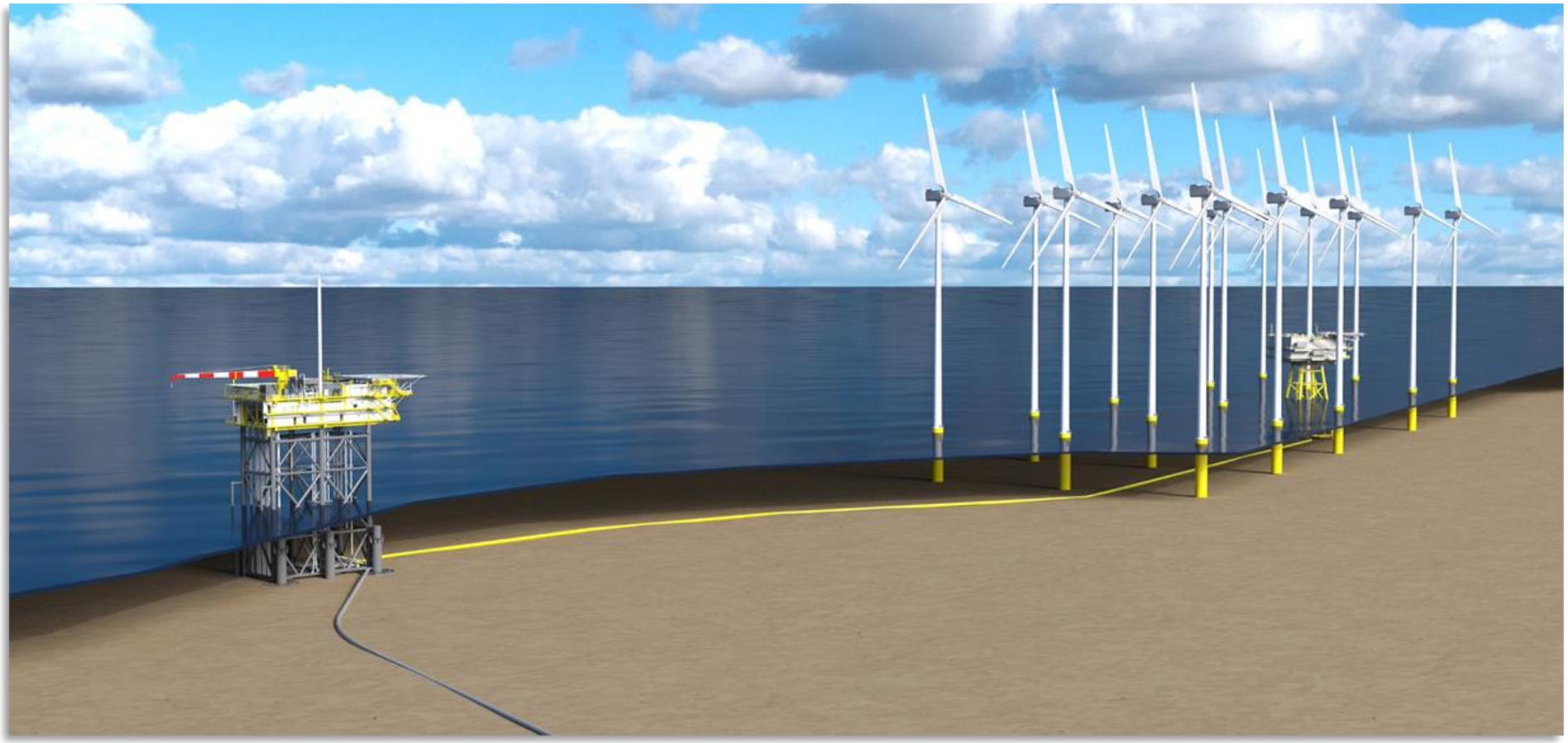
N05A: Autonomous Production Location

A journey to a new way of operating

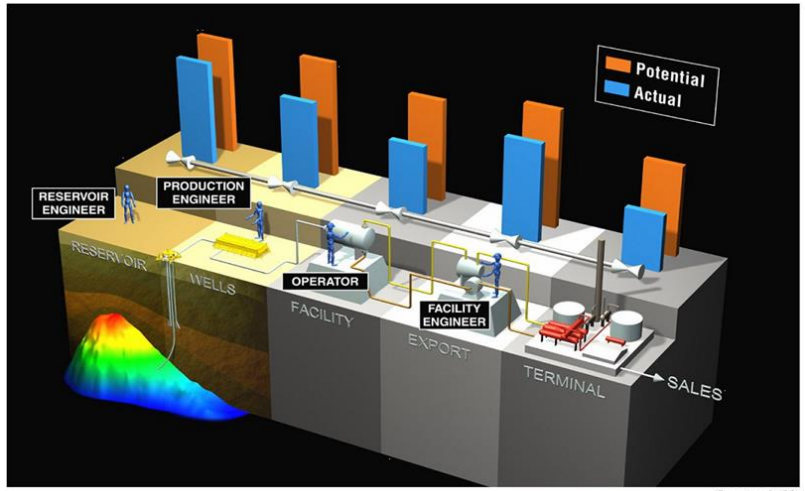
N05A: New way of operating

- **Vision:** A no-emissions autonomous production platform to continue and optimize production while upsets occur.
- **Goal:** Decrease lifetime cost and maximize production without harm to the environment



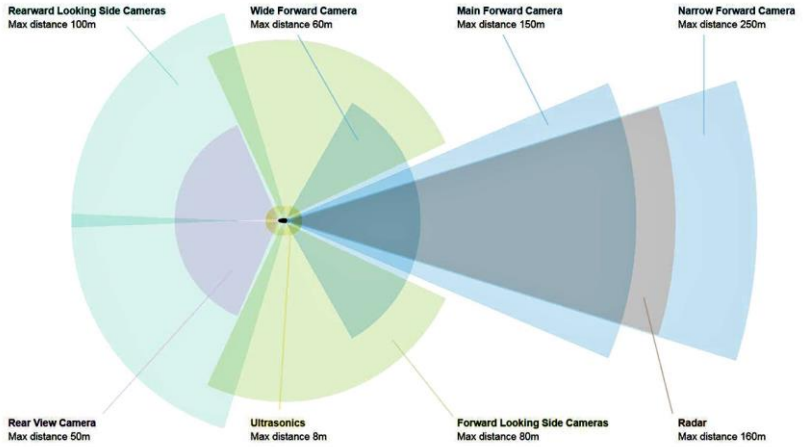
Philosophy: Combining Novel but Proven Technologies

- **Automated Process Control loop**



(Property of KBR)

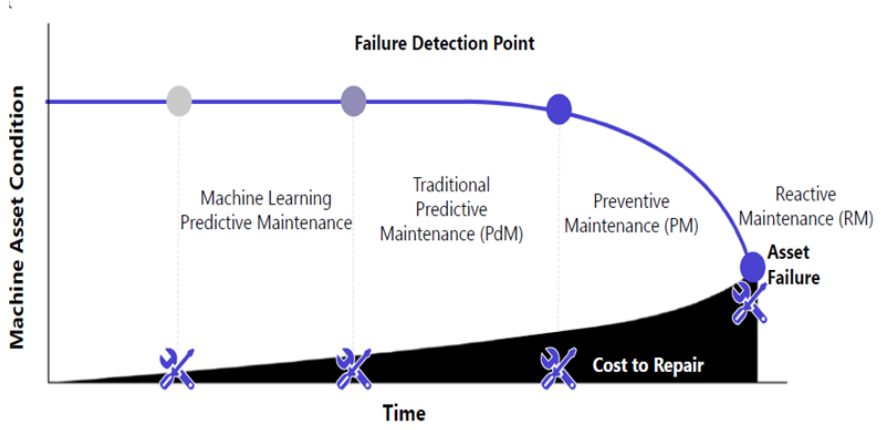
- **Automated Safety systems**



Tesla's radars

- **Automated Guidance of Production Optimization**

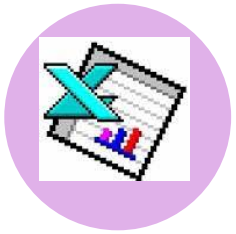
- **Automated and simplified maintenance**



- **Simplified logistics**

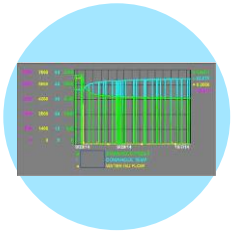
And the time is now

Digitalisation



Start

Excel monitoring and analysis solution
Basic RT monitoring system

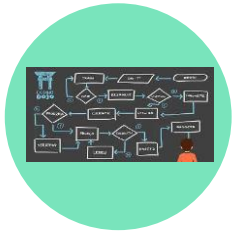


Past

Data storage in separate databases
Advanced RT monitoring System

Current

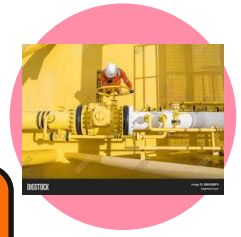
RT (Physics basedl) Models
Integrated Databases
BI reporting



Future

Self Learning Algorithms
LLM's
Faster decision loops

Automation



Start

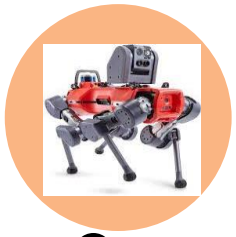
Human locally operated platforms

Past

Human operator
Automated P&ID controller

Current

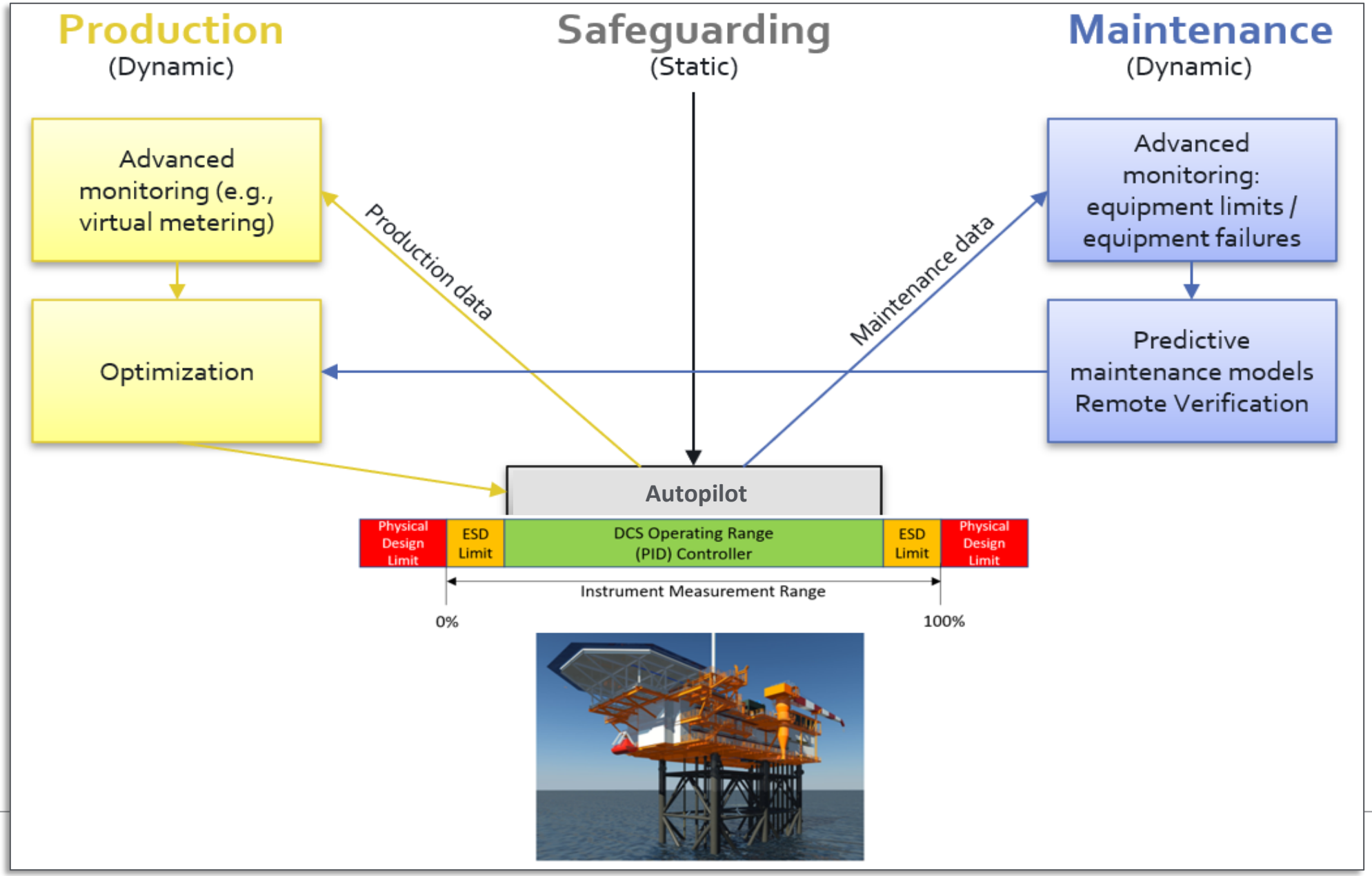
Remote Control
Equipment controlled
Advanced Process Control
Smart Systems (Camera's)



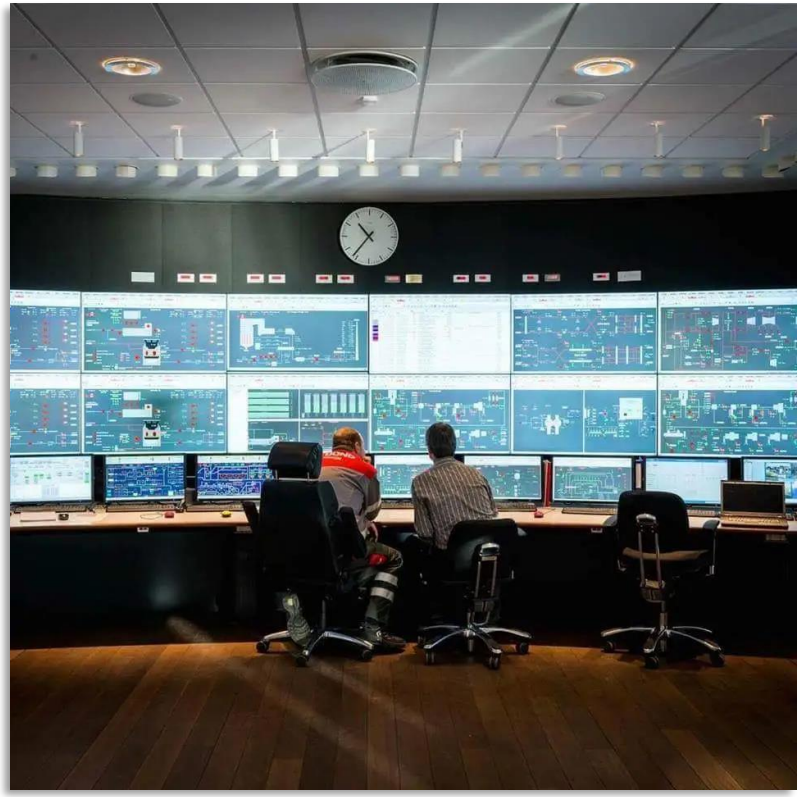
Future

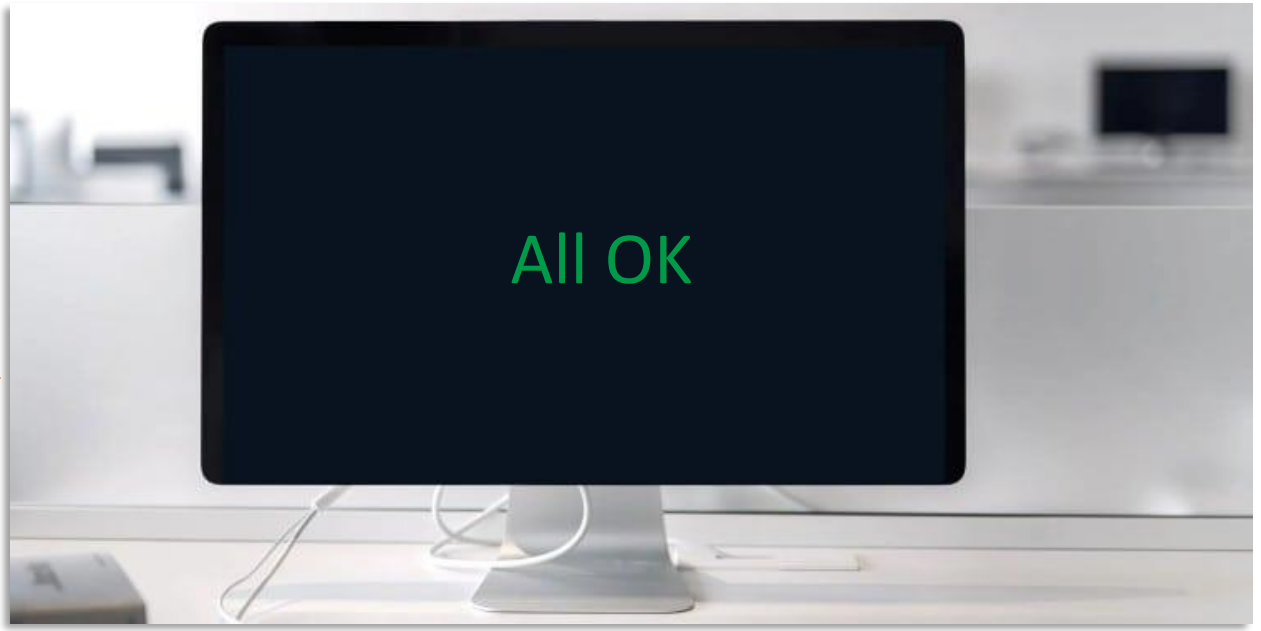
Robotics
Self Learning Algorithms
Autonomous Control

To get to the next level



Resulting in a new way of working





- **No dedicated Control Room as system operates by itself**
  - *Exception Based events and notifications*
- Change of traditional ways of working
  - E.g. offline maintenance planning and training

Office Engineers

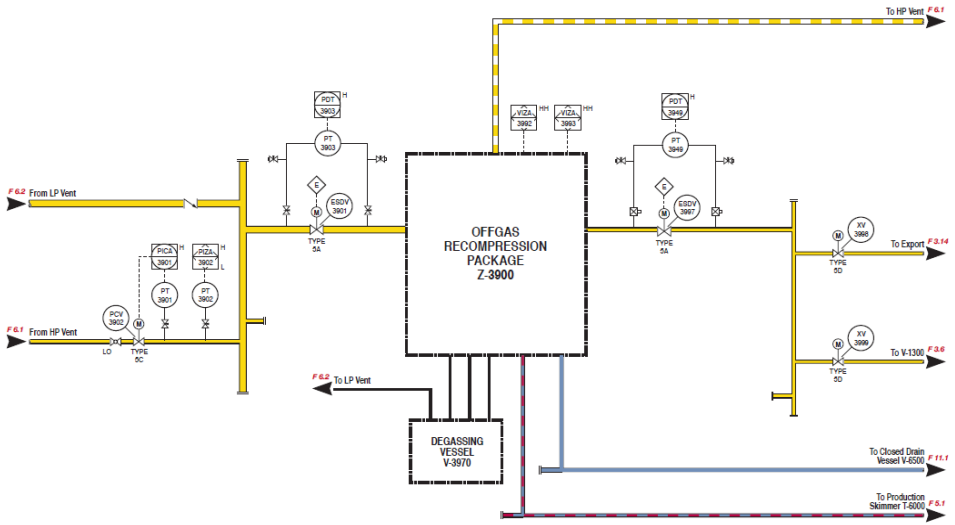
APL Installation Manager (APLIM)

(Maintenance) Planner

IT Support

Innovations to meet our requirements

- **Environmental:**
  - Fully electricially driven platform and powered by a nearby windfarm
  - Off gas compressor to recompress the gas and prevent venting
  - Electrical wellheads and valves to increase efficiency and minimize chances of spills
  - Only 2 visits per year
    - 75% CO2 reduction on boats and helicopters
    - Remote inspections and data verification schemes



Innovations to meet our requirements

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  - Electrical wellheads and valves to increase efficiency and minimize chances of spills
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- **Safety:**
  - Continues monitoring on Safety systems' proper operation.
    - By online C&E verification
    - By online Valve monitoring
  - Autonomous CCTV monitoring on surroundings
  - Gasdetection cameras with quantification of emissions
    - *Future: Robots*

Generated with AI

Innovations to meet our requirements

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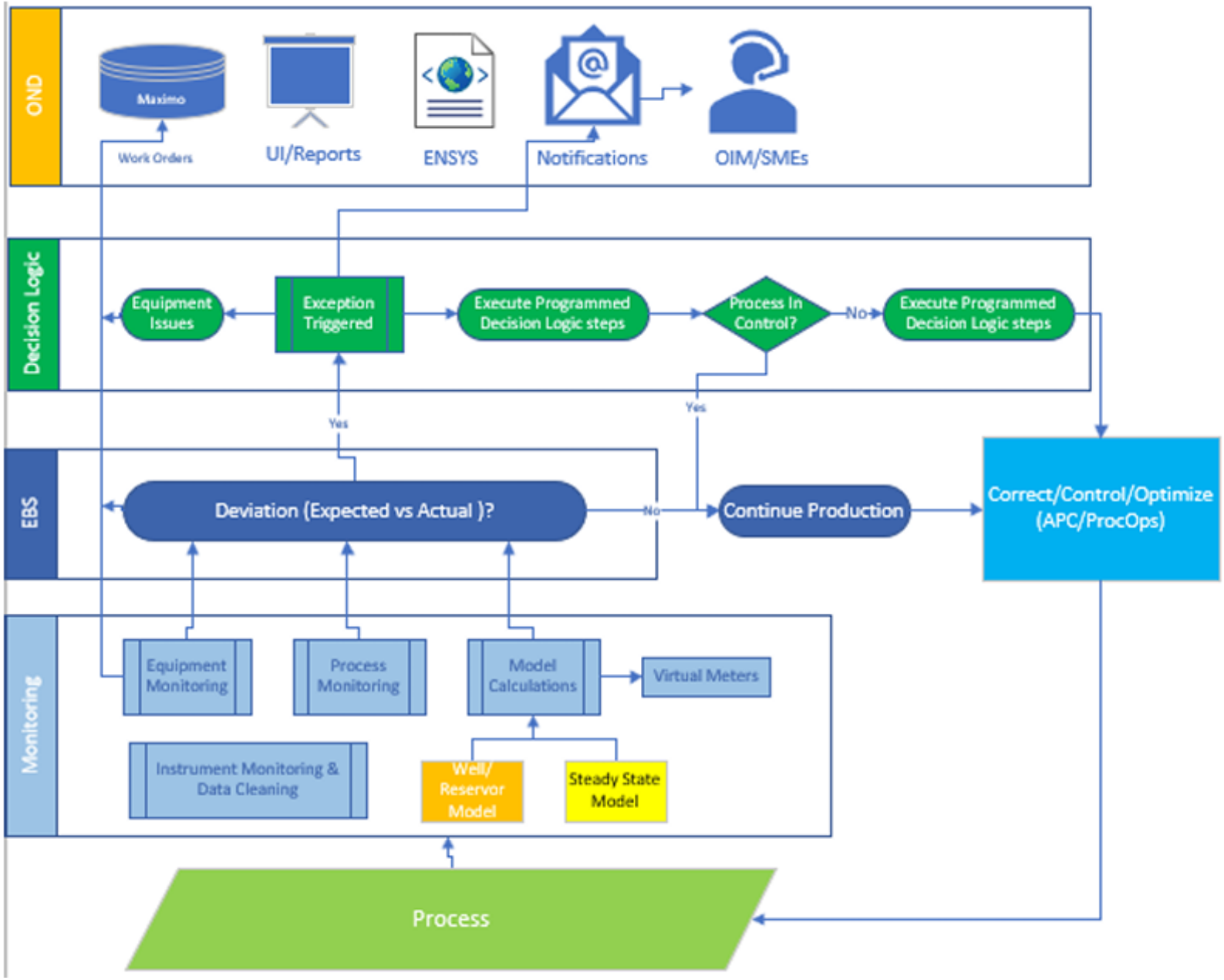
- **Operations:**
  - Remote maintenance, testing and inspection
  - Autonomous system - Autopilot
  - Closed loop between equipment monitoring to process control.
  - ETS to train the model

Autonomous model: Autopilot Overview



Lessons Learned

- **People**
  - Aligning the teams
  - Competencies
  - Acceptance by the regulators and governing bodies
  - Preparation and catching operator knowledge

- **Costs**
  - Installing the right equipment

- **Technology**
  - Connecting the different models and systems
  - Data availability & quality
  - Training the model


Thank You