

Security & Safe Maintenance

European Responsible Care® Forum

Topic:

Maintenance & Safety Policy

**Maintenance on equipment with
dangerous substances**



The Chemical Company

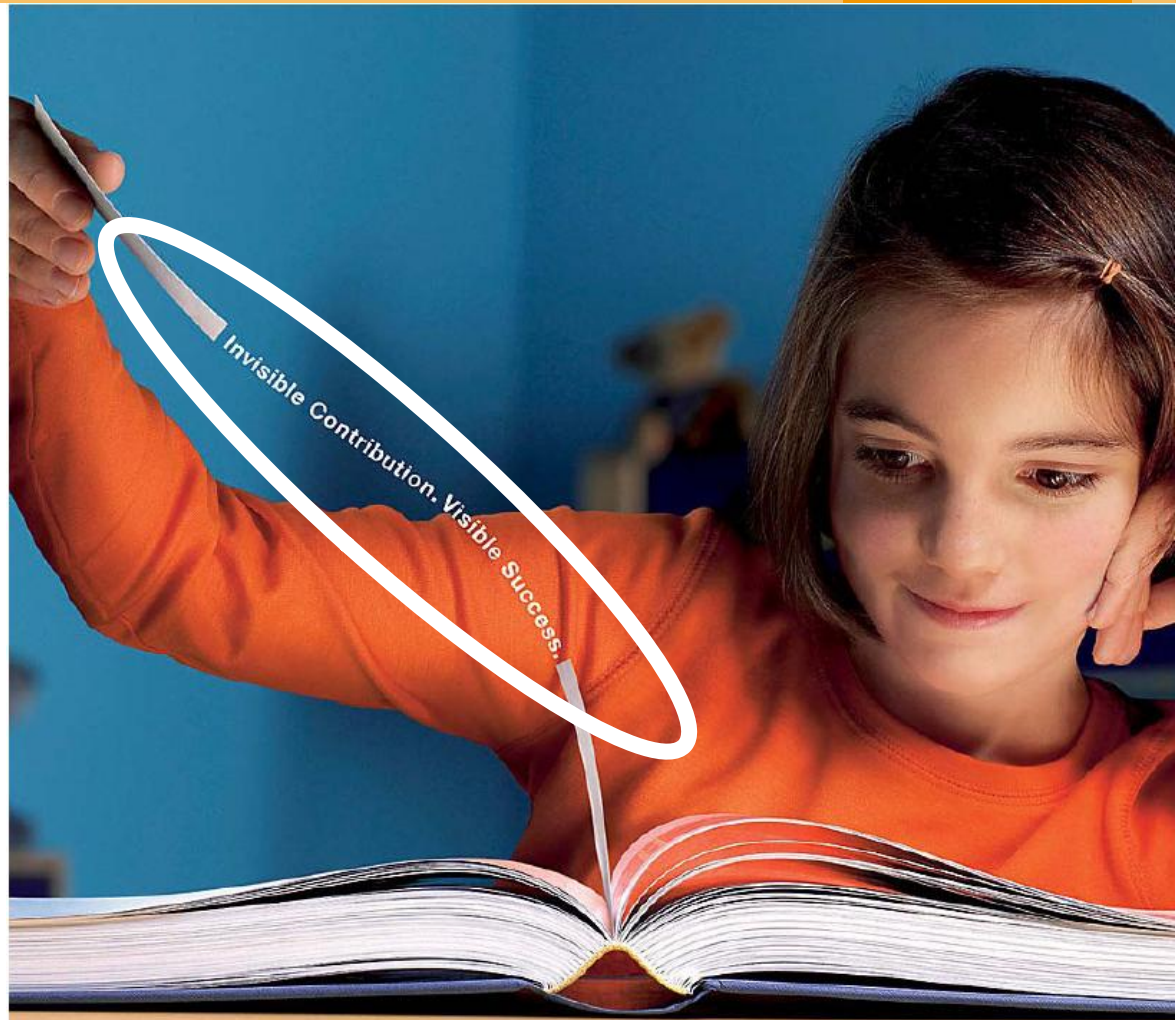
Johnny Nobels
Safety Engineer
BASF Antwerpen N.V.

Who is BASF ?

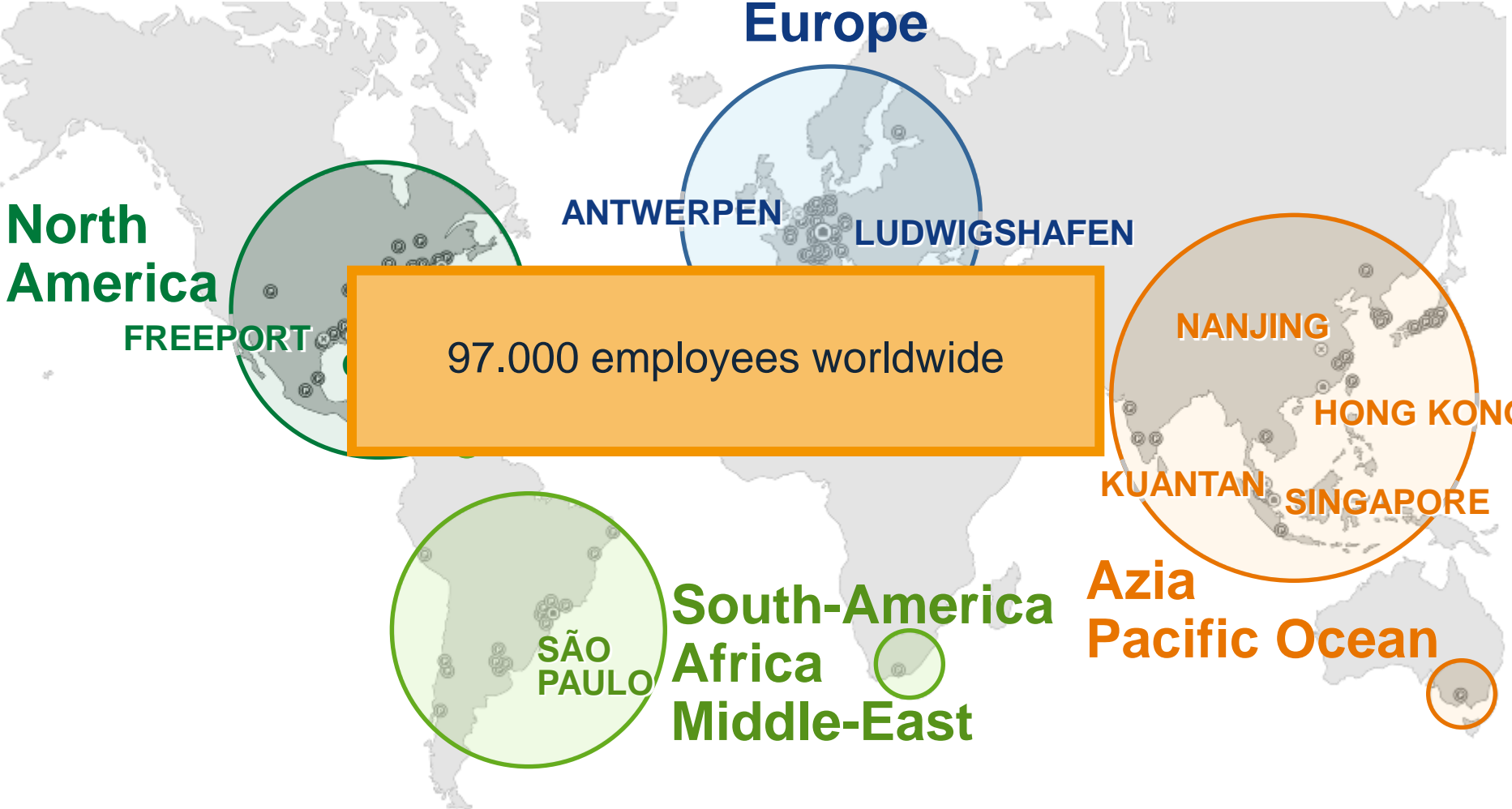


Who is BASF ?

Specialist in raw
materials and
intermediates



BASF operates worldwide



BASF Antwerp N.V.



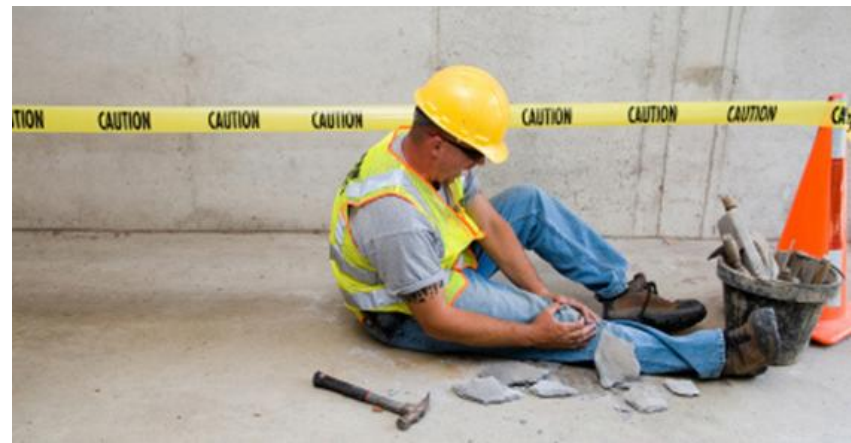
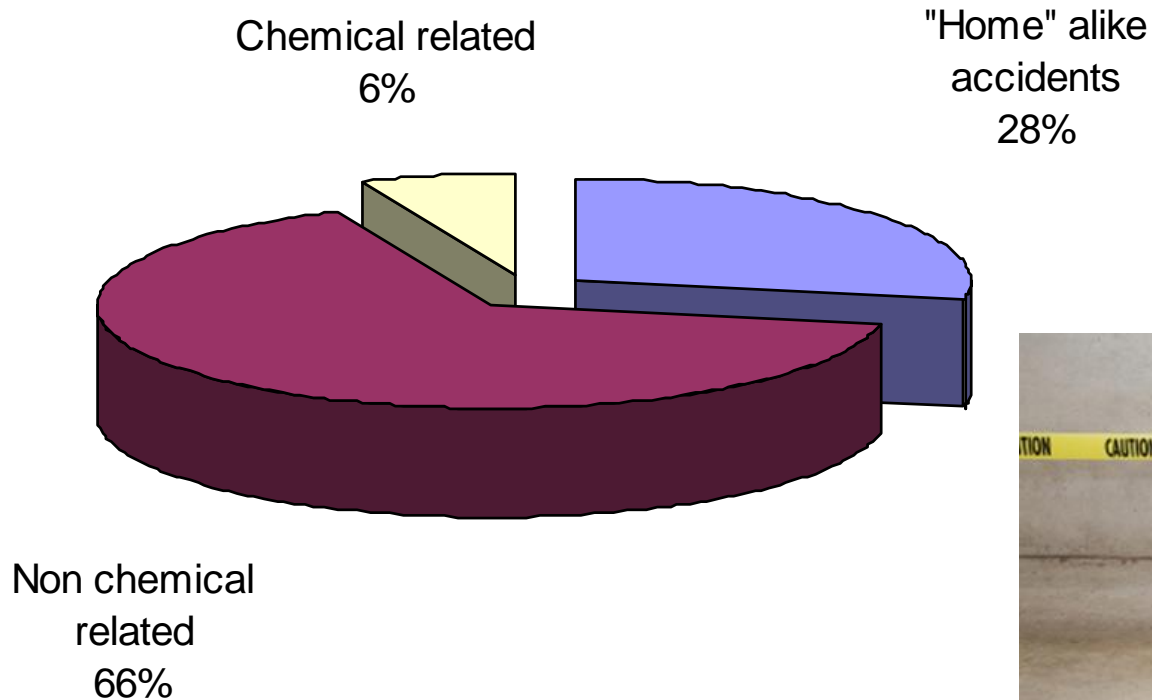
■ Total surface area	600 ha
■ Number of production plants	54
■ Number of BASF employees	3500
■ Number of contractor employees	1200
■ Turnover, 2010	6 billion Euro

Some pictures













How do we perform ?

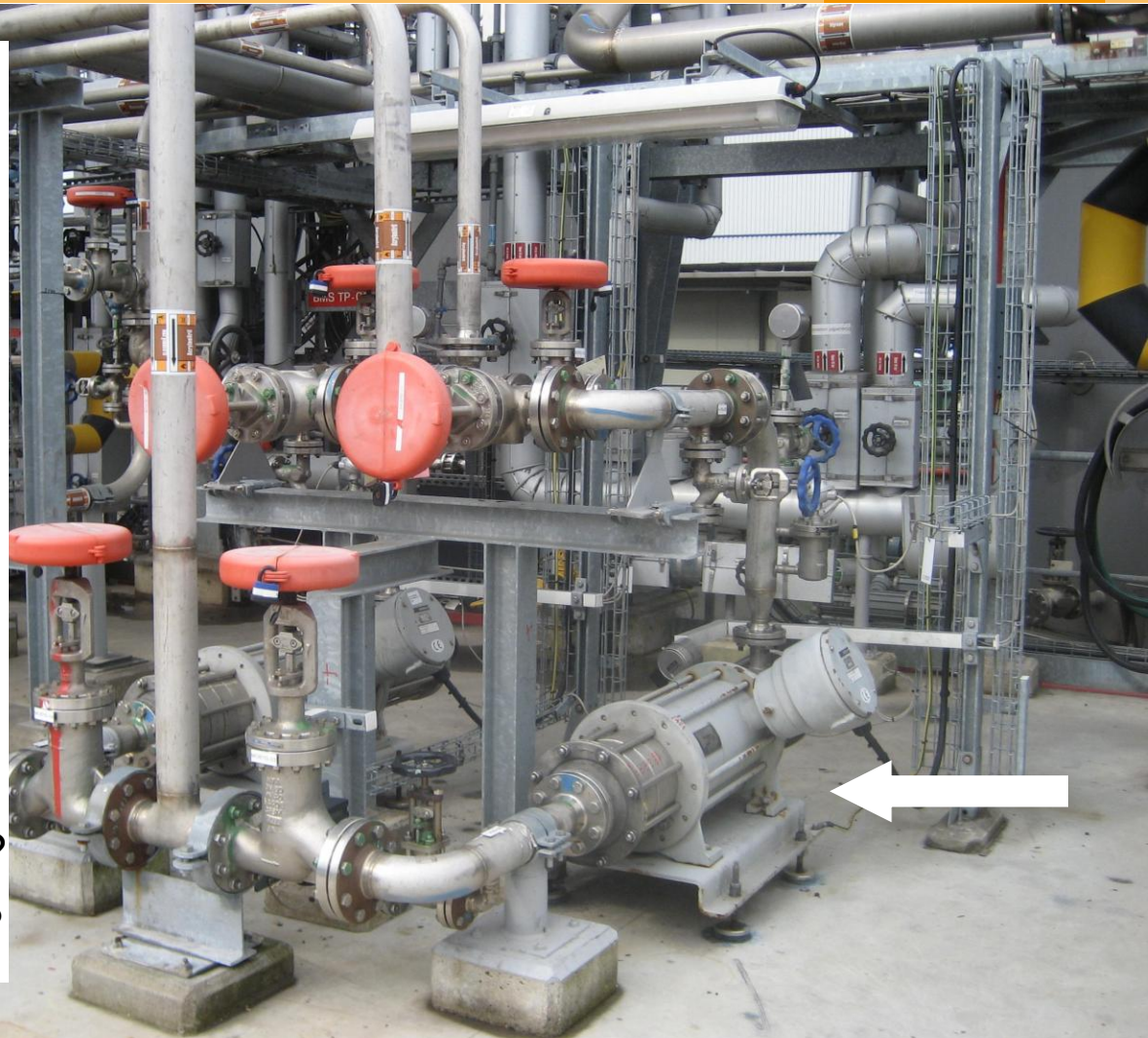
- Check of 141 LTI's (BASF + contractors)
- 94 LTI's during maintenance activities



Maintenance work in a chemical plant

What is a maintenance worker facing ?

- We need to disassemble the pump
- What is inside ?
 - Ethylene, -102 C ?
  
 - Ammonia, 9 bar ?
   
 - Benzene ?
  
 - Empty ???
 - What does “Empty” mean ?
 - Sure this is the right pump ???

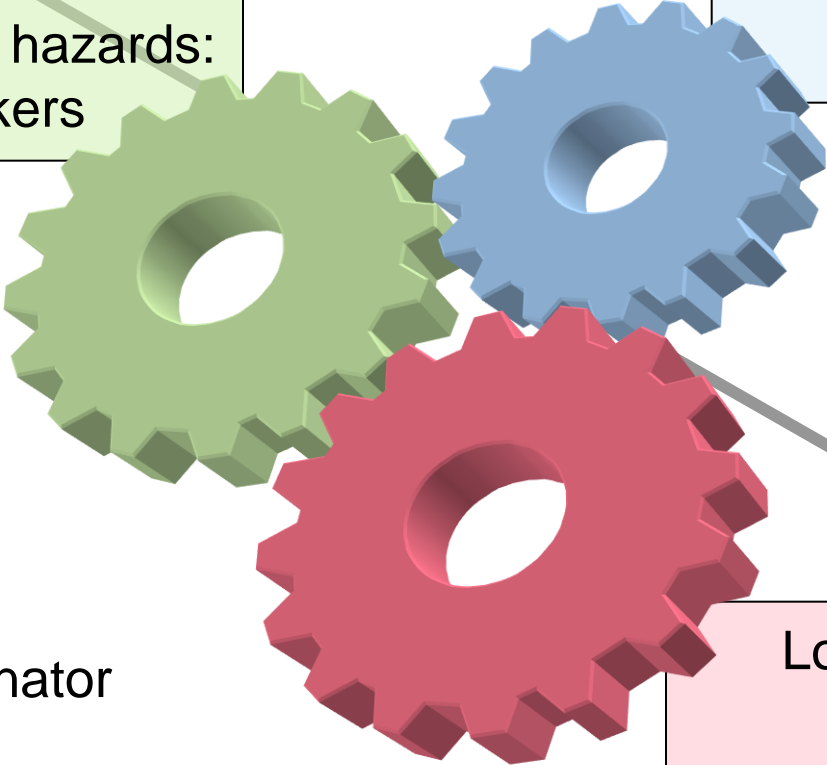


Maintenance work in a chemical plant

What type of hazards must be assessed ?

Interaction hazards:
other workers

Work specific hazards:
welding fumes, sharp
edges, sparks,



Maintenance company

Owner,
work coordinator

Location specific hazards:
chemicals, noise,

Maintenance work in a chemical plant

→ 3 key elements

- 1. Permit to work system**
- 2. Highly qualified maintenance workers**
- 3. Thorough work preparation**




Maintenance work in a chemical plant

Permit to work system

- Main goals:
 - Assess all specific hazards

Identificatie gevaren (situatie vóór het nemen van veiligheidsmaatregelen)

1. Producten: _____

								
T/T+ Giftig	Xn Schadelijk	C Corrosief	Xi Irriterend	F+ F Licht ontvlambaar	O Oxiderend	E Explosief	N Milieu- gevaarlijk	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ja neen

2. Installatiedeel op druk / vacuum* _____

3. Gevaar voor brand-/vrieswonden _____

4. Gevaar bij aanraking (draaiende delen, inklemming, elektrocutie...) _____

5. Andere _____

6. Brand / Explosiegevaar (niet Ex-gereedschappen, slijpen, lassen, ...) _____

7. Gevaren door de uitvoering van het werk voor de installatie of directe omgeving _____

Maintenance work in a chemical plant

Permit to work system

- Main goals:
 - Assess all specific hazards
 - Document necessary measures before the work can start
→ reduce risks to a minimum

Veiligheidsmaatregelen genomen vóór het begin van het werk:					
Dit gedeelte is:	ja	neen	Dit gedeelte is beveiligd door:	ja	neen
1. Ontspannen	<input type="checkbox"/>	<input type="checkbox"/>	7. Ventielen	<input type="checkbox"/>	<input type="checkbox"/>
2. Gasvrij	<input type="checkbox"/>	<input type="checkbox"/>	8. Steekschijven	<input type="checkbox"/>	<input type="checkbox"/>
3. Leeggelaten	<input type="checkbox"/>	<input type="checkbox"/>	9. Afkoppeling	<input type="checkbox"/>	<input type="checkbox"/>
4. Vrij van gevaarlijke stoffen.....	<input type="checkbox"/>	<input type="checkbox"/>	10. Energieloos	<input type="checkbox"/>	<input type="checkbox"/>
5. Gespoeld met: water	<input type="checkbox"/>	<input type="checkbox"/>	11. Slot op veiligheidsschakelaar	<input type="checkbox"/>	<input type="checkbox"/>
stoom	<input type="checkbox"/>	<input type="checkbox"/>	12. Uitbouw/afscherming*	<input type="checkbox"/>	<input type="checkbox"/>
stikstof	<input type="checkbox"/>	<input type="checkbox"/>	radioactieve bronnen	<input type="checkbox"/>	<input type="checkbox"/>
lucht	<input type="checkbox"/>	<input type="checkbox"/>	13. Uitdienstname verwarming	<input type="checkbox"/>	<input type="checkbox"/>
met	<input type="checkbox"/>	<input type="checkbox"/>	14. Afbakenen gevarezone	<input type="checkbox"/>	<input type="checkbox"/>
6. Op omgevingstemperatuur	<input type="checkbox"/>	<input type="checkbox"/>	15. Bijkomende maatregelen	<input type="checkbox"/>	<input type="checkbox"/>
				

Maintenance work in a chemical plant

Permit to work system

- Main goals:
 - Assess all specific hazards
 - Document necessary measures before the work can start
→ reduce risks to a minimum
 - Specify necessary measures to be taken during the work
→ protect workers from residual risks

Veiligheidsmaatregelen te nemen door de uitvoerders t.g.v. risico's uit de installatie:

	ja	neen	
1. Adembescherming	<input type="checkbox"/>	<input type="checkbox"/>	{ persluchtapparatuur/ademluchtnet/*
2. Specifieke veiligheidsbril	<input type="checkbox"/>	<input type="checkbox"/>	filtermasker: type filter
3. Gezichtschermscherm	<input type="checkbox"/>	<input type="checkbox"/>	type
4. Handbescherming	<input type="checkbox"/>	<input type="checkbox"/>	type
5. Beschermingskledij	<input type="checkbox"/>	<input type="checkbox"/>	type
6. Vonkvrij handgereedschap	<input type="checkbox"/>	<input type="checkbox"/>	vonkenvrije grijp / slag werktuigen / nat houden*
7. Veiligheidsgordel (1)	<input type="checkbox"/>	<input type="checkbox"/>	
8. Slot op veiligheidschakelaar	<input type="checkbox"/>	<input type="checkbox"/>	
9. Andere	<input type="checkbox"/>	<input type="checkbox"/>
		

Maintenance work in a chemical plant

Permit to work system

- NO maintenance job is done without a written permission !
 - Production always gives permission to start a job
- Different permits for different types of work
 - Suggesting specific hazards and measures
 - Normal work and line breaking
 - Hot work
 - Work in confined spaces
 - Excavation work
 - ...

Maintenance work in a chemical plant

Permit to work system

- Permit issuer is an experienced, trained worker (mostly shift supervisor)
- Permit receiver (contractor) is trained on how to use BASF permits (e-learning with test)
- All workers are informed about the required measures by their supervisor

Maintenance work in a chemical plant

Permit to work system

- Special precautions
 - 4-eye principle : Hazard assessment and measures are checked twice e.g. for confined space entry and hot work (shift supervisor and plant manager)
 - Last minute check : Permit hand-over in the field e.g. for line breaking activities (Production worker directly to maintenance worker)



Maintenance work in a chemical plant

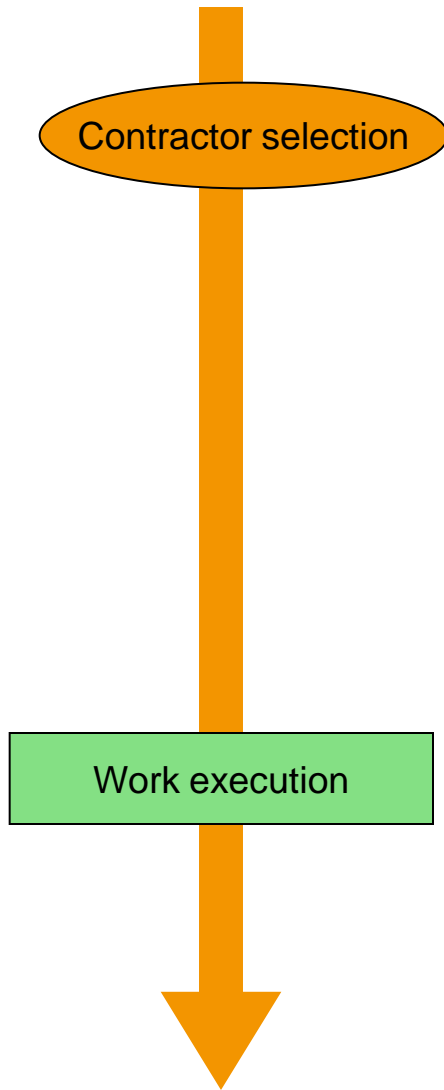
Highly qualified workers

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Maintenance work in a chemical plant

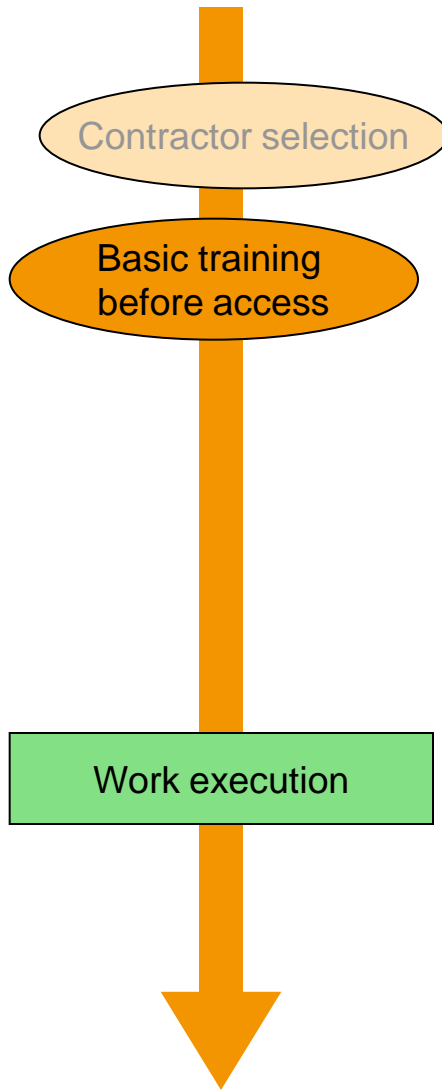
Highly qualified workers



- Only contractor companies with good safety performance and safety management system are selected. E.g.
 - VCA+, VCA++, VCA-P (B, NI)
 - SCC (D)
 - MASE (F)

Maintenance work in a chemical plant

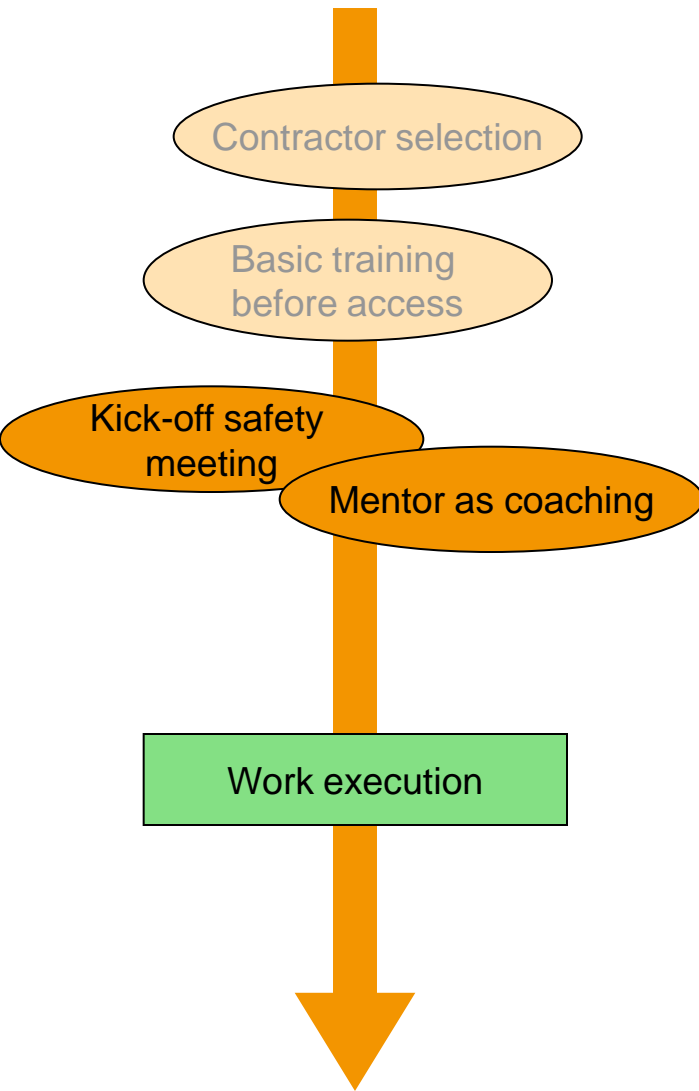
Highly qualified workers



- Required safety training for contractor employees
 - Basic safety training (1 week, according to VCA system)
 - Certified training on critical tasks (e.g. explosion/oxygen measurements, use of respiratory equipment, etc.)
 - Site specific training before access on site

Maintenance work in a chemical plant

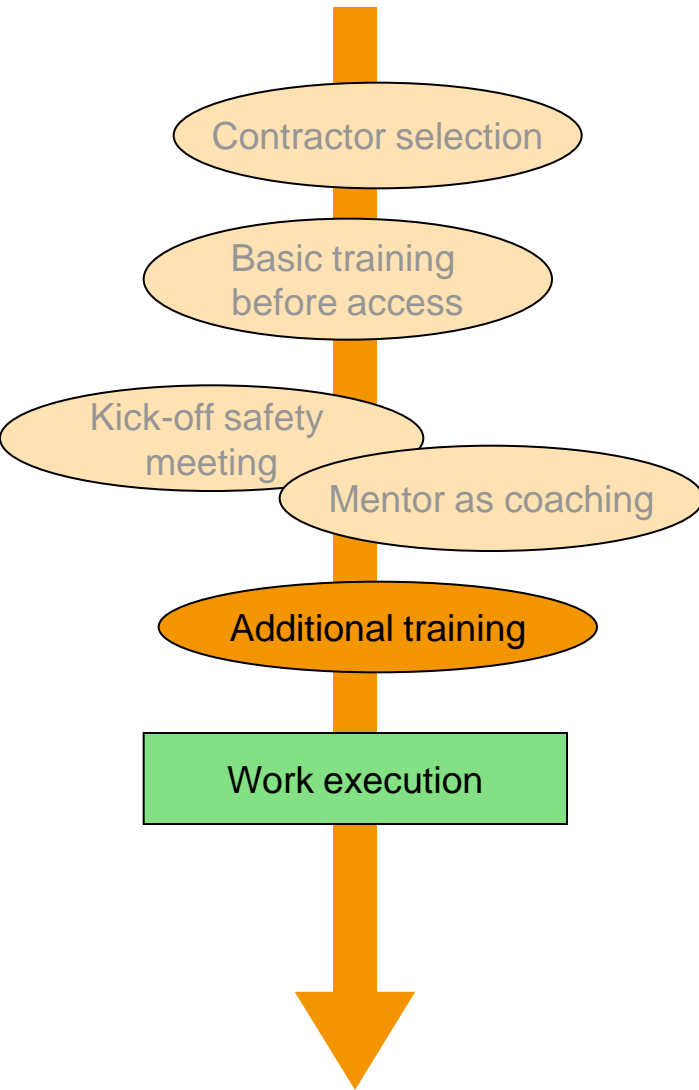
Highly qualified workers



- Shut down, projects : Kick-off safety meeting
 - Written information/training on specific project related hazards and measures
- On-site contractors : BASF Mentor
 - “translates” relevant site rules
 - Regularly checks (safety) performance

Maintenance work in a chemical plant

Highly qualified workers

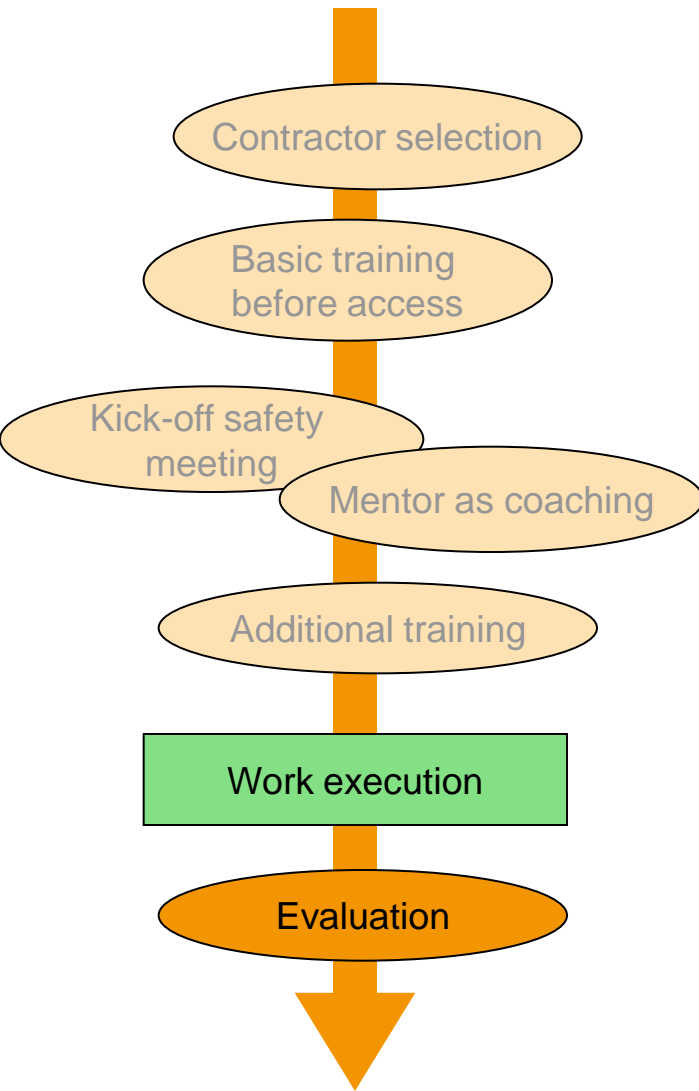


- Additional training. E.g.
 - Permit to work system : only trained supervisors are allowed to sign for receipt of permits
 - Use of specific PPE



Maintenance work in a chemical plant

Highly qualified workers



- Safety evaluation.
 - Periodically for on site contractors
 - After completion for project contractors
- Contractor safety reflection platform
 - Quarterly meeting between BASF and contractor representatives
 - Discuss general points of improvement, new safety initiatives,...

Maintenance work in a chemical plant

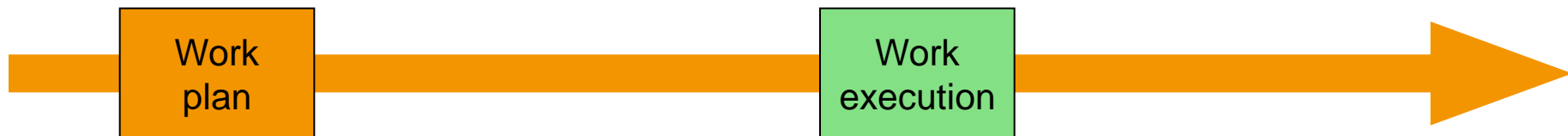
Thorough work preparation



Maintenance work in a chemical plant

Thorough work preparation

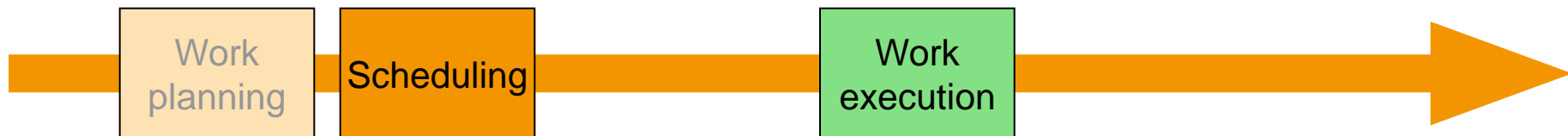
- Work preparation.
 - Split the maintenance job in its different steps to create a detailed work plan
 - Think of all necessary safety aids for each step (e.g. scaffolds, special PPE, how to clean, etc...)
 - Request necessary permits for each step



Maintenance work in a chemical plant

Thorough work preparation

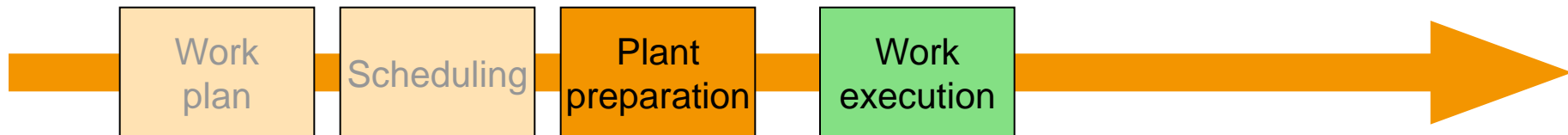
- Scheduling.
 - Avoid interaction hazards between different jobs
 - Check availability of workers and materials



Maintenance work in a chemical plant

Thorough work preparation

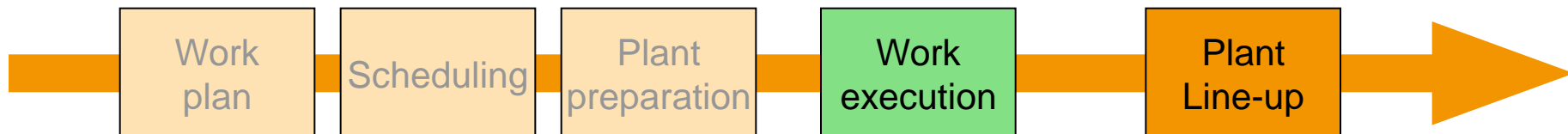
- Plant preparation.
 - Prepare permits
 - Take all necessary measures before start of the work
 - Evaluate additional hazards due to urgent (not planned) work
 - Issue permit if all measures are taken



Maintenance work in a chemical plant

Thorough work preparation

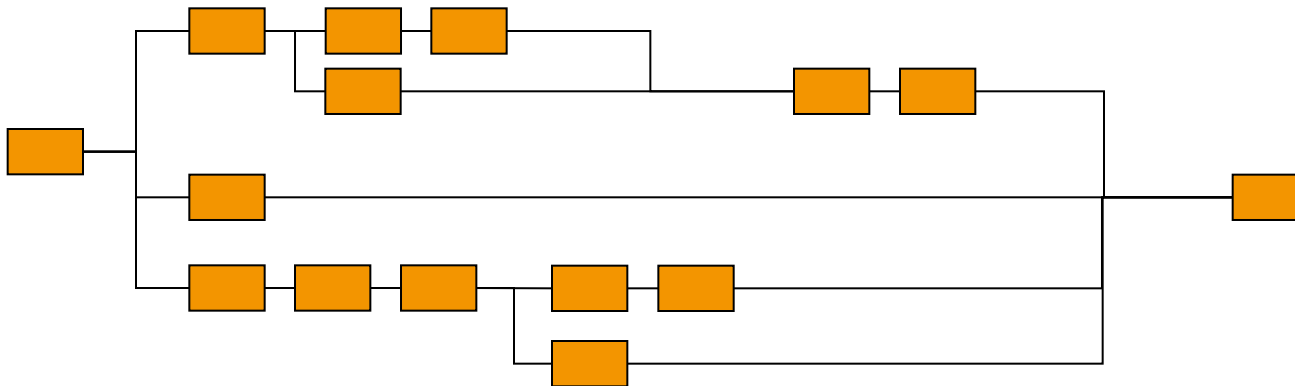
- Work execution.
 - Apply measures on work permit.
Workers confirm that they have been informed of the measures to be taken.
 - Safety observations by BASF
 - Safety tours by contractor



Maintenance work in a chemical plant

Thorough work preparation

- Approach for large shut-downs:
 - Separate IT tools
 - Jobs are “chained” preventing one can start before the previous one has ended



BASF policy




Content

- 1 Scope and Objective
- 2 Definition
- 3 Organization and Responsibilities
- 4 Elements of Occupational Safety
 - 4.1 Occupational Safety Targets
 - 4.2 Identification of Hazards and Risk Assessment
 - 4.3 Hazardous Substances
 - 4.4 Personal Protective Equipment (PPE)
 - 4.5 Operating Procedures
 - 4.6 Work Permit System
 - 4.7 Training
 - 4.8 Plant Inspections and Audits
 - 4.9 Incident Management
 - 4.10 Contractor Management**
 - 4.11 Behavior based Safety
- 5 Communication

Competence
Responsible

BASF Group Directive
Occupational Safety

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The Chemical Company

Competence Center
Responsible Care (CCRC)

Global Expert Group Occupational Safety

Requirements "Safe Contractor Work"

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5 Development of a Safety Concept	3
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10 Permanent Dialogue between BASF and Contractor	5

For internal use only.

We can still improve...

- Topics for further improvement:
 - Balance between safety and costs
e.g. secure necessary supervision
 - Balance between desired flexibility (number) and quality of workers
 - Safety standard of workers from new EU member states
e.g. no comparable VCA system
 - Language barriers
 - ...

Thank you for your attention



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