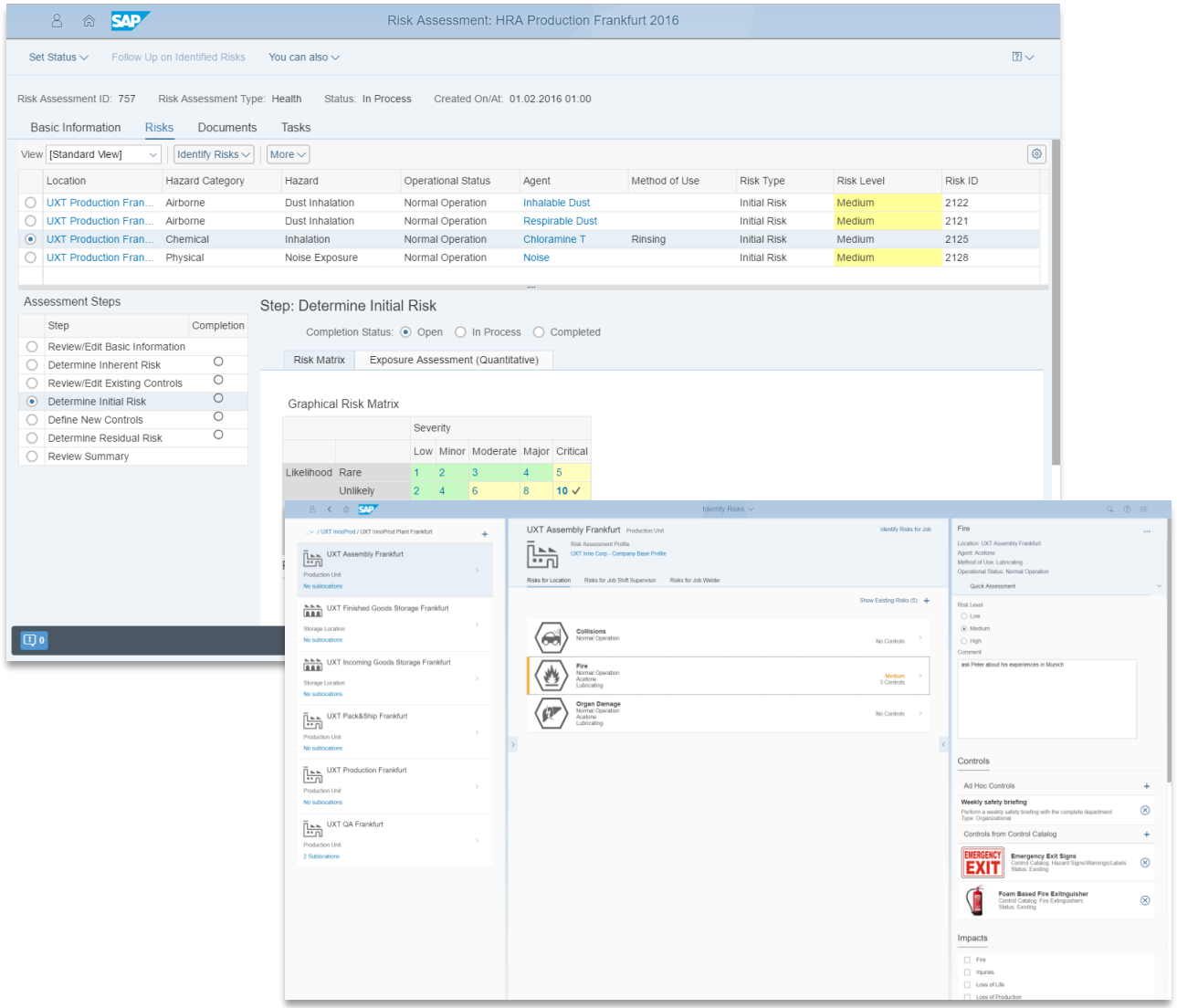
Operational Risk Assessment



Objective

Enable an end-to-end process for identifying and dealing with all manner of hazards and risks in the workplace

Capabilities

- **Comprehensive environment, health, and safety risk assessments (including JHA)**
- **Trigger follow-up actions and tracking them to completion**
- **Multiple risk analysis methods (e.g. risk matrix, job hazard analysis, OEL comparison)**
- **Real-time analytical reports and dashboard views**
- **Mobile apps for hazard identification in the field and communication of all safety-related information in one view**
- **Validation between hazards, impact, and controls**

Benefit

- **Standardized, cost-effective approach to managing operational risks**
- **Minimize workplace exposures and related health impacts**
- **Increased visibility and automation of tasks and corrective actions**
- **Valuable process integration within EHS and other SAP applications**

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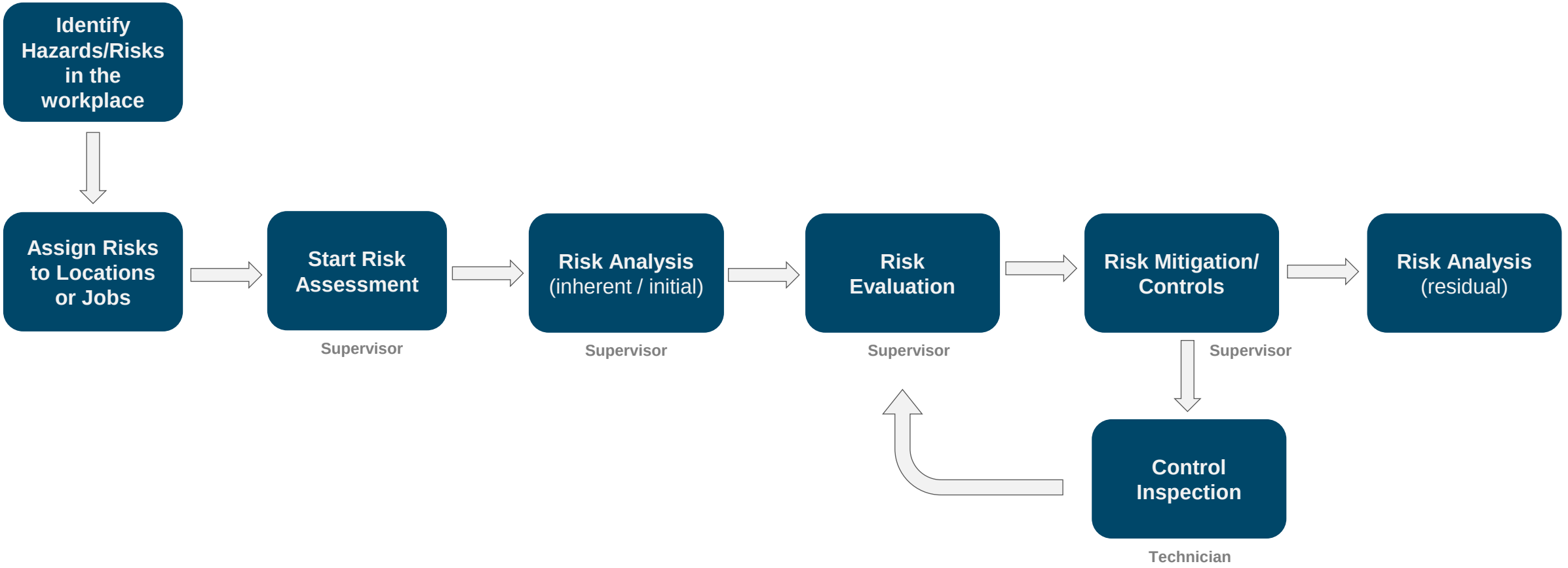
Operational Risk Assessment

Business Process



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Operational Risk Assessment

Functional Components

Hazard Identification

- Location assignment
- Operational Status
- Hazards and Hazard Category
- Physical Agents
- Hazardous Chemicals
- Impacts and Existing Controls

Risk Analysis

- Inherent, Initial and Residual Risk
- Workplace sampling data
- Statistical Analysis on Sampling Data
- Job Hazard Analysis
- Risk Dashboard and Analytics

Risk Evaluation

- Risk Ratings/Matrix
- **Embedded MS Excel templates for further calculations**
- Exposure Assessment (quantitative)

Risk Mitigation

- Control catalog
- Management of existing and new Controls
- Automatic Proposal for Health Surveillance Protocols
- Task Management
- Control Inspections
- Chemical Safety Instructions
- Equipment Safety Instructions
- Safety Relevant Info Mobile App

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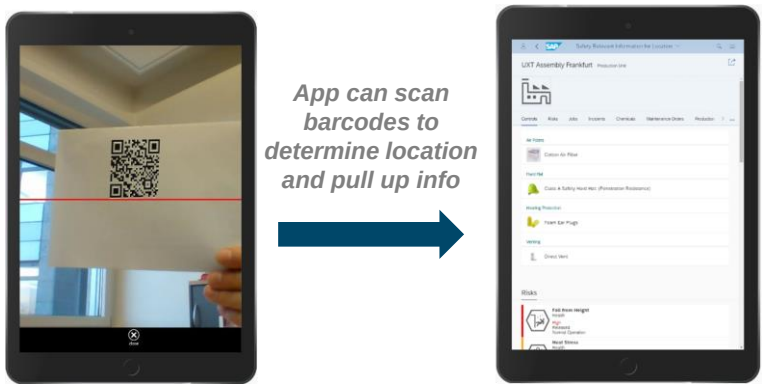
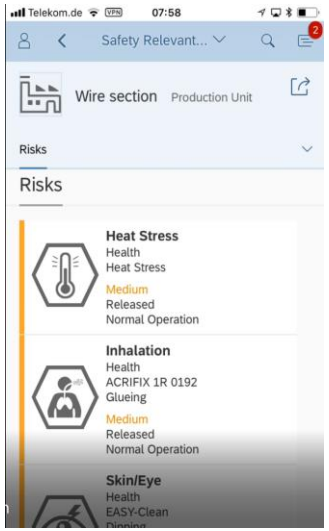
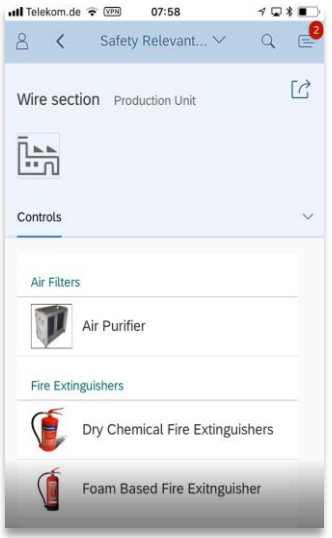
Key Feature - Display Safety Relevant Info App

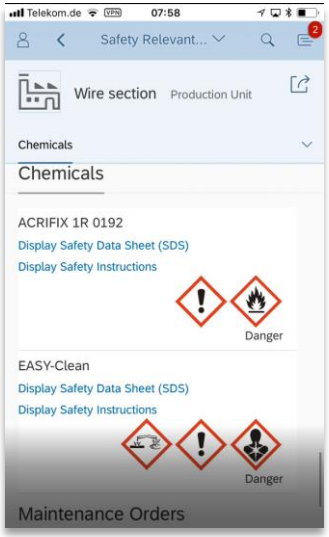
Provides the worker with relevant safety and risk information by merging EHS information with real-time operational context at a specific location or workplace.

- Risks and hazards identified
- Controls in place
- Safety instructions and safety data sheets
- Appropriate PPE
- Past incidents
- Work-related information such as open maintenance orders and production orders









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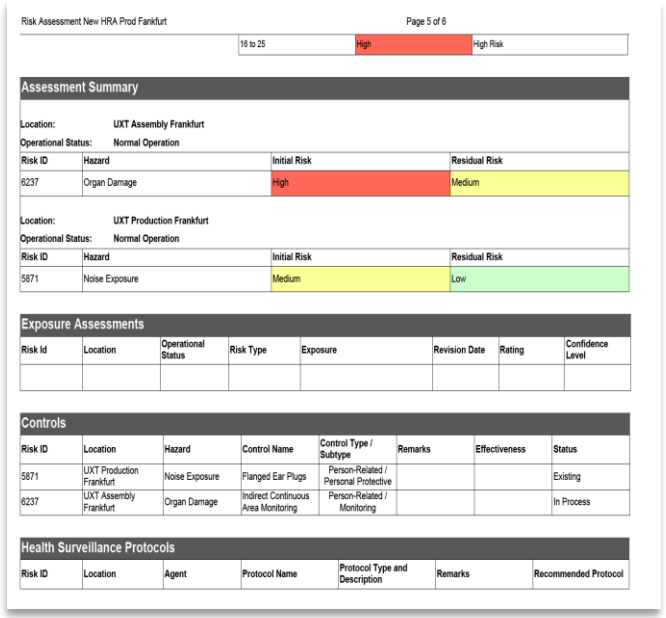
Operational Risk Assessment

Outputs

Forms



Risk Assessment New HRA Prod Fankfurt Page 5 of 6

16 to 25	High	High Risk

Assessment Summary

Location: UXT Assembly Frankfurt
Operational Status: Normal Operation

Risk ID	Hazard	Initial Risk	Residual Risk
6237	Organ Damage	High	Medium

Location: UXT Production Frankfurt
Operational Status: Normal Operation

Risk ID	Hazard	Initial Risk	Residual Risk
5871	Noise Exposure	Medium	Low

Exposure Assessments

Risk Id	Location	Operational Status	Risk Type	Exposure	Revision Date	Rating	Confidence Level

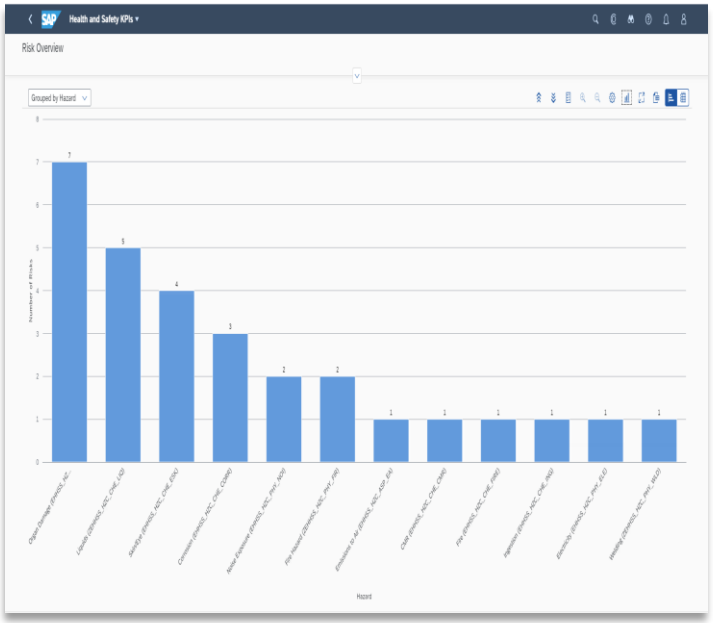
Controls

Risk ID	Location	Hazard	Control Name	Control Type / Subtype	Remarks	Effectiveness	Status
5871	UXT Production Frankfurt	Noise Exposure	Flanged Ear Plugs	Person-Related / Personal Protective			Existing
6237	UXT Assembly Frankfurt	Organ Damage	Indirect Continuous Area Monitoring	Person-Related / Monitoring			In Process

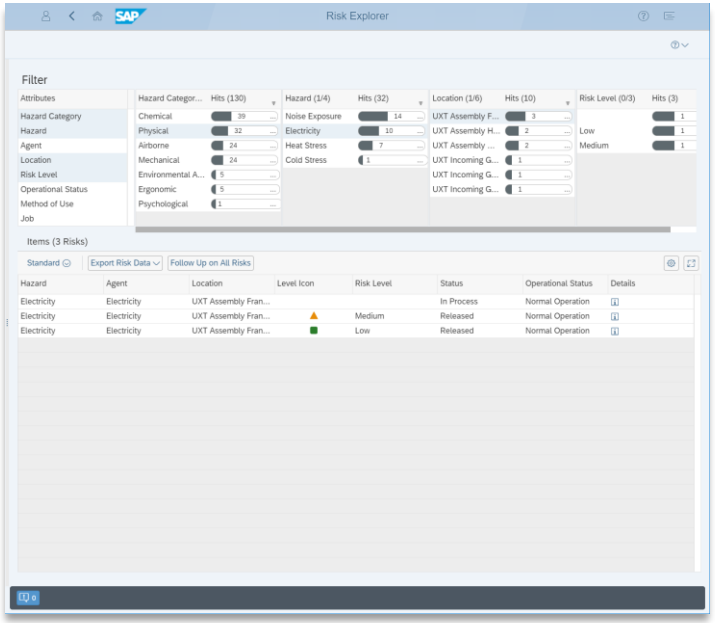
Health Surveillance Protocols

Risk ID	Location	Agent	Protocol Name	Protocol Type and Description	Remarks	Recommended Protocol

Dashboards



Drill Down Reporting



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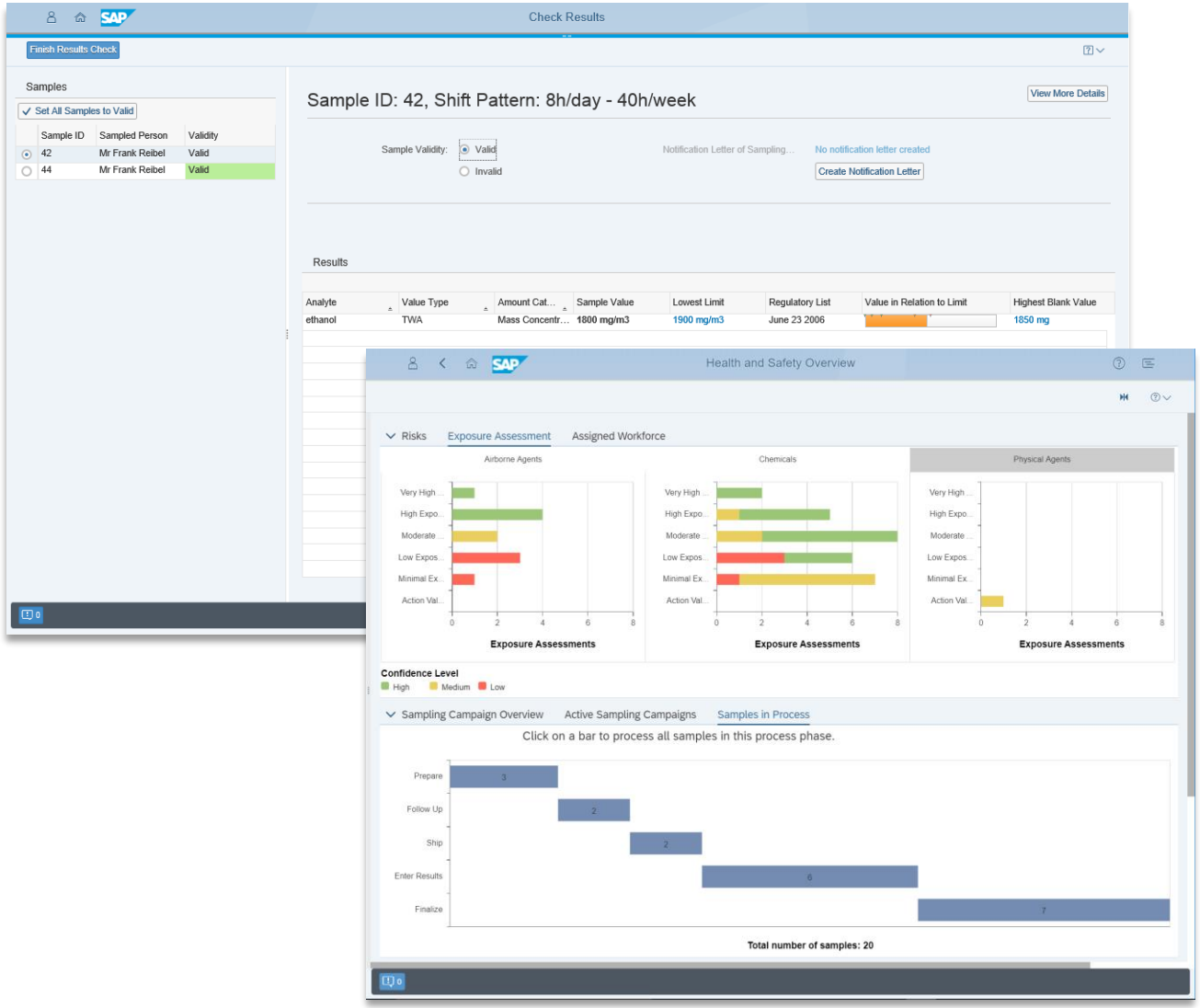
Workplace Sampling & Industrial Hygiene



Objective

Optimize Industrial Hygiene programs and the efficiency of workplace sampling and exposure assessment.

Capabilities

- **Planning and tracking of sampling campaigns**
- **Documentation of industrial hygiene equipment calibration**
- **Collaboration with internal or external laboratories**
- **Managing industrial hygiene data and exposure analysis through qualitative and quantitative analysis embedded in the EHS risk assessment**
- **Automated comparison of sampling results versus occupational exposure limits (OEL)**
- **Managing similar exposure groups (SEG) and compiling personal exposure profiles**

Benefit

- **Visibility into all steps and chain of custody transfers in the sampling campaign**
- **Minimize industrial hazards to employees in order to keep them safe and healthy while ensuring regulatory compliance.**

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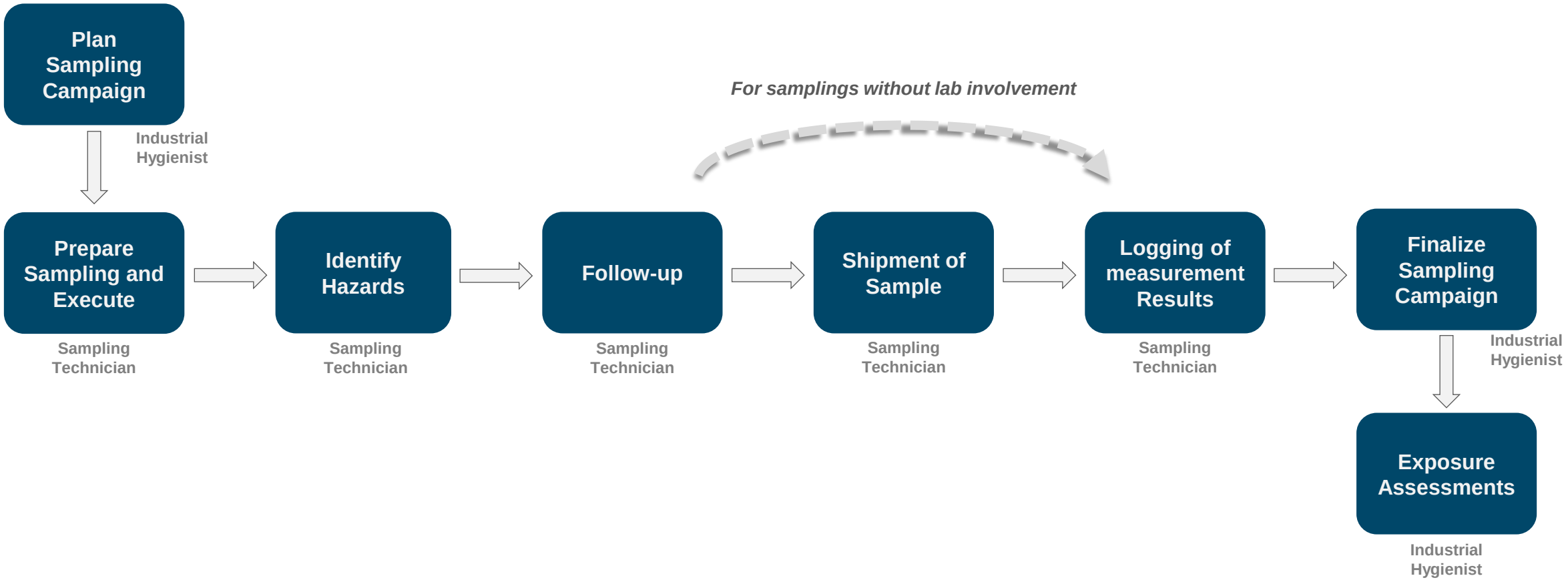
Workplace Sampling and Industrial Hygiene

Business Process



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Workplace Sampling and Industrial Hygiene

Functional Components

Workplace Sampling

- Sampling Campaign
- Date / appointment planning (e.g. Outlook)
- Field Sheet
- Sampling of:
  - Physical Agent
  - Airborne Agent
  - Chemicals
- Sampling Methods and Sampling Targets
- Equipment calibration
- Spreadsheet import of measurement data
- Monitoring Dashboards on sampling campaign

Exposure assessment

- Qualitative and quantitative Exposure assessment
- Chemicals with OELs
- OELs adjustable for shift patterns
- Automatic comparison of sample data with OELs
- Option to include statistical analysis
- Exposure rating including confidence level
- Sampling Methods and Sampling Targets
- Chemicals with OELs
- Adjust OEL for Shift Patterns
- Dashboard on campaign monitoring

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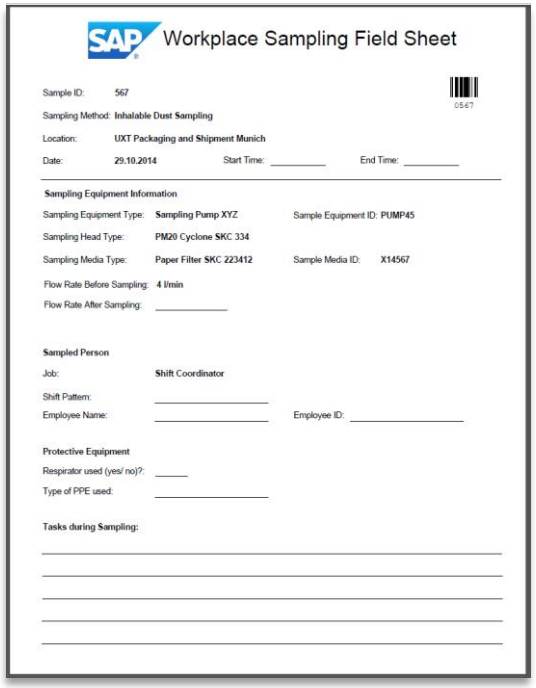
Workplace Sampling and Industrial Hygiene

Outputs

Forms



Workplace Sampling Field Sheet

Sample ID: 567

Sampling Method: Inhalable Dust Sampling

Location: UXT Packaging and Shipment Munich

Date: 29.10.2014 Start Time: _____ End Time: _____

Sampling Equipment Information

Sampling Equipment Type: Sampling Pump XYZ Sample Equipment ID: PUMP45

Sampling Head Type: PM20 Cyclone SKC 334

Sampling Media Type: Paper Filter SKC 223412 Sample Media ID: X14567

Flow Rate Before Sampling: 4 l/min

Flow Rate After Sampling: _____

Sampled Person

Job: Shift Coordinator

Shift Pattern: _____

Employee Name: _____ Employee ID: _____

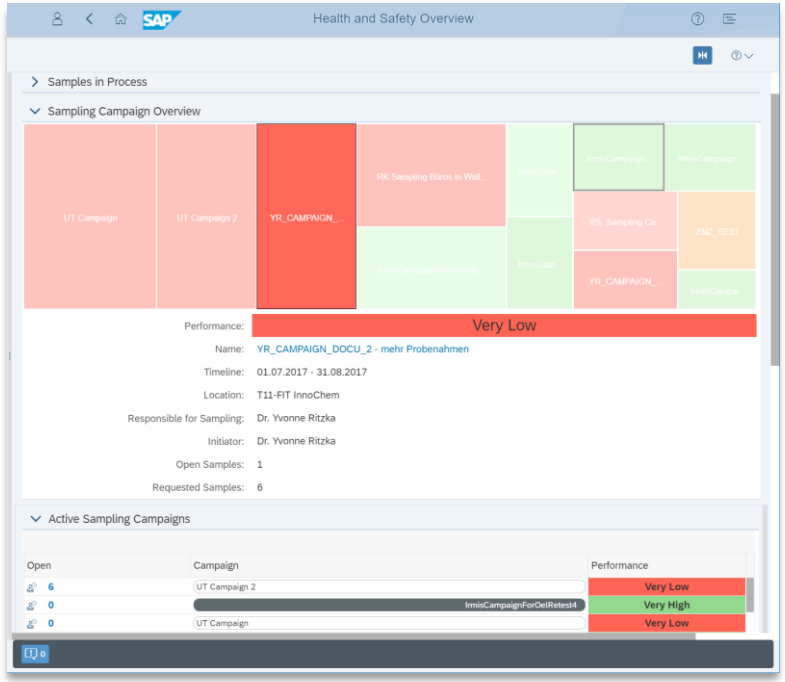
Protective Equipment

Respirator used (yes/ no)?: _____

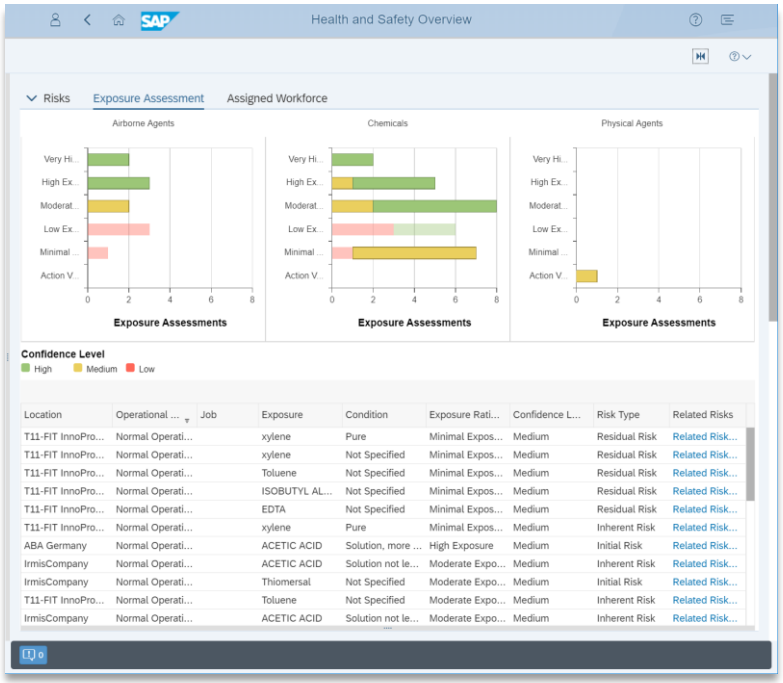
Type of PPE used: _____

Tasks during Sampling:

Dashboards



Drill Down Reporting



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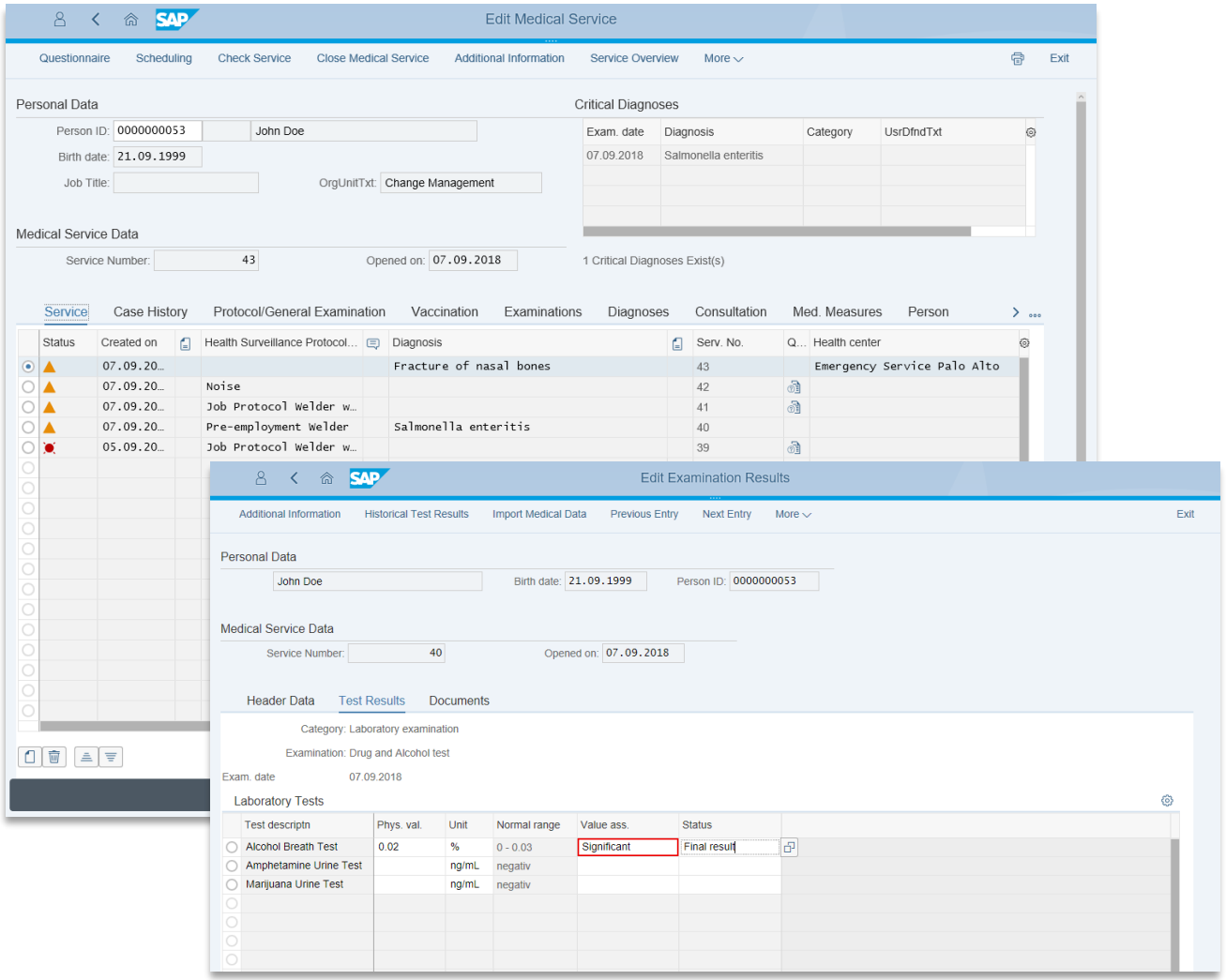
Occupational Health



Objective

Provide a repository to track the occupational health history of employees, and drive a risk-based Occupational Health process with integration back to central HR data.

Capabilities

- **Define Health surveillance protocols including laboratory and physical tests and questionnaires.**
- **Assign protocols to individuals manually or automatically based on the work area and hazards to which they will be exposed.**
- **Schedule appointments and send documentation/ questionnaires to the patient. Enable ad-hoc consultations.**
- **Capture examination results, diagnoses, follow up events, work restrictions in the central patient record**

Benefit

- **Central list of health surveillance protocols to drive the scheduling of medical services and testing for the appropriate personnel**
- **Visibility to the identified risks that require medical monitoring**

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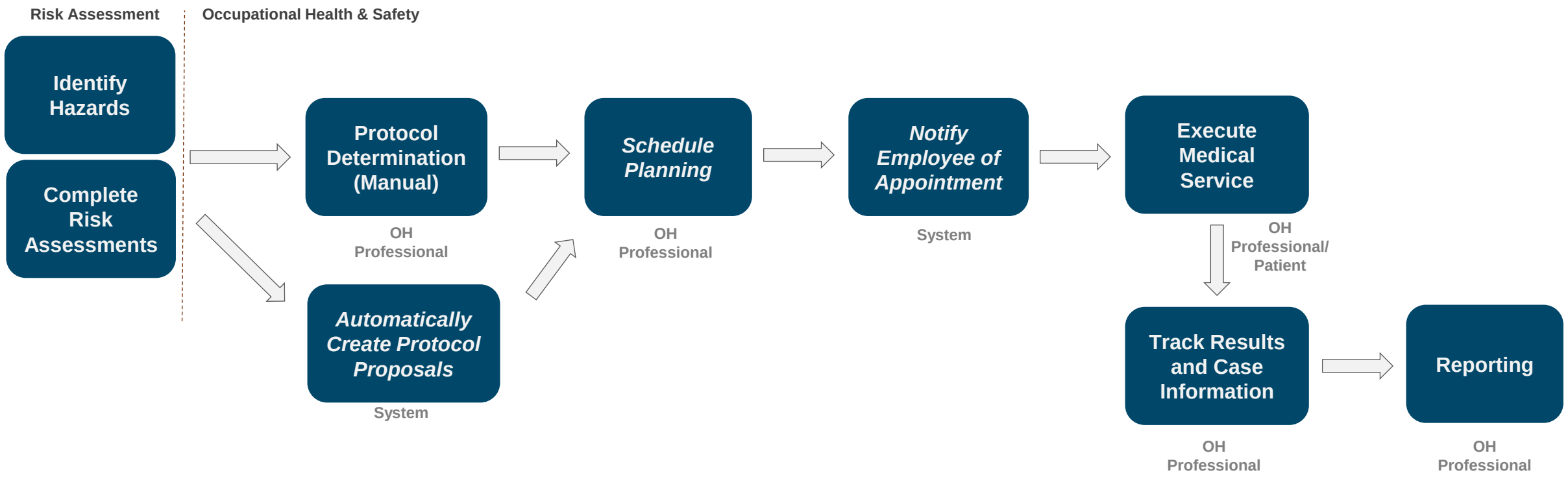
Occupational Health & Safety

Business Process



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Occupational Health & Safety

Functional Components

Medical Service Initiation

- Medical Service Protocol
- Brief Consultation
- Proposal list of surveillance protocols from EHS Risk Assessment

Medical Service Processing

- Laboratory Tests
- Physical Tests
- Questionnaire
- Examinations
- Health Centers
- Physicians
- Health Surveillance Protocols
- Case History
- Vaccinations
- Diagnoses
- Documents
- Medical Measures
- Restrictions

Medical Service Outputs

- Schedule
- Protocol log
- Medical certificate
- Flexible Reporting
- Restrictions

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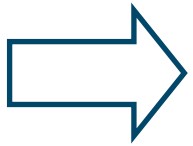
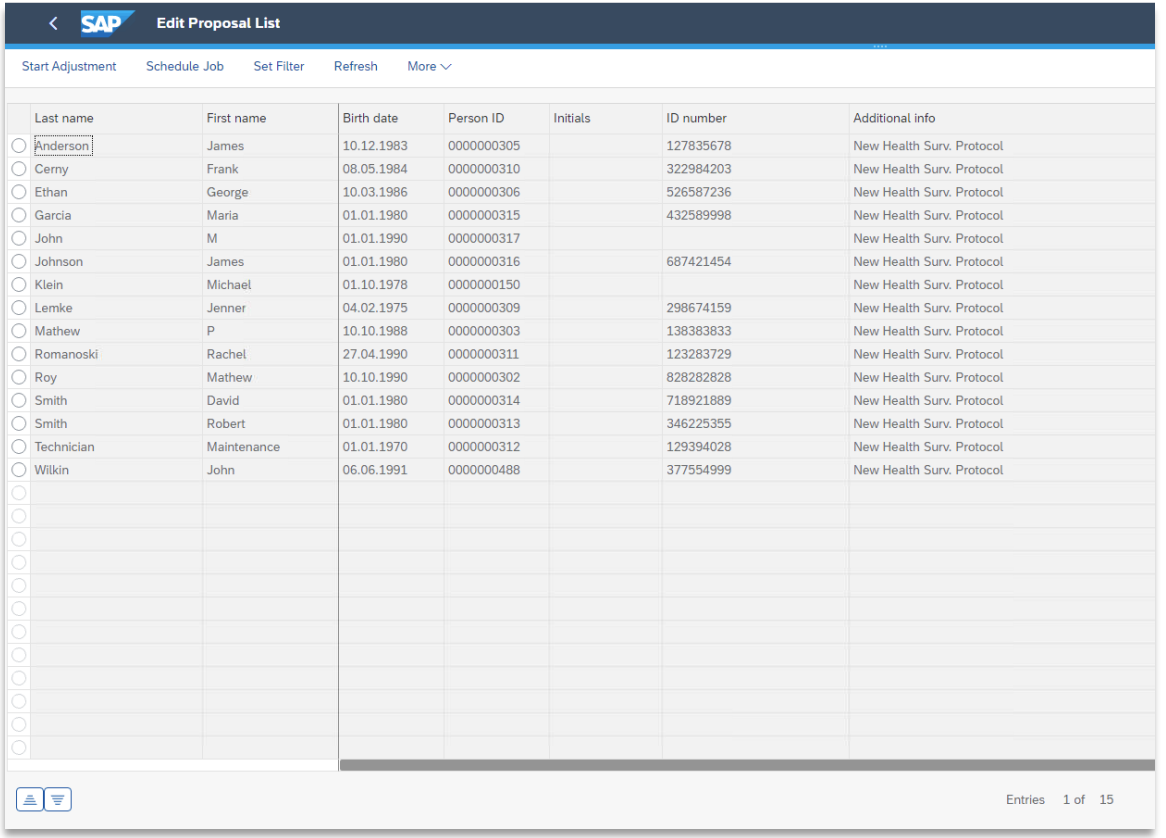
Key Feature – Automated Proposal of Surveillance Protocols

Based on data from exposure risk assessments, job safety analysis, and organizational hierarchies, the system can propose a list of specific individuals who may need to be placed in a health surveillance protocol to monitor health risks.

Exposure risk

Medical History	**Risk controls**
Job Tasks	**Org Hierarchy**
Location	**Work Hours**
IH sampling results	**Professional Judgement**





Last name	First name	Birth date	Person ID	Initials	ID number	Additional info
Anderson	James	10.12.1983	0000000305		127835678	New Health Surv. Protocol
Cerny	Frank	08.05.1984	0000000310		322984203	New Health Surv. Protocol
Ethan	George	10.03.1986	0000000306		526587236	New Health Surv. Protocol
Garcia	Maria	01.01.1980	0000000315		432589998	New Health Surv. Protocol
John	M	01.01.1990	0000000317			New Health Surv. Protocol
Johnson	James	01.01.1980	0000000316		687421454	New Health Surv. Protocol
Klein	Michael	01.10.1978	0000000150			New Health Surv. Protocol
Lemke	Jenner	04.02.1975	0000000309		298674159	New Health Surv. Protocol
Mathew	P	10.10.1988	0000000303		138383833	New Health Surv. Protocol
Romanoski	Rachel	27.04.1990	0000000311		123283729	New Health Surv. Protocol
Roy	Mathew	10.10.1990	0000000302		828282828	New Health Surv. Protocol
Smith	David	01.01.1980	0000000314		718921889	New Health Surv. Protocol
Smith	Robert	01.01.1980	0000000313		346225355	New Health Surv. Protocol
Technician	Maintenance	01.01.1970	0000000312		129394028	New Health Surv. Protocol
Wilkin	John	06.06.1991	0000000488		377554999	New Health Surv. Protocol

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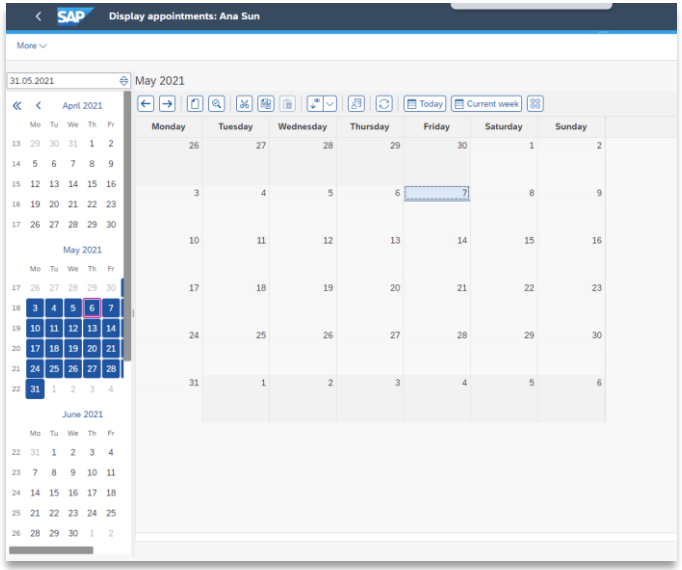
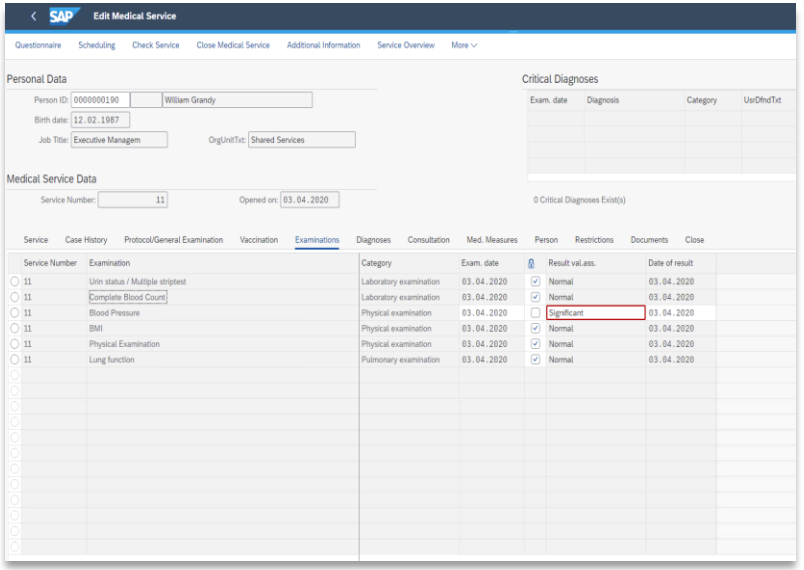
Occupational Health & Safety

Outputs

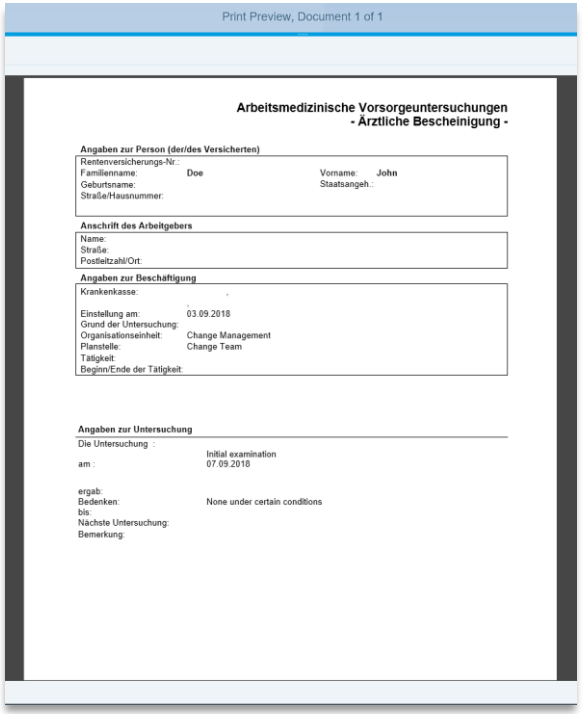
Appointment Calendar



Medical Service History



Medical Certificate



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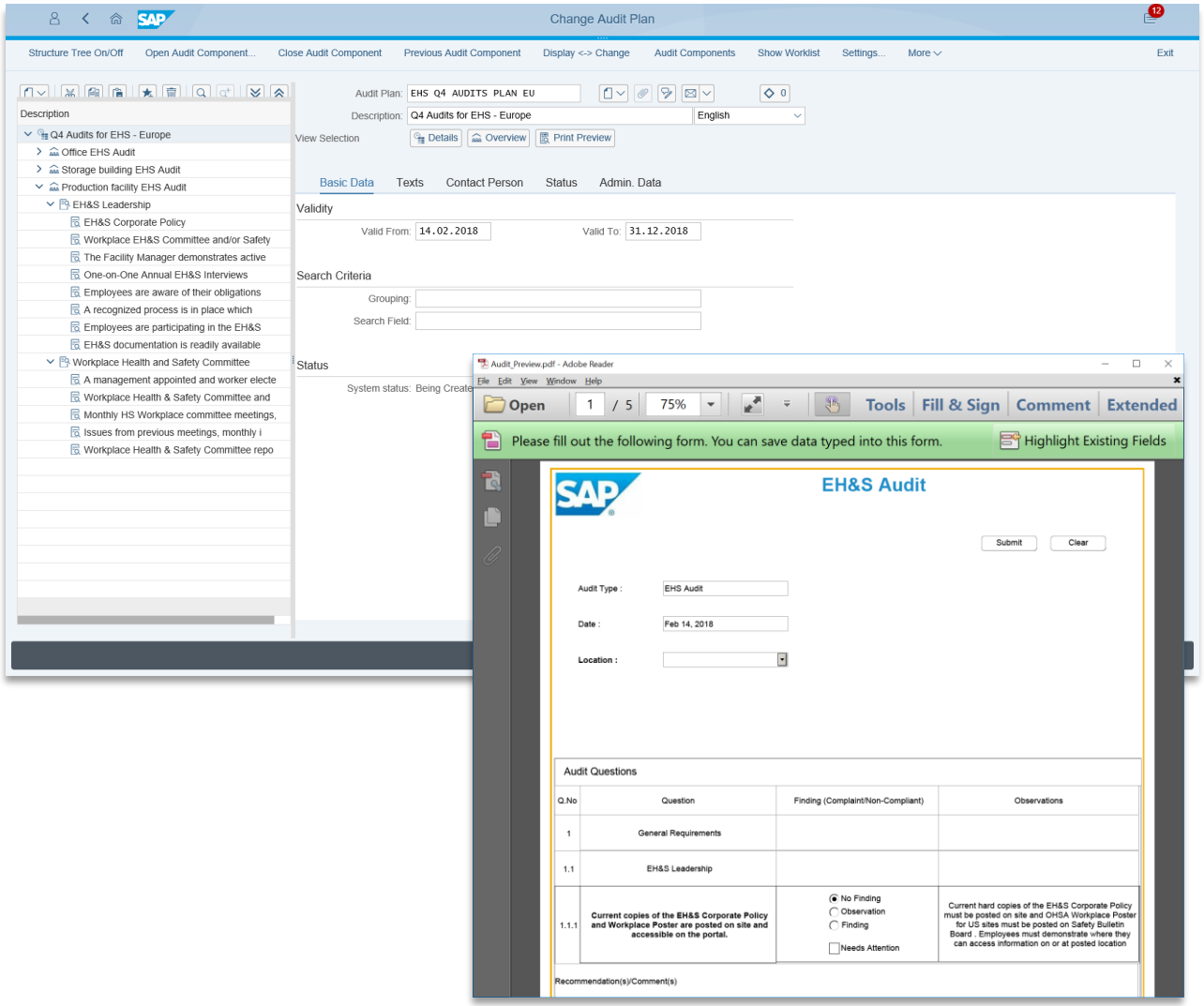
Audit Management



Objective

Comprehensive auditing activities across multiple business domains and processes

Capabilities

- **Complete planning of audit programs and individual audits**
- **Audit Scheduling and Execution**
- **Supporting different Audit Types (OSHA, ISO, API RP75 GMP, etc)**
- **Offline processing of Audits**
- **Audit Valuation**
- **Corrective and Preventive Actions (CAPA)**
- **Reporting and analysis**

Benefit

- **Simplify communication with audit partners in all phases of the process by leveraging different technology within the application**
- **Integrate auditing activities across multiple applications for different business requirements**
- **Reduce the cost and complexity of auditing**

Note: The Audit Management application is a component of the core S/4HANA Enterprise license and is not included within SAP EHS

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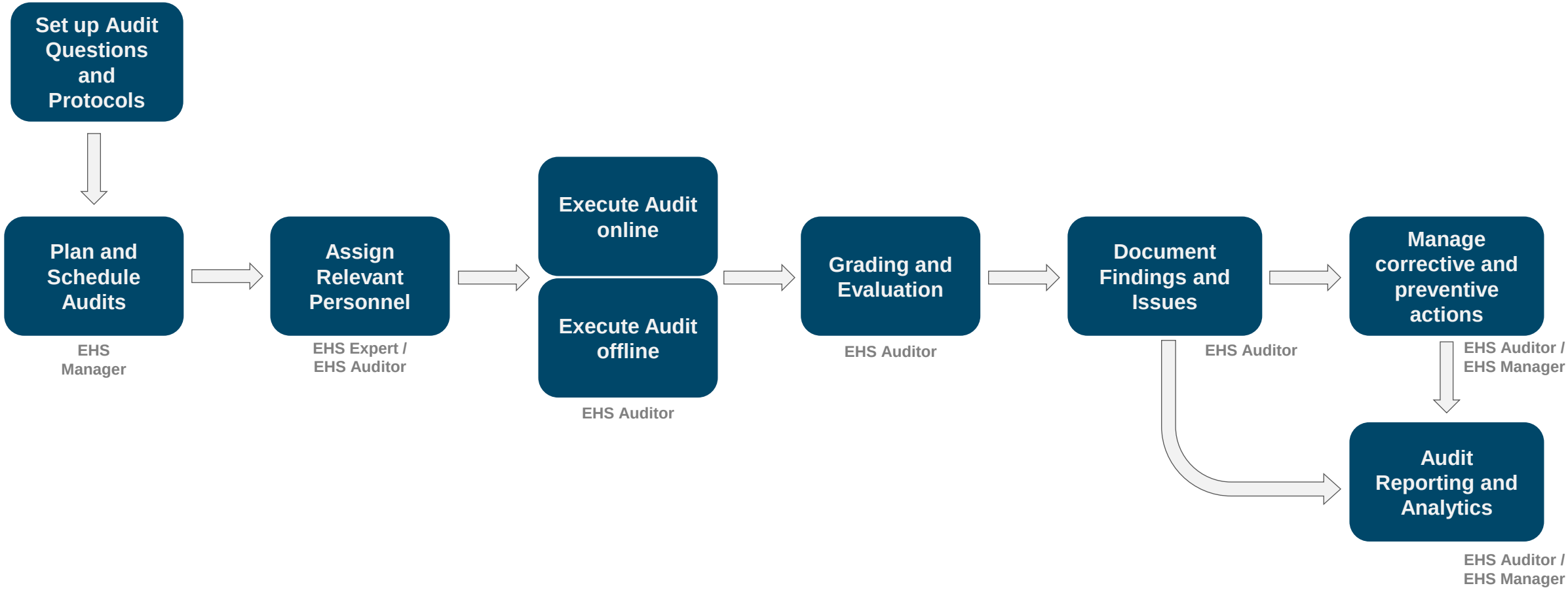
Audit Management

Business Process



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Audit Management

Audit Planning

- Define Audit Scheme for Audit Program
- Manage question lists
- Schedule Audits
- Coordinate Audit team
- Coordinate with external stakeholders

Audit Processing

- Basic Audit Information
- Involved People
- Online and offline auditing
- Manage valuation criteria
- Corrective Actions
- Grading of Audit questions
- Document Attachments
- Record and document findings
- Digital Signature

Audit Outputs

- Form based repots on Audit questions or corrective actions
- Analytics on audit findings
- Analytical, ad-hoc tabular reporting
- Data export to MS Excel, email

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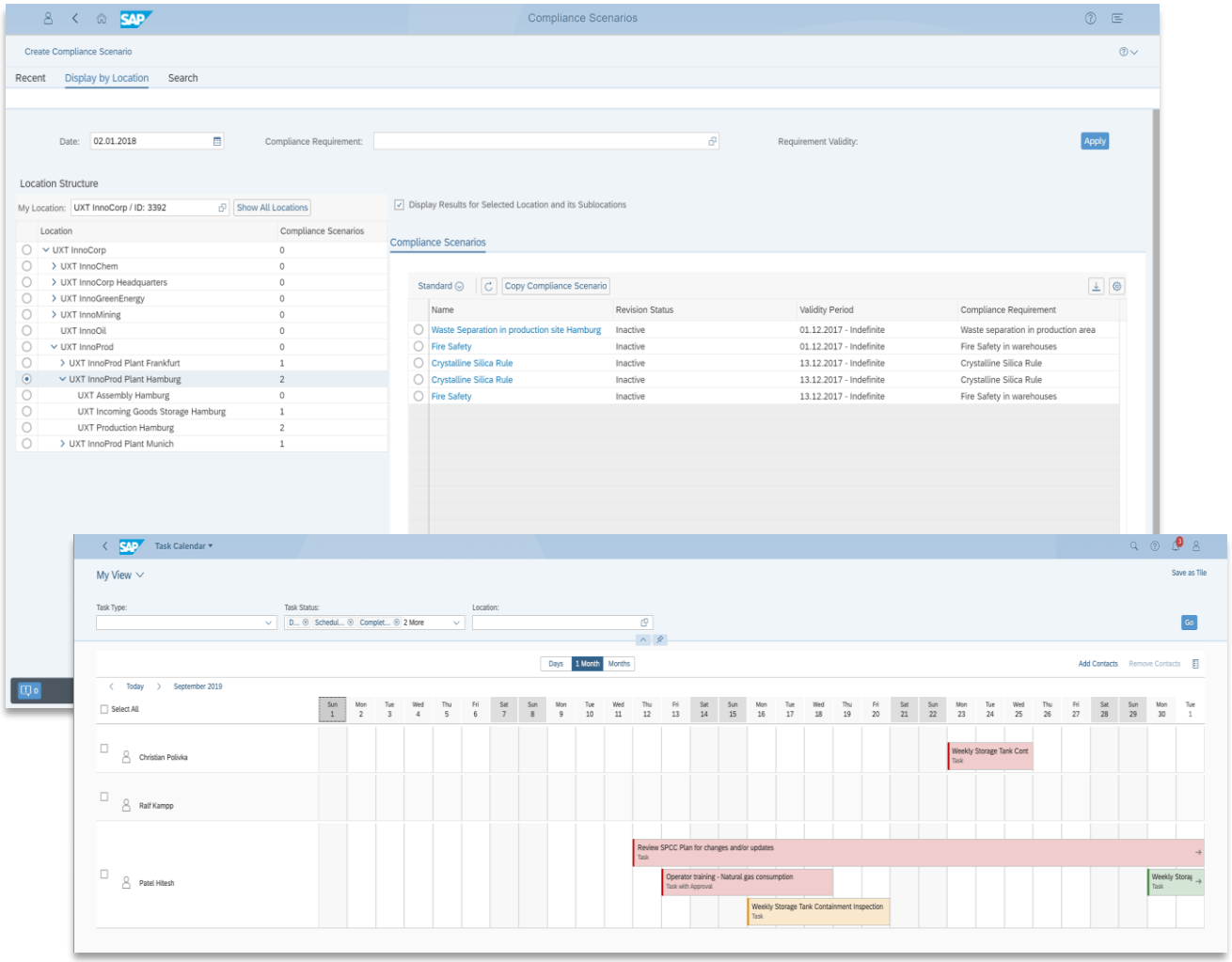
Regulatory and Permit Compliance



Objective

Manage a central legal/permit/policy requirement registry and consistent process to support the full lifecycle of compliance driven tasks and exceptions.

Capabilities

- **Automated import applicable regulatory requirements from content providers**
- **Maintain a comprehensive EHS legal/permit/policy requirement registry**
- **Manage all compliance related tasks using the Task Calendar and Task Analysis app**
- **Record, investigate and trigger corrective actions for compliance deviations**

Benefit

- **Ensure transparency on compliance requirements and improve compliance performance.**
- **Reduce Compliance risk and ensure auditability**

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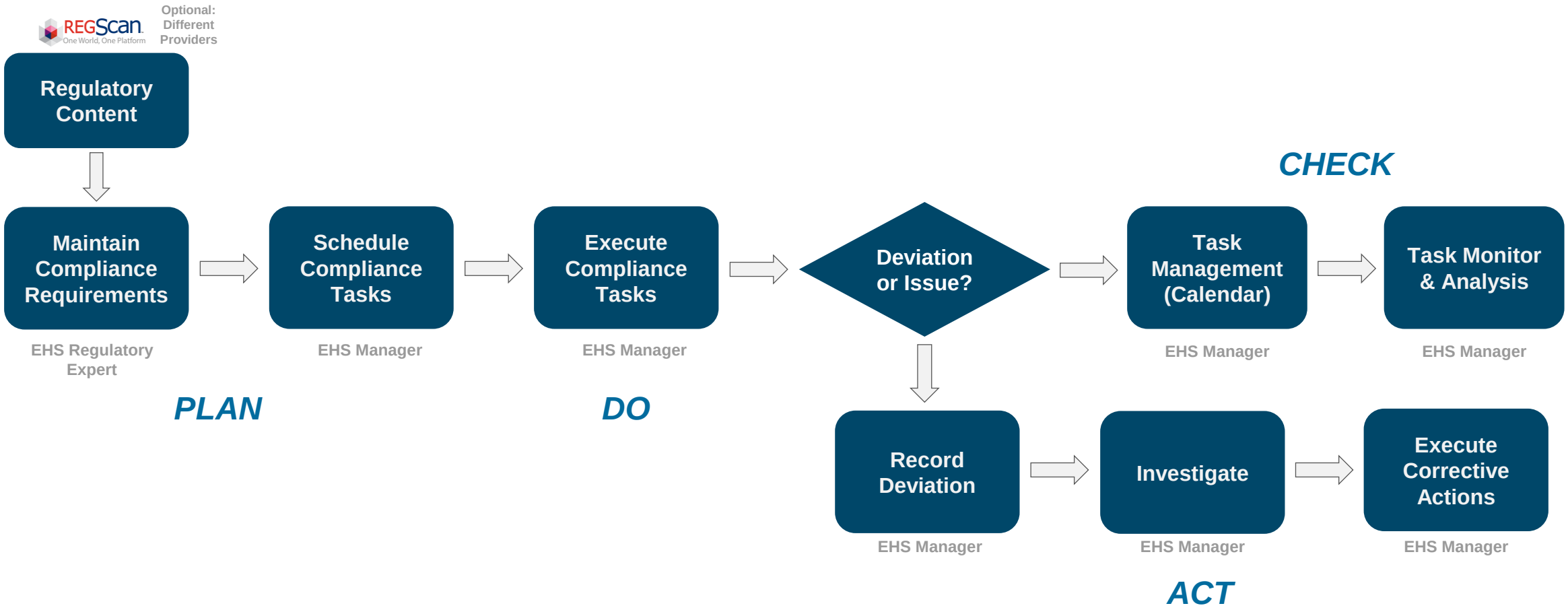
Regulatory and Permit Compliance

Business Process



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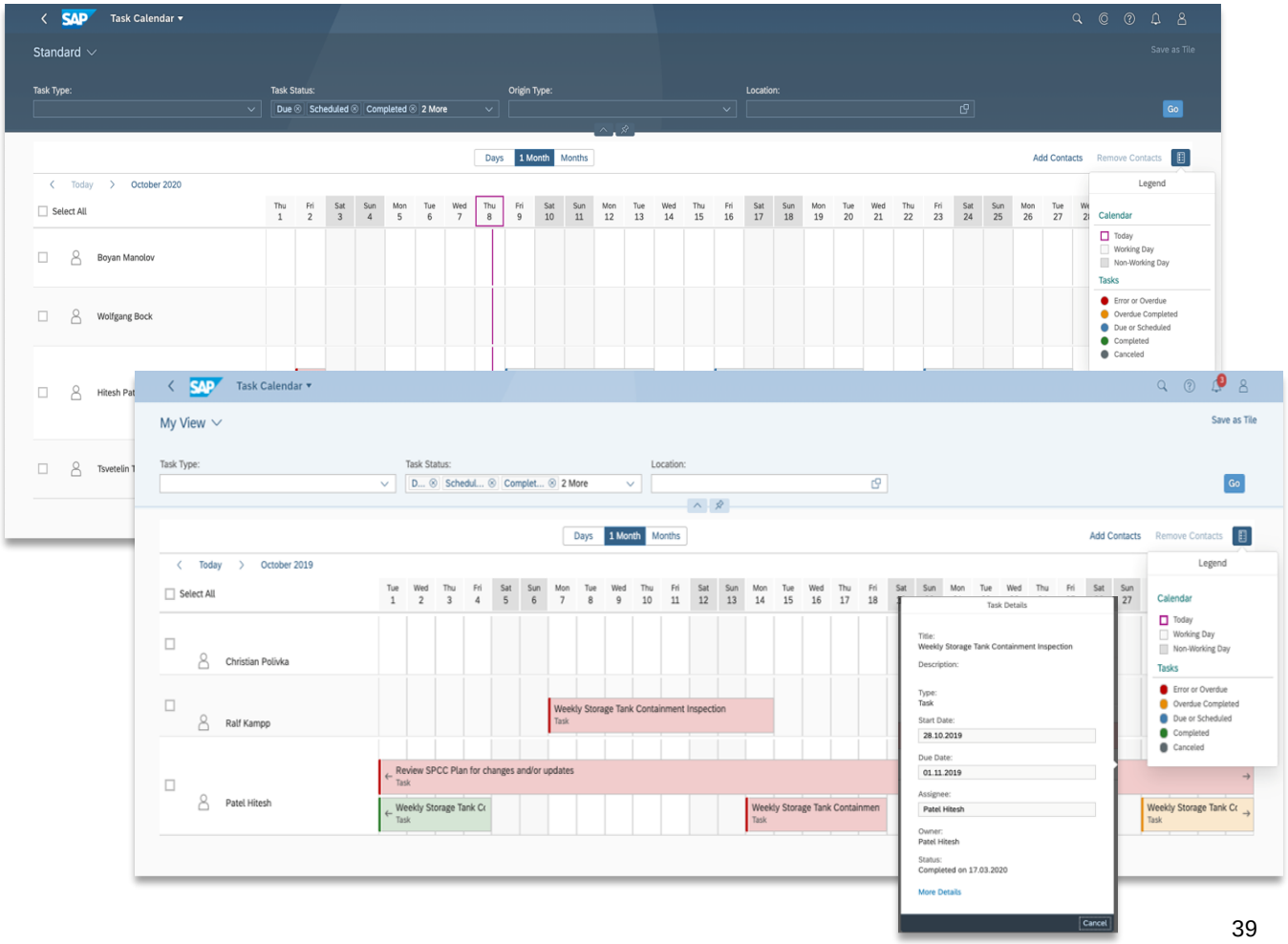
Key Feature – EHS Task and Compliance Calendar

Provides a comprehensive calendar-based view for all tasks being processed in SAP EHS, not only the ones related to compliance assurance. This app is available through traditional portal screens or on mobile devices.

- Tasks can be filtered based on Location, Status and Type
- Ability to reassign the tasks by dragging and dropping it between individual users
- Ability to change start/end date by stretching or shrinking the tasks
- Daily or Monthly views are available



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Regulatory and Permit Compliance

Functional Components

Compliance Requirement

Import new/updated regulatory requirements from content provider

Manage regulations/ permits/internal requirements

Assign validity areas (countries/regions) to requirements

Document attachments

Revision management

Compliance Scenario

Assignment of Compliance Requirement to locations

Data collection planning

Manage workplace sampling

Schedule compliance tasks

Task Management

My Inbox app for completing compliance task

Task Calendar for individuals or teams

One time or recurring tasks.

Document attachments

Task monitoring

Task Analytics

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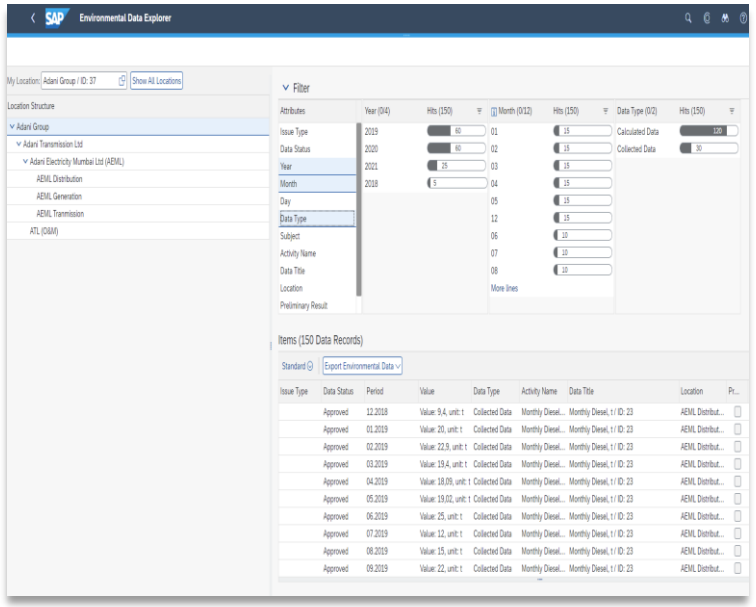
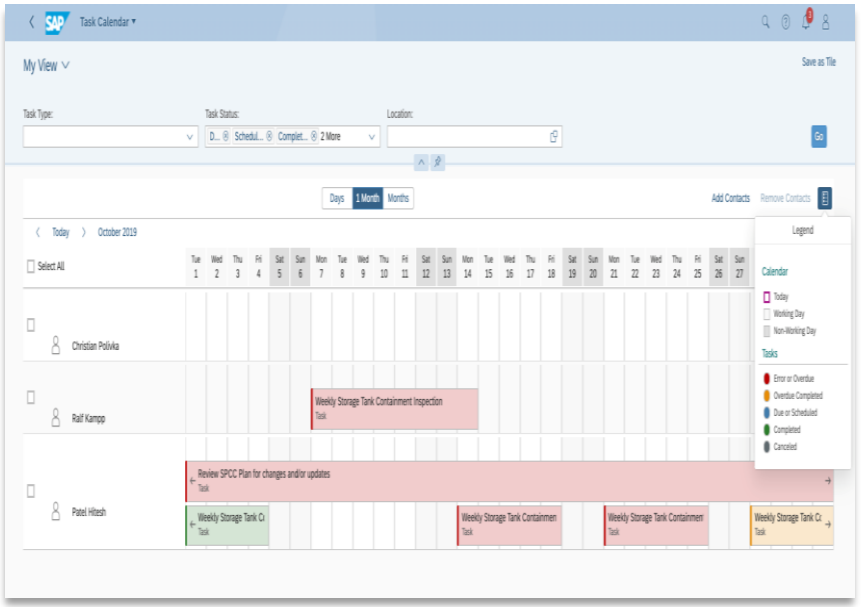
Regulatory and Permit Compliance

Outputs

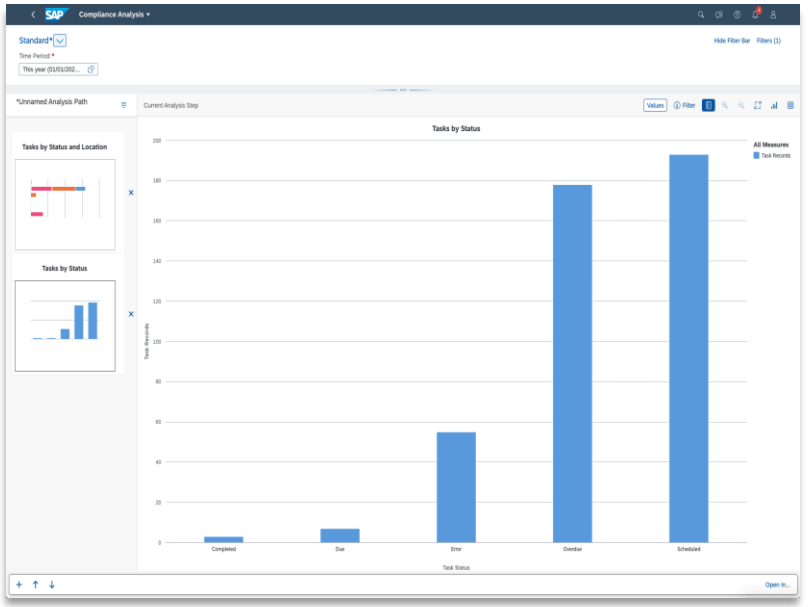
Data Explorers



Task Calendar



Drill Down Reporting



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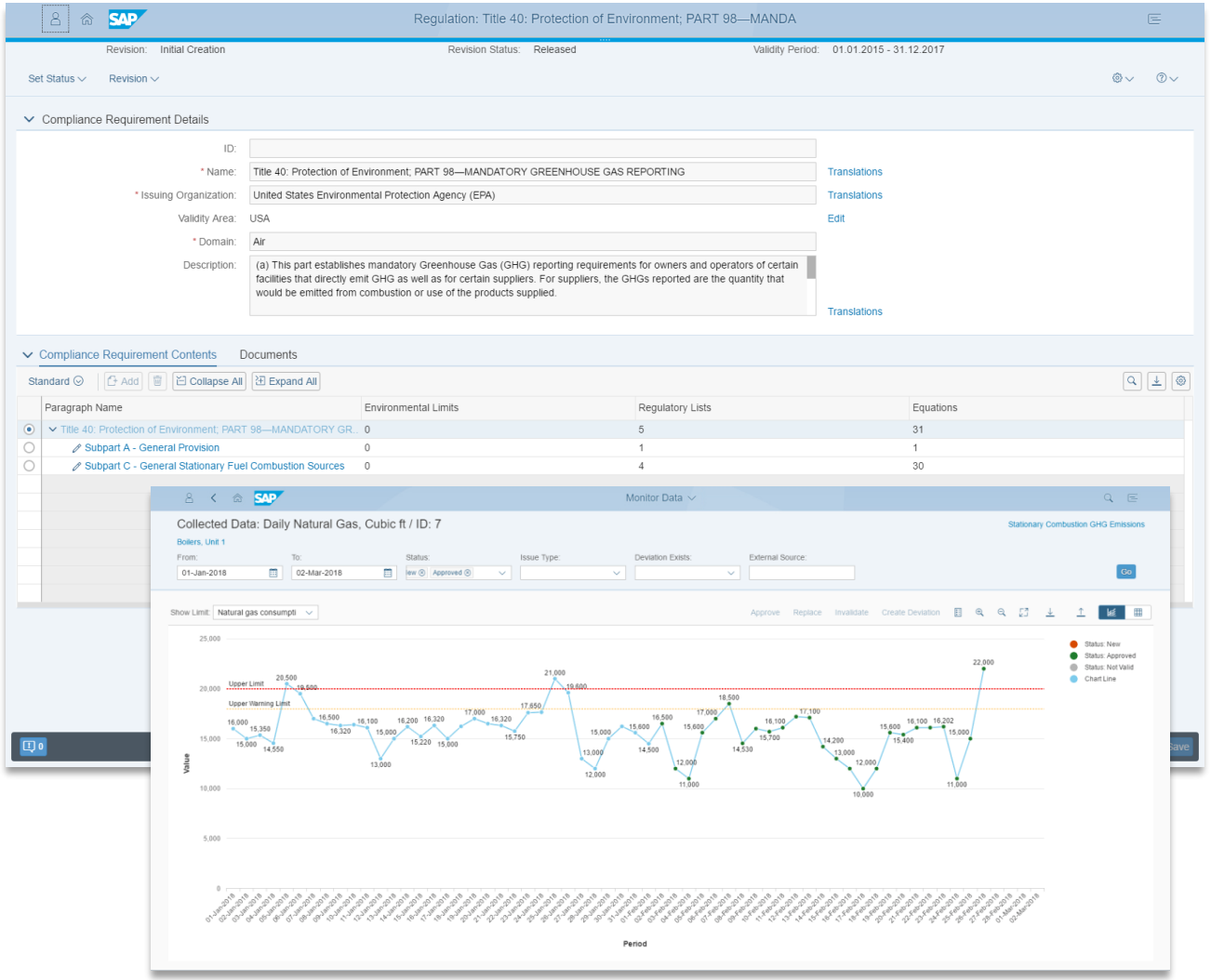
Emissions Management



Objective

Reduce your environmental impact with a comprehensive emissions management

Capabilities

- **Manage all types of emissions resulting from operations such as hazardous air pollutants, greenhouse gas (GHG), and other air or water emissions to fulfill legal requirements**
- **Calculate and aggregate emissions while fostering proactive data transparency & monitoring**
- **Detect and communicate deviations, including investigations and tracking follow-up activities**

Benefit

- **Reduce risk of environmental non-compliance and penalties**
- **Ensure license to operate**
- **Improved calculation accuracy and transparency**

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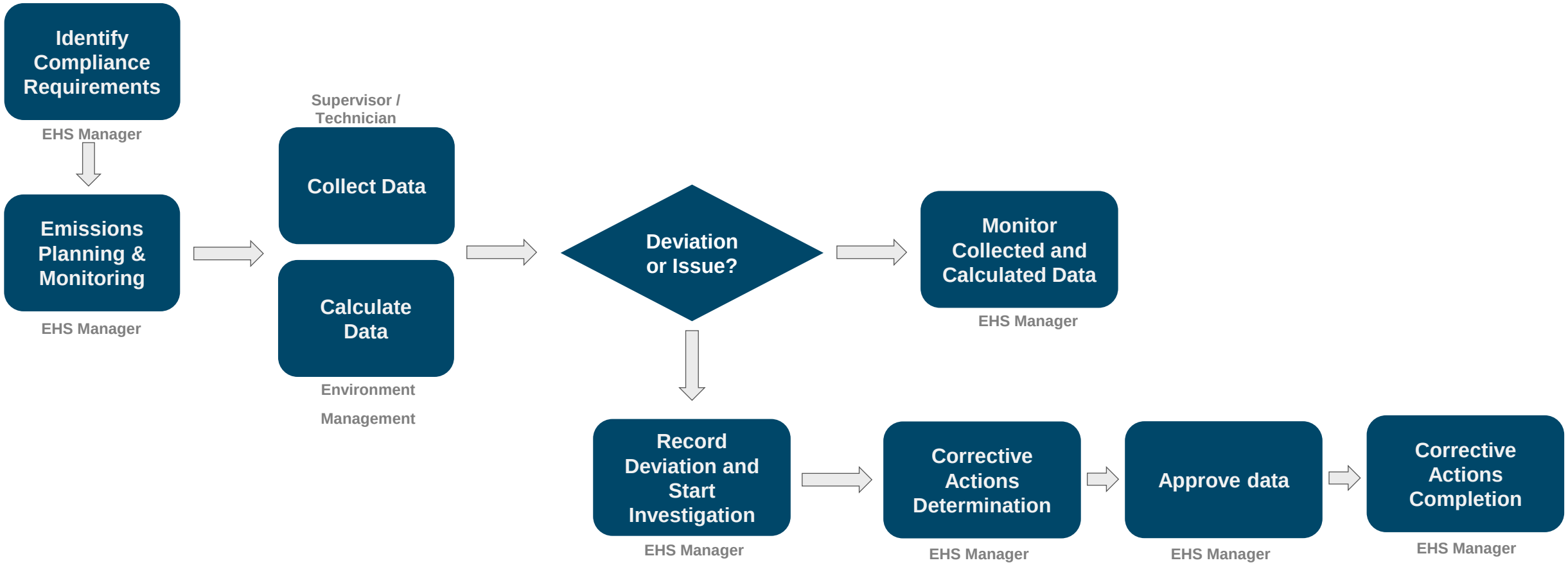
Emission Management

Business Process



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Emission Management

Functional Components

Identify Requirements

- Structure requirement data from regulations, permits, or policies
- Environmental limits
- Regulatory lists
- Equations
- Track changes with revision handling
- Notifications for new revisions of compliance requirements

Plan Compliance Activities

- Link applicable requirements to locations and equipment
- Plan data collection, calculations, sampling and aggregation activities
- Definition of limits checks
- Scheduling and processing of compliance tasks
- Track changes with revision handling

Collect and Calculate Data

- Notification-driven data collection
- Data based on hourly, daily, monthly and yearly data periods
- Options for automatic data collection
- Aggregation based on location hierarchy
- Equations and calculations based on standards such as AP-42 or greenhouse-gas emissions

Monitor Data

- Data issues monitoring and handle : missing data, limit exceedances and warnings
- Data analysis with Environment Data Explorer
- Data Export
- Forecast Emissions

Process Deviations

- Identify deviations
- Investigation
- Corrective and preventive measures
- Deviation reports

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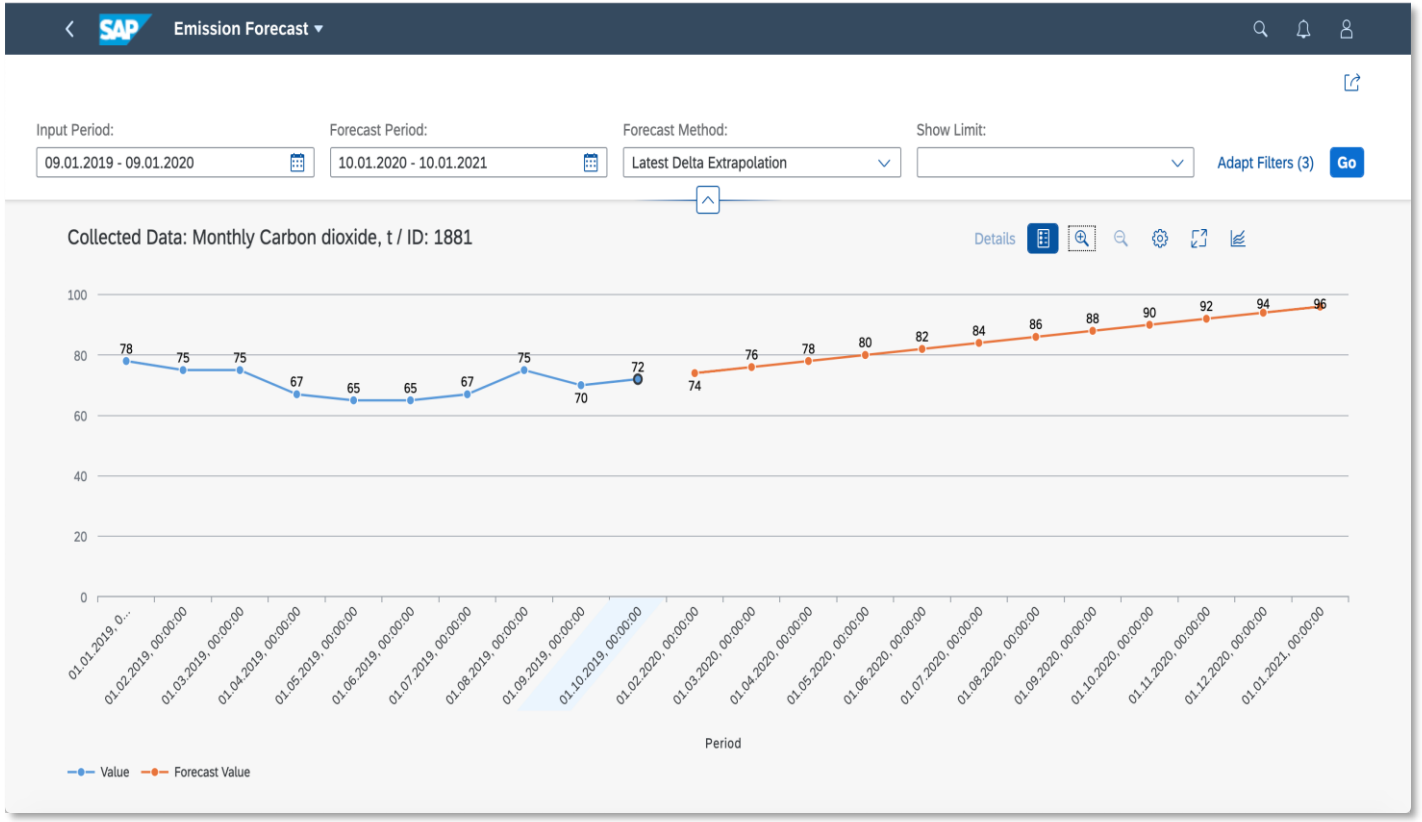
Key Feature – Emissions Scenario Forecasting

EHS Environment Management leverages the embedded analytics tools to provide a basic view of extrapolated emissions amounts for a specific future time period.

- User-defined input time period providing the data on which the forecasts are calculated
- The forecast period is a period in the future for which values will be forecasted
- Multiple forecasting methods can be defined
- The forecasted result is displayed in a graphical view along with actuals and limit values
- Two customizable forecasting calculations, Latest Data Extrapolation and Double Exponential Smoothing Method, are delivered in the standard solution



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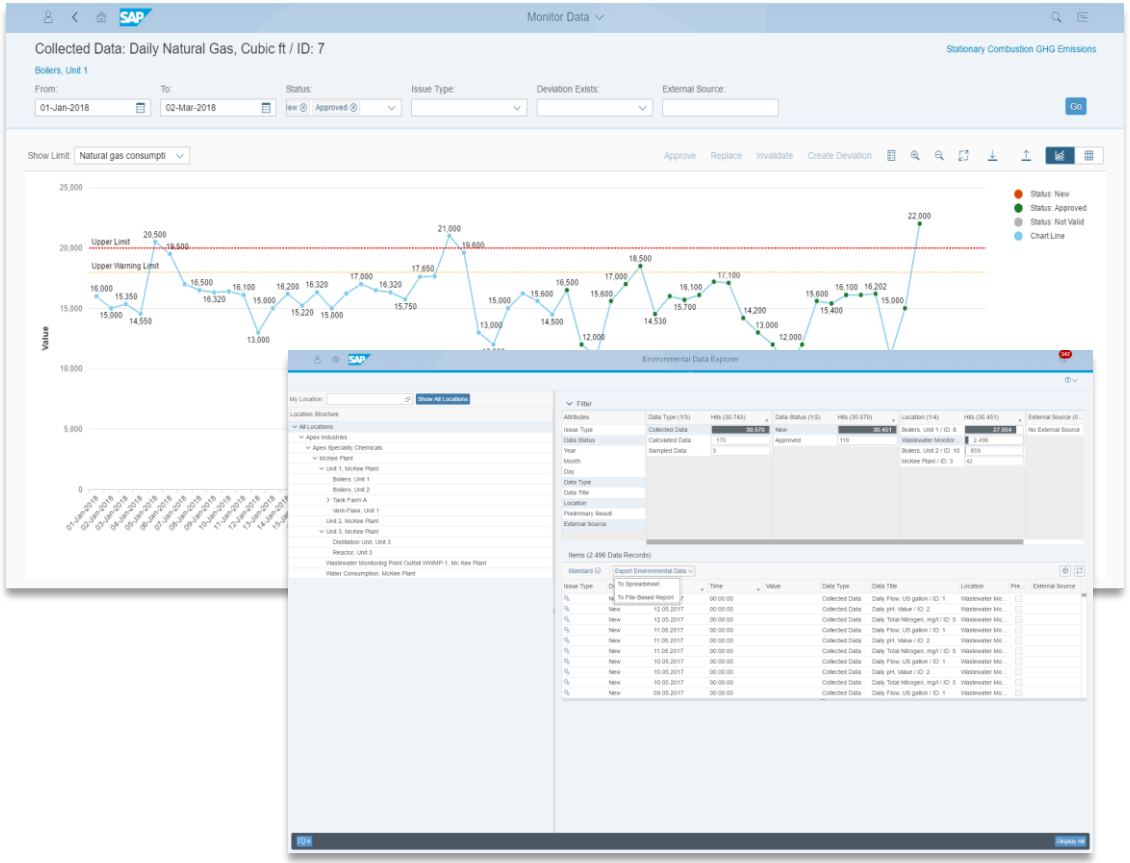
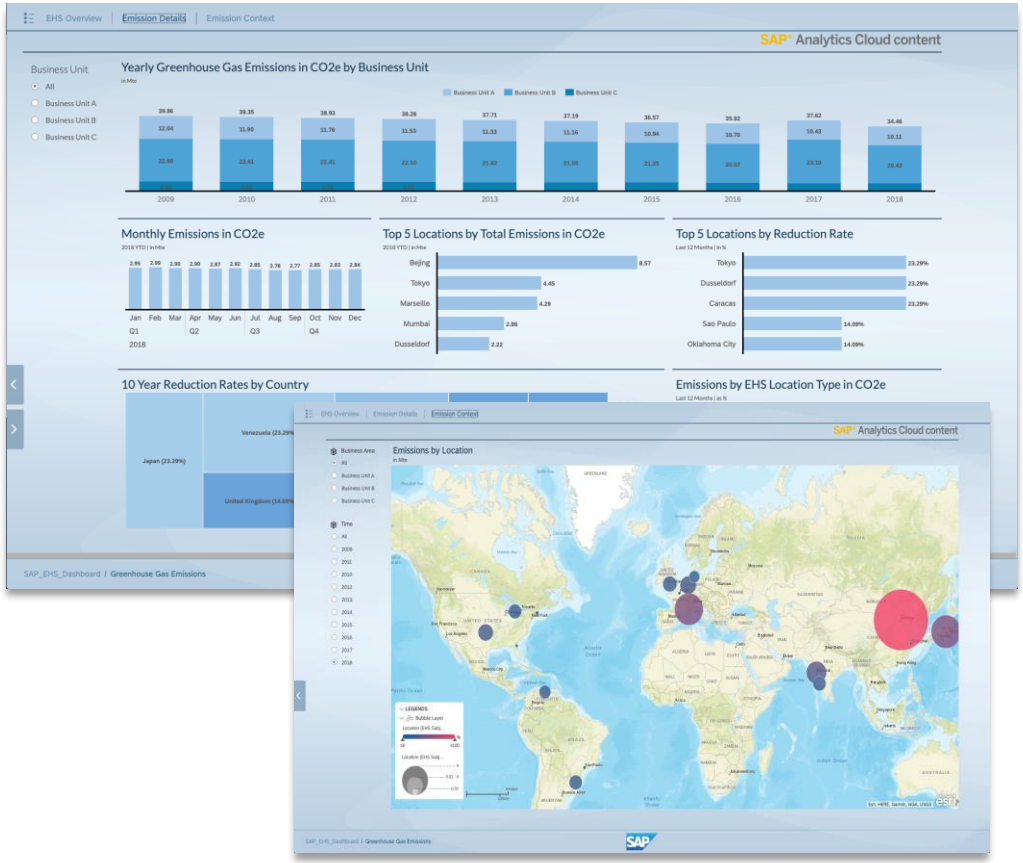
Emissions Management

Outputs

Trend Monitoring



Analytics



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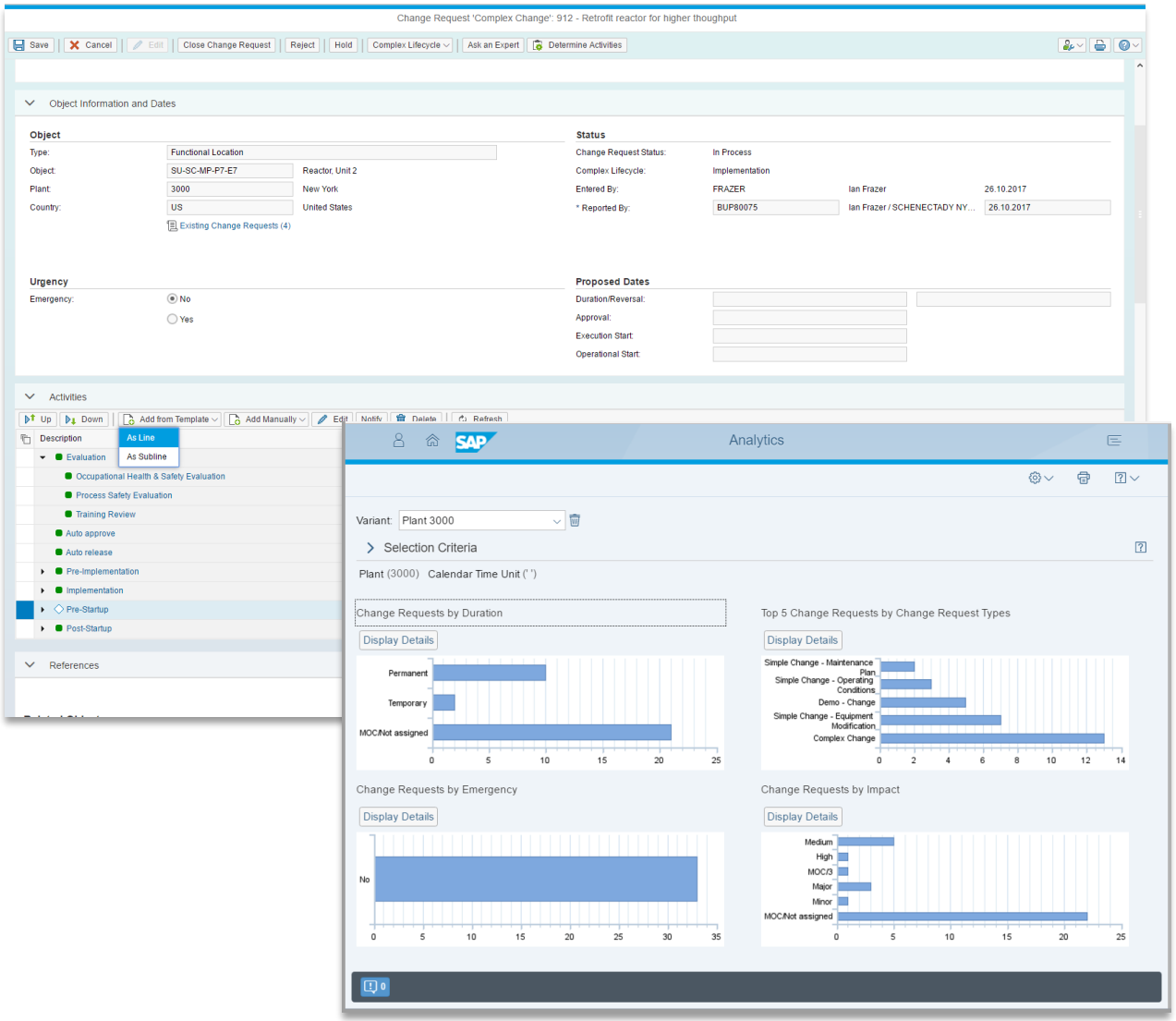
Management of Change



Objective

Provide system to execute and monitor change effectively within an organization so it does not lead to unknown or uncontrolled operational risk.

Capabilities

- **Easy-to-use Change Request screen for field users**
- **Highly configurable based on a business rules engine that drives notifications and approval process**
- **Adaptable to any type of change – PSM, PHA, PSSR, procedural, what-if, etc**
- **Ability to pull in expert input to evaluate change and drive risk assessments**
- **Tracks all activities and tasks to ensure the approved change is completed properly**
- **Closed-loop integration with core ERP to reduce data entry, ensure accuracy**

Benefit

- **Implement operational changes with full confidence that potential risks have been assessed and controlled**
- **Rationalize and automate management-of-change processes to reduce manual effort, wasted time, and error**

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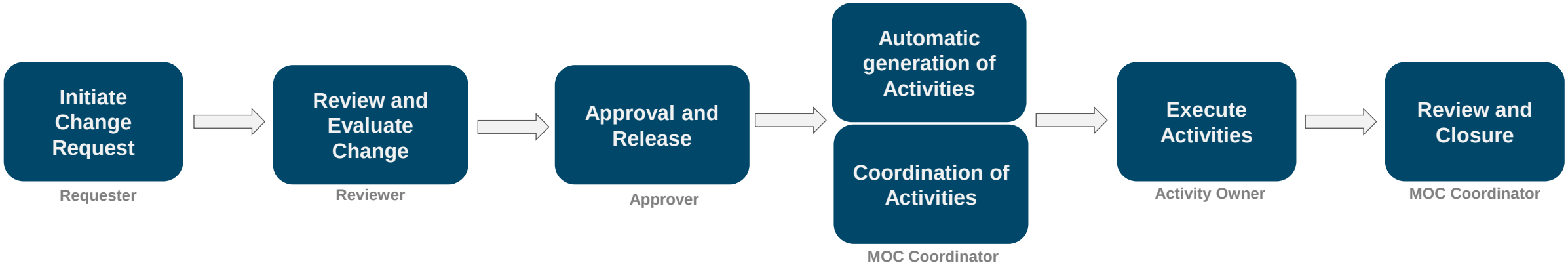
Management of Change

Business Process



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Management of Change

Functional Components

Change Request Initiation

- Change Request Entry Form
- Change Request Quick Entry Form
- Main Reference Object
- Questioners
- Attachments

Change Request Processing

- Change Request Definition
- References
- Involved People
- Free Text Search
- New Ref .Object
- EHS Risk Assessment
- Attachments and Links
- Questionnaire
- Status Log
- User Status
- Mandatory Questions and Controls
- Engineering Change Record
- Activity
- Tasks
- Digital Signature
- Mass Change of Assignments
- Automatic notification
- Plant Maintenance notification

Change Request Outputs

- Change Request Output Form
- Activity Output Form
- Worklist Output
- Data export to MS Excel
- Analytical Dashboard

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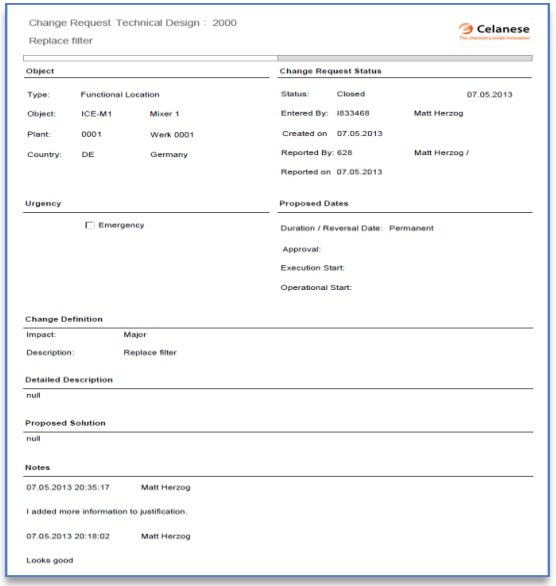
Management of Change

Outputs

Forms



Change Request Technical Design : 2000

Replace filter

Celanese

Object

Type: Functional Location

Object: ICE-M1 Mixer 1

Plant: 0001 Werk 0001

Country: DE Germany

Change Request Status

Status: Closed 07.05.2013

Entered By: I833468 Matt Herzog

Created on 07.05.2013

Reported By: 628 Matt Herzog /

Reported on 07.05.2013

Urgency

☐ Emergency

Proposed Dates

Duration / Reversal Date: Permanent

Approval:

Execution Start:

Operational Start:

Change Definition

Impact: Major

Description: Replace filter

Detailed Description

null

Proposed Solution

null

Notes

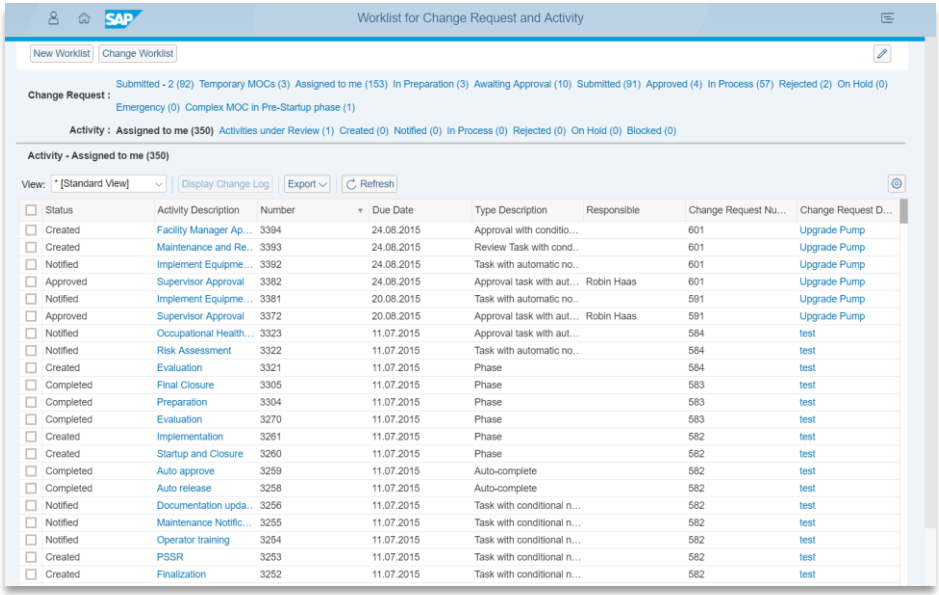
07.05.2013 20:35:17 Matt Herzog

I added more information to justification.

07.05.2013 20:18:02 Matt Herzog

Looks good

Search Hitlists



Worklist for Change Request and Activity

New Worklist | Change Worklist

Change Request : Submitted - 2 (92) Temporary MOCs (3) Assigned to me (153) In Preparation (3) Awaiting Approval (10) Submitted (91) Approved (4) In Process (57) Rejected (2) On Hold (0) Emergency (0) Complex MOC in Pre-Startup phase (1)

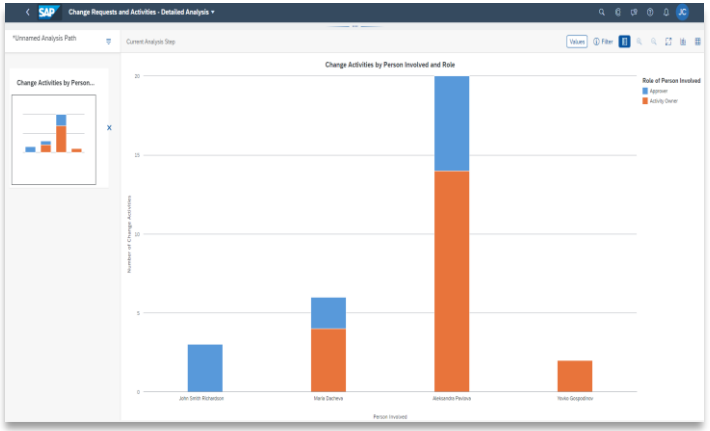
Activity : Assigned to me (350) Activities under Review (1) Created (0) Notified (0) In Process (0) Rejected (0) On Hold (0) Blocked (0)

Activity - Assigned to me (350)

View: * [Standard View] | Display Change Log | Export | Refresh

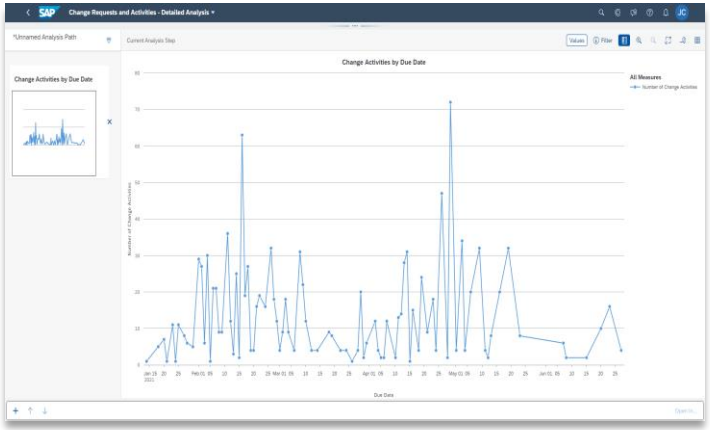
Status	Activity Description	Number	Due Date	Type Description	Responsible	Change Request Nu…	Change Request D…
Created	Facility Manager Ap…	3394	24.08.2015	Approval with conditio…		601	Upgrade Pump
Created	Maintenance and Re..	3393	24.08.2015	Review Task with cond..		601	Upgrade Pump
Notified	Implement Equipme…	3392	24.08.2015	Task with automatic no..		601	Upgrade Pump
Approved	Supervisor Approval	3382	24.08.2015	Approval task with aut…	Robin Haas	601	Upgrade Pump
Notified	Implement Equipme…	3381	20.08.2015	Task with automatic no..		591	Upgrade Pump
Approved	Supervisor Approval	3372	20.08.2015	Approval task with aut…	Robin Haas	591	Upgrade Pump
Notified	Occupational Health…	3323	11.07.2015	Approval task with aut…		584	test
Notified	Risk Assessment	3322	11.07.2015	Task with automatic no..		584	test
Created	Evaluation	3321	11.07.2015	Phase		584	test
Completed	Final Closure	3305	11.07.2015	Phase		583	test
Completed	Preparation	3304	11.07.2015	Phase		583	test
Completed	Evaluation	3270	11.07.2015	Phase		583	test
Created	Implementation	3261	11.07.2015	Phase		582	test
Created	Startup and Closure	3260	11.07.2015	Phase		582	test
Completed	Auto approve	3259	11.07.2015	Auto-complete		582	test
Completed	Auto release	3258	11.07.2015	Auto-complete		582	test
Notified	Documentation upda..	3256	11.07.2015	Task with conditional n…		582	test
Notified	Maintenance Notific…	3255	11.07.2015	Task with conditional n…		582	test
Notified	Operator training	3254	11.07.2015	Task with conditional n…		582	test
Created	PSSR	3253	11.07.2015	Task with conditional n…		582	test
Created	Finalization	3252	11.07.2015	Task with conditional n…		582	test

Reporting



Change Requests and Activities - Detailed Analysis

Change Activities by Person Involved and Role



Change Requests and Activities - Detailed Analysis

Change Activities by Due Date

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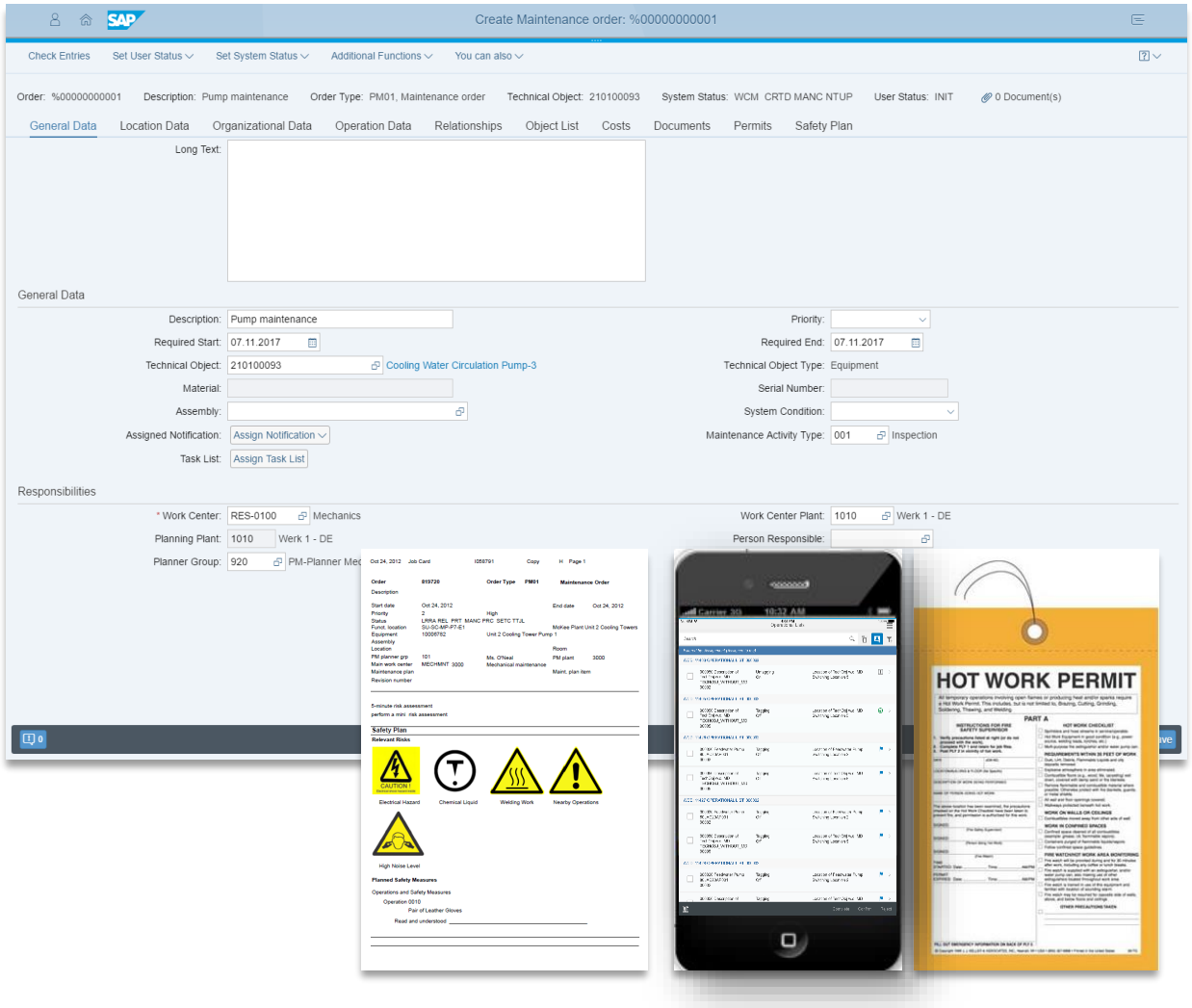
Maintenance Safety & Permit to Work



Objective

Leverage an integrated process between Asset Management and EHS to communicate pertinent safety risks and control the maintenance work being performed

Capabilities

- **Full electronic support for controlling hazardous work using permits and isolation procedures**
- **Supports various levels of work permits and multilevel approvals**
- **Manage necessary operational lists, tags, and test tags within the isolation procedures**
- **Natively integrated with master data in the SAP Enterprise Asset Management solution and the maintenance work order process**
- **Mobile app for Work Clearance Management supporting Lockout/Tagout Procedures**

Benefit

- **Complete hazardous work safely while reducing the cost of maintenance and increasing equipment uptime**
- **Prevent safety violations and incidents**

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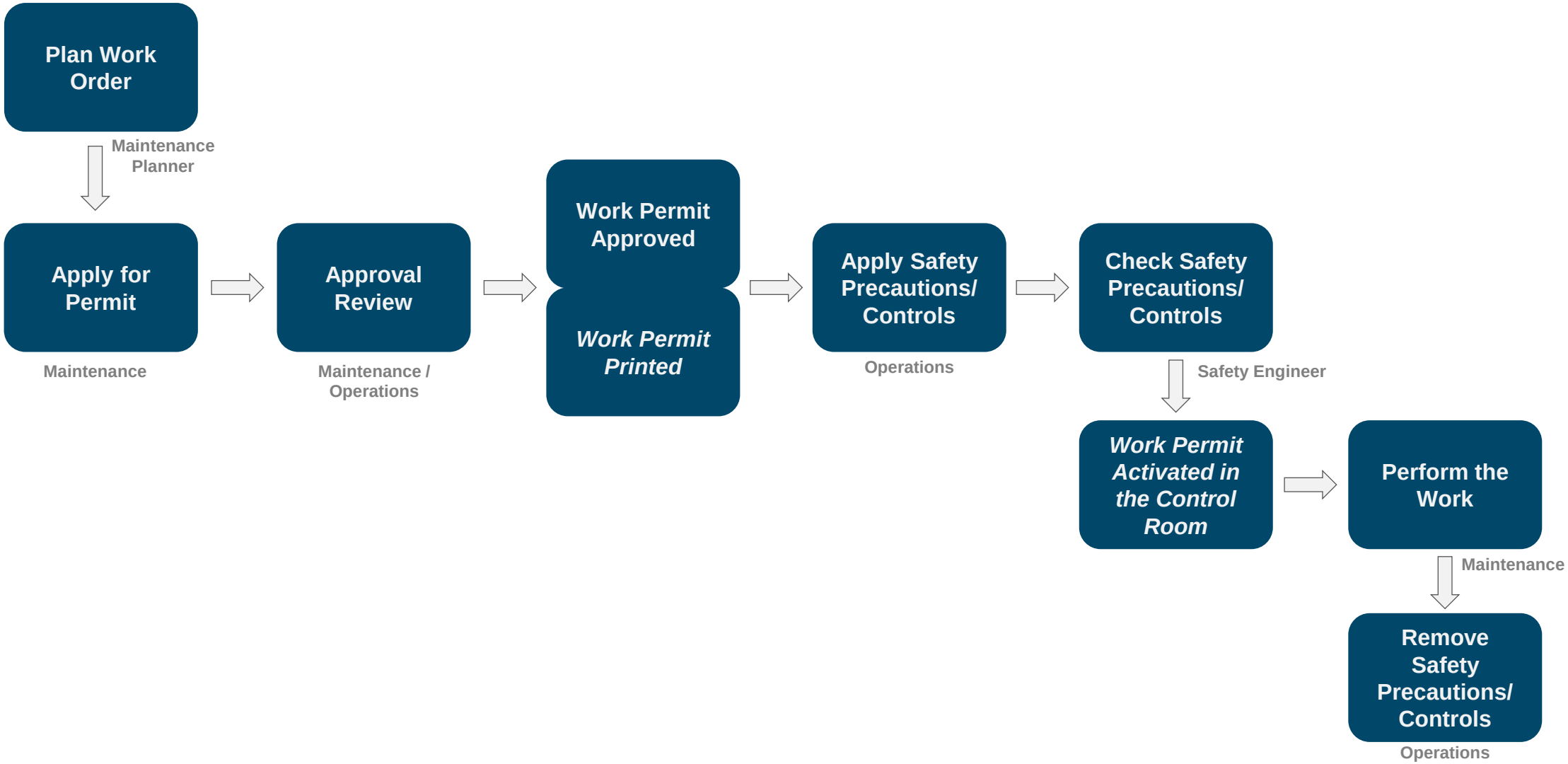
Maintenance Safety and Permit to Work

Business Process



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Maintenance Safety and Permit to Work

Functional Components

Permits

- Work Permit “Type 1”
- Work Permit “Type 2”
- Work Permit Templates

Work Permits

- Hot Work Permit
- Vessel Entry Permit
- Cold Work Permits

Impact

- Approvals
- Requirements
- Work
- Partner
- Documents

Risk

- High
- Medium
- Low

Control

- Permit
- Safety Certificates
- Work Order
- LO/TO Permit
- Temporal Control

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Lockout - Tagout

Functional Components

Isolation List

- Pre-Maintenance Activities
- Post-Maintenance Activities
- Approval Process
- Graphical Isolation Sheet
- Mobile Lockout/Tagout

Isolation Items

- Functional Locations
- Equipment
- Isolation Points without Master Data
- Switching Location
- Documents
- Tagging/Untagging Condition

Control

- Work Permit
- Safety procedure
- Conflict Verification
- LO/TO Process

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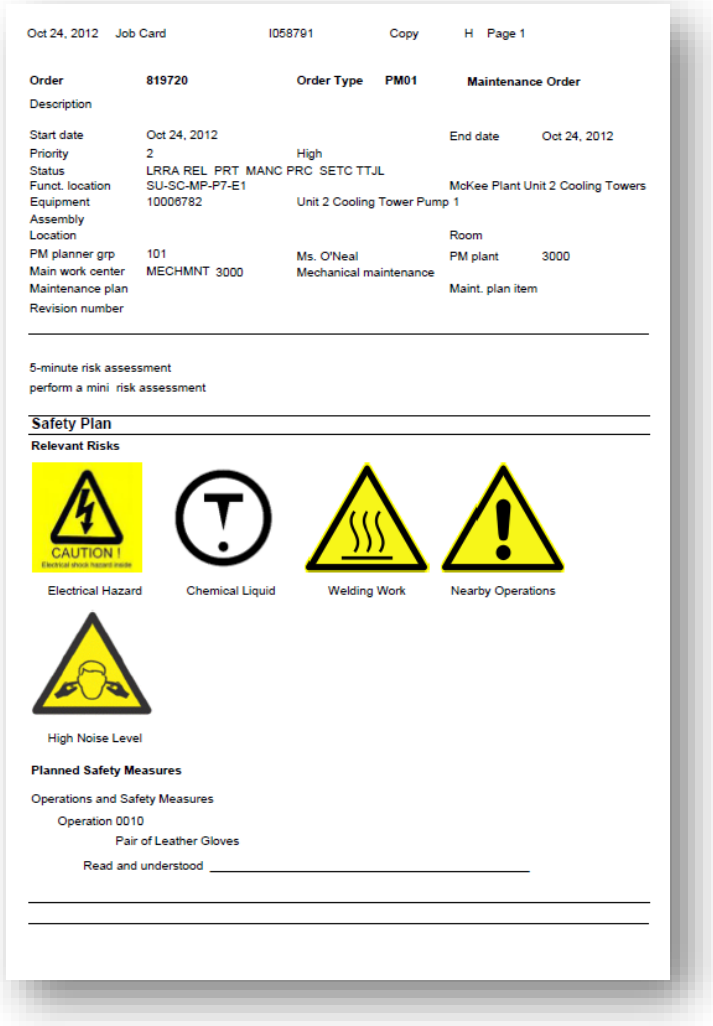
Maintenance Safety and Permit to Work

Output – Job Safety Card



Oct 24, 2012 Job Card I058791 Copy H Page 1

Order	**819720**	**Order Type**	**PM01**	**Maintenance Order**	
Description					
Start date	Oct 24, 2012			End date	Oct 24, 2012
Priority	2	High			
Status	LRRA REL PRT MANC PRC SETC TTJL				
Funct. location	SU-SC-MP-P7-E1			McKee Plant Unit 2 Cooling Towers	
Equipment	10006782	Unit 2 Cooling Tower Pump 1			
Assembly					
Location				Room	
PM planner grp	101	Ms. O'Neal		PM plant	3000
Main work center	MECHMNT 3000	Mechanical maintenance			
Maintenance plan				Maint. plan item	
Revision number					

5-minute risk assessment
perform a mini risk assessment

Safety Plan

Relevant Risks

Electrical Hazard | Chemical Liquid | Welding Work | Nearby Operations

High Noise Level

Planned Safety Measures

Operations and Safety Measures
Operation 0010
Pair of Leather Gloves
Read and understood _____

Job Safety Card

- Risk information applied in work context
- Automated association of risk to assets
- Streamlined work order creation by planners – accelerating safe work
- Standard processes for work execution, work permitting
- Effective, timely Hazard Communication
- Standard safety icons on job card to clearly communicate job hazards to the worker

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Integration

The Value of True Integration

Process

- Handoffs and triggers that occur in your real-life business processes can be driven by the system with no drops in communication or responsibility
- Process improvement is not only enabled by the system, but the system becomes a source of new ideas and innovation

Data

- Provides context not matched by point solutions
- Data entry at all levels is quicker and less error-prone
- Processes run on a consistent source of truth
- EHS department does not need to deal with maintaining enterprise data

Reporting

- Consistent user-interfaces across multiple parts of SAP
- No need to maintain separate interfaces to other reporting tools
- Leverage central SAP ERP hierarchies as a source of truth like Plant, Functional Locations, Cost Centers, and Org Structure to enable both roll-up and drill-down reporting in real time
- Consistent security paradigm between process data and reporting logic
- Gain additional insight with ability to pull data from disparate processes within the SAP landscape

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Process Integration with SAP Plant Maintenance

SAP EHS
Environment Management

Permit Limit Requirement

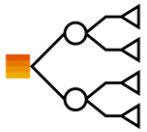
Location Applicability

Measurement Compliance Task

SAP EHS
Incident Management

Incident Occurred

Investigation



Root Cause

Corrective Action

Maintenance Task

PM Notification created automatically based on corrective action. Once maintenance task completed, the EHS corrective action is updated.

SAP EHS
Health and Safety

Hazard Identified

Risk Evaluated

Controls Identified

SAP Plant Maintenance

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Process Integration with SAP HR/SuccessFactors

SAP EHS
Incident Management

Incident Occurred › **Investigation** › **Root Cause** › **Corrective Action**

SAP EHS
Health and Safety

Hazard Identified › **Risk Evaluated** › **Controls Identified**

Employee Central

Employee and organizational data shared directly with SAP EHS

LMS/Success Map

Performance Management

Rewards and Recognition

Process integration with HR actions triggered from EHS requirements or events

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Data integration with SF personnel data

SAP EHS
Incident Management

One source of truth for valid person data pulled dynamically to EHS-IM

Up to 18 personnel data points stored on the incident record at time of entry

Dynamic use of Organization Structure for workflow, security, reporting, etc

Hours Worked can be pulled for OSHA forms and incident rate calculations

SAP EHS
Health and Safety

One source of truth for valid person data pulled dynamically to EHS-HS

Valid Person data for Similar Exposure Group assignments

Valid Person data for exposure tracking and personal sampling

Dynamic use of Organization Structure for workflow, security, reporting, etc

Employee Central

Employee and organizational data shared directly with SAP EHS

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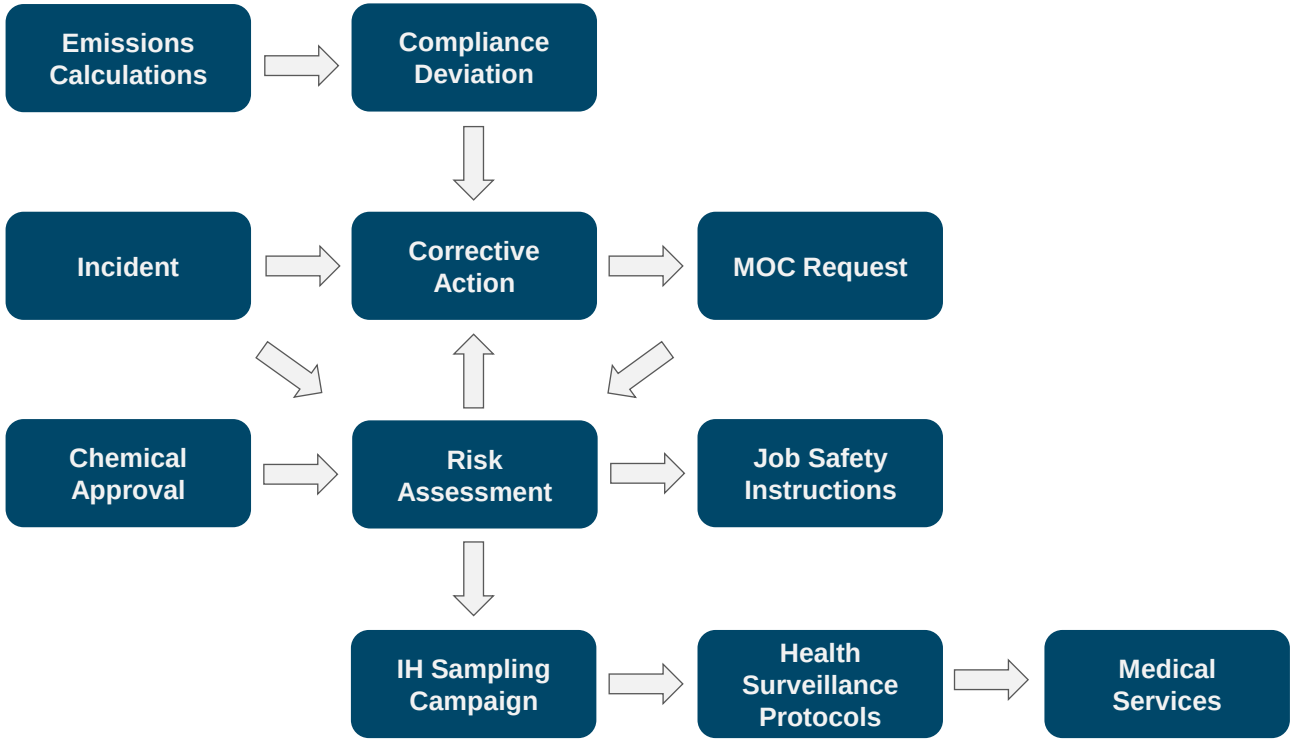
Data Integration of SAP EHS



Holistic, end-to-end process integration of EHS drives consistency, commonality, and efficiency

Analytics

- SAP Analytics Cloud
- BW/Business Objects
- Embedded Analytics

LOB Processes

- HR/SuccessFactors
- Organization Management
- Finance/Controlling
- Materials Inventory Management
- Asset Management
- Plant Maintenance
- Plant Data Historians

End-User/ Shop Floor

Safety Relevant Info App

My Inbox App

Task Calendar App

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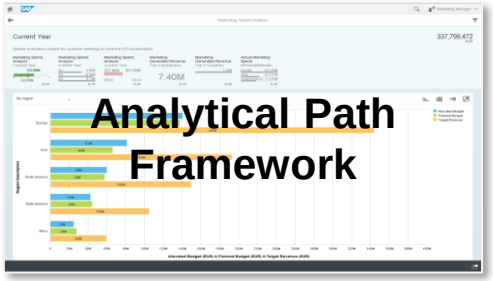
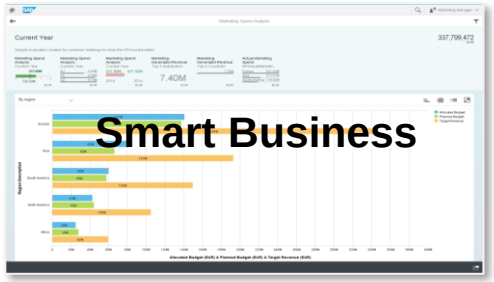
SAP EHS Analytics

SAP EHS Analytics – Solution Scope

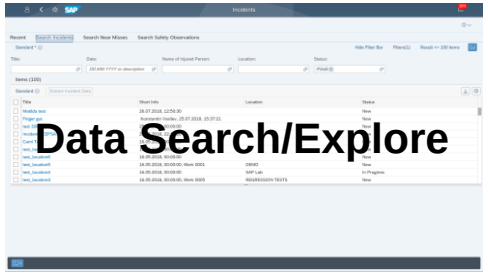
Corporate

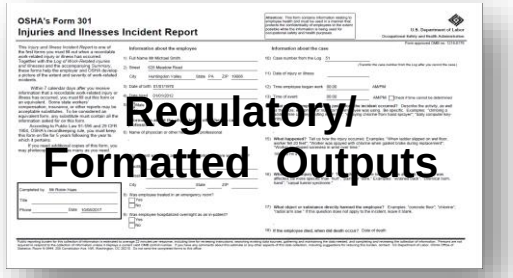
EHS Practitioner





Operations





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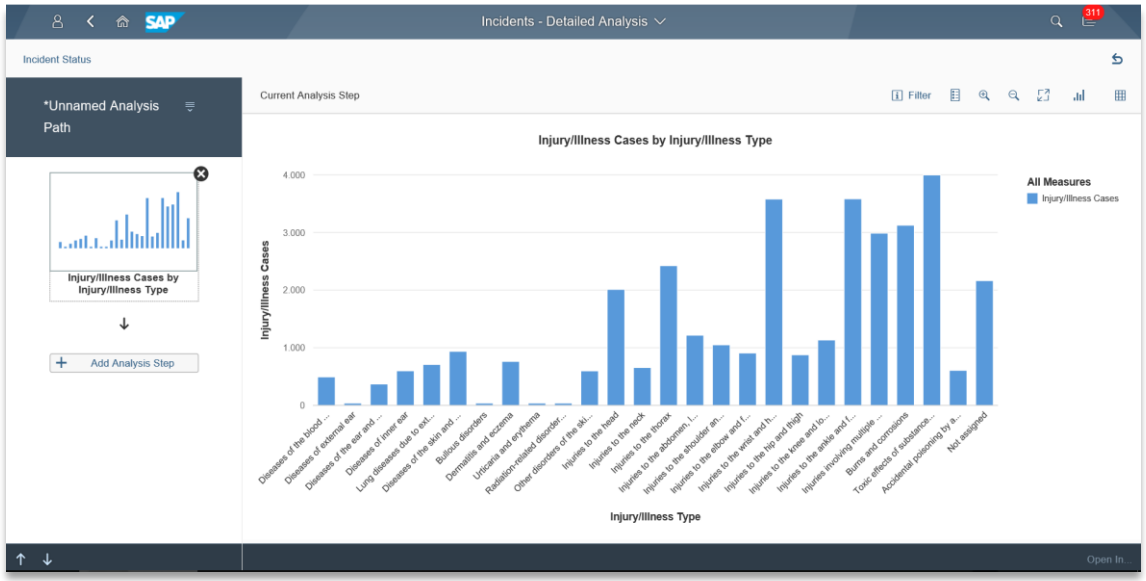
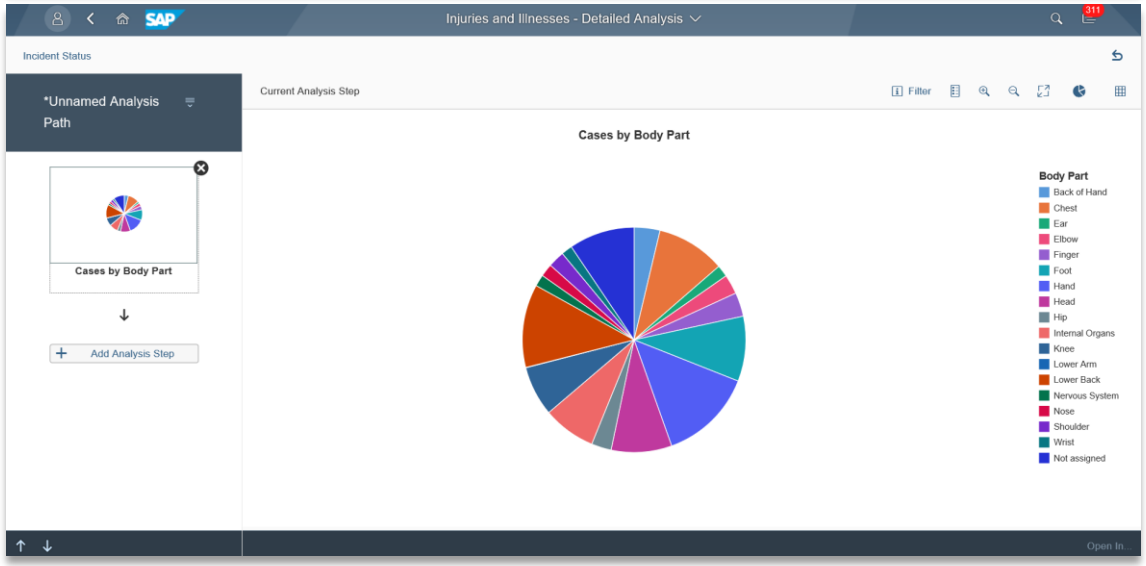
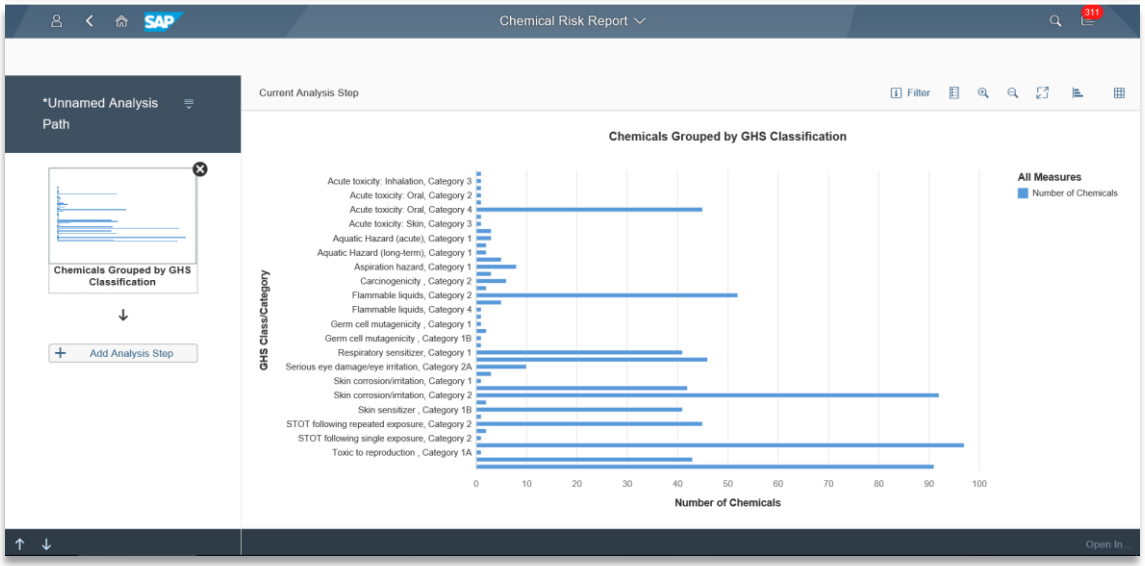
Realtime ad hoc reporting for EHS







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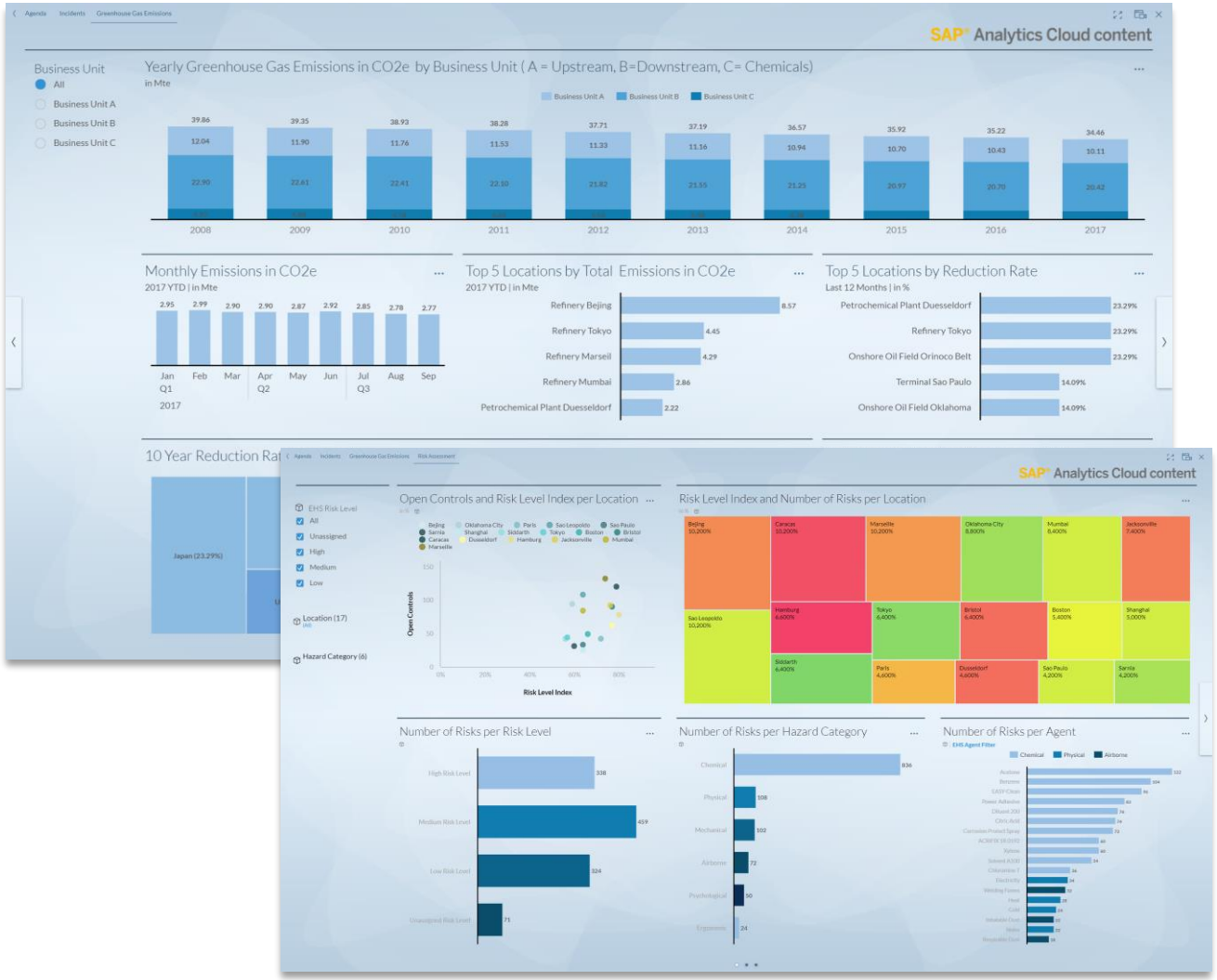
Why SAP Analytics Cloud for EHS



Objective

SAP Analytics Cloud is a single experience for decision making that allows users to discover, visualize, plan and predict, all in one place.

Capabilities

- Interactive dashboards controlled by the same role-based authorization model as the rest of the SAP enterprise system
- Clean and model your data with first-class data collection functionality
- Connection to on-premise and cloud data sources across all lines of business, with either Live or Import Data connections
- Machine learning and other data tools help to enhance your data even faster by suggesting transformations and automating workflows

Benefit

- Give executives a complete, real-time view of company situations and key figures across departments – and foster trust among leaders
- Blend data from different sources, create compelling data visualizations, run ad hoc reporting, and more

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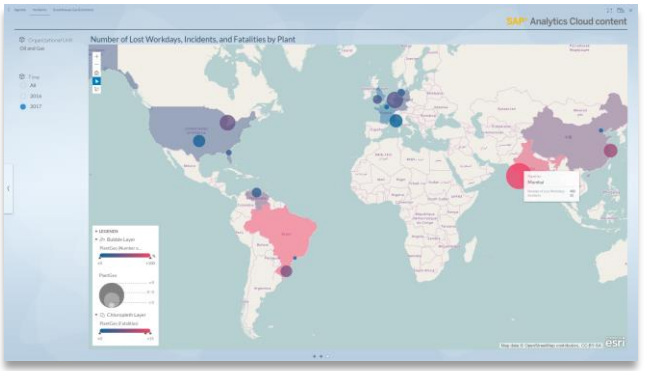
EHS Content in SAC (*and Digital Boardroom*)

Greenhouse Gas Emissions:

- Track the companies emission reduction targets for CO2 equivalents.
- Monitor carbon emissions of the company's own operations, benchmark different countries, location types,
- Compare emissions against predefined target values or plants reach the companies emission reduction targets.

Overview of Incident Data:

- Analyze trends and report on current status of incidents, near misses and safety observations with a focus on injuries.
- Identify in which plants or locations the most injuries happened, which root causes can be targeted to reduce this number.
- Monitor the severity of injuries by showing the effect the incidents had on lost work days.



Health and Safety Management:

- Get an overview of the risk situation at certain locations
- Status tracking of control implementations that have been initiated based on these risks during the risk identification process.

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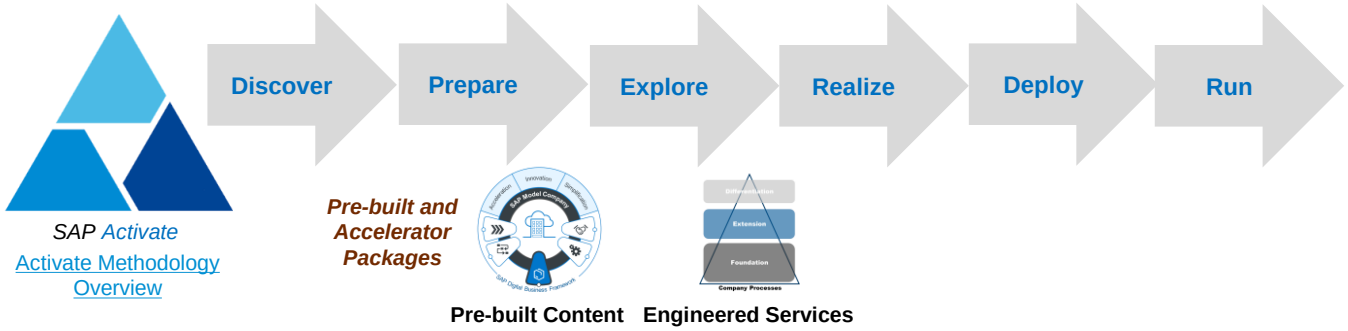
Implementation

Methodology



Considerations

- Each SAP EHS application can be purchased and implemented individually with no technical dependencies between modules.
- Although no dependencies exist, there are valuable process and data integrations between the applications which can be leveraged and may influence how an implementation is planned out.
- There are three main deployment models – traditional on-premise, Single-tenant hosting, and a Multi-tenant public cloud offering.

Execution Principles

START WITH BEST PRACTICES
Re-use Knowledge Assets and Prebuild Content

VALIDATE SOLUTION
Validation to Best Practices and fit-gap analysis

MODULAR AND AGILE
Configure the project, deliver the solution incrementally

PRE-ASSEMBLY & CLOUD READY
Leverage the flexibility and speed of the cloud

Content

QUALITY BUILT-IN
Identify risk early with total quality approach for implementation

For further information on envisioning an implementation plan, check out the Customer Adoption Journey Map

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Useful Links

Visit SAP's Sustainability Report

SAP Sustainability Solution Page

SAP EHS Product Page

Official SAP Roadmaps

SAP Solution Explorer

Documentation (EHSM)

Documentation (S/4HANA)

PAM Matrix

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SAP Environment Health and Safety
Key takeaways

- Holistic approach to embed safety and operational risk management into all of your operations
- Critical safety information available to all – top floor to shop floor – to foster a proactive safety culture
- Enable EHS practitioners to be at the forefront of digital transformation within their organizations

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Thank You

Contact information:

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michael.censurato@sap.com

THE BEST RUN SAP