

# An Integrated Project and Operations team - A Success Factor for a Safe Start Up

AIChE-meeting  
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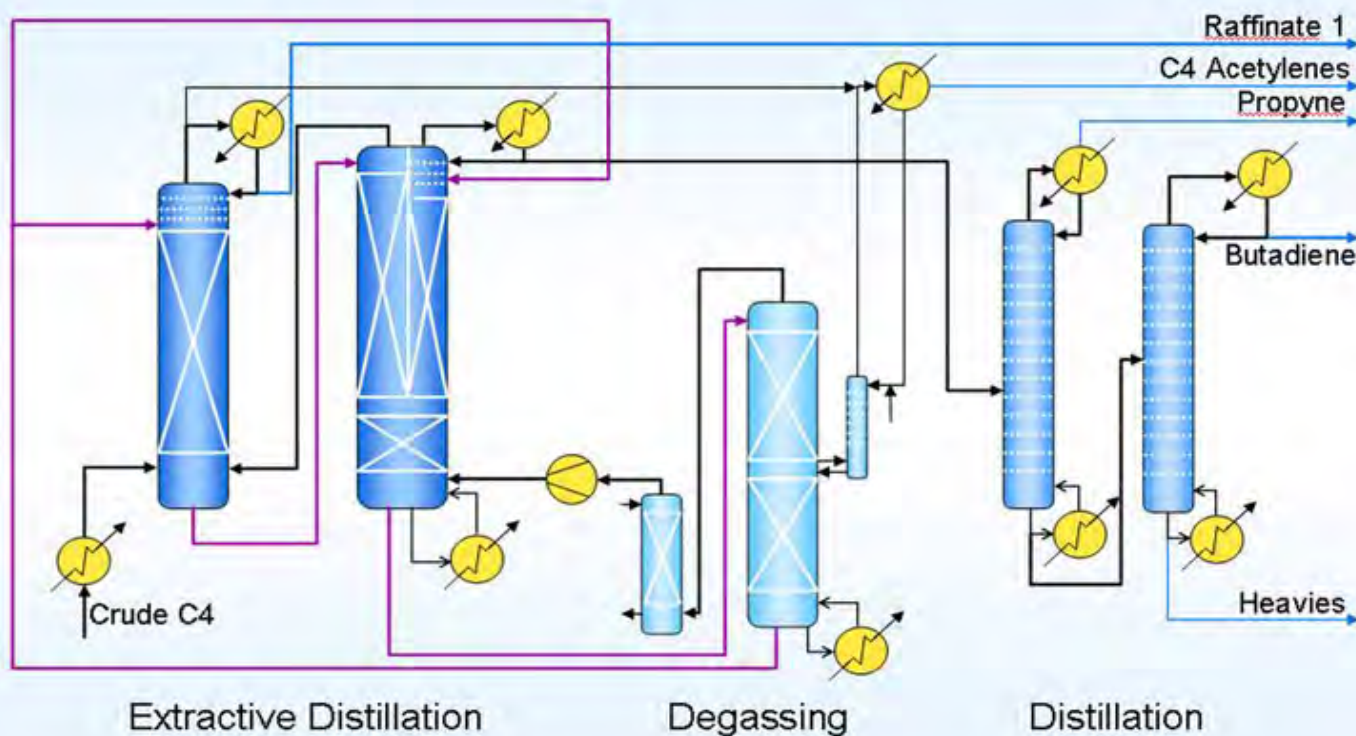
ISBL

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# Butadiene Extraction Plant Antwerp BDex Technology Process Design

## BASF's NMP Process for Butadiene Extraction

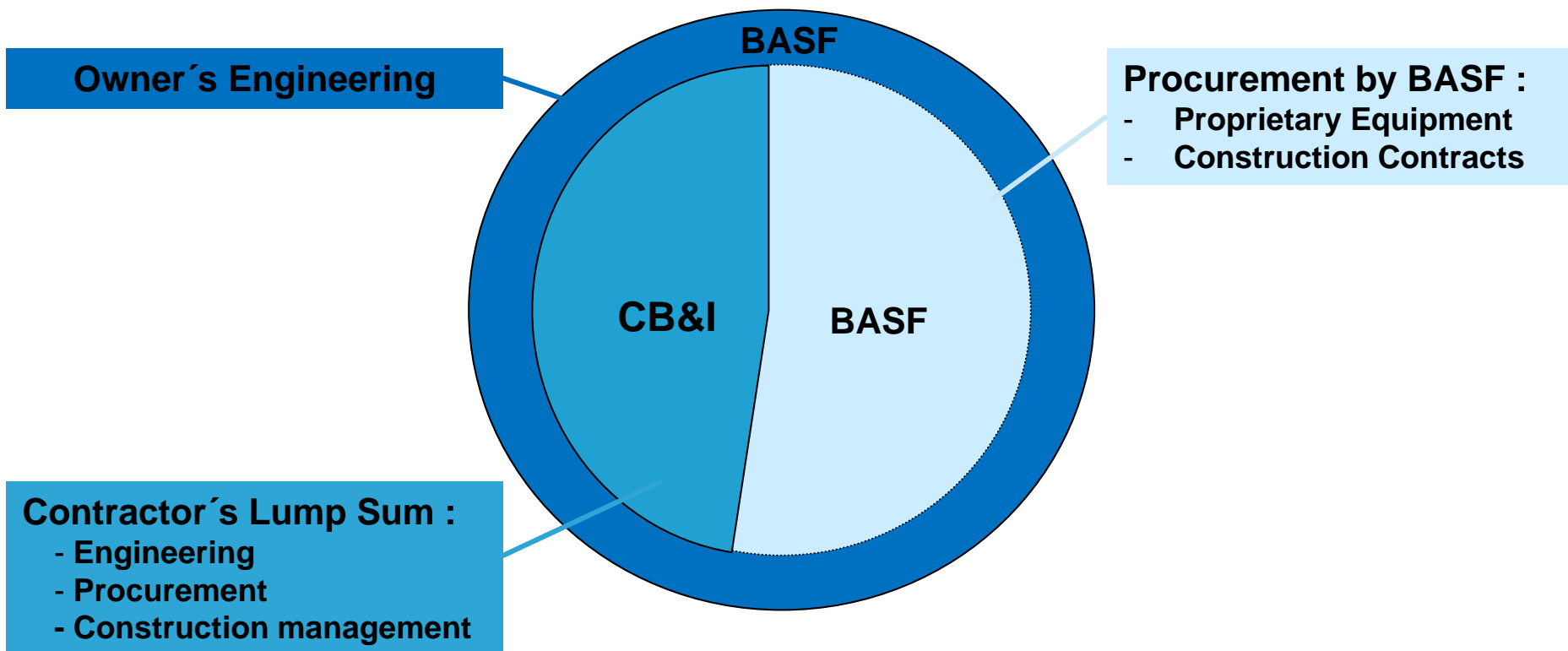
### Standard Configuration



# BDex Extraction Antwerp Project format “EPCm”



- EPCm-Contract with *Engineering*, *Procurement* en *Construction management*



# Safety – Key Performance Indicators

## 1. *Occupational safety*

- *KPI = LTI (Lost Time Injury)*
- *Goal: No LTI's for the total project*
- *LTI according to OSHA definition*

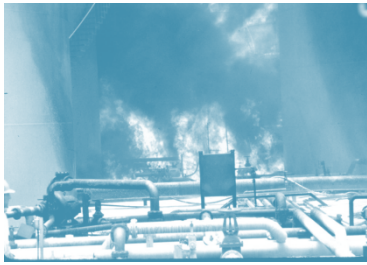
## 2. *Process safety*

- *KPI = FER (Fire, Explosion & Release)*
- *Goal: No FER's during start up phase*
- *FER according to BASF guidelines – see next slide*



# Reporting Criteria KPI-FER

## Fires



## Explosions



## Releases



- Incident in a Process resulting in a **F**ire, **E**xplosion/Implosion/Bursting or **R**elease of Substance with either:
  - A Fatality or LTI Injury,
  - Property Damage  $\geq$  25k €
  - Release of Substances exceeding Thresholds:
    - > 100 kg for Materials with Danger Symbol
    - > 5 kg for GHS H300/H310/H330 (Former T<sup>+</sup>)
    - > 2000 kg of all other Substances
  - Off-Site Impact (Evacuation, Injury or ERPG2 detected outside Fence Line,...)

# Occupational Safety – Challenges

## Challenges for Occupational Safety:

- **BASF Antwerp Site regulations vs CBI corporate requirements**
  - Different company cultures
  - Working at height ( 6ft vs 2m)
  - Use of cage ladders for access, with harness and 100% tie off
- Follow up of a strict “Balance of Consequences” policy.
- How to implement “phased” mechanical completion without compromising occupational safety guidelines.



# Occupational Safety - Facts

## ■ Heavy Lifting

- **Columns** – for each lift a detailed Task Risk Analysis was prepared and approved lifting procedures provided
- **Butadiene sphere** – lifting over piperack





# Occupational Safety - Results

**Week 20 - 2014**



## Health, Safety and Environment



WEEK	TOTAL
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First Aid Case : 

0	7
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Near Misses : 

0	588
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Unsafe Acts / Situations : 

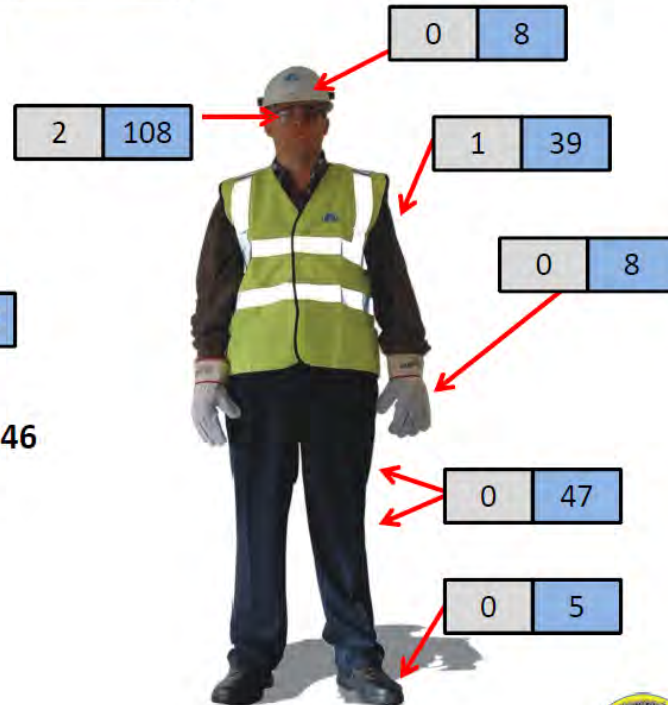
4	380
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Hours worked (at site) to date : 795646

Hours worked without LTI : 748401

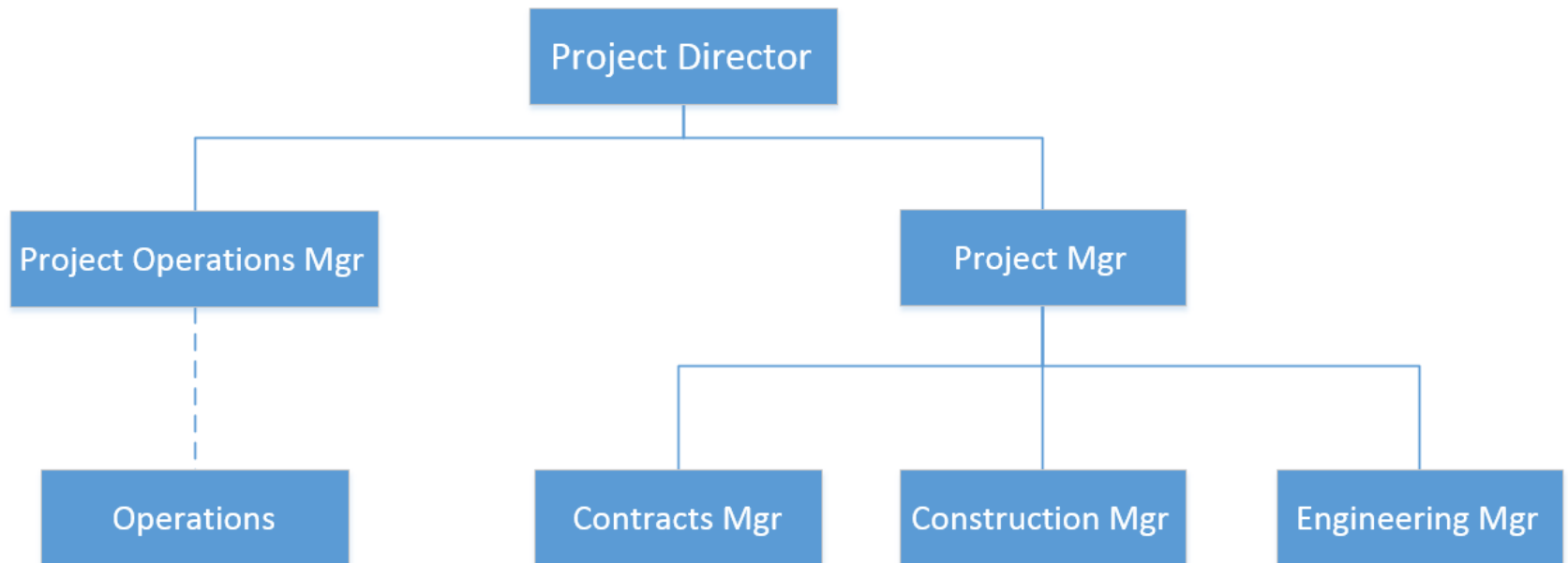
LTI: 1

RWC: 0





# BASF Project Organization



# Process Safety - Definitions

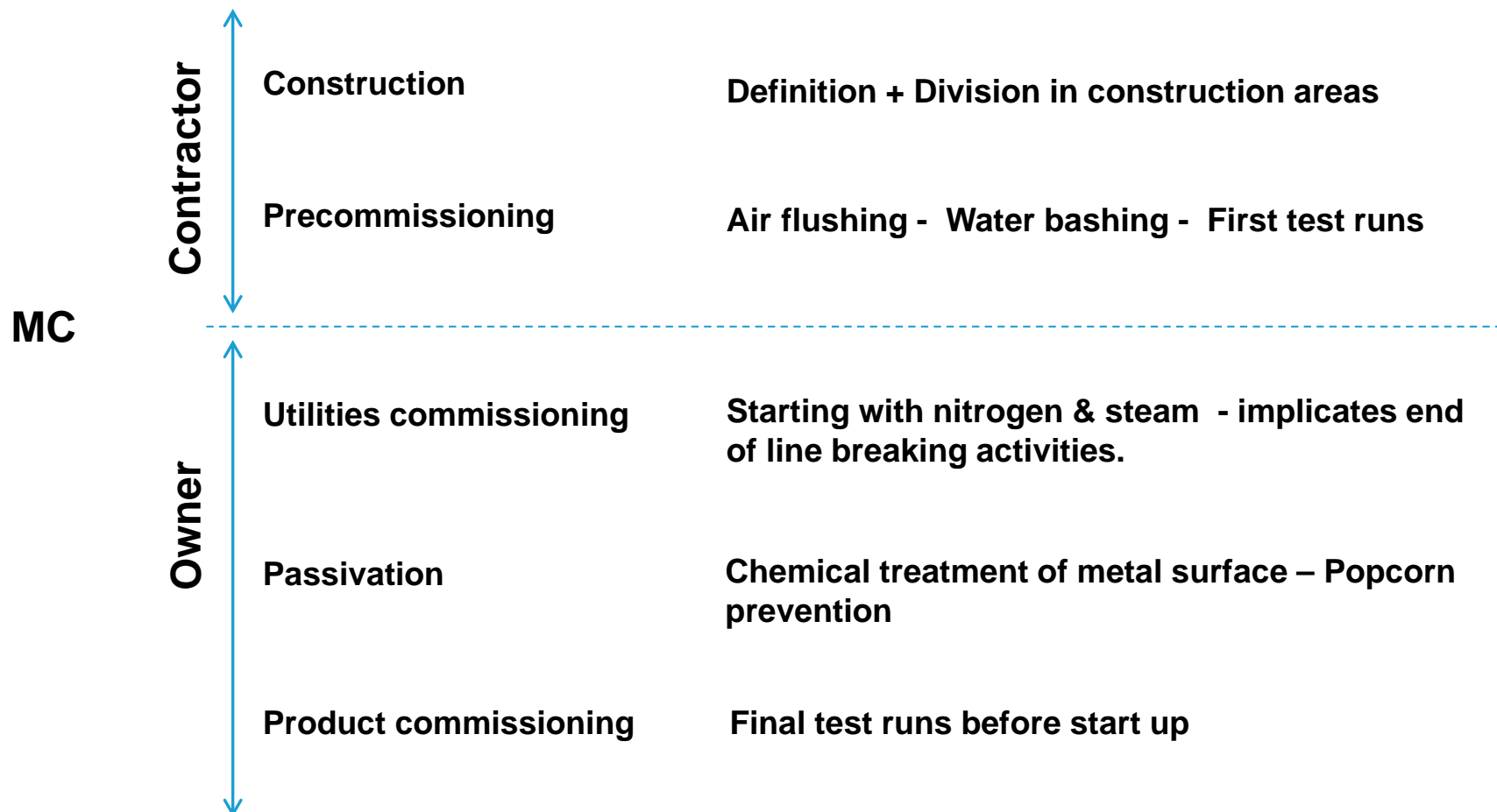
## Generic definitions relevant for each project

- Construction zone
- Precommissioning
- Commissioning
- Start Up

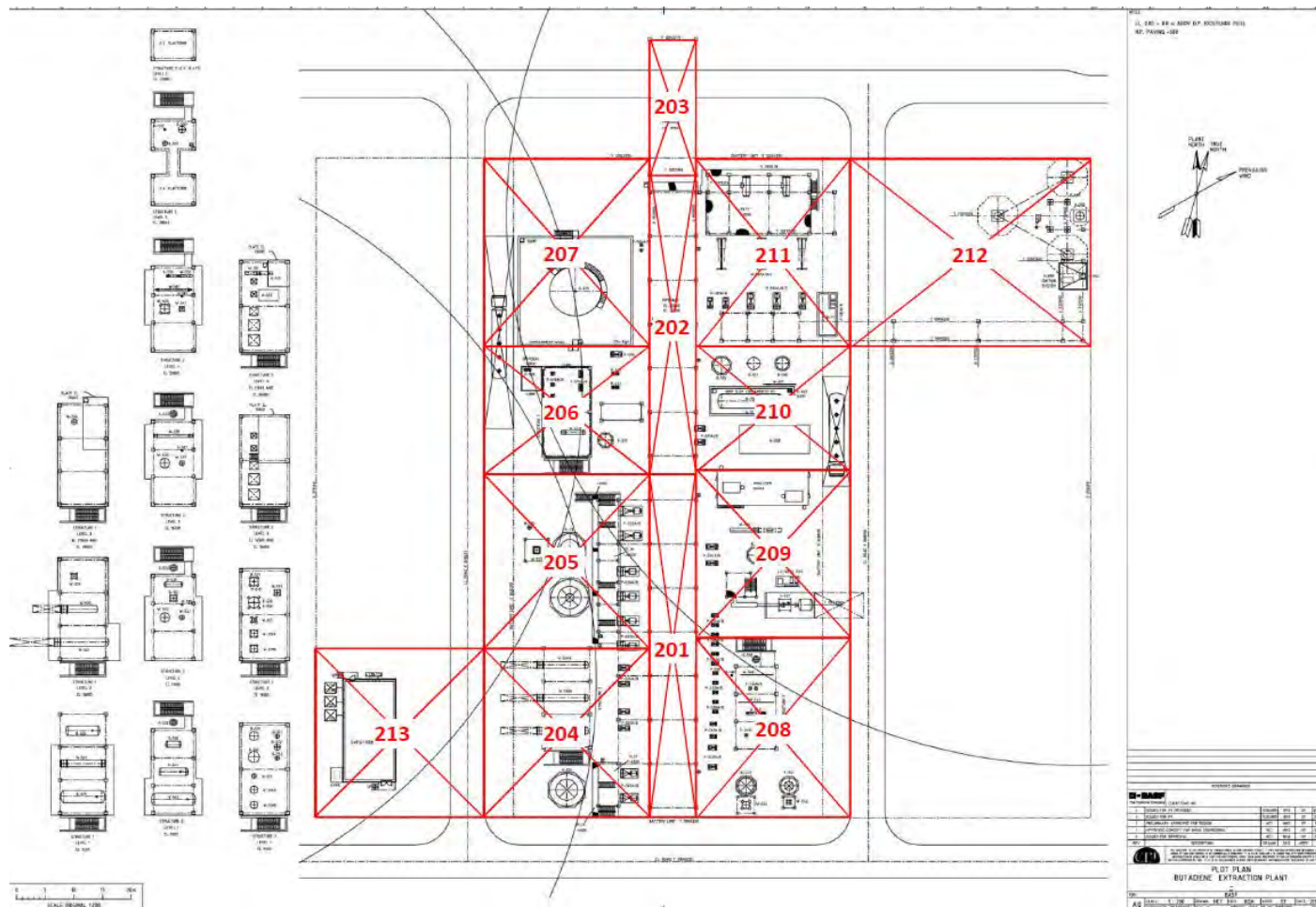
## Special definitions relevant for Butadiene project

- Passivation
- TOS : Turnover System

# Process Safety - Timeline



# Construction zone – different areas





# Pressure Test systems → Start of Precom



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# Gradual transition from Construction to Precommissioning

- In a certain phase of the construction (ca 60/70% completion) it is decided to switch over from area to system completion.
  - Definition of Turn Over System (TOS)
  - Precom / Com philosophy is known & procedures are available
  - Indication of the priorities in an early stage towards contractors
- Chosen for a « phased » mechanical completion concept.
  - Turnaround Management System is used as overall tool to guide the different procedures in a safe way
  - Requires switch over from Contractor to BASF tool

# TOS System – reflection on P&ID



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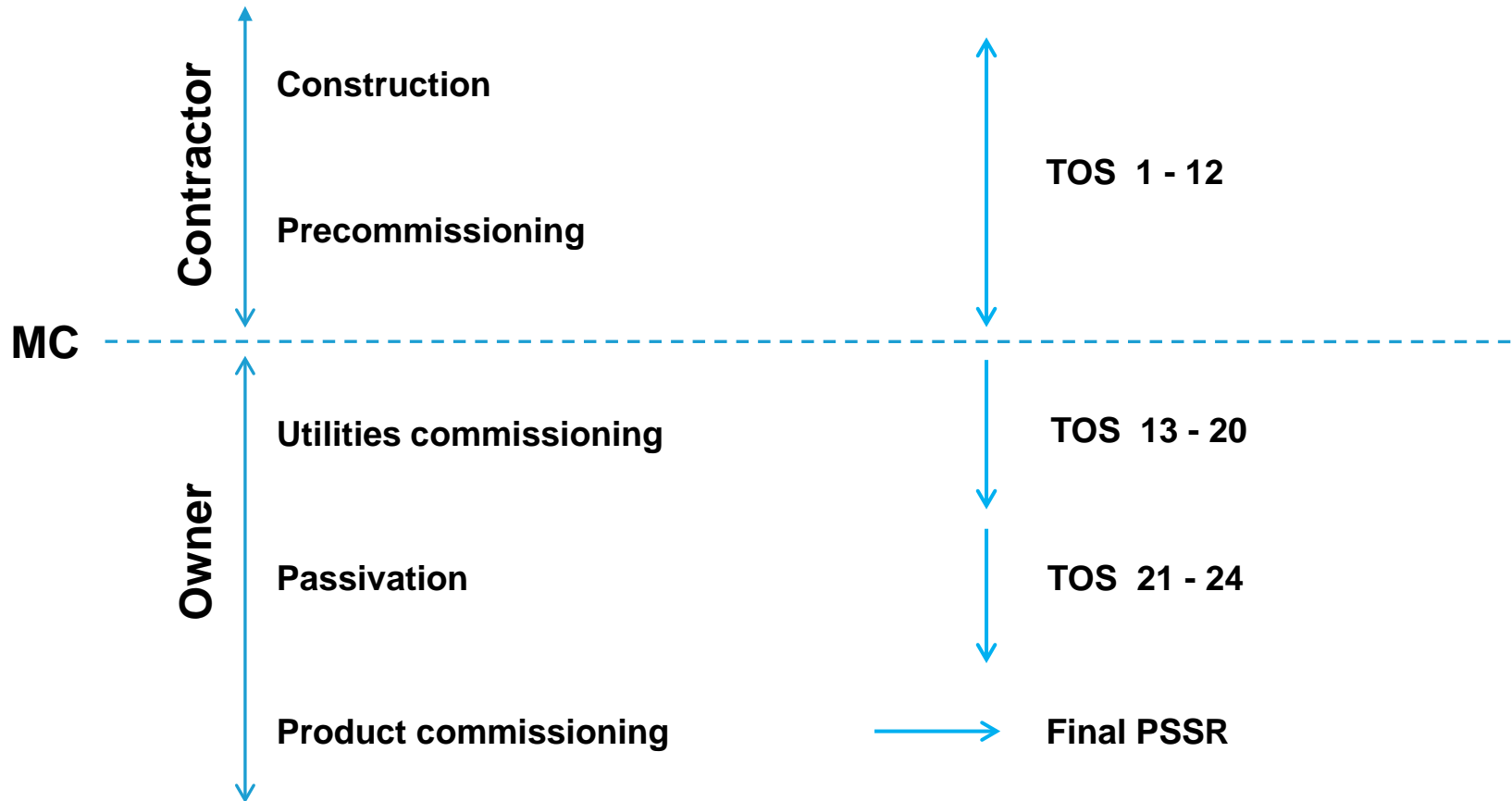
# Detailed construction info per TOS-system



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# Impact phased mechanical completion on timeline

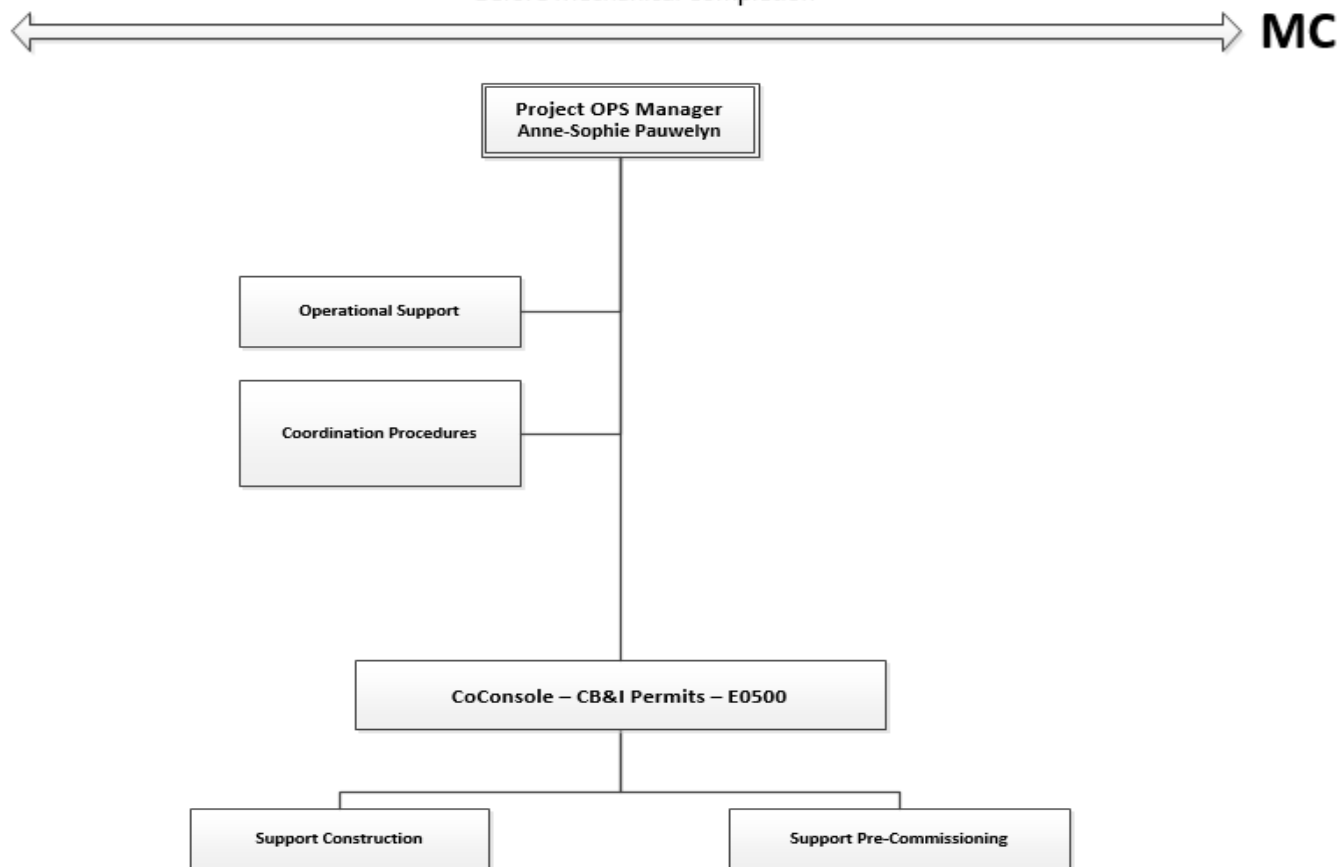


# Build up of a Plant Organization during Construction

Versie 25-06-2013

Projectteam BDEX - ISBL

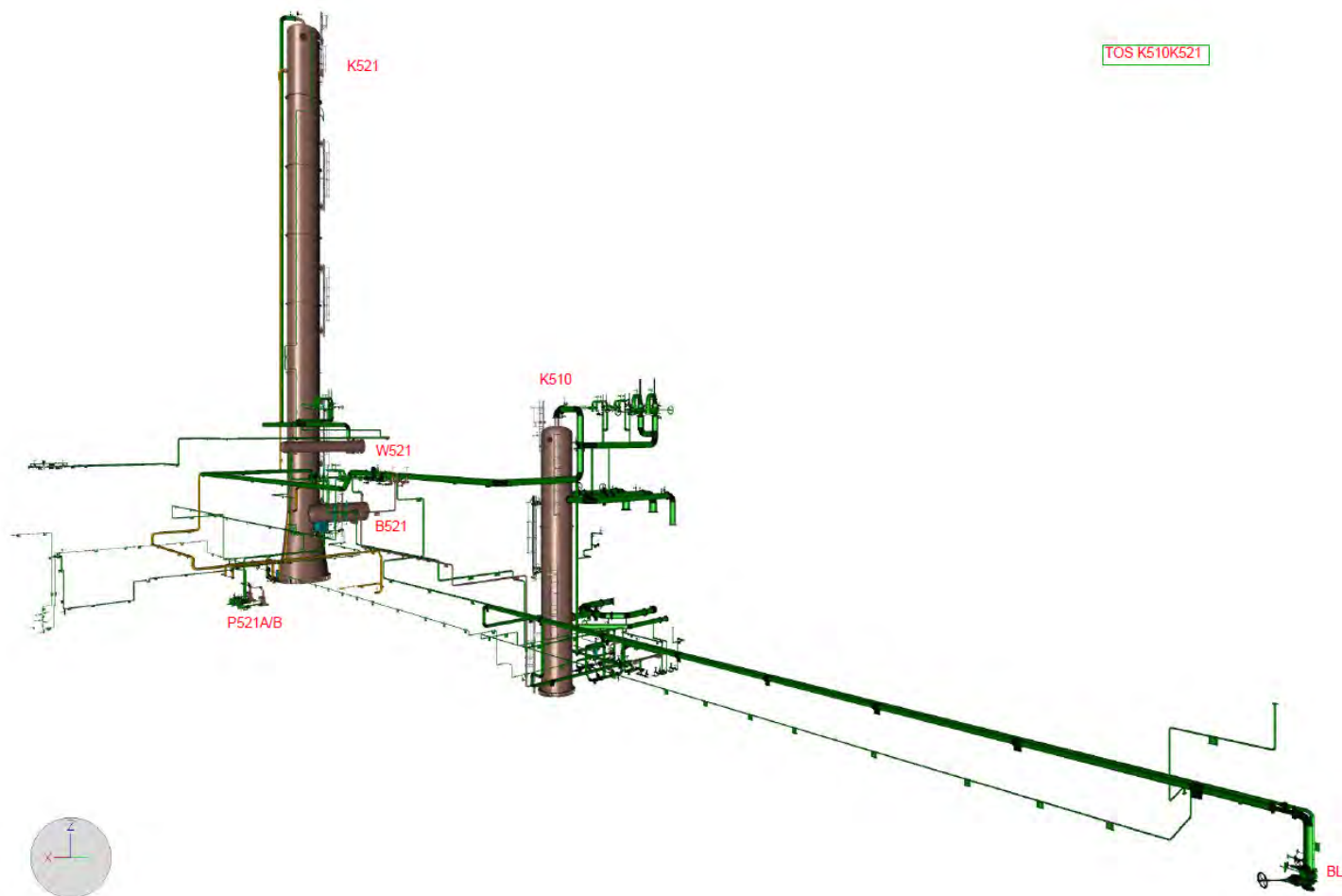
Before Mechanical Completion



# Communication & Cooperation

- Integrated team formed with members of « Contractor » and « Owner ».
- Weekly meetings discussing:
  - Precom procedures prepared by Contractor
  - Review of procedures by Owner, inclusive input operating personnel.
  - Execution of procedures under supervision of Contractor, with support of operations personnel,
- Resulting in a win/win situation:
  - Effective support for contractor.
  - Training opportunity for operations personnel
  - Continue precom procedures during night and week-end shift

# Use of 3D model for Precom procedures





# Final result on P&ID for Precom procedure



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# Similar exercise for Passivation Procedures (Owner's responsibility)

Steekschijf bij opstart. Tussen Extractieve destillatie & Si-olie  
(S00001 & S00003)

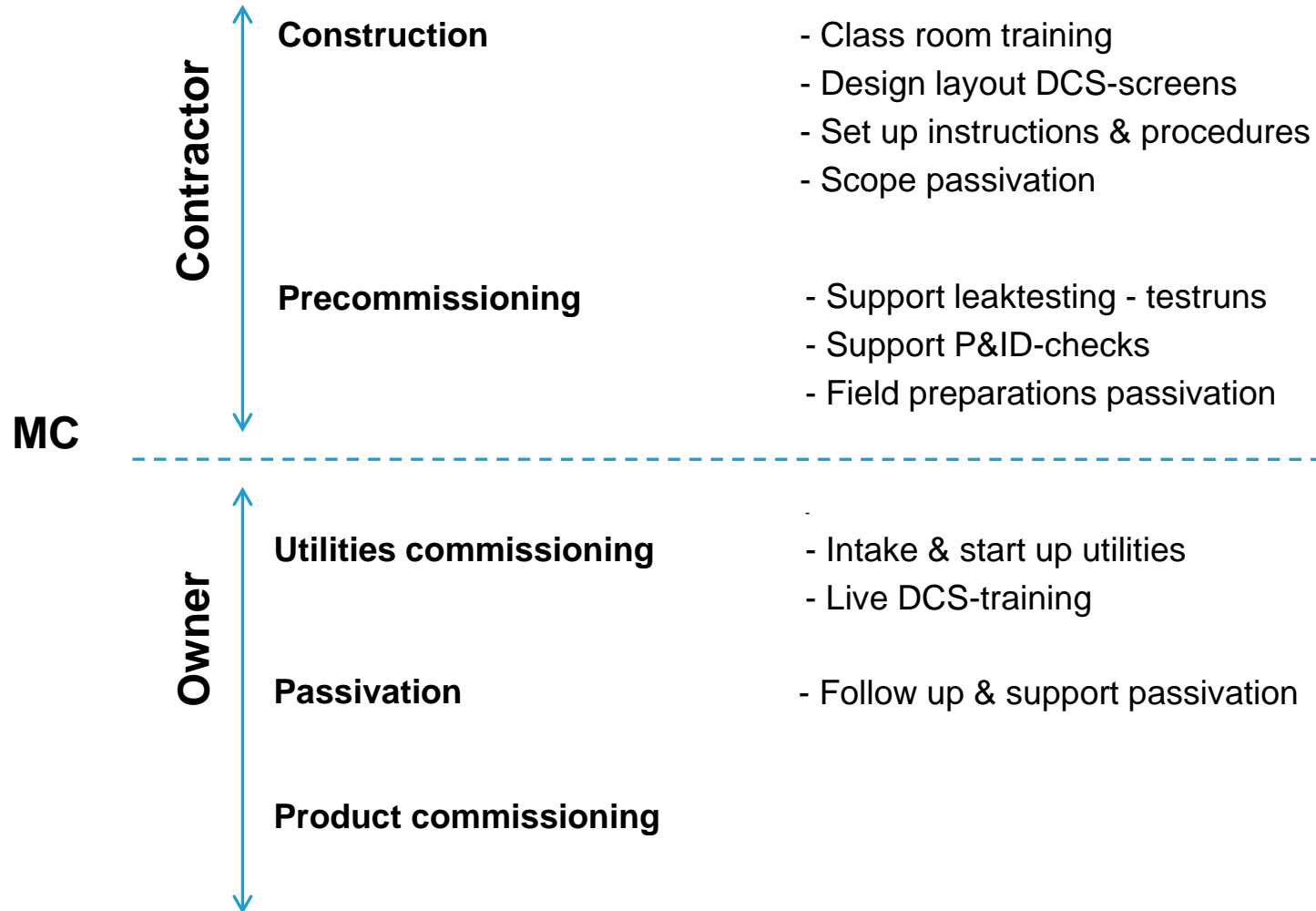


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# Impression of passivation activities



# Training

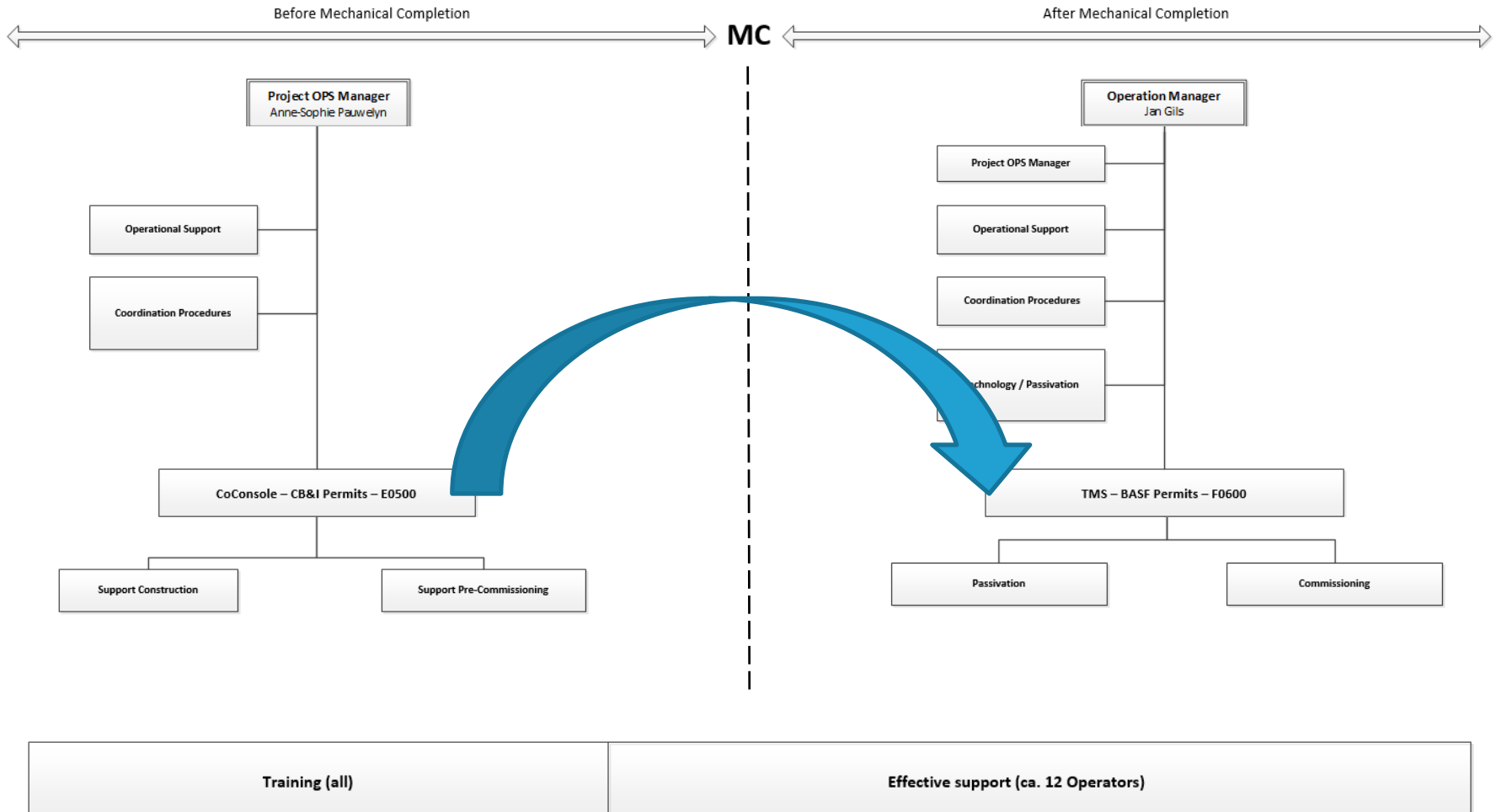




# Transition from Project to Plant Organization

Versie 25-06-2013

Projectteam BDEX - ISBL



# Safety – Results

## 1. Occupational safety

- KPI = LTI (Lost Time Injury)
- Final result:
  - Only one minor LTI following BASF rules
  - No LTI for CB&I under OSHA

## 2. Process safety

- KPI = FER (Fire, Explosion & Release)
- Final result: No FER's

# An integrated Team – Success Factor for a Safe Start Up



# Final Conclusion + Questions



***With thanks to Ellen for the nice lay out and format!***