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PROCESS CONTROL AND ARTIFICIAL INTELLIGENCE

Challenges and Opportunities

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ENGINEERED
TO OUTRUN

Introduction

Department of Process Performance

- **25+ specialists**



MSc & PhDs in Control & Chemical Engineering



Oslo, Norway

- **40+ sites & 500+ improvement projects**



150 000+ hours on-site experience

- **Key assets:**



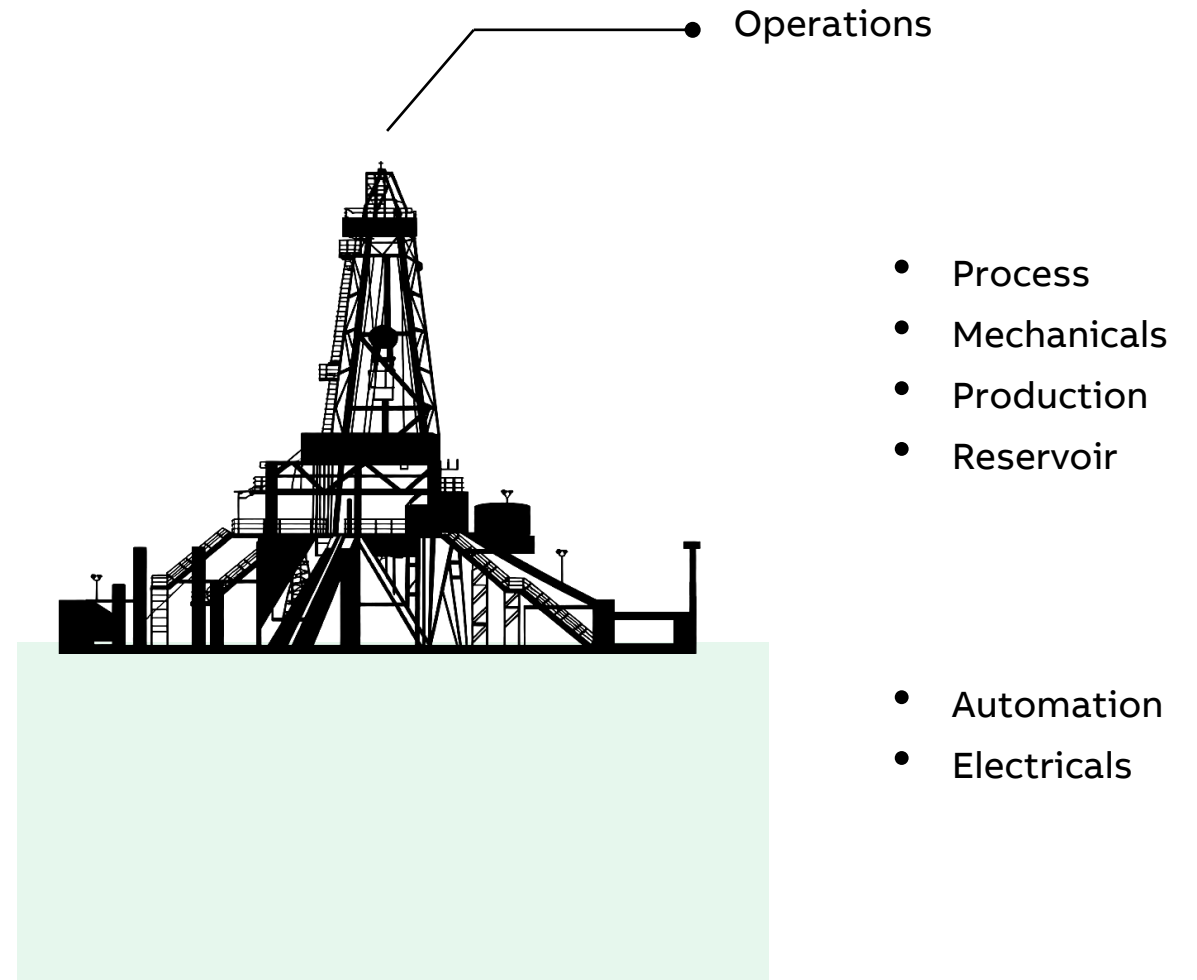
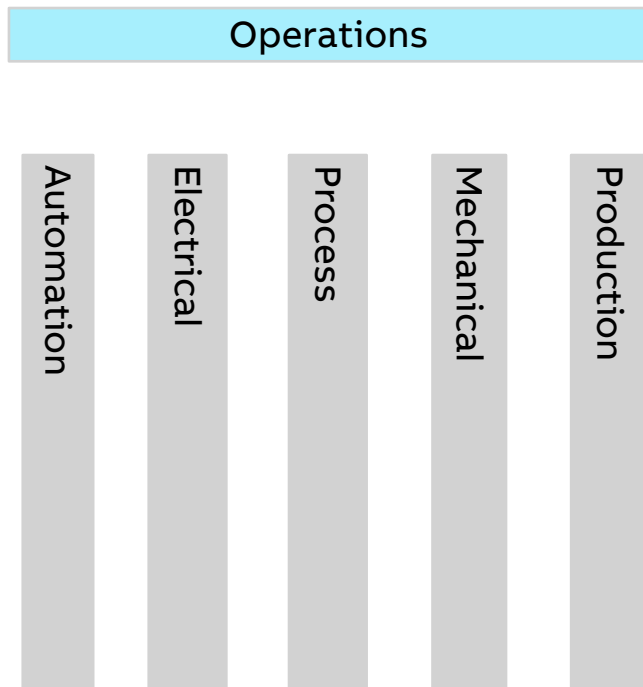
Hands-on in improving process operation

Keen interest in getting things to work ?



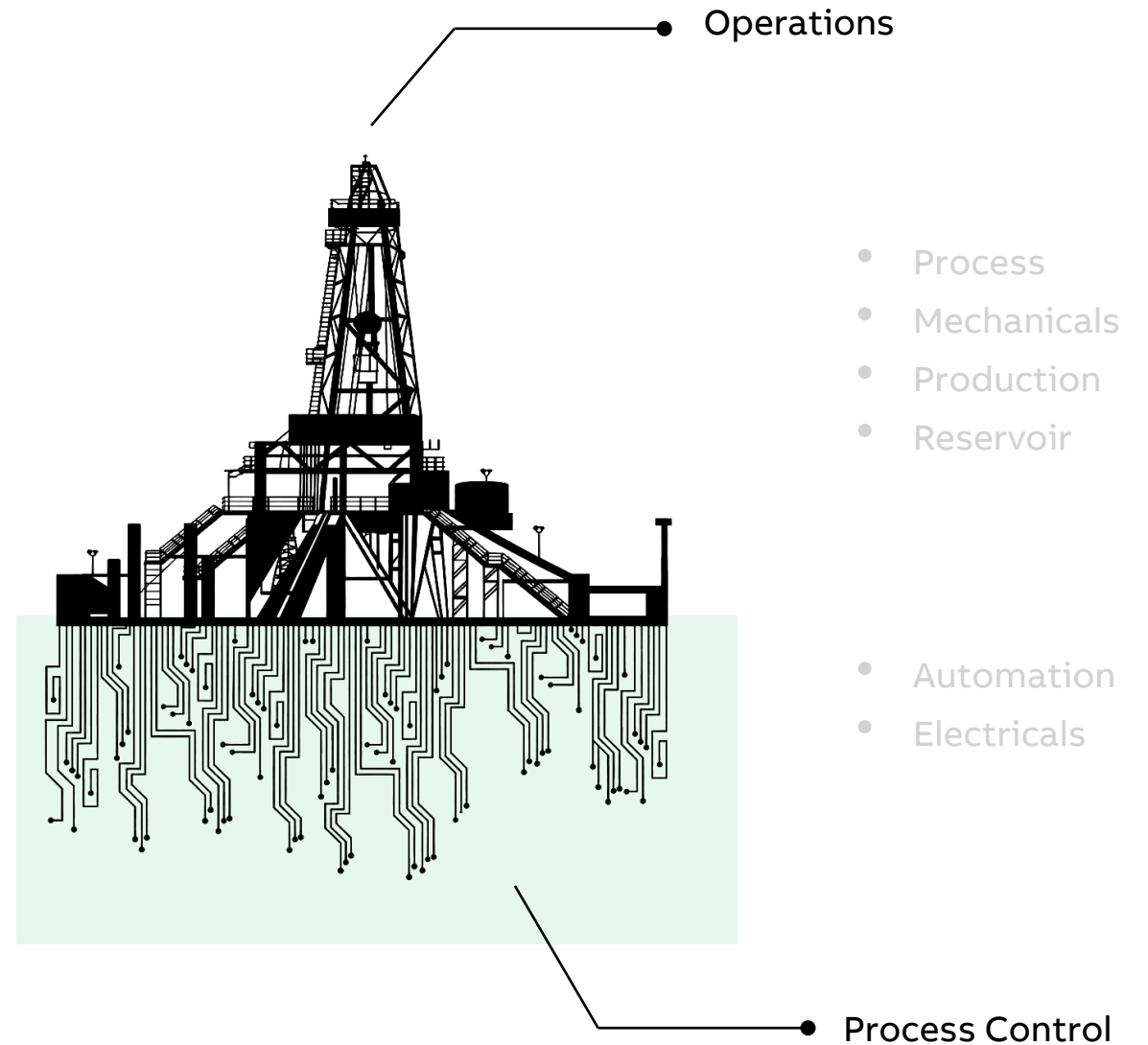
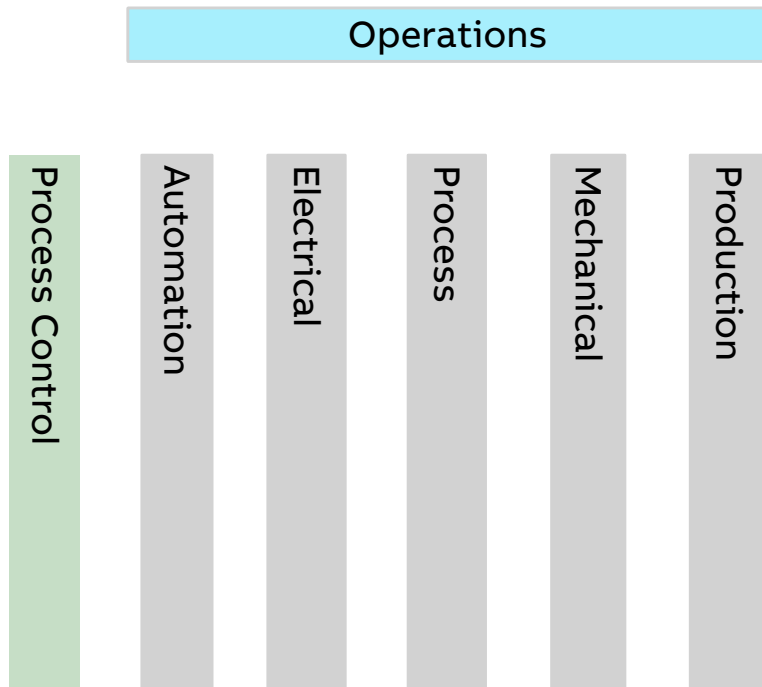
Introduction

Getting things to work?!



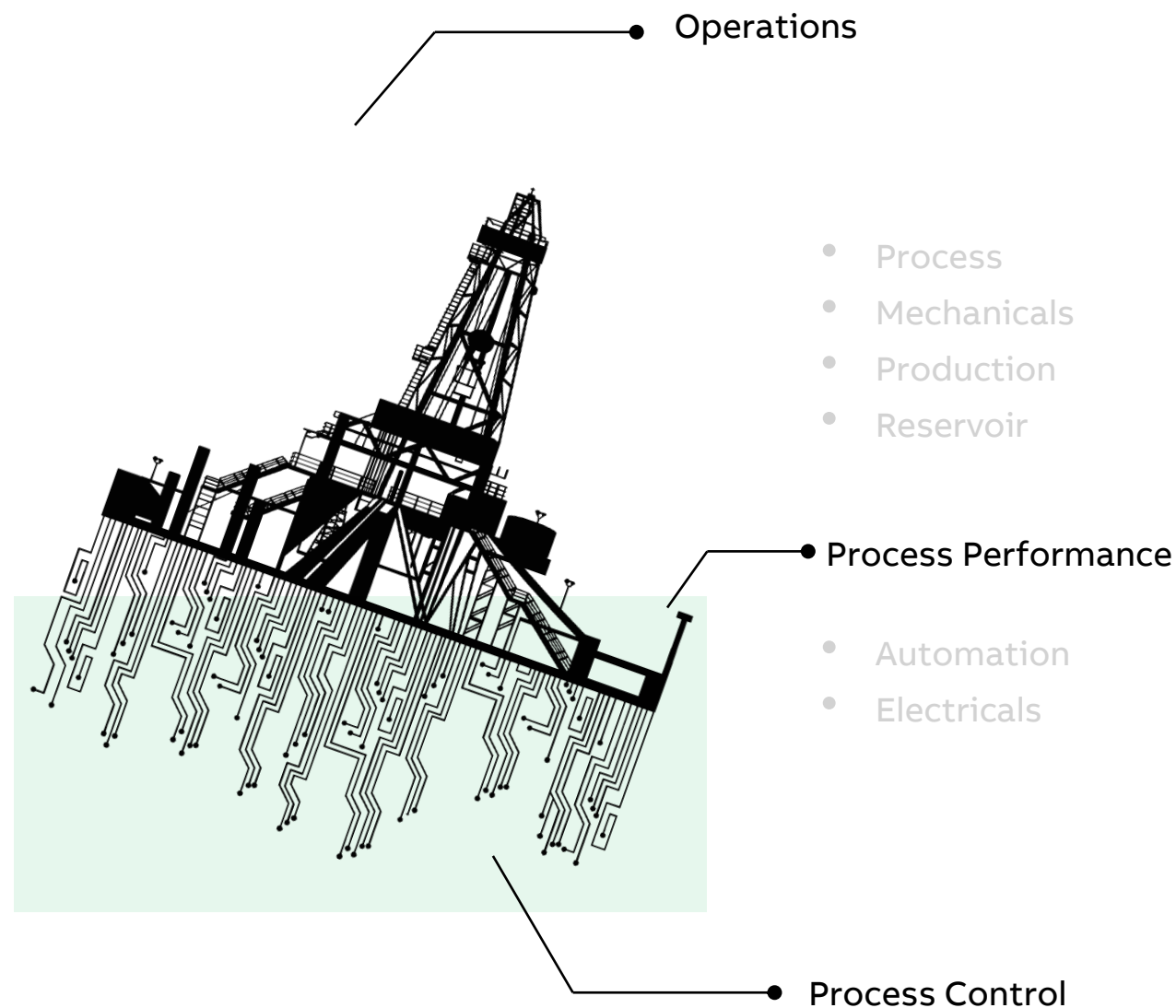
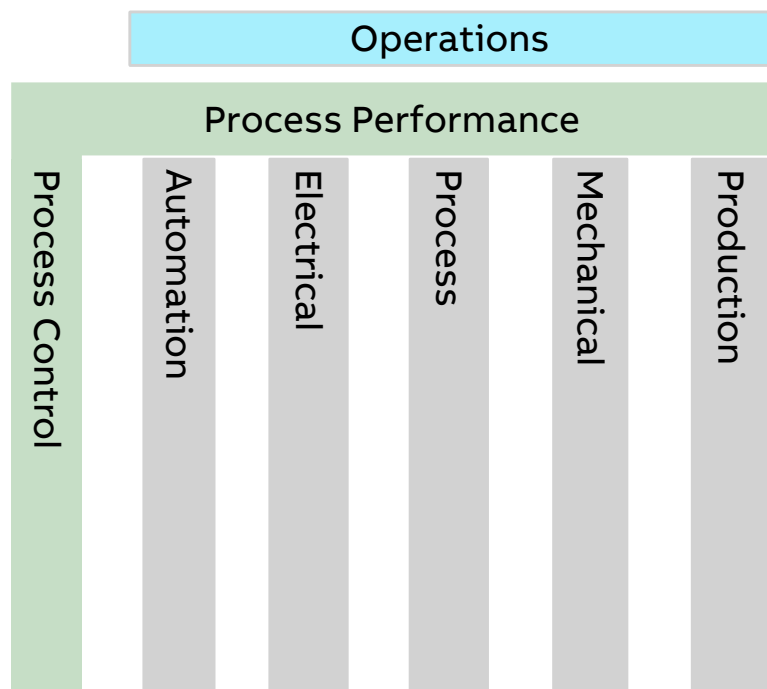
Introduction

Getting things to work?!



Introduction

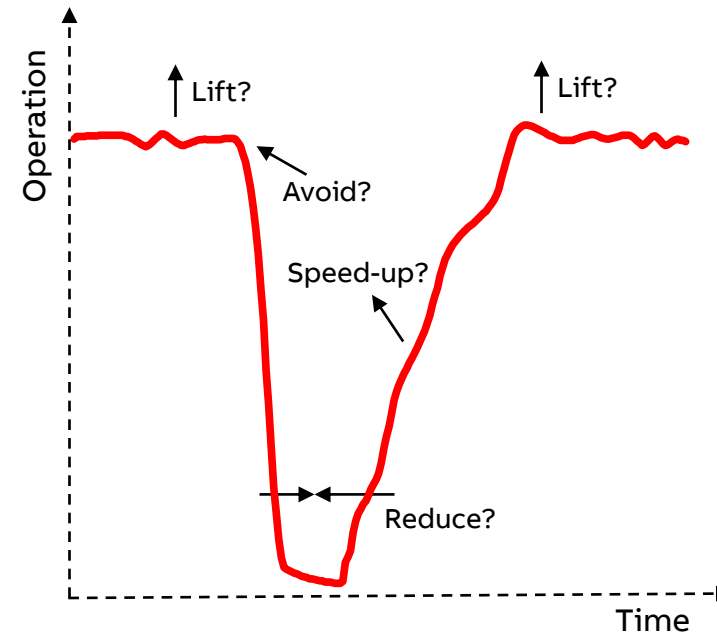
Getting things to work?!



Process Performance

Why it matters?

1. Environmental footprint & cost reduction
2. Asset reliability
3. ↑ Throughput & ↓ Downtime



Process Performance

Process design challenges in daily life

Mindsets in the Industries

Short term focus & project execution models

Operational Experience

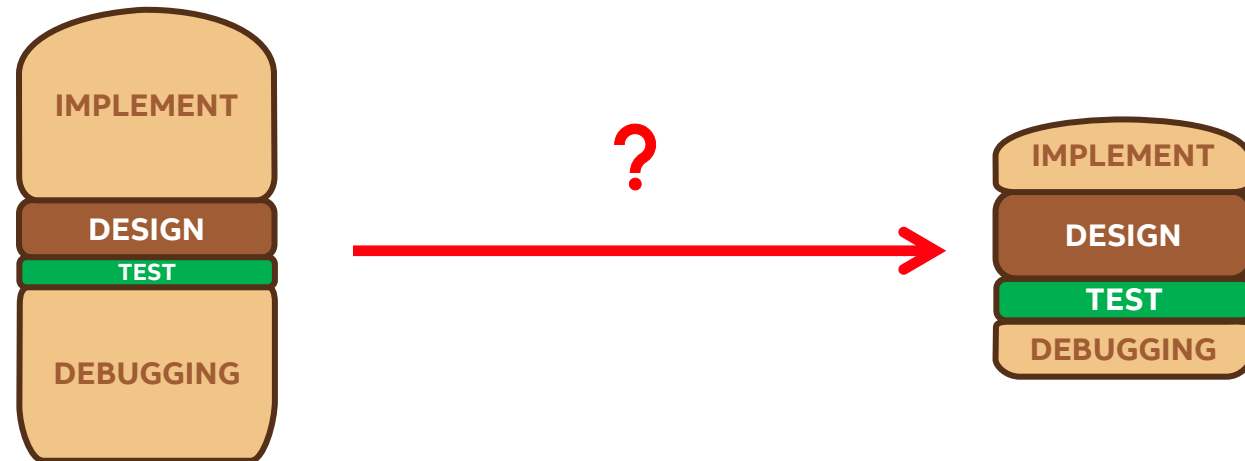
Engineering experience ≠ Operational experience

Outdated Formats & Data

Slow standardization

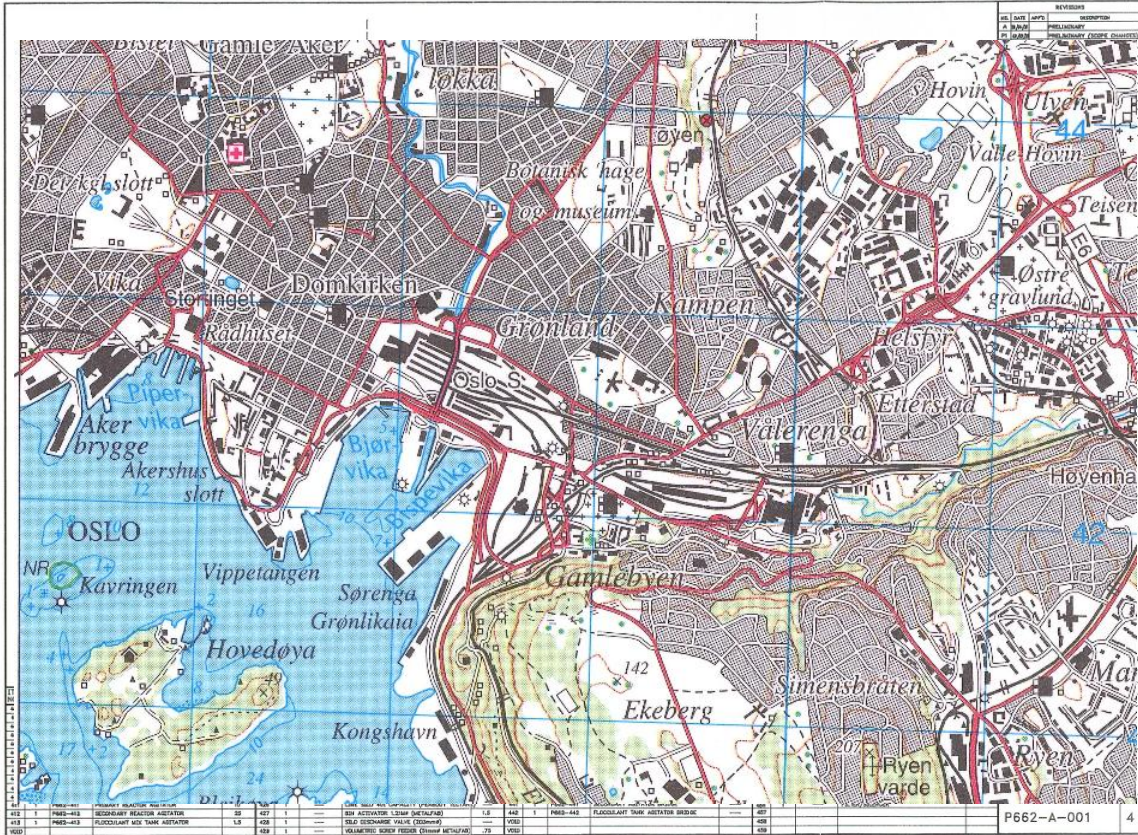
Implementation Complexities

Tedious manual work

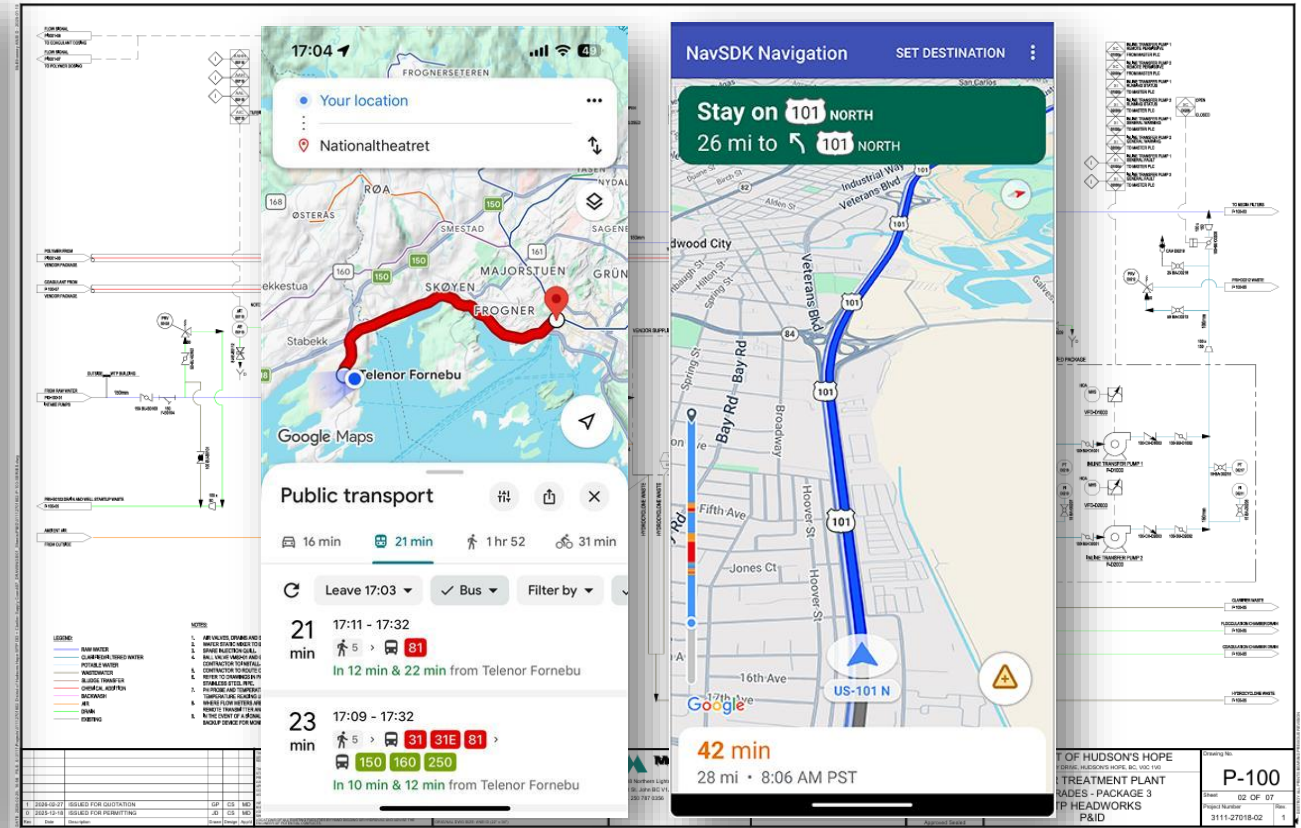


Process design challenges

Outdated Standards & Data



1990s



2026

Process design challenges

Implementation Complexities

Obvious

- Design control structures (PID, cascade, SPC, ...)
- Normal operation
- Designing a controller on paper

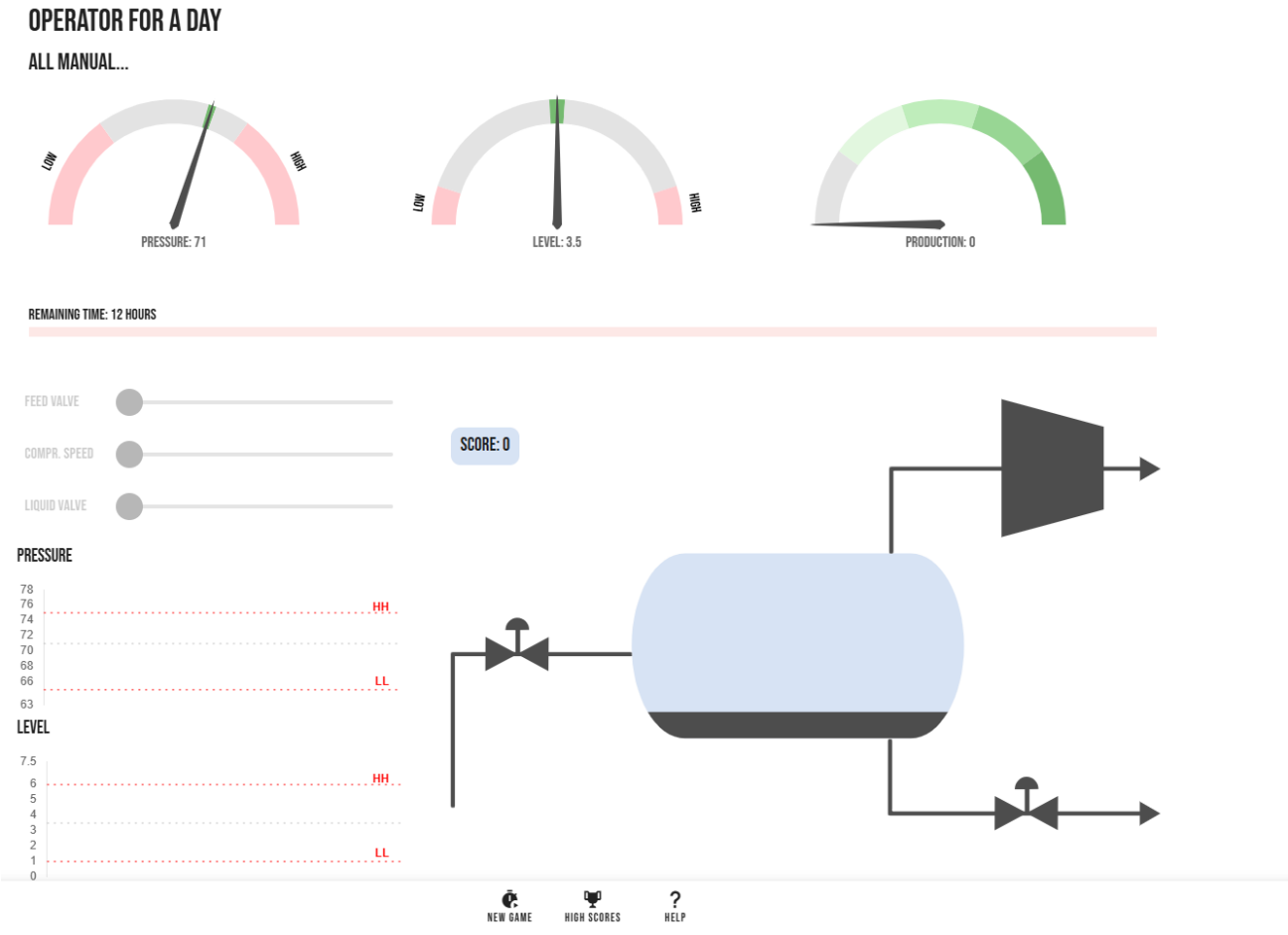
Not-so-obvious

- Non-regulatory logic (sequences, pumps, ...)
- Plant startup (highest priority for operators)
- Implementing a controller (interfaces, network, fail-safes)

Identifying the true source of complexity is essential for process performance and AI readiness.

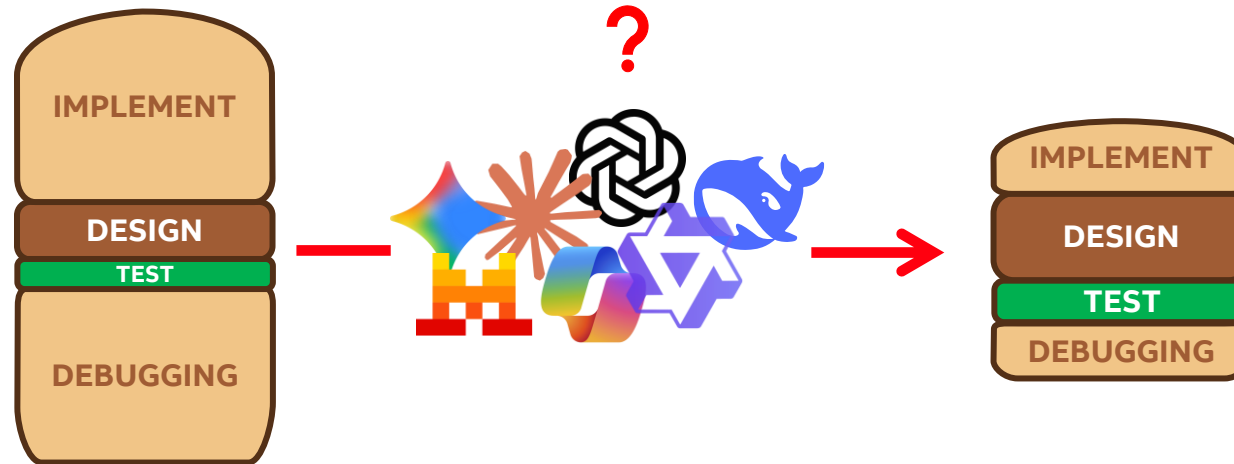


Challenge: Operator for a day



Process Performance

Does AI give us the burger we want?



Process Performance and LLM's

Status quo

LLM's are used for

- Creation of custom tools for automating manual work
- Data extraction from old documentation
- Prototype simulation models (MCP + Simulink)

LLM's are not used for

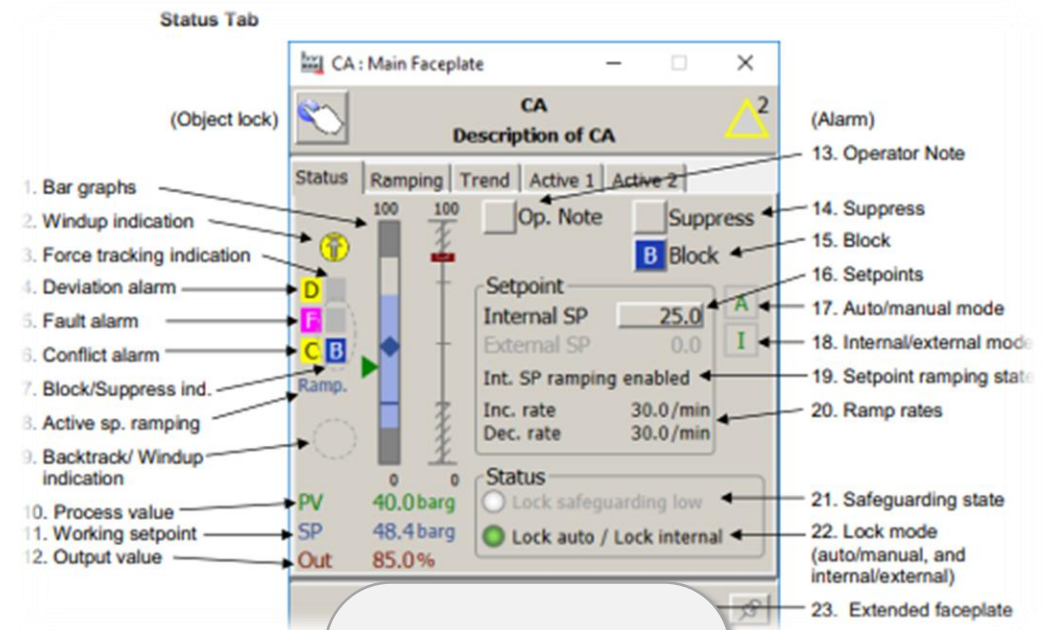
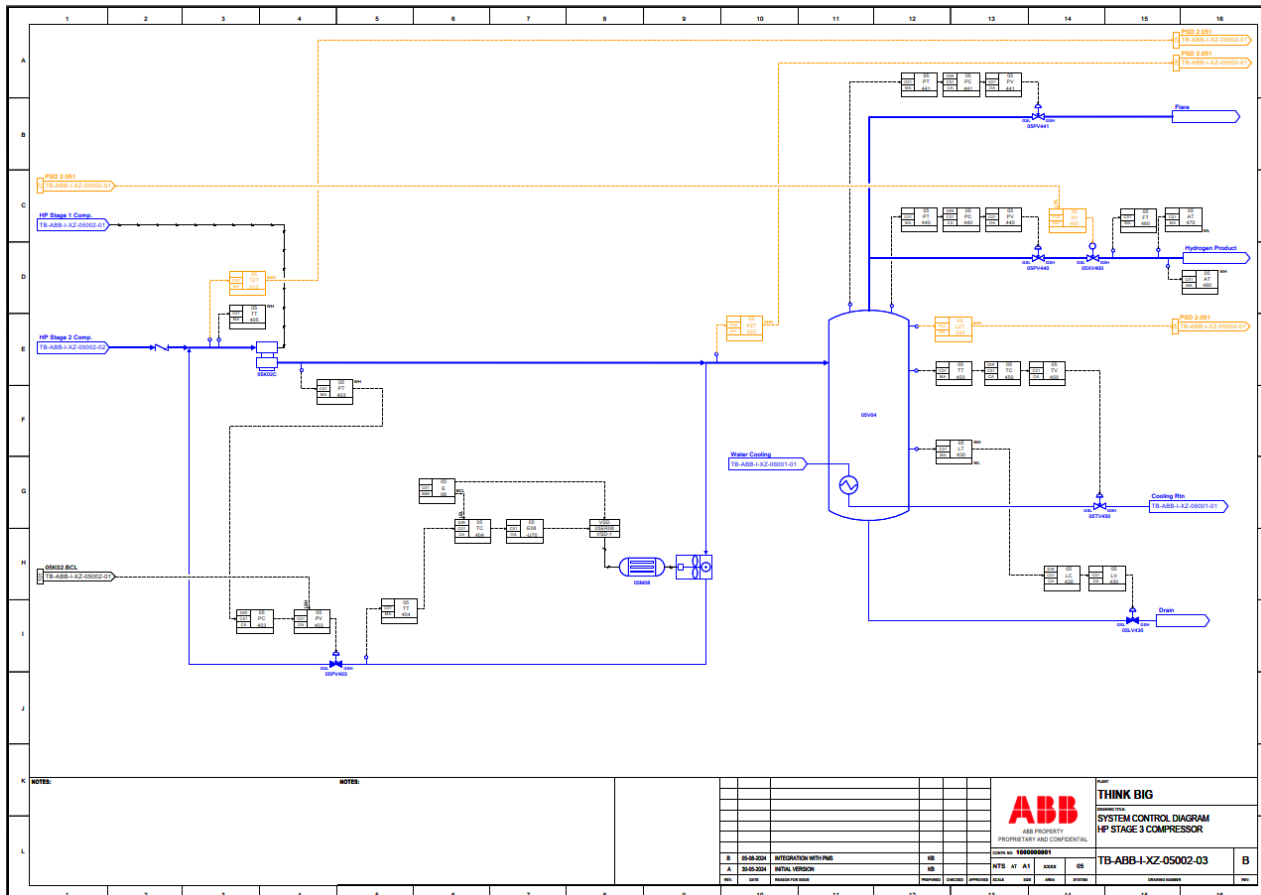
- LLM based regulatory control
- LLM based supervisory control
- Automated control structure design

CAUTION: LLM tools are the bane of standardization!

Current LLM use is non-interventional

Example: Shorten the distance between Design and Test

SCD (IEC 63131) & ABB REUSE library

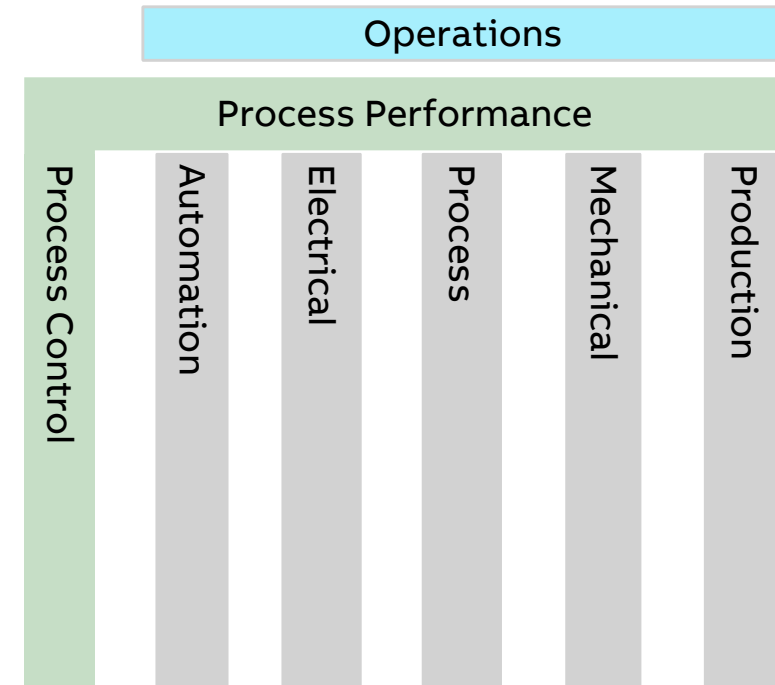


REUSE Library

Critical deliveries in 4 months vs. 12!
Higher quality process control delivery!

Summary

- Process Control & Performance are key for operations
- LLMs can be extremely useful to reduce manual work and execution time if projects are sufficiently AI ready
- Process Control standards must keep pace with technology



AABB



Challenge: Operator for a day

