NAPCON ADVISOR

NAPCON Advisor helps your operators 24/7 find the best way to reach their targets. Based on up-to-date machine learning models NAPCON Advisor will always know what is going on with your process.

NAPCON IMPROVE

- **NAPCON COTROLLER**
- **NAPCON OPTIMIZER**
- **NAPCON ADVISOR**

NAPCON ADVISOR SHARES THE INSIGHT OF YOUR PLANT PROCESS TO ALL ORGANIZATION LEVELS - BETTER SITUATIONAL AWARENESS DRIVES OPERATIONAL EXCELLENCE

NAPCON Advisor is a digital operator assistant that predicts the process future behavior and gives operation suggestions.

NAPCON Advisor helps you easily reach the true limits of a plant with situation-specific optimization whether there is a need to reduce carbon emissions, optimize utilities or maximize certain yields.

INDUSTRIAL IOT (IIOT)

AI-assisted decision making and operational excellence increase productivity.

SITUATIONAL AWARENESS

Human centric AI solution. NAPCON Advisor helps people to perform better, augments their capabilities and keeps them in the loop.

NAPCON ADVISOR COLUMN

24/7 COMPANION OF THE OPERATOR

IMPROVES SITUATIONAL AWARENESS

FAST IMPLEMENTATION

MINIMIZES YIELD LOSS FROM CHANGES IN YOUR PROCESS

SHOWS THE FUTURE OF YOUR PROCESS

NAPCON ADVISOR MAIN BENEFITS

INCREASED PRODUCTIVITY

NAPCON Advisor will help minimize yield loss during sudden or planned changes and helps decision making in production and planning.

LEARNING FROM THE FUTURE

NAPCON Advisor can predict process behavior several hours ahead. It can be used to explore alternative futures to select the most suitable one with "what-if scenarios".

CONTINUOUS DIGITAL SUPPORT FOR THE PLANT PERSONNEL

NAPCON Advisor is a solution to augment human capabilities. It is ML and AI based digital operator assistant, which guides how to run entire processes optimally.

A STEP TOWARDS INDUSTRY 4.0 SMART REFINING

NAPCON Advisor is a true Industrial AI and relies on Industrial IoT, OPC UA communication and information models that form a solid base for smart refining of the future.

IMPROVED SAFETY

NAPCON Advisor helps to improve situational awareness for everyone involved in operation. In this way, it also increases the safety of the plant.

FAST DELIVERY

NAPCON Advisor technology can be deployed to any process. It has been built to serve the needs of the process industry.

NAPCON ADVISOR KEY FEATURES

INDUSTRIAL AI

NAPCON Advisor is an industrial AI solution ready to lead you to industry 4.0 era smart refining. NAPCON Advisor runs on-premises or on the cloud. All it needs is a connection to the column data. Information modelling shapes the data for easy data exploration and smooth model maintenance activities.

INDUSTRIAL ML PIPELINE

NAPCON ML Pipeline serves NAPCON Advisor with predictive deep learning models and PyTorch, but also other use cases like predictive maintenance and soft sensors for virtual laboratory. It's an information refining highway for future Smart Refinery.

CALCULATIONS

Advanced calculations with full Python language plus a wide range of industry specific calculation extensions, such as energy efficiency calculations, product property predictions and exact energy and mass balance calculations.

EASY TO EXPAND

NAPCON ML Pipeline creates a versatile platform for your Industrial AI. Your AI solutions are easily expanded with other units and assets as well as safety and learning optimization in the future. There are options also for KPI Dashboards and other Operational Intelligence applications.

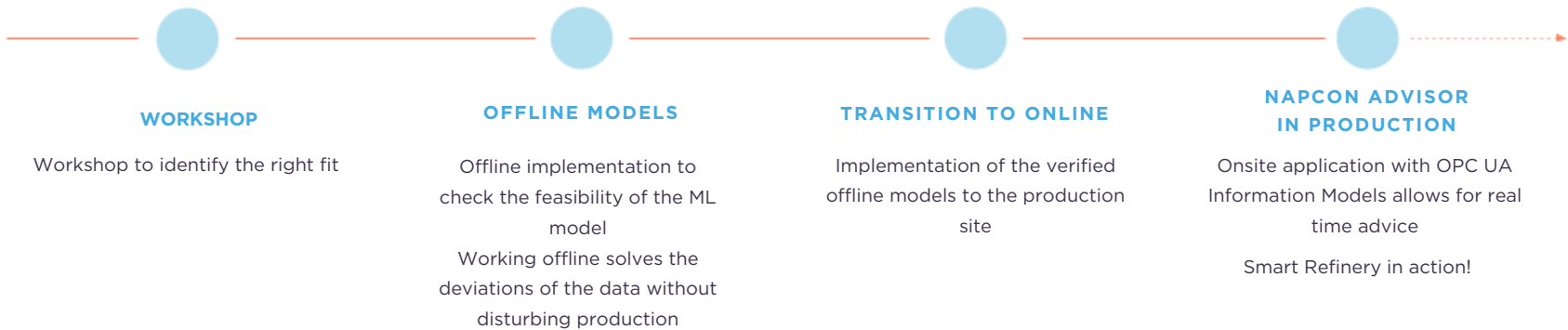### AI -ASSISTED DECISION MAKING

NAPCON Advisor refines actionable insights from the data in real time to support human decision making.

OPERATIONAL SAFETY

Keeping human-in-the-loop improves human situational awareness and improves safety and recovery from process disturbances.

NAPCON ADVISOR AS A PROJECT

NAPCON Advisor works on **OT-technology / onsite / edge** with OPC UA information models, supporting future Smart Refinery.

WORKSHOP

Workshop to identify the right fit

OFFLINE MODELS

Offline implementation to check the feasibility of the ML model
Working offline solves the deviations of the data without disturbing production

TRANSITION TO ONLINE

Implementation of the verified offline models to the production site

NAPCON ADVISOR IN PRODUCTION

Onsite application with OPC UA Information Models allows for real time advice

Smart Refinery in action!

- Flowchart illustrates typical implementation process of NAPCON Advisor delivery.

HIGHLIGHTS

- Easy and fast implementation
- Smooth deployment
- Maximizing the yields continuously

NAPCON ADVISOR COLUMN
ARE YOUR YIELDS WHAT THEY SHOULD BE?

NAPCON Advisor Column is an advanced AI solution to maximize the yields of the most valuable products from a fractional distillation column.

NAPCON Advisor Column for the distillation column is an advanced AI solution to maximize the yields of most valuable products in fractional distillation.

NAPCON Advisor Column is an AI assistant for operators and production engineers which predicts the process future behavior and gives what-If operation options and operation suggestions.

NAPCON Advisor Column optimizes crude column cut points and thereby fractions of different yields to make further refining and blending process premise optimal. Simultaneously it keeps human-in-the-loop to improve situational awareness and preparedness to process deviations and recovery.

WHAT-IF SCENARIO

Perform a what-if scenario to a selected control variable
e.g. to a cut point set point:

- Set the target cut point value and time of occurence in the what-if panel

- NAPCON Advisor Column produces predictions based on this set point change for all of the predicted variables

- Based on the prediction results the user knows beforehand if some threshold limits are exceeded or if the magnitude of the change is big/small enough

- What-if scenario makes user aware of where to pay attention to when implementing the same change in the real distillation column

Example of a what-if scenario produced by NAPCON Advisor. Upper trend windows show normal predictions and lower trend windows show the effect of the implemented what-if scenario.

CASE EXAMPLE

The first of many NAPCON Advisor versions has been built for typical distillation columns used in oil refining. It supports operators and production engineers to maximize the yields of most valuable products in fractional distillation thus providing the best starting point for future process steps.

NAPCON has implemented Advisor Column to Neste Porvoo refinery crude oil distillation. Data streaming relies on NAPCON Production Information Platform (PIP) implementation made earlier, which serves NAPCON ML pipeline and NAPCON Advisor as real time data input. NAPCON Advisor's advanced deep learning process models estimate 30 most important process variables every 30 second to give a view of the future of the process and to support human decision making. Operators have a dedicated display where they see all these estimates anytime.

NAPCON Advisor Column has helped operators to achieve accurate yields of the most valuable fractions. No more yield losses due to varying crude feed or unresponsiveness to process variations. Taking the maximum out of the feedstock results to improved refinery economy.

The experiences of using NAPCON Advisor have been promising. The operators feel they have a more thorough view of what is happening in their process, which gives them new insights into their work.

The results are very encouraging and according to the operators, NAPCON Advisor really helps them to perceive the different operating options in a whole new way.

OPC UA ENABLES INTEROPERABILITY

NAPCON Advisor enables your pathway to Industry 4.0 by fully utilizing the strengths of OPC UA. It creates an interface for industry 4.0 interoperability and forms a basis for more advanced industrial applications such as ML based AI tools. NAPCON Advisor benefits from OPC UA structured data and Information models.

- Windows Server 2016 support

- Optimized Hyper-V containers for an additional security boundary

- Windows Azure cloud service to run the application

NAPCON ML PIPELINE

NAPCON ML Pipeline supports all your future needs with data based models with the industry standard tools.

- NAPCON ML Pipeline utilizes Industry 4.0 key communication technology, OPC UA and its information modelling capabilities.

- Uses the most familiar ML libraries e.g. Python and PyTorch.

- Fully integrated Pandas and NumPy packages for advanced analytics of the data.

- Operative ML models - NAPCON ML Pipeline can run ML models for different use cases, for example predictive maintenance.

- Support for machine-to-machine AI that will be needed for full scale adoption of Industry 4.0 benefits.
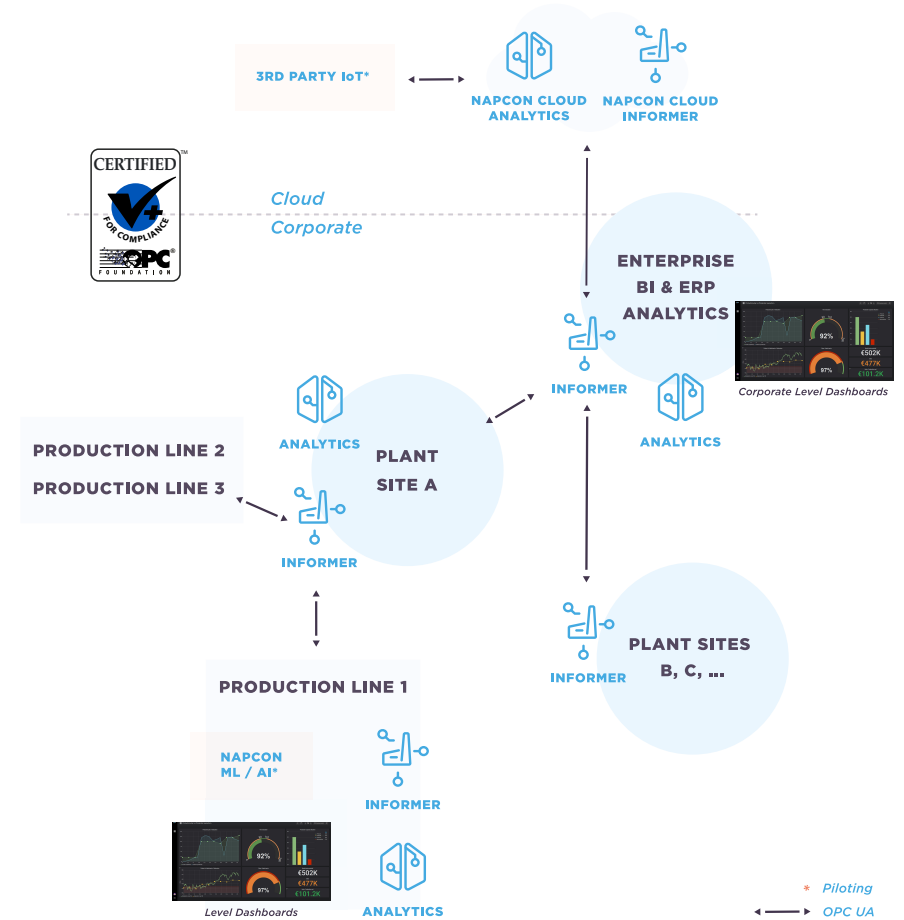
OPC UA COMMUNICATION is the official method for Industry 4.0, and future-proof Industrial AI is built on it.

- Guarantees structured data and Information models.

- OPC UA Client for secure and fast streaming data access for the future interoperable communication in the Industry 4.0 context.

- Wide range of security features: OPC UA based cyber security and safety logic for transferring calculation results to other systems.

SEAMLESS INTEGRATION to other NAPCON applications for utilizing intelligence from machine learning, soft sensors and other streaming data based estimations for enhanced process control.

- NAPCON Advisor runs on NAPCON Informer platform offering a wide variety of OT process information management services.

- Use cases can vary from production planning and predictive maintenance - OPC UA data for all AI use cases.

- Connections to 3rd party applications are handled with REST API & Web services, also csv data exports can be utilized.

- JSON-communication with web-based User Interface (newer versions of Chrome, Safari, Firefox).

3RD PARTY IoT*

NAPCON CLOUD ANALYTICS   NAPCON CLOUD INFORMER

CERTIFIED FOR COMPLIANCE — OPC FOUNDATION

Cloud Corporate

ENTERPRISE BI & ERP ANALYTICS

INFORMER

Corporate Level Dashboards

PRODUCTION LINE 2
PRODUCTION LINE 3

ANALYTICS   PLANT SITE A   ANALYTICS

INFORMER

PLANT SITES B, C, ...

INFORMER

PRODUCTION LINE 1

NAPCON ML / AI*

INFORMER

Level Dashboards   ANALYTICS

*   *Piloting*

◄──►   *OPC UA*

NAPCON

UNDERSTAND

NAPCON Understand solutions will turn the data provided by your plant into relevant information that helps to optimize your company's production.

NAPCON Informer
NAPCON Analytics

IMPROVE

NAPCON Improve solutions will bring out the maximum potential of your operations and helps you to ensure that your investments meet your strategic goals.

NAPCON Controller
NAPCON Optimizer
NAPCON Advisor

TRAIN

NAPCON Train solutions will bring the real life plant into the virtual world, making training operators and testing the limits of your plant safe and exciting.

NAPCON Simulator
NAPCON Games

WWW.NAPCONSUITE.COM
NAPCON@NESTE.COM
+358(0)10 458 1200