

Global IT-Tool for Process Hazard Assessment

Additional Use of Big Data

Bertram Wendt / BASF

European Conference on Plant & Process
Safety September 14, 2022



Agenda

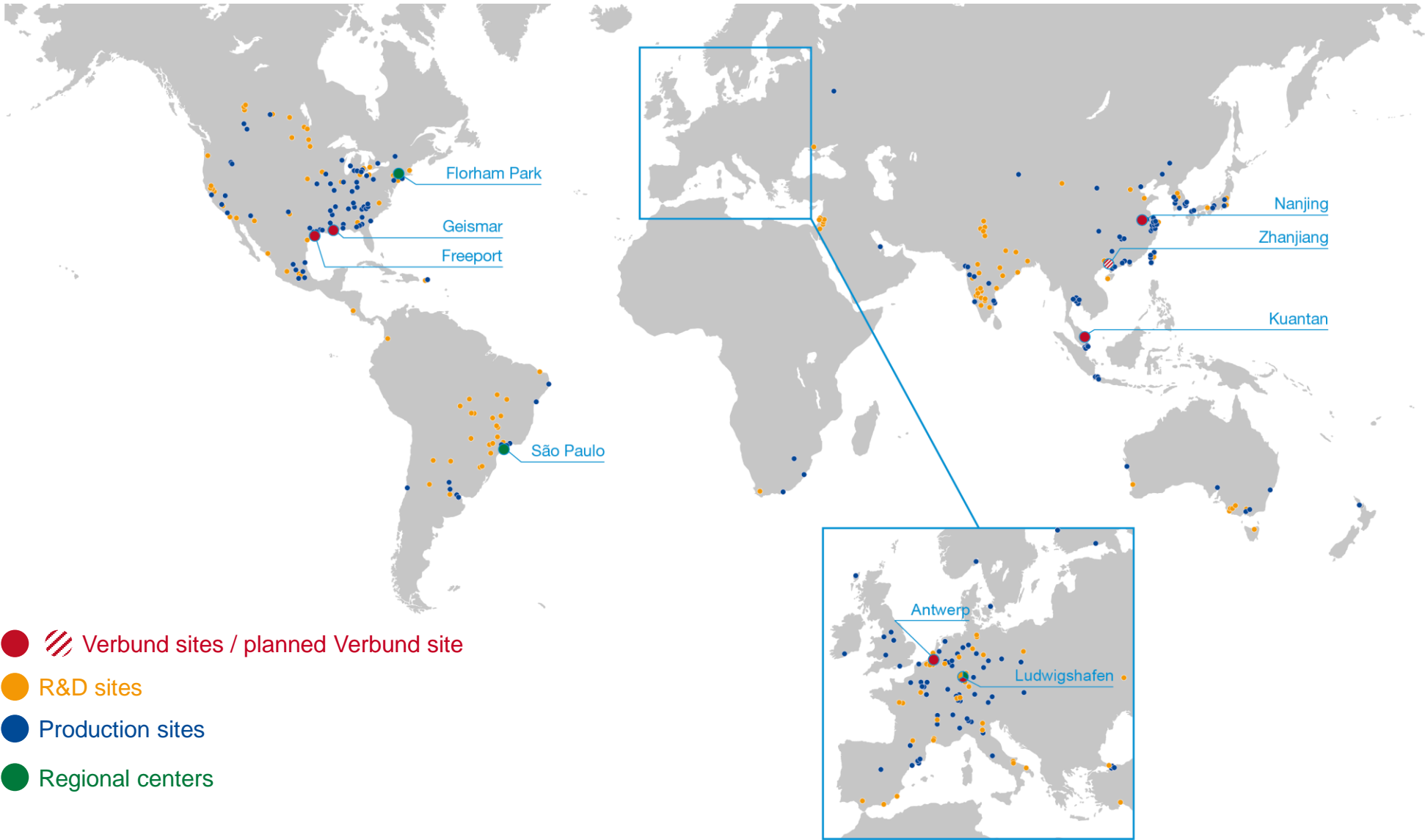
- 1.** BASF – At a Glance
- 2.** Process Hazard Assessment – Why and How?
- 3.** Stature® – Our Global IT Tool, Training and Resources
- 4.** Results, Experience and Enhancements after 7 Years



BASF — At a Glance 2021

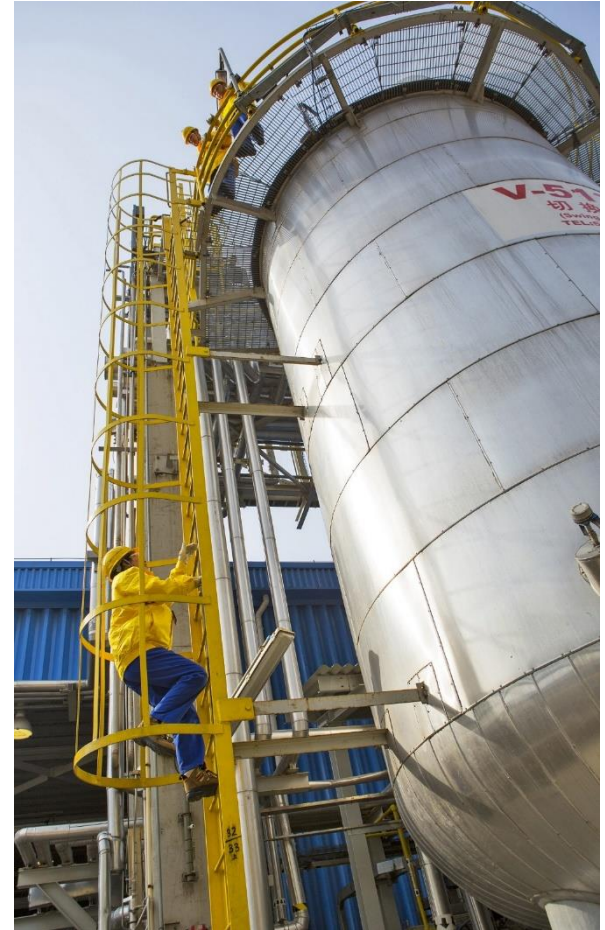


BASF worldwide: sites



Organization of the BASF Group

- Combined into six **segments**, 11 **divisions** bear operational responsibility
- The **regional and country units** represent BASF locally and support the growth of business units with local proximity to customers.
- Together with our divisions, our global **research divisions** safeguards our innovative capacity and competitiveness.
- The **Corporate Center** units support the Board of Executive Directors in steering the company as a whole.
- Five **service units** provide competitive services for the operating divisions and sites

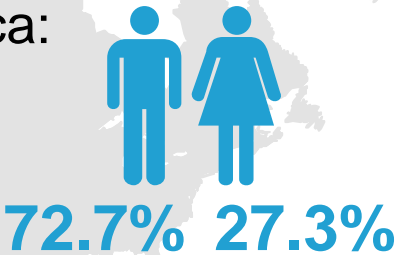


Employees

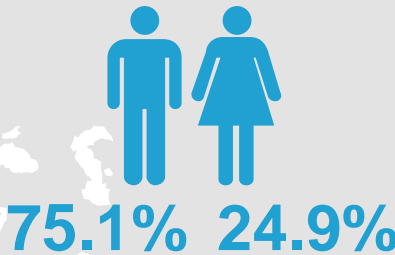
BASF Group employees by region

(Total: 111,047, thereof 26.1% women, as of December 31, 2021)

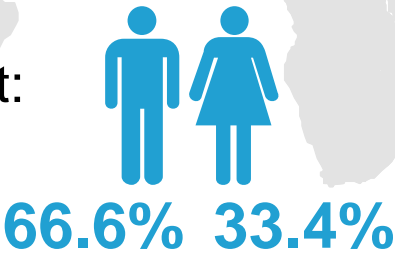
North America:
16,753
(15.1%)



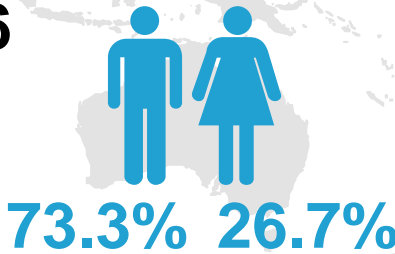
Europe*:
67,532
(60.8%)



South America,
Africa,
Middle East:
6,786
(6.1%)



Asia Pacific:
19,976
(18.0%)



* Germany: 51,026 (45.9%),
thereof women: 24.5%
BASF SE: 34,405 (31.0%),
thereof women: 21.9%

Agenda

1. BASF – At a Glance
2. Process Hazard Assessment – Why and How?
3. Stature[®] – Our Global IT Tool, Training and Resources
4. Results, Experience and Enhancements after 7 Years

Safety, Health & Environmental Hazards

By three methods we may learn wisdom:

First, by **reflection**, which is noblest;

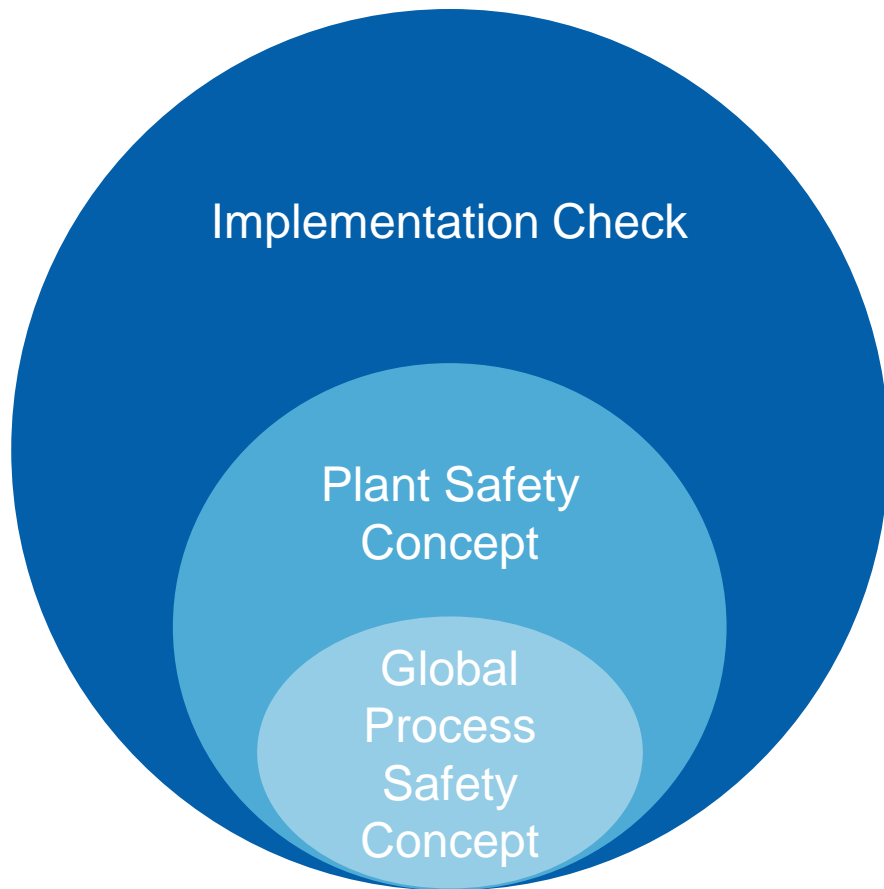
Second, by **imitation**, which is easiest;

and third by **experience**, which is the bitterest.

Confucius

Fundamentals for Safe Operations

Layers within the Framework of Process Safety



Global Process Safety Concept

- For Core Technologies
- Summary of related Hazards, corresponding Risk Evaluation and recommended Countermeasures

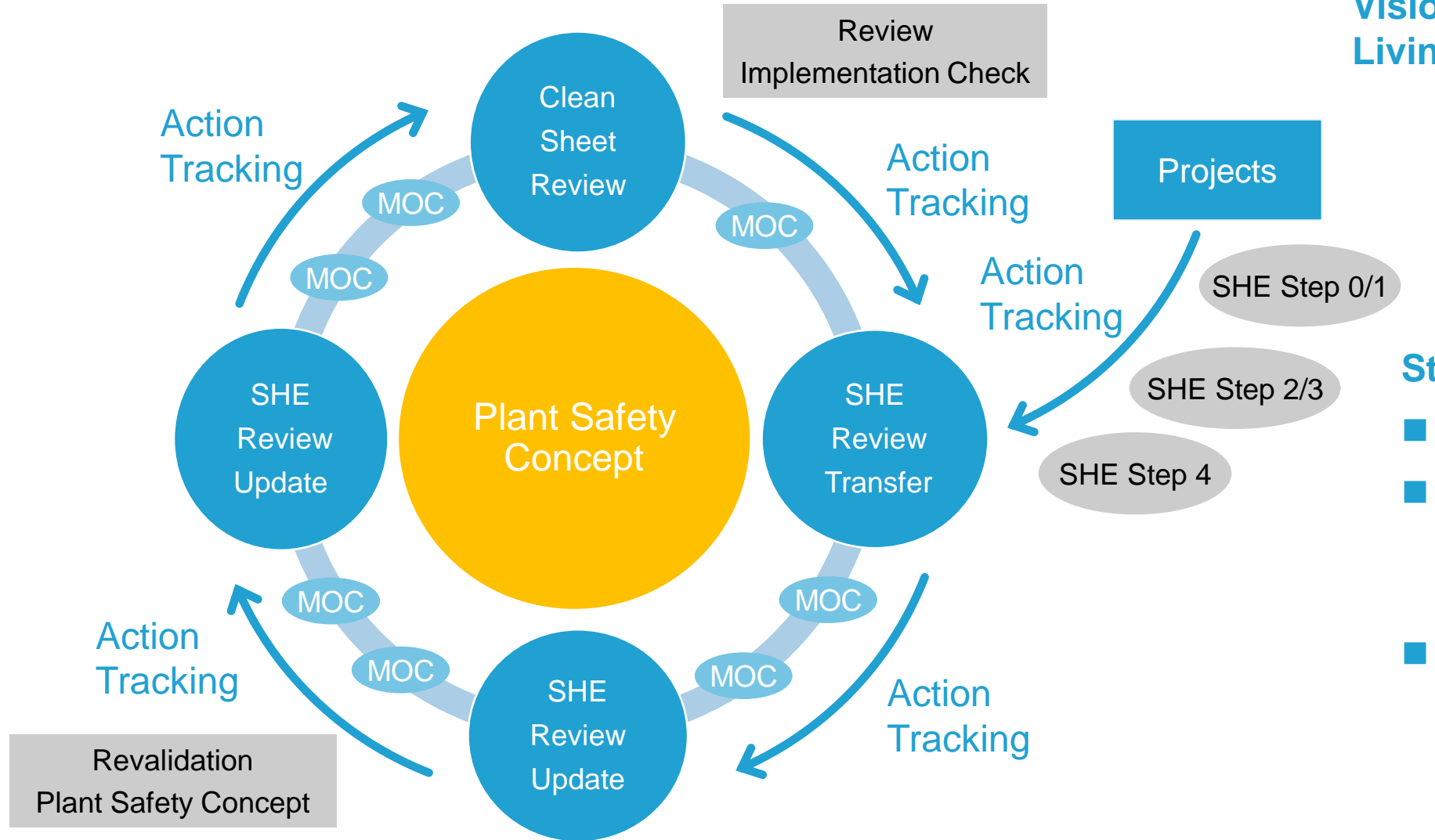
Plant Safety Concept

- For each Plant on a conceptual Level
- SHE Review Process with all Process-Related Hazards, Risks and appropriate Safeguards

Implementation Check (Clean Sheet Review):

- For all Plants on a detailed Level
- Identify based on P&IDs (Piping and Instrumentation Diagrams) appropriate Risk Mitigation Measures and their Effectiveness
- Method depends on Hazard Potential and local regulatory Status

Hazard Review Lifecycle



Vision: Making a study a Living Document in Stature®

Stature® for

- Projects (SHE Step 0 - 4)
- Existing Plants, MOC, revalidation und “clean sheets”
- Existing Plants → initial load of documents

MOC: Management of Change

Agenda

1. BASF – At a Glance
2. Process Hazard Assessment – Why and How?
- 3. Stature® – Our Global IT Tool, Training and Resources**
4. Results, Experience and Enhancements after 7 Years

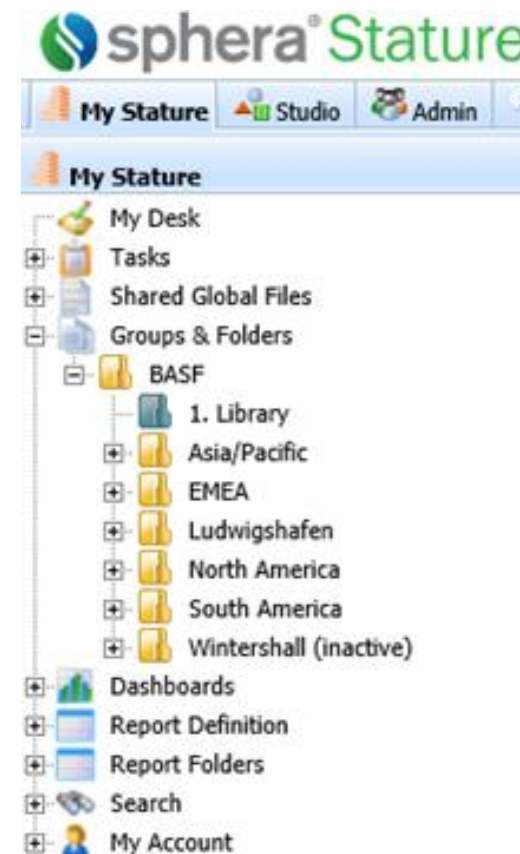
Stature® in BASF

What is it about?

- Stature® is a Global Web-Based Platform for documenting Hazard Assessments for new Projects and existing Plants
- Stature® is a mandatory Tool since 2015
- Stature® facilitates Tracking and Management of Action Items

Who are the User Groups?

- Plant Management / Operations
- Process Safety and Global Auditors
- Engineering
- Global Technology Teams
- More than 8 000 users globally



Business Value of a Centralized Risk Management Solution

Expected Benefits at Launch in 2015



Employees

- One System
- Clear Processes and Responsibilities



Plants

- Transparency
- Status of Studies
- Status of Open Points
- Compare Similar Plants



IT-Tool

- Resource Planning
- Prioritization
- Analysis above the Plant Level



Documentation

- Less Time for SHE Review
- Documentation available Globally

Stature® Training & Resources

Online



Classroom or Virtual



In Stature®

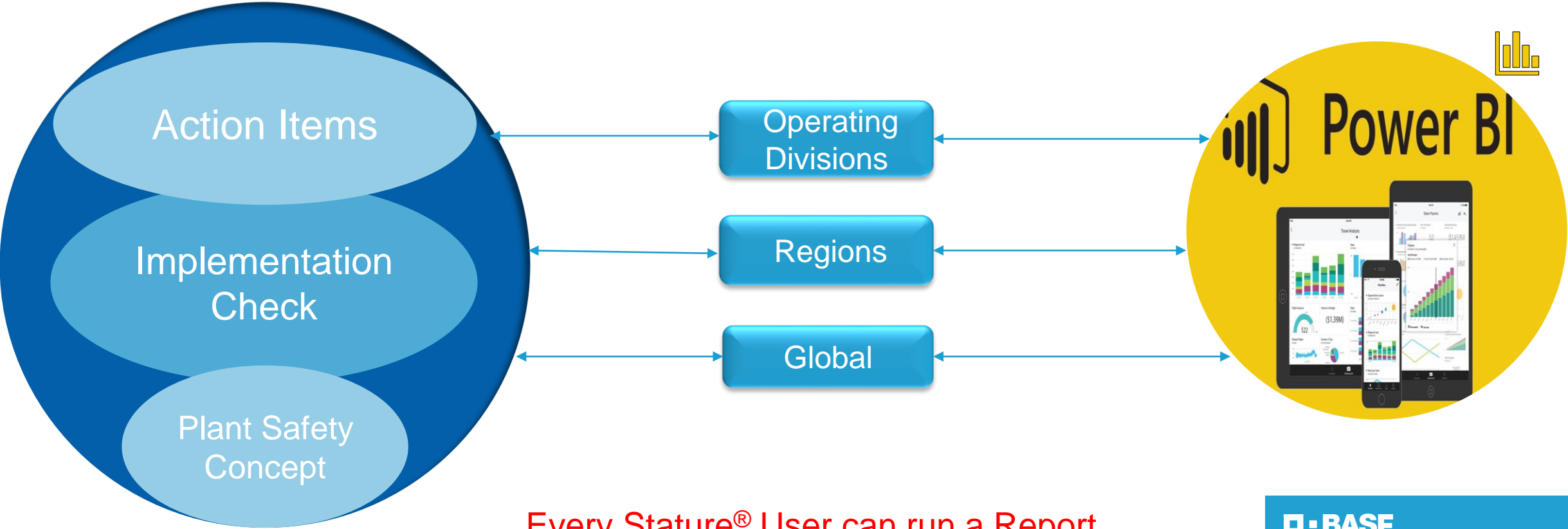


E-Learning Modules are accessible via BASF Intranet to all Employees

Agenda

1. BASF – At a Glance
2. Process Hazard Assessment – Why and How?
3. Stature[®] – Our Global IT Tool, Training and Resources
4. Results, Experience and Enhancements after 7 Years

Data Visualization - From Stature® to Power BI for Analytics



Every Stature® User can run a Report

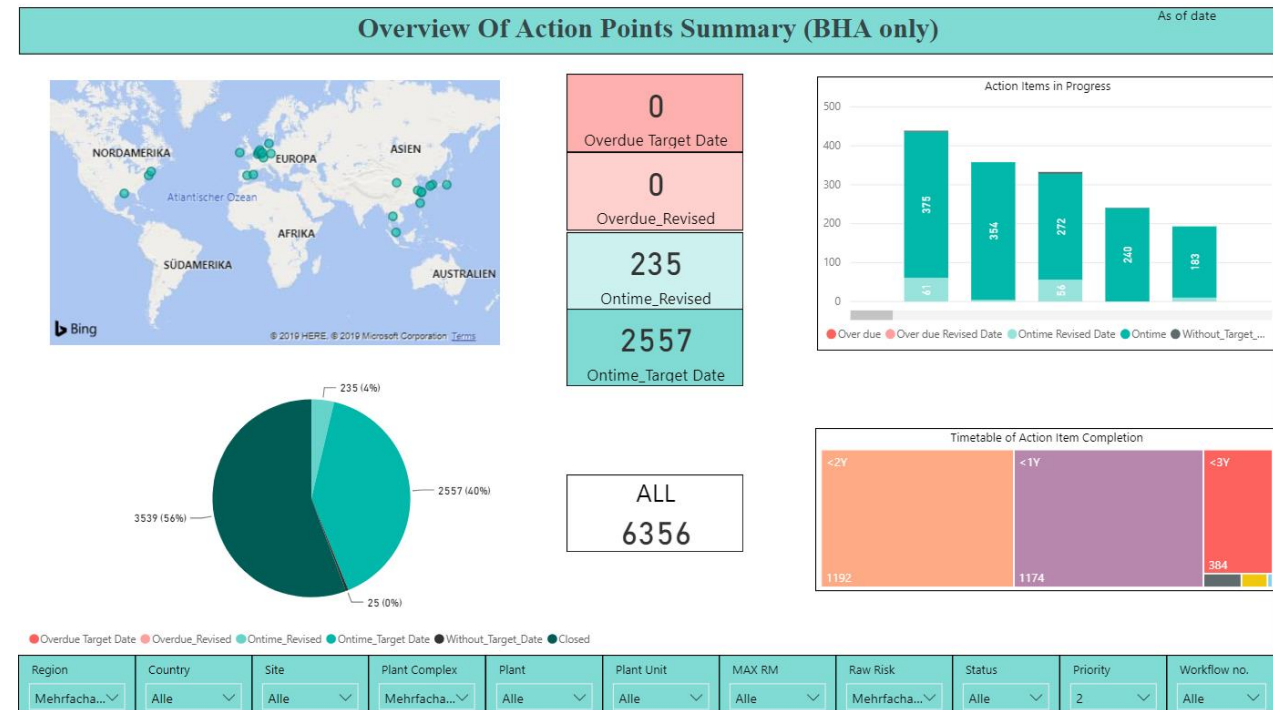
Big Data – Unleash the full Power of Stature®

■ Visualization of Data Analyses and Data Mining

- ▶ Improve Transparency on Completion of PSC or Implementation Check (CSR)
- ▶ Include Status of Action Items from Safety Reviews and Transfer existing AI
- ▶ Complete after 5 Years
- ▶ Interpret the Stature® Data, Prioritize and Devise Improvement Plan

■ Purpose: Allow Monitoring of Data Quality

■ Leading indicators and Detailed Reporting



Business Value of a Centralized Risk Management Solution

Experience after 7 Years



Employees

- Training of IT and Methodology
- Differences in Processing (Consistency)



Plants

- Transparency
- Status of Studies, Open Points and Prioritization
- Critical Risks Visible
- Compare Similar Plants



IT-Tool

- Resource Planning
- Information for Management
- Visualization of Reports, Leading Indicator
- Automatized Reporting

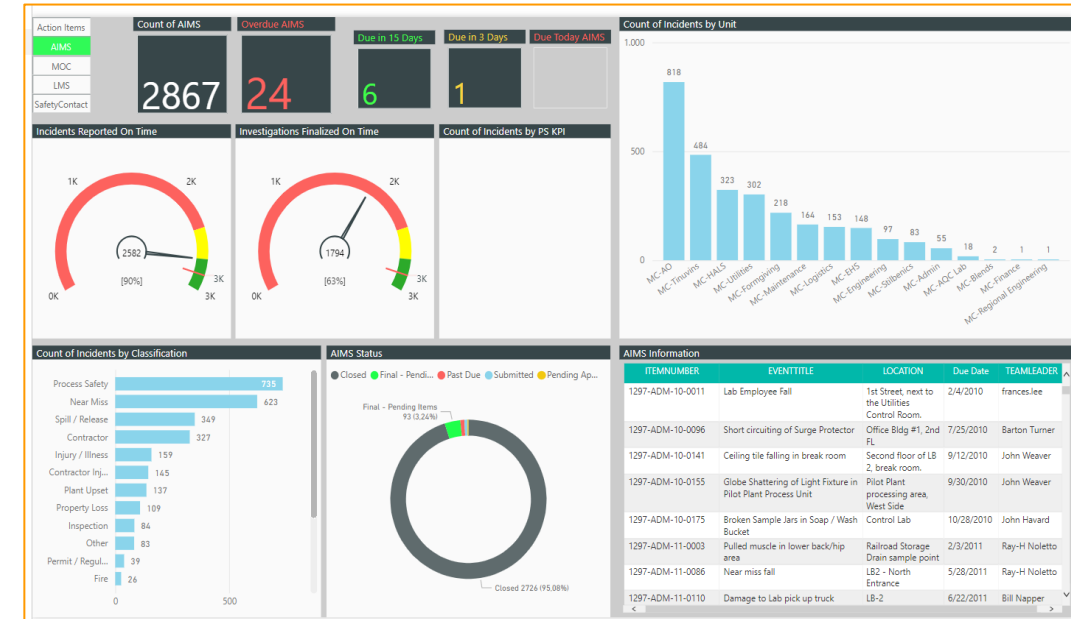


Documentation

- Less time for SHE Review
- Documentation Available Global
- Global PSC as Blueprint for new Plants

Big Data – Sustained Audit Readiness (SAR) Dashboard

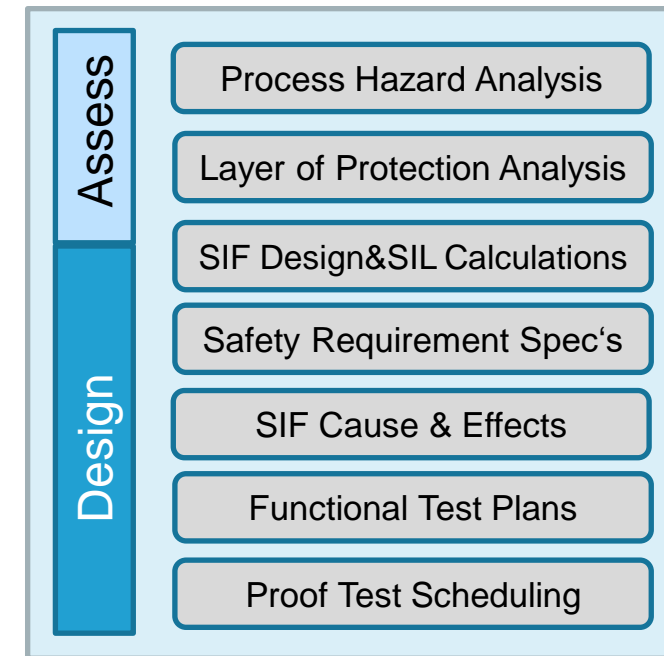
- Interactive Dashboard provides Essential Information and Analytical Insights
 - ▶ Connection of Existing Databases in one Dashboard
 - ▶ Automatized Data Collection from e. g., Stature®, Incident Database, Tracking Tools, SuccessFactors® for Training
- Global Focus
 - ▶ Data Lake Integration, Structure, Data Security
 - ▶ Aggregate Dashboards (OD*, Region)



- Use Case: Site/Plant Management and EHS Experts track EHS Compliance
(* OD: Operating Division)

Integrated Process – Digital Transformation IEC 61511 Specification

- Safety Instrumented System (SIS) must be documented in Safety Requirement Specification (SRS, according to IEC 61511)
 - ▶ SRS is the Central Anchor Point for the Design, Testing and Operation of a SIS
 - ▶ SRS Documentation is based on Countermeasures defined in SHE Review
 - ▶ Global Standardized Document (former: Word-Template)
- New: Simplified Data Transfer from SHE Review to SRS-/(MSD*) Document
 - ▶ Improvement of Quality using a uniform Documentation of Plant Safety
 - ▶ Avoidance of possible Errors during manual Data Transfer
 - ▶ Achievement of full Data Consistency and Minimization of Workload
- Basis for Next Steps e. g., Check before Start-Up and Management of Change



*MSD: Mechanical safety device

Stature® Roadmap 2022

SWOT Analysis and Summary

S

Strengths

- One Global System for Process Safety
- Full Transparency of Plant Safety Concepts and Implementation Checks
- Action Tracker with Implementation of all relevant Action Items
- > 8 000 User

O

Opportunities

- One Global Reporting System for OD* based of different Databases
- Global Prioritization of Action Items

W

Weaknesses

- Training for End-User needed
- Train the Trainer Concept needs Support of EHS Experts
- Users do not follow the Rules
- Users' Behavior affect Data Quality → Follow Up Ground Rules, e. g., use of Modifier

T

Threats

- Release 4.15 and Template Change
- Cloud Solution

*OD: Operating Division



We create chemistry



Bertram Wendt

Dr.

Kurzwahl (BCN): 8-1-58124

Telefon: +49 621 60-58124

Mobiltelefon: +49 1520 9377048

BASF SE

COR/OP Process Safety

LU-EUROPAHAUS - 0247

Ludwigshafen, Germany

bertram.wendt@basf.com